HORTICULTURAL REPORT

2012 WEED CONTROL RESEARCH ON FRUIT & VEGETABLE CROPS

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By

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WEED CONTROL IN HORTICULTURAL CROPS – 2012
FORWORD

This report summarizes the results of weed control experiments on horticultural crops in Michigan in 2011. It is intended to inform industry and university research and extension colleagues of our current results.

We greatly appreciate the support for our weed control research and extension program from commodity groups, chemical companies, MSU Extension, and the Michigan AgBio Research Station. The following companies and organizations provided financial support, chemicals, equipment, seeds, plants, research sites, or other support for our program:

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METHODS

Chemical Application

Herbicides were applied with a small plot sprayer using carbon dioxide as a source of pressure. Spray volumes are specified in each experiment. All herbicide rates are expressed as pounds of active ingredient per acre.

Visual Evaluations

In most instances, weed control ratings were made on individual weed species. General ratings for broad-leaved weeds and grasses were sometimes used in orchard studies or for late-season assessments.

Weed control and crop injury are rated on a 1 to 10 scale; 1 = no visible injury or reduction in growth; 10 = complete kill of plants. The ratings can be roughly translated into percentages as follows:

10 = 100% kill, all the plants are dead or none are visible.
9 = 90-100% kill or reduction in growth and stand.
8 = 80-90% kill or reduction in growth and stand.
7 = 70-80% kill or reduction in growth and stand.
This is a still commercially acceptable control.
6 = 60-70% kill or reduction in growth and stand.
5 = 50% kill or reduction in growth and stand.
4 = 30-40% kill or reduction in growth and stand.
3 = 20-30% reduction in growth and stand.
2 = 10-20% reduction in growth and stand.
1 = 0-10% reduction in growth, no obvious effect of herbicide.

Experimental Design and Statistical Analysis

Experiments were set up and analyzed in the program Agriculture Research Manager (ARM) version 8.3.4, from Gylling Data Management, Inc. (RR 4 405 Martin Boulevard, Brookings, SD 57006). Unless otherwise specified, the experiments were laid out as randomized complete blocks. The data were subjected to analysis of variance and the means were compared with the LSD test at the 5% level. Since data transformations were not used, the coefficient of variation for skewed ratings or weed densities may be misleading. In some instances, yields for weeded check plots may be low because of severe early weed competition. In these cases, it may be more desirable to compare new herbicides with standard treatments.

WEED LIST

Abbreviations for the common names of weeds correspond to those presented in the NCWSS proceedings volume 28 (1973), 143.

Abbr.	Common Name	Botanical Name
ALFA	alfalfa	*Medicago sativa* L.
ANBG	annual bluegrass	*Poa annua* L.
ANFB	annual fleabane	*Erigeron annuus* (L.) *Pers.*
ATRI	Atriplex	*Atriplex patula L. (Gray)*
BABR	bald brome (upright brome)	*Bromus racemosus* L.
BEGR	Bermudagrass	*Cynodon dactylon* L. *Pers.*
BFTF	birdsfoot trefoil	*Lotus corniculatus* L.
BHPL	buckhorn plantain	*Plantago lanceolata* L.
BLDO	broadleaf dock	*Rumex obtusifolius* L.
BLME	black medic	*Medicago lupulina* L.
BRFB	British fleabane	*Inula britannica* L.
BRPL	broadleaf plantain	*Plantago major* L.
BSPL	blackseed plantain	*Plantago rugelii* Dcne.
BYGR	barnyardgrass	*Echinochloa crus-galli* (L.) Beauv.
CABR	California brome	*Bromus carinatus* L.
CAGE	Carolina geranium	*Geranium carolinianam L.*
CATH	Canada thistle	*Cirsium arvense* (L.) Scop.
CAWE	carpetweed	*Mollugo verticillata* L.
CLGC	clammy groundcherry	*Physalis heterophylla* Nees.
COBD	common burdock	*Arctium minus (Hill) Bernh.*
COBU	cocklebur	*Xanthium strumarium* L.
COCW	common chickweed	*Stellaria media* (L.) Cyrillo
COGR	common groundsel	*Senecio vulgaris* L.
COLQ	common lambsquarters	*Chenopodium album* L.
COMA	common mallow	*Malva neglecta Wallr.*
COMU	common mullien	*Verbascum Thapsus* L.
COMW	common milkweed	*Asclepias syriaca* L.
COPU	common purslane	*Portulaca oleracea* L.
COPW	common pokeweed	*Phytolacca americana* L.
CORW	common ragweed	*Ambrosia artemisiifolia* L.
CRWS	creeping woodsorrel	*Oxalis corniculata* L.
CUDO	curly dock	*Rumex crispus* L.
CWBS	catchweed bedstraw	*Galium aparine* L.
DAND	dandelion	*Taraxacum officinale* Weber
DOBG	downy bromegrass	*Bromus tectorum* L.
EBNS	eastern black nightshade	*Solanum ptycanthum* Dun.
FAPA	fall panicum	*Panicum dichotomiflorum* Michx.
FIBW	field bindweed	*Convolvulus arvensis* L.
FIPA	field pansy	*Viola rafinesquii* Greene
FIPC	field pennycress	*Thlaspi arvense* L.
FISB	field sandbur	*Cenchrus incertus* M.A.Curtis
FIVI	field violet	*Viola arvensis*
GIRW	giant ragweed	*Ambrosia trifida* L.
GOGR	goosegrass	*Eleusine indica* (L.) Gaertn.
GORO	goldenrod	*Solidago nemoralis* Ait.
GIFT	giant foxtail	*Setaria faberi* Hermm.
GRFT	green foxtail	*Setaria viridis* (L.) Beauv.
GFPW	greenflower pepperweed	*Lepidium densiflorum* Schmd.
HABC	hairy bittercress	*Cardamine hirsute* L.
HANS	hairy nightshade	*Solanum sarrachoides* Sendtner

WEED LIST

Abbr.	Common Name	Botanical Name
HEMU	hedge mustard	*Sisymbrium officinale (L.) Scop.*
HOAL	hoary alyssum	*Berteroa incana* (L.) DC.
HONE	horsenettle	*Solanum carolinense* L.
HOWE	horseweed (marestail)	*Conyza canadensis* (L.) Scop.
IRFB	Irish fleabane	*Inula salicina*
JIWE	jimsonweed	*Datura stramonium* L.
LACG	large crabgrass	*Digitaria sanguinalis* (L.) Scop
LATH	ladysthumb	*Polygonum persicaria* L.
MATA	marestail (horseweed)	*Conyza canadensis* (L.) Scop.
MAYC	marsh yellowcress	*Rorippa islandica* (Oeder) Barbs
MECW	mouseear chickweed	*Cerastium vulgatum* L.
MECR	mouseear cress	Arabidopsis thaliana(L.) Heynh
MONO	monolepis	*Monolepis nuttaliane* Greene
MUTH	musk thistle	*Carduus nutans* L.
MWCH	mayweed chamomile	*Anthemis cotula* L.
NLLQ	narrowleaf lambsquarters	*Chenopodium desiccatum* A. Nels
OEDA	oxeye daisy	*Chrysanthemum leucanthemum* L.
ORGR	orchardgrass	*Dactylis glomerata* L.
PAWE	pineappleweed	*Matricaria matricariodes* (Less)C.L.Porter
PEST	perennial sowthistle	*Sonchus arvensis L.*
PESW	Pennsylvania smartweed	*Polygonum pennsylvanicum* L.
PERG	perennial ryegrass	*Lolium perenne* L.
POAM	Powell amaranth	*Amaranthus powellii S. Wats*
POIV	poison ivy	*Rhus radicans* L.
PRKW	prostrate knotweed	*Polygonum aviculare* L.
PRLE	prickly lettuce	*Lactuca serriola* L.
PRPW	prostrate pigweed	*Amaranthus blitoides* S. Wats.
PUDN	purple deadnettle	*Lamium purpureum* L.
PUSW	purslane speedwell	*Veronica serpyllifolia* L.
PUVI	puncturevine	*Tribulus terrestris* L.
QUGR	quackgrass	*Agropyron repens* (L.) Beauv.
RECL	red clover	*Trifolium pratense* L.
REFE	red fescue	*Festuca rubra* L.
RESO	red sorrel	*Rumex acetosella* L.
ROCI	rough cinquefoil	*Potentilla norvegica L.*
ROFB	rough fleabane	*Erigeron strigosus* Muhl. ex Willd.
RRPW	redroot pigweed	*Amaranthus retroflexus* L.
RSFI	redstem filaree	*Erodium cicutarium* (L.) L'Hér. ex Ait.
RUTH	Russian thistle	*Salsola iberica* L.
SFGE	smallflower geranium	*Geranium pusillum*
SHPU	shepherdspurse	*Capsella bursa-pastoris* (L.) Medic.
SPKW	spotted knapweed	*Centaurea biebersteinii* DC.
SPSP	spotted spurge	*Euphorbia maculata L.*
STGR	stinkgrass	*Eragrostis cilianensis* (All.) E. Mosher
SWSW	swamp smartweed	*Polygonum coccineum* Muhl. ex Willd.
TAFE	tall fescue	*Festuca arundinacea* Schreb.
TLSW	thymeleaf sandwort	*Arenaria serpyllifolia* L.
TRCV	trailing crownvetch	*Coronilla caria L.*
TUPW	tumble pigweed	*Amaranthus albus* L.
VELE	velvetleaf	*Abutilon theophrasti* Medic.

WEED LIST

Abbr.	Common Name	Botanical Name
VICR	Virginia creeper	*Parthenocissus quinquefolia* (L.) Planch.
VIPW	Virginia pepperweed	*Lepidium virginicum* L.
VOAS	volunteer asparagus	*Asparagus officinalis* L.
WESA	western salsify	*Tragopogon dubius* Scop.
WHCA	white campion	*Silene latifolia Poir.*
WHCL	white clover	*Trifolium repens* L.
WIBW	wild buckwheat	*Polygonum convolvulus* L.
WICA	wild carrot	*Daucus carota* L.
WICH	wild chamomile	*Matricaria chamomilla* L.
WIGR	witchgrass	*Panicum capillare* L.
WIMU	wild mustard	*Sinapis arvensis* L.
WIRA	wild radish	*Raphanus raphanistrum* L.
WLDGRP	wild grape	*Vitis* sp.
WLDRASP	wild raspberry	*Rubus* sp.
YEFC	yellow fieldcress (kiek)	*Rorippa sylvestris* L.
YEFT	yellow foxtail	*Setaria glauca* (L.) Beauv.
YEHW	yellow hawkweed	*Hieracium caespitosum Dumort.*
YENS	yellow nutsedge	*Cyperus esculentus* L.
YERO	yellow rocket	*Barbarea vulgaris* R. Br.

CHEMICAL LIST

COMMON NAME	TRADE NAME	FORMULATION	MANUFACTURER
2,4-D amine	Weedar 64	3.8 L	Nufarm Inc.
acetochlor	Harness	7.0 E	Monsanto
acetochlor	Surpass	6.4 E	Dow Agrosciences
acifluorfen	Ultra Blazer	2 L	United Phosphorus
atrazine	Aatrex	4 L	Syngenta
bensulide	Prefar	4 EC	Gowan
bentazon	Basagran	4 L	Arysta
bromoxynil	Buctril	4 EC	Bayer CropScience
carfentrazone	Aim	2.0 EC	FMC
chlorimuron-ethyl	Classic	25 WDG	DuPont
clethodim	Intensity One	0.97 EC	CPS
clethodim	Select Max	0.97 EC	Valent
clomazone	Command	3 ME	FMC
clopyralid	Stinger	3 EC	Dow Agrosciences
cloransulam-methyl	Firstrate	84 WDG	Dow Agrosciences
cycloate	Ro-Neet	6 EC	Helm Agro
dicamba	Clarity	4 L	BASF
diclobenil	Casoron G	4 G	Chemtura
diflufenzopyr 21.4% + dicamba 55%	Distinct	76.4 WG	BASF
dimethenamid-p	Outlook	6 EC	BASF
diquat	Reglone	2 EC	Syngenta
diuron	Karmex	80 DF	DuPont
EPTC	Eptam	7 EC	Gowan
ethalfluralin	Curbit	3 EC	CPS
ethalfluralin 1.6 lb ai + clomazone 0.5 lb ai	Strategy	2.1 EC	CPS
ethofumesate	Nortron SC	4 SC	Bayer CropScience
flazasulfuron	Mission	25WG	ISK Bioscience
fluazifop-P	Fusilade DX	2 EC	Syngenta
flucarbazone	Everest	70 WDG	Arysta
flufenacet	Define	60 DF	Bayer CropScience
flufenacet 54.4% + metribuzin 13.6%	Axiom	68 DF	Bayer CropScience
flumetsulam	Python	80 WDG	Dow Agrosciences
flumioxazin	Chateau SW	51 WG	Valent
flumioxazin	Sureguard	51 WDG	Valent
fluroxypyr	Starane Ultra	2.8 L	Dow Agrosciences
fomesafen	Reflex	2 EC	Syngenta
fomesafen 10.2% + s-metolachlor 46.4%	Prefix	5.29 L	Syngenta
foramsulfuron	Option	35 WG	Bayer CropScience
glufosinate	Rely 280	2.34 L	Bayer CropScience
glyphosate	Roundup Weath. Max	5.5 L	Monsanto
glyphosate	Touchdown Total	4.17 L	Syngenta
glyphosate	Roundup Original	4 L	Monsanto
glyphosate	Roundup Ultra	4 L	Monsanto
glyphosate	Roundup Ultramax	5 L	Monsanto
glyphosate	Roundup Powermax	5.5 L	Monsanto
glyphosate	Durango	5.4 L	Dow Agrosciences

CHEMICAL LIST

COMMON NAME	TRADE NAME	FORMULATION	MANUFACTURER
halosulfuron	Permit	75 WG	Gowan
halosulfuron	Sandea	75 WG	Gowan
hexazinone	Velpar	2 L	DuPont
hexazinone	Velpar ULV	75 SG	DuPont
hexazinone + sulfometuron	Westar	75 WDG	DuPont
imazamox	Raptor	1 AS	BASF
imazapic	Plateau	70 WG	BASF
imazethapyr	Pursuit	2 EC	BASF
imazosulfuron	V 10142	75 WDG	Valent
indaziflam	Alion	1.67 CS	Bayer CropScience
isoxaben	Gallery, Trellis	75 DF	Dow Agrosciences
linuron	Lorox	50 DF	DuPont
mesotrione	Callisto	4 SC	Syngenta
metribuzin	Sencor	75 DF	Bayer CropScience
napropamide	Devrinol	50 DF	United Phosphorus
norflurazon	Solicam	80 DF	Syngenta
oryzalin	Surflan	4 AS	United Phosphorus
oxyfluorfen	Goal XL	2 L	Dow Agrosciences
oxyfluorfen	Goaltender	4 SC	Dow Agrosciences
paraquat	Firestorm	3 L	Chemtura
paraquat	Gramoxone SL	2 L	Syngenta
pelargonic acid	Scythe	4.2 EC	Gowan
pendimethalin	Prowl	3.3 EC	BASF
pendimethalin	Prowl H2O	3.8 ACS	BASF
penoxsulam + oxyfluorfen	Pindar GT	4.013 SC	Dow Agrosciences
phenmedipham	Spin-Aid	1.3 L	Bayer CropScience
phenmedipham 0.6 lb ai+ desmedipham 0.6 lb ai+	Betamix	1.3 L	Bayer CropScience
prometryn	Caparol	4 L	Syngenta
pronamide	Kerb	50 WP	Dow Agrosciences
pronamide	Kerb	3.3 SC	Dow Agrosciences
propachlor	Ramrod	4 L	Monsanto
pyraflufen-ethyl	Venue	0.17 SC	Nichino
pyrazon	Pyramin	68 DF	Arysta
pyroxasulfone	Zidua	85 WDG	BASF
quinclorac	Quinstar	3.8 L	BASF
quizalofop p-ethyl	Assure II	0.88 EC	DuPont
quizalofop p-ethyl	Targa	0.88 EC	Gowan
rimsulfuron	Matrix	25 DF	DuPont
rimsulfuron	Pruven	25 DF	MANA
saflufenacil	Treevix	70 WG	BASF
sethoxydim	Poast	1.53 EC	BASF
simazine	Princep	90 DF	Syngenta
s-metolachlor	Dual Magnum	7.62 EC	Syngenta
s-metolachlor 2.68 lb ai+ mesotrione 0.268 lb ai+ atrazine 1.0 lb ai	Lumax	3.948 L	Syngenta
s-metolachlor 3.34 lb ai+ mesotrione 0.33 lb ai	Camix	3.67 L	Syngenta

CHEMICAL LIST

COMMON NAME	TRADE NAME	FORMULATION	MANUFACTURER
s-metolachlor II	Dual II Magnum	7.64 EC	Syngenta
sulfentrazone	Spartan	4 F	FMC
sulfentrazone 3.15 lb ai+ carfentrazone 0.35 lb i	Spartan Charge	3.5 SE	FMC
sulfosulfuron	Maverick	75 WG	Monsanto
tembotrione	Laudis	3.5 SC	Bayer CropScience
terbacil	Sinbar	80 WDG	TKI
topramezone	Impact	2.8 L	Amvac
triclopyr	Garlon	3 SC	Dow Agrosciences
trifloxysulfuron	Envoke	75 WG	Syngenta
trifluralin	Treflan	4 EC	Dow Agrosciences
triflusulfuron	Upbeet	50 WDG	DuPont

ADJUVANTS

TRADE NAME	ABBREVIATION	DESCRIPTION	MANUFACTURER
Activator 90	NIS	nonionic surfactant	Loveland
ammonium nitrate		100% salt	
ammonium sulfate	AMS	spray grade fertilizer	
copper sulfate		100% salt	
Freeway		organosilicone surfactant	Loveland
Herbimax	COC	80% paraffin base petroleum oil 20% surfactant	Loveland
LI6193-11	COC		Loveland
MSO		Methylated Seed Oil	Loveland
28% Nitrogen	UAN	28% urea ammonia nitrate solution	
Silwet L-77		organosilicone surfactant	Loveland
Sylgard 309		organosilicone surfactant	DowCorning

ABBREVIATIONS USED IN THE REPORT

A =	Acre
ai =	Active Ingredient
Amt =	Amount
ACS =	Aqueous Capsule Suspension
AS =	Aqueous Solution
ASPA =	Asparagus
CEC =	Caption Exchange Capacity
CRC =	Clarksville Research Center
CS =	Capsule Suspension
CV =	Coefficient of Variability
DF =	Dry Flowable
DS =	Designator
EC =	Emulsifiable Concentrate
EPRE =	Early PRE
EPOS =	Early POST
F =	Flowable
FALL =	Fall Application
FORM =	Formulation
FM =	Formulation
FT =	Distance in FT
g / gr =	Gram
GAL =	Gallon
GPA =	Gallon per acre
GROW STG =	Growth Stage at time of Application
HTRC =	Horticulture Teaching and Research Station
IN =	Inch
KG =	Kilogram
L =	Liquid
LPRE =	Late PRE
LPOS =	Late POST
LO =	Low Odor
LSD =	Least Significant Difference
LB =	Pounds
ME =	Microencapsulated
MKTBL =	Marketable
MPH =	Mile(s) per hour
MSU =	Michigan State University
N =	No
N/A =	Not Applicable/ Not Available
No. =	Number
OM =	Organic Matter
oz =	Ounce
P =	Probability
POH =	Post Harvest
PO1 =	Postemergence 1
PO2 =	Postemergence 2
POT =	Post Transplant
PPI =	Preplant Incorporated
PRE =	Preemergence
PREC. =	Precipitation (inches)
PRT =	Pretransplant
PSI =	Pounds per square inch
PT PR =	Pint Product
QT =	Quart
QT PR =	Quart Product
RCBD =	Randomized Complete Block Design
RH =	Relative Humidity
REPS =	Replication
SE =	Suspoemulsion
SNBE =	Snapbean
SP =	Soluble Powder
SPRING =	Spring Application
STBE =	Strawberry
SURF =	Surface
T =	Temperature
TRNC =	Trevor Nichols Research Complex
TRT =	Treatment
UNMKTBL =	Unmarketable
VOAS =	Volunteer Asparagus
WDG =	Water Dispersible Granule
WG =	Water Soluble Granule
WP =	Wettable Powder
WT =	Weight
" =	Inches
Y =	Yes

TEMPERATURE AND PRECIPITATION DATA

MSU Horticulture Teaching and Research Center

Recorded at
MSU Horticulture Teaching and Research Center (HTRC)
East Lansing, Michigan
2012

APRIL				MAY				JUNE			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	54.2	34		**1**	59.2	46.8	0.01	**1**	53	46.1	0.58
2	57.4	31.1		**2**	81.3	50.3		**2**	70.2	46.1	
3	61.7	37.7	0.19	**3**	84.7	57.8	0.85	**3**	75.7	56.8	
4	60.1	35.6		**4**	78.4	55.4	0.35	**4**	71.2	52.2	
5	46.6	33.5		**5**	66.6	49.1		**5**	68.5	49.1	
6	58.1	28.4		**6**	67.3	50.1	0.28	**6**	77.5	43.8	0.01
7	63.3	26.6		**7**	69.1	50.4	0.12	**7**	78.7	51.1	
8	58.1	42.7		**8**	67.7	48.1		**8**	80.5	49.3	
9	57.6	36.8		**9**	62.5	45.9	0.02	**9**	84.5	62.7	
10	43.2	35.6		**10**	65.9	39.9		**10**	88.2	58.7	
11	54.5	33.5		**11**	73.3	38.3		**11**	80.3	64.8	0.02
12	58.9	27.4		**12**	62.4	55.2	0.32	**12**	74.5	57.7	0.02
13	62.3	28.2		**13**	72.9	49.6	0.14	**13**	72.7	47.5	
14	63.9	47.9		**14**	75.1	41.3		**14**	79	47.8	
15	73.4	55.2	0.63	**15**	79.6	44.4	0.03	**15**	85.7	53.3	
16	68.5	42	0.12	**16**	64.9	48.6	0.05	**16**	86.9	62.6	
17	54.2	33.9		**17**	69.7	35.3		**17**	80	59.6	
18	64.5	30.3		**18**	77.1	43.8		**18**	79.6	57.6	0.37
19	69.4	49.7	0.04	**19**	84.3	49.3		**19**	91.5	73.4	
20	65.4	36.7	0.19	**20**	87.4	58		**20**	90	71.3	
21	50.2	34.1		**21**	74.2	56.6		**21**	84.8	62.9	0.05
22	50.2	32.3		**22**	71	49.6		**22**	80.5	58.2	
23	56.5	34.8		**23**	77.7	41.1		**23**	82.7	52.8	
24	60.7	37.2		**24**	84.9	56.3		**24**	84.2	64.7	
25	64.2	31.4	0.01	**25**	80.1	63.7		**25**	73.8	54.7	
26	54.2	36.3	0.07	**26**	74.7	59.4	0.08	**26**	80.7	46.6	
27	55	29.7		**27**	81.1	59.4		**27**	86.7	52.7	
28	46.7	36		**28**	90.2	61.4	0.01	**28**	94.5	66.2	
29	62	24.5		**29**	81.9	63.8		**29**	87	64.5	
30	57.5	39.4	0.49	**30**	68.5	49.9		**30**	87.5	65	
				31	56.8	44.1	0.18				

TEMPERATURE AND PRECIPITATION DATA

MSU Horticulture Teaching and Research Center

Recorded at
MSU Horticulture Teaching and Research Center (HTRC)
East Lansing, Michigan
2012

JULY				AUGUST				SEPTEMBER			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	90.8	61		**1**	83.8	60.6		**1**	80.8	61.2	
2	94.7	61		**2**	89	61.7		**2**	83.2	64.2	
3	92.4	70.1		**3**	94.2	66		**3**	89.9	60.2	0.05
4	96.9	72.4		**4**	89.4	68.1	0.11	**4**	83.9	66.1	0.64
5	95.7	68.4	0.03	**5**	81.8	66.1		**5**	79	63.9	
6	100.9	68.9		**6**	83.1	50.7		**6**	83.7	63.7	
7	92.3	73.2		**7**	86.5	54.5		**7**	76.4	57.8	0.28
8	83.2	63.9		**8**	83.7	65.1		**8**	68	52.9	0.06
9	86.2	57.5		**9**	71.4	58.6	0.43	**9**	71.2	47.9	
10	82.6	61.1		**10**	62.5	57.7	0.7	**10**	74	41.8	
11	85.2	54.7		**11**	72.2	57.2	0.38	**11**	79.1	51	
12	88	53.9		**12**	76.5	55.9		**12**	82.4	55.4	
13	90.4	59.4		**13**	70.9	60	0.03	**13**	78.4	55.7	0.2
14	90.3	63.8	0.2	**14**	78	60.6	0.05	**14**	70.4	51.5	0.36
15	88.4	68		**15**	82.6	56.9		**15**	73.6	41.6	
16	92.6	65.9		**16**	75.9	60.9	0.06	**16**	76.3	47.9	
17	95.9	75.2		**17**	73.4	57.1		**17**	75.7	50.7	0.01
18	84.7	68	0.4	**18**	75.1	44.9		**18**	64.4	43.5	0.19
19	74.8	65.9	0.26	**19**	77.6	51		**19**	65	38.8	0.01
20	80.5	60	0.01	**20**	75.6	49.2		**20**	68.3	47.7	0.06
21	85.1	53.9		**21**	78.1	49.2		**21**	67.1	43.4	0.16
22	89.2	65.1		**22**	80.3	49.1		**22**	58.7	44.2	0.06
23	93.4	71.7	0.04	**23**	86.9	50.4		**23**	55.8	40.6	0.06
24	83.2	65.6		**24**	88.2	58.6		**24**	61.9	37.5	0.01
25	88.4	55.8	0.02	**25**	89.7	58.6		**25**	67.7	49.5	0.02
26	84.5	69.3	0.19	**26**	88.7	63.8	0.12	**26**	71.3	49.6	0.01
27	79.3	65.7		**27**	84.4	67.9	0.2	**27**	65	47.2	
28	80.9	59.9		**28**	78.9	58.6		**28**	69.2	45.7	
29	85.5	53.8		**29**	81.2	50.7		**29**	71.7	40.3	
30	87.6	59.6		**30**	84.2	51.6		**30**	64.4	44.8	
31	85.4	62.7	0.31	**31**	90.9	68.1					

TEMPERATURE AND PRECIPITATION DATA

MSU Muck Soils Research Station

Recorded at
MSU Muck Soils Research Station (Muck Farm)
Laingsburg, Michigan
2012

APRIL				MAY				JUNE			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	53	34.3		1	57.2	46.6	0.01	1	53.4	45.5	0.73
2	57.4	30.5		2	81.5	48.4		2	69.8	46	0.02
3	60.5	39.7	0.35	3	86	58.7	1.02	3	76.3	51.6	
4	59.9	34.4		4	75	55.4	0.16	4	71.1	42.5	
5	44.7	33.3		5	66.9	48.2		5	67.5	41.3	
6	57.7	26.1		6	68.2	50.2	0.2	6	78.1	38	
7	62.8	28.9		7	63.8	50.5	0.37	7	80.4	43.7	
8	57.6	43.6	0.01	8	67.5	48.8		8	82	42.8	
9	57	36.9		9	61.2	43.2	0.09	9	86	55.9	
10	43.5	35.7		10	65.6	35.8		10	89.6	52.2	
11	54.5	33.2		11	74	37		11	81	60.4	
12	56.2	29.3		12	62.6	54.1	0.34	12	74.6	56	0.03
13	62.3	29.1		13	71.5	46.6	0.01	13	72	36.5	
14	64.8	49.6		14	75.2	39.7		14	81.1	41.1	
15	74.3	55.9	0.69	15	80.4	41.4	0.01	15	88.2	48.2	
16	69	42	0.15	16	64	43.6	0.03	16	90	61	
17	53.6	33.8		17	66.8	33.4		17	80.8	54.7	
18	64.7	32		18	77.4	42.6		18	81.2	51.1	0.33
19	66.9	49.5	0.03	19	84.9	45.5		19	94.1	70.2	
20	65.2	37.7	0.24	20	87.2	55.6		20	92.5	64.6	
21	48.3	34.2		21	73.6	53.3	0.01	21	86.5	57.2	0.01
22	48.5	29.7		22	70.2	47.1		22	81.5	50.4	0.01
23	55.3	34.8		23	78	39.5		23	83.6	46.3	
24	59.7	37.9		24	84.5	57.9		24	86.3	61.7	
25	63.3	31.7	0.1	25	80.5	57.7		25	74.9	48.1	
26	52.4	36.9	0.05	26	76.3	58	0.03	26	81.7	40	
27	55	28.6		27	80.7	58.6		27	88.9	46.5	
28	47	35.5		28	91.9	62.8		28	96.9	59.5	
29	61.6	25.5		29	82.4	56.4		29	88.2	58.8	
30	56.9	38.9	0.67	30	71.3	43.9		30	90.8	56.9	
				31	58.6	43	0.16				

TEMPERATURE AND PRECIPITATION DATA

MSU Muck Soils Research Station

Recorded at
MSU Muck Soils Research Station (Muck Farm)
Laingsburg, Michigan
2012

JULY				AUGUST				SEPTEMBER			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. In.	Date	High Temp F	Low Temp F	Total Prec. in.
1	89.8	54		1	83.2	50		1	83.9	55.3	
2	95.5	54.6		2	88.2	54.6		2	85.7	59.3	
3	94.3	66.8		3	93.9	61.5		3	92.1	53.1	
4	98.9	67.8		4	90.1	61.1	0.02	4	83.6	61.7	0.93
5	94.3	67.2	0.93	5	82.5	51.9	0.01	5	82.6	58.5	
6	100.6	66		6	83.9	41.9		6	86.3	54.4	
7	90.1	70.5		7	86.9	45.5		7	77.3	51.1	0.32
8	82.2	59.3		8	83.7	55.7		8	69.1	46.6	0.08
9	86.3	52.8		9	66.9	58.3	0.28	9	72	40.6	
10	83.8	50.4		10	62.8	57.6	0.07	10	75.3	34.2	
11	85	47.7		11	73.3	57	0.01	11	81.5	40.3	
12	88.3	47.7		12	79	48.2	0.01	12	85.4	52.4	
13	91.4	52.7		13	73.2	56.5	0.02	13	82.2	54.4	0.22
14	91	62.9	0.2	14	79.8	55.4	0.05	14	73.7	42	0.31
15	89.2	65.9	0.03	15	84	51.9		15	74.5	34.1	
16	94.2	59.1		16	78.2	55.2	0.09	16	78.4	40.8	
17	96.2	68		17	75.1	47.1	0.01	17	77.6	43.2	
18	82.9	68.1	0.43	18	77.3	37.7		18	64.4	36	0.14
19	73.5	65.5	0.29	19	79.9	45.5		19	67.4	30.1	
20	79.9	54.2	0.01	20	76.4	42.5		20	69.4	42	0.08
21	85.7	48.3		21	79.6	42		21	69.4	38	0.16
22	89.6	60.4		22	82.9	43.1		22	58.8	37.1	0.05
23	94.3	70.7	0.01	23	89.8	44.6		23	56.4	34.2	0.02
24	83.1	59.5		24	91.1	51.2		24	63.2	29.1	
25	89.2	47.8		25	93.9	53.5		25	71.6	45.4	
26	85.2	68.7	0.58	26	92.6	63.5	0.01	26	71	40.8	
27	80.2	64.5	0.42	27	87.3	62	0.14	27	66.8	35.5	
28	81.5	55.1		28	80.5	48.4		28	70.5	37.4	
29	85.2	48.8		29	82.8	43.6		29	75	33	
30	89.2	54.7		30	88.1	44.6		30	66.8	34.3	
31	84.5	62.4	0.35	31	93.1	67.4					

TEMPERATURE AND PRECIPITATION DATA

MSU Clarksville Research Center

Recorded at
MSU Clarksville Research Center (Clarksville)
Clarksville, Michigan
2012

APRIL				MAY				JUNE			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	57.7	35.5		**1**	62	46.2		**1**	49.9	42.6	1.09
2	56.8	33.2		**2**	78.7	48.5		**2**	68.9	44.7	0.01
3	63	37.9	0.52	**3**	83.5	61.4	0.13	**3**	74	53.3	
4	61	31.4	0.04	**4**	79.9	54.4	0.34	**4**	73.7	49.9	
5	47.8	31.9		**5**	59.3	47	0.01	**5**	69.4	47.4	
6	57.6	25.3		**6**	64.3	45.4	0.38	**6**	77.1	45.4	0.03
7	63	29.6		**7**	60.7	47.6	0.14	**7**	79.1	50.6	0.01
8	56	38.7		**8**	66	43.3		**8**	81	50.8	
9	55.6	34.8		**9**	61.2	43.3	0.01	**9**	85.1	62	
10	39.2	32.7		**10**	64.4	36.7		**10**	89.1	60.6	
11	55.8	29.7		**11**	73.5	38.8		**11**	82.8	65.2	
12	55.7	26.6		**12**	62.8	54	0.13	**12**	72	51.7	
13	62	29.2		**13**	71.8	48.1	0.01	**13**	73.2	41.9	
14	62.3	48.6		**14**	74	41.7		**14**	80.8	46.1	
15	71.2	54.3	0.42	**15**	79.6	45.6	0.14	**15**	88.8	55	
16	68.2	37.9	0.12	**16**	64.5	41.8	0.04	**16**	88.7	61.2	
17	53.2	30.3	0.16	**17**	68.8	37.4		**17**	78.8	60.9	0.09
18	64.7	30.4	0.21	**18**	78.8	45.7		**18**	88.5	59.4	0.52
19	65.5	47.6	0.05	**19**	85.6	50.4		**19**	90.6	74	
20	49.2	36	0.25	**20**	87.9	57.5		**20**	90.5	70.5	
21	52.2	29.7	0.09	**21**	68.7	52.2	0.11	**21**	80.9	63.4	0.03
22	52.2	27.7		**22**	73.4	43.1		**22**	80.1	56	
23	56.4	32.3		**23**	78.4	44.7		**23**	81	52.5	
24	60.1	35.6		**24**	85	56.1		**24**	84.1	60.3	
25	61.2	35.1	0.05	**25**	77.3	61.9		**25**	75.9	49	
26	53.2	34.4	0.09	**26**	76.3	57.4	0.06	**26**	80.7	48.7	
27	55	24.7		**27**	83.4	58.8		**27**	87.9	51.5	
28	46	34.8		**28**	89.8	65.3		**28**	95	65.9	
29	60.5	25.8		**29**	78.1	56.9	0.16	**29**	86	64.2	
30	52.1	38.6	0.51	**30**	69.4	47.7		**30**	87.6	63.4	
				31	57.1	40.2	0.17				

3TEMPERATURE AND PRECIPITATION DATA

MSU Clarksville Research Center

Recorded at
MSU Clarksville Research Center (Clarksville)
Clarksville, Michigan
2012

JULY				AUGUST				SEPTEMBER			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	88.1	61.2		**1**	82.4	56		**1**	82.2	59.2	
2	94.1	59.6		**2**	85.7	62.1		**2**	84.5	61.1	
3	93.3	72.9	0.01	**3**	92.9	67.2		**3**	88.4	58.2	
4	97.2	72.9		**4**	90.5	65.5	0.33	**4**	82.4	65.6	0.29
5	98.3	71.7		**5**	78.2	59.7		**5**	83.3	63.5	
6	101.8	69.9		**6**	80.7	50.3		**6**	82	59.3	
7	96.5	75.2		**7**	85.7	55.5		**7**	76.2	54.4	0.15
8	86.5	64.6		**8**	83.2	60.6		**8**	67.8	49.4	0.01
9	87.4	59.6		**9**	68.8	58.1	0.6	**9**	72.2	47.9	
10	85.2	56.3		**10**	58.9	54.3	2.35	**10**	73.5	41.9	
11	87.3	55.3		**11**	72.5	56.6	0.04	**11**	79.8	50.4	
12	89.3	55.3		**12**	75.5	51.4		**12**	83.3	55.4	
13	92.7	60.2		**13**	65.4	58.4	0.07	**13**	78.5	52.2	0.04
14	92.2	67	0.05	**14**	76.1	58		**14**	71.4	44.7	0.15
15	88.9	66		**15**	82	56.3		**15**	73.1	40.6	
16	94.7	63.4		**16**	74.1	61.5	0.32	**16**	76.6	48	
17	97.6	73		**17**	70.3	50.6		**17**	76	50.1	
18	87.7	69	0.01	**18**	73.1	45.2		**18**	60.3	40.6	0.05
19	73.5	62.1	0.99	**19**	74.6	50.2		**19**	65.3	37.1	
20	82	58.9	0.53	**20**	74.9	49.5		**20**	68.3	50	0.12
21	82.5	55.7	0.03	**21**	76.6	48.2		**21**	66.1	42.8	0.13
22	87.9	65.2		**22**	79	47.7		**22**	58.4	43.2	0.12
23	91.3	69.5	0.08	**23**	84.5	53.3		**23**	55.6	38.3	0.01
24	84.5	65.7		**24**	87.5	61.6		**24**	62	37.3	
25	89.3	60.2		**25**	89.7	60.5		**25**	71.9	46.8	
26	83.7	68.3	0.63	**26**	87.7	63	0.01	**26**	71.7	47.6	
27	78.6	63.8	0.36	**27**	83.5	62.6	0.1	**27**	67.8	44.7	
28	81.7	58.3	0.06	**28**	79.8	55.9		**28**	68.6	43.8	
29	82.9	57.2		**29**	79.8	50.8		**29**	73.3	39.4	
30	86.8	58.9		**30**	83.5	53		**30**	67.3	40.7	
31	82.3	61.2	0.42	**31**	87.9	64.9					

TEMPERATURE AND PRECIPITATION DATA

MSU Trevor Nichols Research Complex

Recorded at
MSU Trevor Nichols Research Complex (Fennville)
Fennville, Michigan
2012

APRIL				MAY				JUNE			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	57.1	39.3		**1**	66.7	44.5		**1**	51.9	45.2	0.32
2	63	39.9	0.03	**2**	77.6	57.2		**2**	68.2	47.2	
3	67.9	41.5	0.33	**3**	81.8	63.8	0.39	**3**	73.9	54.9	
4	60.3	35.7		**4**	72	55.6	0.46	**4**	72.8	51.1	
5	54.2	32.5		**5**	64.5	52.7	0.18	**5**	72.4	49.1	
6	58.5	26.4		**6**	69.1	49.4	0.19	**6**	73.8	45.3	
7	61.2	29.3		**7**	57.2	47	0.35	**7**	76.3	17.2	
8	55.6	41.4		**8**	65.4	45.6	0.01	**8**	80	45.4	
9	53.9	35.7		**9**	53.9	42.7	0.01	**9**	84.2	61.4	
10	39.9	33.8		**10**	58.3	36.1		**10**	90	57.8	
11	48.7	35.1		**11**	72.3	36		**11**	84	63.3	
12	53.4	27.8		**12**	66.1	49.5	0.08	**12**	76.6	49.2	
13	63	28.8		**13**	74	43.1	0.01	**13**	72.9	42.9	
14	92.7	49.9		**14**	70.8	39.1		**14**	83.5	49	
15	73.4	56.1	0.98	**15**	78.5	45.4	0.02	**15**	90.2	54.9	
16	66.1	40.1	0.31	**16**	63.5	40.9	0.01	**16**	89.8	60.9	0.2
17	50.1	31.7		**17**	71.5	36		**17**	78.1	61.6	0.07
18	67.9	31		**18**	83.2	47.6		**18**	90.3	59.3	
19	63.8	48.1	0.09	**19**	87.3	50.8		**19**	90	76	
20	54.6	40.3	0.24	**20**	88.9	61.3	0.09	**20**	89.2	71	
21	52.9	33.5		**21**	64.8	52.7	0.31	**21**	80.6	58.5	0.06
22	54	32.7		**22**	67.6	43.9		**22**	78.5	56.1	0.05
23	50.3	33.9		**23**	81.3	42.3		**23**	83.8	52.1	
24	54.1	39.9		**24**	87.3	55.9		**24**	81.7	58.4	
25	62.2	33.5	0.1	**25**	76.6	59.3		**25**	78.4	50.3	
26	52.4	36.7	0.02	**26**	76.2	56.4	0.02	**26**	76	47.9	
27	50.1	26.4		**27**	93.5	64.7		**27**	85.3	50.4	
28	45.7	35.8	0.22	**28**	88.4	64.5		**28**	88.3	71	
29	62.2	30.7	0.05	**29**	77.8	56	0.02	**29**	87	61.3	
30	54.4	42	0.84	**30**	64.6	47.9		**30**	81.3	62.3	
				31	54.3	44.5					

TEMPERATURE AND PRECIPITATION DATA

MSU Trevor Nichols Research Complex

Recorded at
MSU Trevor Nichols Research Complex(Fennville)
Fennville, Michigan
2012

JULY				AUGUST				SEPTEMBER			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	87.5	62.7		**1**	81.3	56.2		**1**	81.2	65.4	
2	92.3	58.2		**2**	85	64.1		**2**	86.8	65.3	
3	9.5	74.2		**3**	93.9	66.8		**3**	91.6	62.7	
4	95.3	76.4		**4**	92.2	67.6	0.02	**4**	85.4	65	0.2
5	97.4	75.3		**5**	76.3	54.9		**5**	85.2	64.7	
6	98.3	69.7		**6**	79.6	49.8		**6**	81	58.3	0.03
7	88.1	73.6		**7**	58.4	56.7		**7**	80.1	56	0.04
8	85	65.2	0.08	**8**	87.7	64.1		**8**	68.7	50.5	0.03
9	83.9	60.1		**9**	70.5	60.1	0.36	**9**	74.2	52	0.39
10	86.1	56.6		**10**	60.4	53.9	1.14	**10**	74	44	
11	88.8	56.7		**11**	70.1	57.7		**11**	78.6	49.5	
12	92.4	56.6		**12**	74.4	51.1		**12**	81.2	53.9	
13	93.2	61.2		**13**	67.5	60.7	0.05	**13**	73.8	53.9	0.12
14	90.5	68.7		**14**	77.5	53.9		**14**	70.1	45.2	0.05
15	82.9	64.6	0.04	**15**	81	58.4		**15**	74.5	42	
16	92.8	62.8		**16**	75.7	63.5	0.65	**16**	74.5	47.6	
17	95.3	77.9		**17**	70.1	49.5		**17**	74.9	49.4	0.09
18	95.3	72.9		**18**	73.9	46.1		**18**	60.7	44.7	0.37
19	80.5	66.9	0.89	**19**	74	51.7		**19**	67.4	39.9	
20	84.8	62.5		**20**	77.5	49.8		**20**	66	54.9	
21	80.4	58.8		**21**	74.4	46.7		**21**	64.2	48.5	0.24
22	85.9	67		**22**	76.9	49.9		**22**	59.8	45.9	0.65
23	90.4	72	0.05	**23**	85.3	54.9		**23**	56	40.7	
24	84	64.1	0.26	**24**	89.6	60.5		**24**	63.4	39.9	
25	92.9	62.1	0.02	**25**	89.4	60.1		**25**	71.7	44.3	
26	88.2	67.9	0.14	**26**	87	64.3	0.12	**26**	71.4	47.3	
27	79.6	64.8	0.52	**27**	79.2	64.1	0.01	**27**	66.5	39	
28	82.9	58.5		**28**	82.5	55.8		**28**	70	43.9	
29	83	52.1		**29**	84.2	50.3		**29**	68.1	39.6	
30	87.8	62.7		**30**	83.4	53.9		**30**	69	43.2	
31	81.8	62.4	1.12	**31**	86.1	65.7					

TEMPERATURE AND PRECIPITATION DATA

Fremont

Recorded at
City of Fremont
Fremont, Michigan
2012

APRIL				MAY				JUNE			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	63	36.2		**1**	61.7	46.4		**1**	51.2	43.6	0.51
2	57.2	36.7		**2**	77.4	50.2	0.18	**2**	68.4	46.1	0.04
3	64.8	41.6	0.12	**3**	76.4	58.7	0.58	**3**	77	51.5	
4	62.5	30.1		**4**	69.3	57.8		**4**	77	51.8	
5	53.3	30.2		**5**	63.4	49.4	0.03	**5**	71.4	48	0.01
6	61.7	25.4		**6**	61.4	49.6	0.16	**6**	79.2	46.3	
7	60.5	27.6	0.01	**7**	56.9	46.4	0.06	**7**	80.6	47.8	0.02
8	57.6	40.5	0.05	**8**	66	42.5		**8**	80.9	46.5	
9	55.1	31.8		**9**	60.1	44.3		**9**	83.4	63.8	
10	40.8	32.7		**10**	65.9	37.2		**10**	87.4	57.6	
11	55.9	31		**11**	71	35.4		**11**	82.5	68.6	
12	57	25.1		**12**	72	55.4		**12**	73.3	50.3	
13	63.1	29.4		**13**	76	43.6		**13**	74.2	40.7	
14	59.6	50.3		**14**	74.5	37		**14**	80.5	48.3	
15	69.9	55	1.03	**15**	77.7	43.8	0.27	**15**	89	58.2	
16	66.6	37.8	0.03	**16**	63.7	41.6		**16**	88.1	63.6	0.26
17	51.1	34.1		**17**	70.6	35.3		**17**	78.9	60.8	0.37
18	62.6	30.2		**18**	78.5	49.7		**18**	85.9	59.9	1.15
19	64.3	40.8	0.3	**19**	84.6	52		**19**	85.9	70.9	0.06
20	47.4	39.3	0.36	**20**	87.3	64	0.03	**20**	86.5	71.5	
21	57.2	31.1		**21**	69.1	46.7	0.02	**21**	78.9	62.6	0.38
22	57.5	28.9		**22**	75.9	44.2		**22**	78.5	55.9	
23	55.9	34.1		**23**	78	44.8		**23**	80.8	50.5	
24	60.1	38.9		**24**	84.6	59.8		**24**	81.7	59.4	0.02
25	62.4	32	0.02	**25**	60.4	60.4	0.01	**25**	76.7	51	
26	50.8	34.2	0.17	**26**	57.4	57.4	0.1	**26**	78.3	46.1	
27	55.5	24.2		**27**	59.8	59.8		**27**	82.4	50.1	
28	49	34.3		**28**	64.7	64.7	0.35	**28**	92.3	61.2	
29	63.6	26.3	0.02	**29**	55.7	55.7	0.01	**29**	87.3	62.8	
30	55.7	41.8	0.06	**30**	44.4	44.4		**30**	87.9	61.1	
				31	42.1	42.1	0.01				

TEMPERATURE AND PRECIPITATION DATA

Fremont

Recorded at
City of Fremont
Fremont, Michigan
2012

JULY				AUGUST				SEPTEMBER			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	90.3	59.8		**1**				**1**	80.1	54.2	
2	92.9	59.3		**2**				**2**	85.3	63.4	
3	87.5	70.8	0.16	**3**	91.5	65.3		**3**	89.9	60.1	
4	92.4	70.4		**4**	88.7	66.8	0.04	**4**	86.6	65.5	0.26
5	97.2	71.7	0.01	**5**	75.1	56		**5**	82.9	61.8	0.11
6	99.6	70.2		**6**	76.9	50.8		**6**	81.4	54.4	
7	92.3	71		**7**	83.1	55.2		**7**	72.1	53.3	0.3
8	86.1	61.7		**8**				**8**	66.9	49.1	0.04
9	87.2	58.8		**9**				**9**	71.6	48.6	0.03
10	86.8	53.5		**10**				**10**	70.9	42.7	
11	85.7	55.9		**11**				**11**	75.9	49.2	
12	90.8	55.6		**12**				**12**	81.2	58.2	
13	92.4	58.7		**13**				**13**	72.7	52.8	0.09
14	89.9	69.3		**14**	75.7	53	0.01	**14**	71.2	44	
15	90.5	67		**15**	80.1	56		**15**	73.4	39.7	
16	92	62.9		**16**	72	61.7	0.45	**16**	74.6	46	
17	94.8	68.7	0.12	**17**	69.7	50.1		**17**	72.7	48.4	0.28
18	87.3	67.9	0.46	**18**	71.3	45.2	0.2	**18**	58.1	43.2	0.05
19	73.7	62	0.84	**19**	74.5	46.3	0.11	**19**	64.2	32.3	0.03
20	84.3	57.3		**20**	75.3	46.8		**20**	64.9	46.4	0.13
21	81.6	57.4		**21**	77	46.1		**21**	63.1	41.6	
22	87.3	65		**22**	77.7	50.2		**22**	59.5	40.8	0.23
23	90.4	71.5		**23**	82.9	52.2		**23**	54.5	35.2	
24	86.9	64.1		**24**	87.2	60.5		**24**	62.3	34.2	
25	78.6	61.2		**25**	88.9	60.1		**25**	71.1	50.4	
26	84.2	69	1.1	**26**	84.2	63.1	0.46	**26**	68.7	45.8	
27	79.4	61.9	0.45	**27**	83.7	60		**27**	65.2	44.3	
28	83.1	57.2		**28**	80	55.1		**28**	70.1	43.6	
29	83	51.2		**29**	82.9	51.4		**29**	74.2	39.8	
30	85.5	61.1		**30**	80.7	54.6		**30**	69.6	42	
31				**31**	84.8	63.6					

TEMPERATURE AND PRECIPITATION DATA

Hart

Recorded at
Asparagus Research Farm
Hart, Michigan
2012

APRIL				MAY				JUNE			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	56.8	33.9		**1**	64	43.5		**1**	52.6	43.5	0.35
2	58.8	37.1		**2**	74.9	50.9	0.34	**2**	65.7	47.2	0.07
3	59.6	39.8	0.19	**3**	73.8	55.2	0.38	**3**	76.6	50.4	
4	59.1	30		**4**	72.4	53.9		**4**	71.6	51.2	
5	50.7	28.6		**5**	66.4	49.1	0.02	**5**	73	47	
6	54.2	23.1		**6**	59.9	51.6	0.18	**6**	73.3	46.9	
7	60.1	28.2	0.07	**7**	59	44.1	0.01	**7**	77.3	43.8	
8	57.3	41.5	0.04	**8**	65	39.6	0.05	**8**	81.7	52.1	
9	53.8	34.3		**9**	58.6	40.6		**9**	84.8	68.8	
10	41.7	33		**10**	62.1	31.7		**10**	88.5	60	
11	50.7	30.6		**11**	71.6	38		**11**	85.2	69.5	
12	55.9	23.6		**12**	68.1	48.4		**12**	70.7	46.5	
13	62.4	27.2		**13**	69.9	37.2		**13**	71.2	39.2	
14	63.6	50.3		**14**	74.3	35.9		**14**	81.3	48.8	
15	69.4	55.9	1.02	**15**	78.5	50.8	0.06	**15**	89.2	58.5	
16	67	38.3	0.03	**16**	63	37.2		**16**	89	65.6	0.01
17	47.1	31.3		**17**	70.1	36.4		**17**	77.8	63.2	0.63
18	61.8	30.8		**18**	77.6	50.1		**18**	85.9	63	1.06
19	46.8	40.9	0.47	**19**	84.5	56.7		**19**	86.2	69.6	0.13
20	53.2	39.3	0.44	**20**	87.9	65.2	0.02	**20**	87.1	74.9	
21	54.6	27.4		**21**	65.9	48.6	0.09	**21**	80.3	61.7	0.09
22	54.2	28		**22**	68.3	40.1		**22**	76.4	54	
23	58	31.6		**23**	75.9	43.8		**23**	79.1	49.4	
24	64.6	39		**24**	85.4	57.5		**24**	77.7	59.6	0.1
25	48.1	31.7	0.14	**25**	80	58.8		**25**	73.5	46.1	
26	48.3	31.2		**26**	77.6	56	0.55	**26**	74.9	44.9	
27	49	21.7		**27**	80.4	59.4	0.07	**27**	82.7	50.8	
28	61.7	30.4		**28**	86	61.9	0.07	**28**	91.4	67.4	
29	55.2	24.5		**29**	73.8	50.8		**29**	86.1	59.3	
30	64	41.9	0.14	**30**	62.1	42.6		**30**	86.9	60.6	
				31	56.8	41.1					

TEMPERATURE AND PRECIPITATION DATA

Hart

Recorded at
Asparagus Research Farm
Hart, Michigan
2012

JULY				AUGUST				SEPTEMBER			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	88.2	59.6		**1**	80.9	55.6		**1**	82.7	50.3	
2	93.1	60.4		**2**	79.1	68.1	0.15	**2**	85.7	60	
3	91.7	72.6	0.01	**3**	89.9	66.6		**3**	87.5	60.2	
4	93.3	76.9		**4**	89.1	68.1		**4**	83.9	63.4	0.02
5	97.4	70.1	0.01	**5**	73.8	55.4		**5**	85	57.8	
6	95.9	69.8		**6**	79.1	51.8		**6**	79.1	51.9	
7	87	66		**7**	81.5	56.3		**7**	70.2	51.4	0.18
8	83.3	59.1		**8**	81.2	56.6		**8**	66.8	50.3	0.13
9	83.2	56.5		**9**	68.3	58.5	0.18	**9**	71.8	47.3	0.01
10	79	51.1		**10**	65	58.4	0.03	**10**	73.5	44.2	
11	84.1	54.2		**11**	75.3	56.8		**11**	76.7	50.8	
12	89.1	55		**12**	76.9	47.9		**12**	81.6	66.3	
13	93.6	62.6		**13**	70.7	58.1	0.03	**13**	71	50.3	0.04
14	88.6	69.9	0.02	**14**	75.9	53		**14**	70	40.5	0.01
15	83.8	63.7		**15**	82.2	54.9		**15**	73.4	39.9	
16	94.1	63.4		**16**	71.1	64.1	0.6	**16**	76.3	47	
17	92.2	66.8	0.63	**17**	67.1	49.1		**17**	75.6	51.6	1.01
18	83.4	67.4	1.63	**18**	72.8	48.5		**18**	57.9	45.9	0.21
19	73.3	62.3	0.78	**19**	72.8	49.1		**19**	63.9	33.1	0.13
20	81.5	55.9		**20**	73.2	46.7		**20**	64.1	48.1	
21	81.8	58.9		**21**	76.1	47.4		**21**	62.4	40.5	0.21
22	87.8	66.9		**22**	78.9	50.8		**22**	59	41.6	0.11
23	91.4	73.6		**23**	83.6	55.4		**23**	55.2	40.8	0.01
24	85.6	61.1		**24**	86.4	66.9		**24**	62.7	37	
25	86.7	59.6	0.04	**25**	90.6	63.9		**25**	68.8	48.1	
26	80.7	66.7	0.59	**26**	84.1	67.3	0.17	**26**	64.3	39.3	
27	77.7	62.4	0.17	**27**	80.2	57.8		**27**	65.8	44	
28	78.1	53		**28**	76.8	53.4		**28**	65.5	40.3	
29	83.4	50.3		**29**	80.7	52.8		**29**	72.9	39.2	
30	85.6	61.3	0.07	**30**	82.7	59.7		**30**	67.4	40.1	
31	79.4	61.6	0.85	**31**	81.8	60.2					

TEMPERATURE AND PRECIPITATION DATA

Hudsonville

Recorded at
Michigan Celery Cooperative
Hudsonville, Michigan
2012

APRIL				MAY				JUNE			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	55.6	40	0.02	**1**	65	46.5		**1**	52	44.8	0.28
2	60.2	39.5		**2**	77.2	52.9		**2**	70.5	45.3	0.01
3	66	43	0.01	**3**	82.7	64.8		**3**	75.4	53.1	
4	64.2	33.3		**4**	77.8	58.9	1.34	**4**	74.4	54.5	
5	51.4	36.6		**5**	60.	51.9	0.05	**5**	70.9	51.7	
6	58.3	27.4	0.01	**6**	65.7	50.3	0.9	**6**	77.8	46	
7	63	28	0.01	**7**	56.4	47.3	0.32	**7**	78.3	48.6	
8	57.6	40.2	0.01	**8**	64.8	45.3	0.2	**8**	80.8	46.5	
9	56.1	38.2		**9**	60.1	42.9		**9**	83.9	60.5	
10	41.2	32.3	0.02	**10**	63	34.9		**10**	89.3	61.3	
11	53.5	32.2		**11**	72.4	38		**11**	83.5	69.4	
12	55.3	26.1		**12**	63.6	53.2	0.02	**12**	74.1	51.2	
13	64.3	28		**13**	73.8	46.4		**13**	75.7	44.7	
14	64	50.3		**14**	72.1	38.7		**14**	81.8	51.3	
15	74	56	0.31	**15**	77.3	46.9	0.1	**15**	88.7	60.1	
16	65.6	39.2	0.37	**16**	65.3	43.2	0.04	**16**	89.3	66.6	0.06
17	50.2	31.9		**17**	70.4	36.6		**17**	78.6	62.5	0.1
18	67.4	31.3		**18**	79.8	50.1		**18**	90.9	61.9	0.05
19	65.2	51.3	0.08	**19**	86.2	51.3		**19**	90.8	76.7	
20	54	40.8	0.16	**20**	88.5	62.1	0.4	**20**	90.9	72.5	
21	55.8	32.5		**21**	68.5	52.9	0.13	**21**	79.3	60.5	0.02
22	56.2	31.1		**22**	72.6	42.2		**22**	80.6	54.7	
23	58	32.9		**23**	79	43.6		**23**	82.8	50.9	
24	58.7	33.1		**24**	85.3	61.6		**24**	84.9	84.9	
25	61.7	33.1	0.04	**25**	76.2	60.4	0.04	**25**	78.1	78.1	
26	55	34.5		**26**	76.6	58.1	0.04	**26**	80.4	80.4	
27	52.7	25.4		**27**	86.7	63.1		**27**	87.4	87.4	
28	47.7	35.2	0.02	**28**	89.1	68.4		**28**	92.3	92.3	
29	62.3	28.1	0.01	**29**	77.2	56.9	0.45	**29**	88	88	
30	53.7	42.2	0.42	**30**	66.8	49.1		**30**	85.2	85.2	
				31	56.3	44.9	0.11				

TEMPERATURE AND PRECIPITATION DATA

Hudsonville

Recorded at
Michigan Celery Cooperative
Hudsonville, Michigan
2012

JULY				AUGUST				SEPTEMBER			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	89.5	61.4		**1**	85.3	55.2	0.01	**1**	81.3	66.7	0.01
2	94.5	58.1		**2**	87.9	66		**2**	85.7	66.9	
3	92	75.3		**3**	96.2	65.7		**3**	91.2	63.9	
4	96.5	73.7		**4**	92.5	68.2	0.02	**4**	88.7	67.5	0.87
5	98.5	74.9		**5**	79.4	56.4		**5**	84.8	66.1	0.03
6	101.8	71		**6**	83.5	49.5		**6**	82.9	59.3	
7	94.4	75		**7**	88	59.5		**7**	77.8	56.6	0.05
8	88.1	68.6		**8**	87.2	66		**8**	68.7	50.4	0.04
9	88.2	61.3		**9**	70.5	60	0.3	**9**	73.6	48.7	0.04
10	87.	56.1		**10**	60.6	55.7	1.18	**10**	74.3	43.6	
11	90.2	56.9		**11**	80	57		**11**	79.1	50.8	
12	91.1	55.9		**12**	77.5	50.5		**12**	83	59.2	
13	91.4	60.6	0.18	**13**	69.2	61.4	0.02	**13**	74.3	53.9	0.11
14	92.7	69.5		**14**	78.5	57.8	0.01	**14**	71.6	45.3	0.04
15	86.9	67.6		**15**	82.7	56.5		**15**	76.5	41.4	
16	94.6	62.8		**16**	76.7	61.8	0.24	**16**	77.1	50.1	
17	96.8	75.4		**17**	70.8	50.4		**17**	77.2	50.8	0.09
18	92.5	73.1		**18**	74.3	44.9		**18**	61.9	44.3	0.04
19	78.8	65.3	0.44	**19**	76.2	49		**19**	67.7	37.7	
20	84.5	62.8		**20**	77.1	49.4		**20**	67.8	48.6	0.04
21	83.6	58.1		**21**	77.9	46		**21**	65.2	44.3	0.18
22	88.8	67		**22**	80.8	48.9		**22**	60.9	42.4	0.35
23	91.9	73.1	0.08	**23**	88	55		**23**	54.5	40.8	0.01
24	88	64.1		**24**	90.4	60.9		**24**	63	40.7	
25	92.6	62.2		**25**	92.2	60.5		**25**	72.8	49.6	
26	85.8	68.2	0.3	**26**	88.1	64.9	0.06	**26**	72.2	48.5	
27	82	64		**27**	85.7	62	0.12	**27**	66.3	43.6	
28	85.1	57		**28**	82.9	54		**28**	71.1	45	
29	86.3	52.1		**29**	83.9	52.1		**29**	74.1	39.3	
30	90.5	59		**30**	87.4	54.1		**30**	68.6	44.2	
31	86.7	63.7	0.25	**31**	87.3	66.7					

TEMPERATURE AND PRECIPITATION DATA

Imlay City

Recorded at
Lapeer USDA/NRCS Office
Lapeer, Michigan
2012

APRIL				MAY				JUNE			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	50.6	34.9		**1**	56.3	46.4	0.03	**1**	56.2	46.4	0.69
2	55.1	29		**2**	84.5	47.6		**2**	69.2	45.7	0.21
3	61.9	32.9		**3**	89.1	52.3	1.1	**3**	76.1	50.1	0.02
4	59.1	30.5		**4**	74	51.7	0.05	**4**	69	45.8	
5	45.9	28		**5**	64.8	47.8		**5**	69.2	48.1	
6	59	23		**6**	68.2	42.4		**6**	78.9	42.2	
7	66.4	24.2		**7**	57.3	48.7	0.43	**7**	81.6	46.7	
8	61.2	39.2		**8**	73.3	51.4	0.01	**8**	82.6	48.3	
9	62.1	31.9		**9**	63.3	42.2	0.25	**9**	87.3	62.9	
10	46.4	32.1		**10**	65.7	37.2	0.01	**10**	89.3	55.1	
11	54.3	31.3	0.04	**11**	75.7	36.5		**11**	78.6	60.8	0.02
12	60	23.4		**12**	66.3	51.4	0.29	**12**	77.1	55.7	0.03
13	66.9	26.2		**13**	74.3	47	0.19	**13**	69.8	41.5	
14	68.8	45.9		**14**	77.9	40.9		**14**	78.6	39	
15	74.5	54.7	0.39	**15**	82.5	42.6	0.05	**15**	84.4	53.7	
16	71.2	41.8		**16**	65.6	43.4	0.11	**16**	84.7	58.6	
17	56.3	31.4		**17**	69.9	33.4		**17**	79.6	58.8	0.01
18	62.9	27.7		**18**	75.4	42.4		**18**	81.7	51.9	0.08
19	72.6	43.5		**19**	86.7	45.8		**19**	93.4	74.4	
20	72.7	35.6	0.43	**20**	88.2	50.5		**20**	90.2	69	
21	51	30.3		**21**	77.6	54.5	0.17	**21**	89.9	63.2	0.01
22	50	27.2		**22**	69.6	48		**22**	83.3	56.4	0.01
23	55.6	36		**23**	78	41.3		**23**	83.5	49.5	
24	59.8	36.2		**24**	84.2	53.7		**24**	85.9	61.5	
25	67.3	26.9		**25**	84.3	59.5	0.01	**25**	72.9	49.4	
26	53.5	36.6		**26**	75.8	57.4	0.12	**26**	82.2	44.4	
27	56.3	24.8		**27**	79.4	56.2	0.46	**27**	87.9	50.1	
28	48.3	27.2		**28**	90.5	62.2		**28**	98.3	58.1	
29	62.2	19.2		**29**	80.8	61		**29**	91.2	65.8	
30	50.6	38.1	0.44	**30**	70.6	46.7		**30**	93.3	60.9	
				31	62.6	45.9	0.13				

TEMPERATURE AND PRECIPITATION DATA

Imlay City

Recorded at
Lapeer USDA/NRCS Office
Lapeer, Michigan
2012

JULY				AUGUST				SEPTEMBER			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	91.6	57.2		1	84	56.2		1	83.2	54.5	
2	95.7	56.4		2	86.1	55.7		2	82.3	55	
3	86.8	65.4	0.57	3	89.3	65.2	0.49	3	88	52.4	
4	96.9	70.4		4	86.9	63.3	0.08	4	83.5	61.6	0.84
5	91.3	69.3	0.54	5	81.9	56.4		5	81.1	57.5	0.01
6	99	69.2		6	82.8	48.3		6	84.6	55.8	
7	88.4	65.2		7	87.4	48.7		7	77.7	53.5	0.66
8	81.8	57		8	82.3	58.3		8	71.9	54	0.35
9	87	54.6		9	65.9	60	0.58	9	70.3	42.9	
10	83.8	53.1		10	68.7	59.4	1.18	10	73.8	40	
11	85.3	49.9	0.06	11	70.7	58.5	0.08	11	79.7	42.3	
12	89.1	49.3		12	78.9	55.5		12	82.9	50.4	
13	91.5	56.7		13	77.3	58.4		13	82.4	51.2	
14	88.8	60.5		14	80.2	56.7	0.17	14	71.5	46.4	0.71
15	92.1	67.3		15	82.8	55.1		15	71.9	39.4	
16	95.7	59.9		16	79.4	55	0.03	16	79.2	42.4	
17	99.5	72.7		17	74.4	52.1		17	77.1	45.3	
18	86.1	68	0.05	18	76.4	41.3		18	64.5	41.1	0.11
19	71	62.8	1.15	19	78.3	46.7		19	65.3	32.3	
20	79.3	56.2	0.01	20	76	47.5		20	71.5	45.9	0.04
21	86.9	50.8		21	79.1	43.9	0.02	21	70.2	39.6	0.12
22	90.2	62.9		22	81.6	46.4		22	59.2	40.7	0.01
23	94.6	70.9		23	86.7	46.5		23	57	35.5	0.02
24	81.7	54.6		24	87.1	52.3		24	62.8	28.8	
25	85.7	49.3		25	90.4	54.9		25	73.1	46.4	
26	82.9	67	1.38	26	87.7	57.6	0.03	26	71.8	42	
27	77.3	63.5	0.08	27	85.2	62.7	0.61	27	67	34.5	
28	82.7	57.4		28	78.8	54.6		28	69.6	41.3	
29	85.1	51.6		29	80.2	48.2		29	72	37.1	
30	86.9	56.3		30	83.3	47.5		30	66	35.9	
31	84.7	61.7	0.21	31	91.8	65					

TEMPERATURE AND PRECIPITATION DATA

Momence

Recorded at
Stelle, Illinois Climate Network Station
Stelle, Illinois
2012

APRIL				MAY				JUNE			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	78.2	45.5	0.68	**1**	67.8	49.9	0.29	**1**	64.8	54.8	0.03
2	69.2	45.9	0.03	**2**	80.2	55.6	0.03	**2**	71.5	59.7	
3	85.6	47.8	0.12	**3**	84.2	62.2	0.02	**3**	81.1	59.8	0.05
4	63.5	41.9	0.01	**4**	79.7	53.	0.17	**4**	78.8	59.8	0.05
5	55.8	34.6		**5**	77.2	53.2	0.03	**5**	73.5	59.9	
6	60.5	30.1		**6**	81.7	56.5	1.62	**6**	76.2	63.8	
7	67.6	31.4	0.01	**7**	65.5	51.5	2.01	**7**	82.0	67.0	
8	66.8	41.2	0.01	**8**	67.7	49.4		**8**	85.8	69.9	
9	65.3	39.4		**9**	64.7	40.0		**9**	88.5	72.9	
10	50.5	26.6		**10**	68.4	39.8		**10**	88.7	76.0	
11	54.1	25.9		**11**	77.0	40.3		**11**	85.9	74.8	0.02
12	62.7	25.8		**12**	70.5	49.9		**12**	78.2	68.0	
13	61.3	35.0		**13**	70.6	48.3		**13**	76.3	63.6	
14	64.6	52.0	0.13	**14**	77.2	45.5		**14**	85.5	69.6	
15	75.5	60.4	0.55	**15**	83.6	45.5	0.03	**15**	91.3	73.3	
16	63.1	38.0	0.06	**16**	65.2	46.4		**16**	92.9	76.6	1.09
17	61.6	39.8		**17**	74.0	41.1		**17**	82.5	72.9	0.27
18	73.2	35.4		**18**	82.7	45.0		**18**	89.2	78.7	
19	77.3	51.4		**19**	90.5	56.5		**19**	90.1	79.2	
20	61.5	38.0	0.28	**20**	92.2	59.7	0.05	**20**	89.6	78.3	
21	54.4	32.9		**21**	65.6	48.6		**21**	80.2	73.4	0.04
22	52.2	33.8		**22**	72.8	45.0		**22**	82.1	69.9	
23	60.4	30.6		**23**	80.1	39.0		**23**	84.2	71.9	
24	61.6	37.8		**24**	86.8	56.8	0.01	**24**	87.7	75.7	0.07
25	72.2	42.1	0.01	**25**	88.4	65.8		**25**	77.0	68.6	
26	63.5	36.4	0.02	**26**	91.9	64.8		**26**	79.6	65.4	
27	58.1	29.0		**27**	96.5	71.1	0.02	**27**	89.6	73.0	
28	48.9	41.2	0.51	**28**	93.3	68.7		**28**	98.5	84.5	0.01
29	57.5	41.4	0.26	**29**	84.8	60.1		**29**	91.6	80.4	0.04
30	63.1	50.9	018	**30**	72.5	47.4	0.01	**30**	82.8	74.8	0.80
				31	57.1	48.9	0.69				

TEMPERATURE AND PRECIPITATION DATA

Momence

Recorded at
Stelle, Illinois Climate Network Station
Stelle, Illinois
2012

JULY				AUGUST				SEPTEMBER			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	82.0	65.9	0.06	**1**	89.3	60.1		**1**	82.0	71.4	2.17
2	91.6	69.9		**2**	91.2	58.9		**2**	80.3	70.9	0.70
3	85.8	66.6		**3**	92.8	59.1		**3**	88.7	68.6	
4	83.7	60.9		**4**	96.6	66.1		**4**	92.1	64.5	0.04
5	88.0	57.9		**5**	85.5	58.2	0.17	**5**	83.9	62.8	0.01
6	88.3	63.7		**6**	86.0	52.6		**6**	86.4	60.2	
7	81.4	62.3		**7**	95.4	54.2		**7**	77.0	57.3	1.03
8	86.0	60.1		**8**	87.4	62.3	0.08	**8**	72.2	51.4	
9	89.2	57.3		**9**	83.5	61.7	0.51	**9**	72.4	49.2	0.01
10	89.7	64.2		**10**	78.1	53.0		**10**	76.9	48.1	
11	93.6	71.9		**11**	79.2	49.7		**11**	81.9	54.2	
12	88.8	66.9	0.02	**12**	78.0	48.7	0.03	**12**	85.2	49.9	
13	78.1	56.1		**13**	66.1	60.8	0.28	**13**	81.0	53.7	0.11
14	81.6	55.3		**14**	82.6	58.0		**14**	73.3	48.5	0.16
15	85.5	61.1		**15**	86.9	56.4		**15**	79.1	44.8	
16	87.8	64.4		**16**	70.8	57.2	0.53	**16**	77.3	44.2	
17	92.9	62.7		**17**	74.8	51.2		**17**	77.3	48.2	0.10
18	88.7	73.1	0.02	**18**	77.3	47.9		**18**	63.1	36.5	
19	96.7	76.3		**19**	77.4	52.8		**19**	71.7	34.3	
20	96.8	73.6		**20**	77.6	50.7		**20**	73.1	42.6	
21	99.6	72.8		**21**	80.4	45.4		**21**	66.9	39.9	0.01
22	95.1	74.6		**22**	85.3	47.7		**22**	58.7	38.0	
23	95.4	70.7		**23**	90.2	55.0		**23**	62.6	33.5	
24	79.3	67.0	1.09	**24**	92.2	56.6		**24**	71.3	28.6	
25	87.4	64.2		**25**	92.0	57.5		**25**	74.8	49.5	
26	90.2	64.7		**26**	82.1	60.3	1.27	**26**	74.6	56.2	
27	89.5	64.7		**27**	85.9	60.4	0.01	**27**	69.5	46.0	
28	91.7	75.0		**28**	86.5	55.2		**28**	69.3	43.5	
29	84.4	67.7	1.10	**29**	85.6	59.7		**29**	77.2	42.5	
30	88.3	66.8		**30**	89.8	57.7		**30**	69.4	43.8	
31	89.7	65.5		**31**	88.1	57.0	0.02				

Weed Control in Asparagus – Hart 2012

Project Code: 120-12-01 **Location: Hart, MI**

Personnel: Bernard H. Zandstra
Crop: Asparagus **Variety: Millenium**
Planting Method: Crowns **Planting Date: 2004** **Harvest Date: See below**
Spacing: 1 ft **Row Spacing: 4.5 ft**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 5.5 ft wide x 30 ft long

Soil Type: Spinks Loamy Fine Sand **OM: 1.5%** **pH: 6.1**
Sand: 83% **Silt: 14%** **Clay: 3%** **CEC: 3.7**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
	4/6/12	11:45 am	61/56	F	Dry	1-2 W	16	0% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
4/6	ASPA = asparagus		Dormant	
4/6	LACG = large crabgrass	1-2″		Few
4/6	DAND = dandelion	3-6″		Moderate
4/6	HOWE = horseweed	2-3″		Moderate
4/6	SFGE = smallflower geranium	6-12″		Many
	YEWH = yellow hawkweed			
	FIBW = field bindweed			
	POAM = Powell amaranth			

Notes and Comments
1. Asparagus was harvested 22 times from May 6 – June 14.
2. Spray applied with 4 nozzle boom. FF8002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
3. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.

Weed Control in Asparagus – Hart 2012

Weed Control in Asparagus - Hart 2012

Trial ID: 120-12-01 Study Director:
Location: Hart, MI Investigator: Dr. Bernard Zandstra

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	ASPA 29/May/12 RATING 1-10	HOWE 29/May/12 RATING 1-10	SFGE 29/May/12 RATING 1-10	YEHW 29/May/12 RATING 1-10	ASPA 20/Jun/12 RATING 1-10
1	pendimethalin	3.8	CS	3.8	lb ai/a	PRE	1.0	3.7	6.3	10.0	1.3
	diuron	80	DF	1.5	lb ai/a	PRE					
2	s-metolachlor	7.62	EC	1.9	lb ai/a	PRE	1.3	9.7	8.3	7.7	1.3
	halosulfuron	75	WG	0.047	lb ai/a	PRE					
3	terbacil	80	WDG	1.0	lb ai/a	PRE	1.3	10.0	10.0	9.7	1.7
	norflurazon	80	DF	2.0	lb ai/a	PRE					
4	flumioxazin	51	WDG	0.192	lb ai/a	PRE	1.0	10.0	4.0	6.0	2.0
	saflufenacil	70	WG	0.045	lb ai/a	PRE					
5	sulfentrazone	4	F	0.375	lb ai/a	PRE	1.0	5.0	8.3	7.7	1.3
	pendimethalin	3.8	CS	3.8	lb ai/a	PRE					
6	mesotrione	4	SC	0.241	lb ai/a	PRE	1.3	10.0	5.0	8.7	1.3
	s-metolachlor	7.62	EC	1.9	lb ai/a	PRE					
7	indaziflam	1.67	SC	0.085	lb ai/a	PRE	1.3	6.3	7.7	7.0	1.3
8	flazasulfuron	25	WG	0.047	lb ai/a	PRE	2.3	10.0	10.0	7.0	2.0
9	isoxaben	75	DF	1.3	lb ai/a	PRE	1.0	2.7	5.3	7.0	1.0
10	untreated						2.0	1.0	5.3	7.0	2.3
LSD (P=.05)							0.91	4.31	5.03	7.02	1.24
Standard Deviation							0.53	2.51	2.93	4.09	0.72
CV							38.82	36.76	41.69	52.7	46.13

Weed Control in Asparagus – Hart 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	FIBW	FISB	HOWE	POAM	SFGE
Pest Code											
Crop Code											
Rating Date							20/Jun/12	20/Jun/12	20/Jun/12	20/Jun/12	20/Jun/12
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	pendimethalin	3.8	CS	3.8	lb ai/a	PRE	7.7	5.3	4.0	6.7	7.0
	diuron	80	DF	1.5	lb ai/a	PRE					
2	s-metolachlor	7.62	EC	1.9	lb ai/a	PRE	7.0	2.3	7.0	10.0	7.0
	halosulfuron	75	WG	0.047	lb ai/a	PRE					
3	terbacil	80	WDG	1.0	lb ai/a	PRE	7.0	10.0	10.0	8.0	9.7
	norflurazon	80	DF	2.0	lb ai/a	PRE					
4	flumioxazin	51	WDG	0.192	lb ai/a	PRE	9.3	6.0	10.0	10.0	4.0
	saflufenacil	70	WG	0.045	lb ai/a	PRE					
5	sulfentrazone	4	F	0.375	lb ai/a	PRE	10.0	10.0	4.3	10.0	9.0
	pendimethalin	3.8	CS	3.8	lb ai/a	PRE					
6	mesotrione	4	SC	0.241	lb ai/a	PRE	7.0	7.0	9.7	9.7	6.3
	s-metolachlor	7.62	EC	1.9	lb ai/a	PRE					
7	indaziflam	1.67	SC	0.085	lb ai/a	PRE	7.7	9.3	7.0	9.3	8.0
8	flazasulfuron	25	WG	0.047	lb ai/a	PRE	9.7	10.0	10.0	10.0	9.3
9	isoxaben	75	DF	1.3	lb ai/a	PRE	8.3	9.7	3.7	10.0	6.0
10	untreated						4.3	1.0	1.7	6.0	5.0
LSD (P=.05)							5.40	3.25	5.10	3.56	5.26
Standard Deviation							3.15	1.90	2.98	2.08	3.07
CV							40.38	26.85	44.2	23.15	42.97

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	ASPA
Pest Code							
Crop Code							ASPA
Rating Date							5/6 – 6/14
Rating Data Type							TOTAL
Rating Unit							KG/PLOT
1	pendimethalin	3.8	CS	3.8	lb ai/a	PRE	8.42
	diuron	80	DF	1.5	lb ai/a	PRE	
2	s-metolachlor	7.62	EC	1.9	lb ai/a	PRE	8.93
	halosulfuron	75	WG	0.047	lb ai/a	PRE	
3	terbacil	80	WDG	1.0	lb ai/a	PRE	9.71
	norflurazon	80	DF	2.0	lb ai/a	PRE	
4	flumioxazin	51	WDG	0.192	lb ai/a	PRE	8.29
	saflufenacil	70	WG	0.045	lb ai/a	PRE	
5	sulfentrazone	4	F	0.375	lb ai/a	PRE	10.15
	pendimethalin	3.8	CS	3.8	lb ai/a	PRE	
6	mesotrione	4	SC	0.241	lb ai/a	PRE	9.31
	s-metolachlor	7.62	EC	1.9	lb ai/a	PRE	
7	indaziflam	1.67	SC	0.085	lb ai/a	PRE	10.24
8	flazasulfuron	25	WG	0.047	lb ai/a	PRE	8.60
9	isoxaben	75	DF	1.3	lb ai/a	PRE	9.48
10	untreated						7.59
LSD (P=.05)							2.573
Standard Deviation							1.500
CV							16.53

Weed Control in Asparagus – HTRC 2012

Project Code: 120-12-02 **Location: East Lansing, MI**

Personnel: Bernard H. Zandstra
Crop: Asparagus **Variety: Jersey Giant**
Planting Method: Crowns **Planting Date:1999** **Harvest Date: See data**
Spacing: 1 ft **Row Spacing: 6 ft**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 5.5 ft wide x 50 ft long

Soil Type: Riddles Sandy Loam **OM: 1%** **pH: 8.1**
Sand: 85% **Silt: 6%** **Clay: 9%** **CEC: 15.6**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	4/5/12	10:30 am	54/48	F	Moist	3-5 W	50	0% Cloudy	Y

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
4/5	ASPA = asparagus		Pre-emerged	
4/5	QUGR = quackgrass	1-3″		Many
4/5	WHCA = white campion	1-3″, 3-8″		Many
	LACG = large crabgrass			
	HOWE = horseweed			
	SPKW = spotted knapweed			

Notes and Comments
1. Spray applied with 4 nozzle boom. FF8002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.
3. The plots were harvested 14 times from 5/7 -6/6 in 2012.

Weed Control in Asparagus – HTRC 2012

Weed Control in Asparagus - Sandhill 2012

Trial ID: 120-12-02 Study Director:
Location: East Lansing, MI Investigator: Dr. Bernard Zandstra

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	ASPA 15/May/12 RATING 1-10	QUGR 15/May/12 RATING 1-10	ASPA 7/Jun/12 RATING 1-10	LACG 7/Jun/12 RATING 1-10	QUGR 7/Jun/12 RATING 1-10
1	terbacil	80	WDG	1.5	lb ai/a	PRE	3.0	8.7	2.3	10.0	10.0
2	diuron	80	DF	4.0	lb ai/a	PRE	1.7	6.0	2.0	7.3	5.0
3	clomazone	3	ME	1.0	lb ai/a	PRE	3.0	9.7	1.3	10.0	9.3
4	flumioxazin	51	WDG	0.192	lb ai/a	PRE	1.0	7.7	1.3	10.0	7.7
5	norflurazon	80	DF	4.0	lb ai/a	PRE	1.7	8.3	2.3	10.0	8.3
6	halosulfuron	75	WG	0.047	lb ai/a	PRE	3.3	5.0	2.0	6.0	6.0
7	mesotrione	4	SC	0.241	lb ai/a	PRE	3.7	4.0	2.7	7.0	4.7
8	sulfentrazone	4	F	0.375	lb ai/a	PRE	4.7	3.7	3.0	7.3	4.0
9	indaziflam	1.67	SC	0.085	lb ai/a	PRE	3.3	3.3	2.7	6.0	5.0
10	flazasulfuron	25	WG	0.047	lb ai/a	PRE	2.0	7.7	2.3	10.0	7.3
11	isoxaben	75	DF	1.3	lb ai/a	PRE	1.7	4.0	2.3	10.0	5.3
12	untreated						3.0	4.7	2.3	10.0	4.3
LSD (P=.05)							3.55	4.39	1.85	4.29	5.12
Standard Deviation							2.09	2.59	1.09	2.53	3.03
CV							78.54	42.78	49.18	29.3	47.16

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	COMW 7/Jun/12 RATING 1-10	HOWE 7/Jun/12 RATING 1-10	SPKW 7/Jun/12 RATING 1-10	ASPA TOTAL KG/PLOT
1	terbacil	80	WDG	1.5	lb ai/a	PRE	6.3	10.0	10.0	3.101
2	diuron	80	DF	4.0	lb ai/a	PRE	5.7	10.0	10.0	3.546
3	clomazone	3	ME	1.0	lb ai/a	PRE	6.7	5.7	10.0	3.243
4	flumioxazin	51	WDG	0.192	lb ai/a	PRE	4.3	6.0	7.3	3.264
5	norflurazon	80	DF	4.0	lb ai/a	PRE	4.0	6.3	7.7	1.766
6	halosulfuron	75	WG	0.047	lb ai/a	PRE	3.7	8.7	7.7	2.822
7	mesotrione	4	SC	0.241	lb ai/a	PRE	7.0	10.0	10.0	1.337
8	sulfentrazone	4	F	0.375	lb ai/a	PRE	4.3	10.0	7.3	3.170
9	indaziflam	1.67	SC	0.085	lb ai/a	PRE	5.0	6.0	9.3	1.963
10	flazasulfuron	25	WG	0.047	lb ai/a	PRE	7.0	6.0	10.0	3.329
11	isoxaben	75	DF	1.3	lb ai/a	PRE	4.3	6.7	7.7	2.803
12	untreated						4.0	6.0	10.0	1.518
LSD (P=.05)							5.12	4.54	3.64	2.3156
Standard Deviation							3.02	2.68	2.15	1.3674
CV							58.21	35.24	24.09	51.5

Weed Control in Snap Bean – HTRC 2012

Project Code: 123-12-01 **Location: East Lansing, MI**

Personnel: Bernard H. Zandstra
Crop: Snap Bean **Variety: Foremost**
Planting Method: **Planting Date: 5/23/2012** **Harvest Date: 8/8/12**
Spacing: 3 inch **Row Spacing: 14 inch, 3 rows/plot**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 5.5 ft wide x 30 ft long

Soil Type: Marlette Fine Sandy Loam **OM: 1.9%** **pH: 7.7**
Sand: 52% **Silt: 24%** **Clay: 24%** **CEC: 9.4**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	5/24/12	3:00 pm	84/76	F	Dry	8 SW	38	50% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
5/24	SNBE = snap bean		Just planted	
	BYGR = barnyardgrass			
	GRFT = green foxtail			
	COLQ = common lambsquarters			
	CORW = common ragweed			
	RRPW = redroot pigweed			
	WIBW = wild buckwheat			

Notes and Comments
1. Harvest: all plants in plots 3 rows x 30 ft.
2. Spray applied with 4 nozzle boom. FF8002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
3. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.

Weed Control in Snap Bean – HTRC 2012

Weed Control in Snap Beans - HTRC 2012

Trial ID: 125-12-01 Study Director:
Location: East Lansing, MI Investigator: Dr. Bernard Zandstra

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	SNBE 20/Jun/12 RATING 1-10	BYGR 20/Jun/12 RATING 1-10	GRFT 20/Jun/12 RATING 1-10	COLQ 20/Jun/12 RATING 1-10	CORW 20/Jun/12 RATING 1-10
1	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	2.3	10.0	10.0	8.0	8.0
2	pendimethalin	3.8	CS	0.95	lb ai/a	PRE	2.0	7.7	8.0	10.0	7.3
3	clomazone	3	ME	0.25	lb ai/a	PRE	1.7	9.0	9.0	4.7	7.7
4	pendimethalin	3.8	CS	0.95	lb ai/a	PRE	2.7	9.0	10.0	9.3	7.7
	clomazone	3	ME	0.25	lb ai/a	PRE					
5	imazethapyr	2	EC	0.031	lb ai/a	PRE	1.3	7.7	7.7	7.3	6.0
6	pendimethalin	3.8	CS	0.95	lb ai/a	PRE	2.3	6.3	8.0	8.3	9.3
	halosulfuron	75	WG	0.023	lb ai/a	PRE					
7	fomesafen	2	SL	0.25	lb ai/a	PRE	2.3	7.0	9.3	6.7	10.0
8	pyroxasulfone	85	WDG	0.09	lb ai/a	PRE	3.3	8.7	8.7	4.3	4.0
9	trifluralin	4	EC	1	lb ai/a	PRE	2.3	4.7	6.3	6.0	6.3
10	untreated						1.7	3.3	6.0	3.0	2.7
LSD (P=.05)							1.02	4.95	4.70	3.72	5.54
Standard Deviation							0.60	2.89	2.74	2.17	3.23
CV							27.1	39.36	33.03	32.03	46.76

Weed Control in Snap Bean – HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	RRPW	WIBW	SNBE	GRFT	COLQ
Pest Code											
Crop Code									SNBE		
Rating Date							20/Jun/12	20/Jun/12	5/Jul/12	5/Jul/12	5/Jul/12
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	10.0	7.3	3.0	10.0	8.3
2	pendimethalin	3.8	CS	0.95	lb ai/a	PRE	10.0	7.0	2.3	7.0	9.0
3	clomazone	3	ME	0.25	lb ai/a	PRE	8.7	10.0	1.7	8.3	6.0
4	pendimethalin	3.8	CS	0.95	lb ai/a	PRE	8.7	10.0	2.0	9.3	8.7
	clomazone	3	ME	0.25	lb ai/a	PRE					
5	imazethapyr	2	EC	0.031	lb ai/a	PRE	9.3	7.3	2.3	8.7	9.0
6	pendimethalin	3.8	CS	0.95	lb ai/a	PRE	9.0	9.0	1.0	5.7	6.7
	halosulfuron	75	WG	0.023	lb ai/a	PRE					
7	fomesafen	2	SL	0.25	lb ai/a	PRE	9.3	7.7	3.0	8.3	5.7
8	pyroxasulfone	85	WDG	0.09	lb ai/a	PRE	9.3	3.0	4.0	6.7	5.0
9	trifluralin	4	EC	1	lb ai/a	PRE	9.0	10.0	3.7	5.7	3.7
10	untreated						6.0	4.0	2.0	5.0	2.3
LSD (P=.05)							2.78	6.42	1.72	4.53	4.36
Standard Deviation							1.62	3.74	1.00	2.64	2.54
CV							18.14	49.66	40.07	35.35	39.52

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	CORW	SNBE	SNBE
Pest Code									
Crop Code								SNBE	SNBE
Rating Date							5/Jul/12	7/Aug/12	7/Aug/12
Rating Data Type							RATING	KG/PLOT	KG/PLOT
Rating Unit							1-10	BEANS	PLANTS
1	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	6.3	15.07	12.99
2	pendimethalin	3.8	CS	0.95	lb ai/a	PRE	6.3	14.14	13.69
3	clomazone	3	ME	0.25	lb ai/a	PRE	6.3	16.81	15.07
4	pendimethalin	3.8	CS	0.95	lb ai/a	PRE	5.0	18.40	17.23
	clomazone	3	ME	0.25	lb ai/a	PRE			
5	imazethapyr	2	EC	0.031	lb ai/a	PRE	6.0	15.89	16.34
6	pendimethalin	3.8	CS	0.95	lb ai/a	PRE	8.7	22.58	20.48
	halosulfuron	75	WG	0.023	lb ai/a	PRE			
7	fomesafen	2	SL	0.25	lb ai/a	PRE	8.7	13.34	12.27
8	pyroxasulfone	85	WDG	0.09	lb ai/a	PRE	4.0	11.63	12.12
9	trifluralin	4	EC	1	lb ai/a	PRE	4.7	9.08	9.28
10	untreated						2.0	11.29	11.94
LSD (P=.05)							4.40	6.023	6.001
Standard Deviation							2.57	3.511	3.498
CV							44.26	23.68	24.74

Weed Control in Beet & Chard – HTRC 2012

Project Code: 109-12-01 **Location: East Lansing, MI**

Personnel: Bernard H. Zandstra
Crop: Beet and Chard **Variety: See notes**
Planting Method: Seeded **Planting Date: 4/10/12** **Harvest Date: See data**
Spacing: 3 inch **Row Spacing: 14 inch**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 5.5 ft wide x 30 ft long

Soil Type: Marlette Find Sandy Loam **OM: 2.0%** **pH: 6.8**
Sand: 51% **Silt: 31%** **Clay: 18%** **CEC: 9.1**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	4/12/12	1:40 pm	57/55	F	Dry	4-5 NW	36	50% Cloudy	N
PO1	5/13/12	3:00 pm	75/68	F	Dry	3-4 SW	24	0% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
4/12	RED BEET	1-3″	3-4 leaves	Many
4/12	SW CHARD	2-4″	3-4 leaves	Many
4/12	SUG BEET	1-2″	3-4 leaves	Many

COLQ = common lambsquarters
CORW = common ragweed
LATH = ladysthumb
GRFT = green foxtail
EBNS= eastern black nightshade

Notes and Comments
1. 2 rows Red Beet, 1 row Swiss Chard, 2 rows Sugar Beet per plot
2. Varieties: Detroit Dark Red Beet, Fordhook Giant Chard, HM9042RR Sugar Beet
3. Spray applied with 4 nozzle boom. FF8002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
4. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.

Weed Control in Beet & Chard – HTRC 2012

Weed Control in Beet & Chard - HTRC 2012

Trial ID: 109-12-01 Study Director:
Location: East Lansing, MI Investigator: Dr. Bernard Zandstra

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	REDBEET 14/May/12 RATING 1-10	SWCHARD 14/May/12 RATING 1-10	SUGBEET 14/May/12 RATING 1-10	COLQ 14/May/12 RATING 1-10	CORW 14/May/12 RATING 1-10
1	s-metolachlor	7.62	EC	0.75	lb ai/a	PRE	2.3	1.7	3.3	8.3	4.7
2	pendimethalin	3.8	CS	0.5	lb ai/a	PRE	2.0	2.3	4.3	8.0	4.0
3	dimethenamid-p	6	EC	0.5	lb ai/a	PRE	3.7	3.0	3.7	10.0	8.3
4	pyrazon	68	DF	2	lb ai/a	PRE	1.3	1.0	1.3	9.7	10.0
5	clomazone	3	ME	0.25	lb ai/a	PRE	6.0	6.0	5.3	10.0	9.7
6	pyroxasulfone	85	WDG	.032	lb ai/a	PRE	6.0	4.3	5.0	6.0	5.0
7	acetochlor	6.4	EC	0.25	lb ai/a	PRE	2.3	2.0	3.3	7.3	9.7
8	ethofumesate	4	SC	2.0	lb ai/a	PRE	1.3	1.7	3.0	10.0	9.7
9	carfentrazone	2	EC	0.1	lb ai/a	PRE	8.3	8.0	9.7	6.0	9.0
10	cycloate	6	EC	3	lb ai/a	PRE	1.3	1.7	2.7	9.0	9.0
11	untreated					PRE	1.0	1.0	1.0	2.7	4.0
	phenmediphan	1.3	L	1	lb ai/a	PO1					
	triflusulfuron	50	WDG	.0156	lb ai/a	PO1					
	clethodim	.97	EC	.068	lb ai/a	PO1					
12	untreated					PRE	1.0	1.0	1.0	5.0	7.7
	phenmedipham	.6	EC	0.08	lb ai/a	PO1					
	desmedipham	.6	EC	0.08		PO1					
	clopyralid	3	L	0.1	lb ai/a	PO1					
	clethodim	.97	EC	.068	lb ai/a	PO1					
13	untreated						1.0	1.0	1.7	1.0	1.0
LSD (P=.05)							1.93	1.52	2.59	3.46	4.72
Standard Deviation							1.14	0.90	1.54	2.05	2.80
CV							39.47	33.75	44.02	28.72	39.69

Weed Control in Beet & Chard – HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	LATH 14/May/12 RATING 1-10	REDBEET 28/May/12 RATING 1-10	SWCHARD 28/May/12 RATING 1-10	SUGBEET 28/May/12 RATING 1-10	GRFT 28/May/12 RATING 1-10
1	s-metolachlor	7.62	EC	0.75	lb ai/a	PRE	6.3	2.0	1.7	2.7	10.0
2	pendimethalin	3.8	CS	0.5	lb ai/a	PRE	4.7	7.0	7.3	7.3	10.0
3	dimethenamid-p	6	EC	0.5	lb ai/a	PRE	8.3	3.7	4.0	3.0	10.0
4	pyrazon	68	DF	2	lb ai/a	PRE	9.0	1.0	1.0	1.0	9.3
5	clomazone	3	ME	0.25	lb ai/a	PRE	10.0	5.0	6.3	5.3	10.0
6	pyroxasulfone	85	WDG	.032	lb ai/a	PRE	3.7	5.0	4.0	3.3	10.0
7	acetochlor	6.4	EC	0.25	lb ai/a	PRE	7.7	2.7	2.0	3.3	10.0
8	ethofumesate	4	SC	2.0	lb ai/a	PRE	9.7	2.0	2.0	2.3	10.0
9	carfentrazone	2	EC	0.1	lb ai/a	PRE	4.3	7.7	6.7	8.3	3.7
10	cycloate	6	EC	3	lb ai/a	PRE	8.0	1.0	1.3	1.7	10.0
11	untreated					PRE	1.0	1.3	1.3	1.3	10.0
	phenmediphan	1.3	L	1	lb ai/a	PO1					
	triflusulfuron	50	WDG	.0156	lb ai/a	PO1					
	clethodim	.97	EC	.068	lb ai/a	PO1					
12	untreated					PRE	1.0	1.0	1.0	1.0	10.0
	phenmedipham	.6	EC	0.08	lb ai/a	PO1					
	desmedipham	.6	EC	0.08		PO1					
	clopyralid	3	L	0.1	lb ai/a	PO1					
	clethodim	.97	EC	.068	lb ai/a	PO1					
13	untreated						1.0	1.0	1.0	1.7	4.7
LSD (P=.05)							3.33	2.08	1.81	1.58	2.68
Standard Deviation							1.98	1.24	1.07	0.94	1.59
CV							34.4	39.81	35.17	28.78	17.6

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	COLQ 28/May/12 RATING 1-10	CORW 28/May/12 RATING 1-10	EBNS 28/May/12 RATING 1-10	LATH 28/May/12 RATING 1-10	REDBEET 7/Jun/12 RATING 1-10
1	s-metolachlor	7.62	EC	0.75	lb ai/a	PRE	4.7	4.0	10.0	4.3	2.0
2	pendimethalin	3.8	CS	0.5	lb ai/a	PRE	6.3	7.0	6.3	4.0	7.3
3	dimethenamid-p	6	EC	0.5	lb ai/a	PRE	7.7	6.0	10.0	8.0	3.0
4	pyrazon	68	DF	2	lb ai/a	PRE	9.0	8.3	10.0	9.3	1.3
5	clomazone	3	ME	0.25	lb ai/a	PRE	10.0	8.3	10.0	10.0	4.3
6	pyroxasulfone	85	WDG	.032	lb ai/a	PRE	6.7	1.0	10.0	3.0	5.0
7	acetochlor	6.4	EC	0.25	lb ai/a	PRE	5.3	3.7	10.0	5.0	3.0
8	ethofumesate	4	SC	2.0	lb ai/a	PRE	9.3	7.0	9.0	9.3	2.3
9	carfentrazone	2	EC	0.1	lb ai/a	PRE	10.0	6.0	10.0	1.3	7.0
10	cycloate	6	EC	3	lb ai/a	PRE	8.7	3.0	1.7	6.3	1.3
11	untreated					PRE	9.0	9.3	9.3	8.0	1.7
	phenmediphan	1.3	L	1	lb ai/a	PO1					
	triflusulfuron	50	WDG	.0156	lb ai/a	PO1					
	clethodim	.97	EC	.068	lb ai/a	PO1					
12	untreated					PRE	7.7	10.0	10.0	6.0	1.7
	phenmedipham	.6	EC	0.08	lb ai/a	PO1					
	desmedipham	.6	EC	0.08		PO1					
	clopyralid	3	L	0.1	lb ai/a	PO1					
	clethodim	.97	EC	.068	lb ai/a	PO1					
13	untreated						1.0	4.0	1.0	1.0	3.0
LSD (P=.05)							4.12	5.86	2.52	2.19	1.90
Standard Deviation							2.45	3.48	1.50	1.30	1.13
CV							33.37	58.18	18.13	22.32	34.17

Weed Control in Beet & Chard – HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	SWCHARD	SUGBEET	GRFT	COLQ	CORW
Pest Code											
Crop Code											
Rating Date							7/Jun/12	7/Jun/12	7/Jun/12	7/Jun/12	7/Jun/12
Rating Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	s-metolachlor	7.62	EC	0.75	lb ai/a	PRE	2.0	3.7	9.7	8.3	6.7
2	pendimethalin	3.8	CS	0.5	lb ai/a	PRE	7.7	7.3	9.7	9.0	7.7
3	dimethenamid-p	6	EC	0.5	lb ai/a	PRE	3.3	2.3	10.0	9.3	7.7
4	pyrazon	68	DF	2	lb ai/a	PRE	1.3	1.7	8.7	8.7	7.0
5	clomazone	3	ME	0.25	lb ai/a	PRE	5.3	4.0	9.3	10.0	7.7
6	pyroxasulfone	85	WDG	.032	lb ai/a	PRE	3.7	4.0	10.0	7.7	9.3
7	acetochlor	6.4	EC	0.25	lb ai/a	PRE	2.7	3.3	10.0	9.7	9.0
8	ethofumesate	4	SC	2.0	lb ai/a	PRE	2.3	1.7	10.0	9.3	7.7
9	carfentrazone	2	EC	0.1	lb ai/a	PRE	6.7	7.7	6.7	7.0	7.0
10	cycloate	6	EC	3	lb ai/a	PRE	1.3	2.3	10.0	10.0	8.7
11	untreated					PRE	1.0	1.7	9.7	9.7	9.3
	phenmediphan	1.3	L	1	lb ai/a	PO1					
	triflusulfuron	50	WDG	.0156	lb ai/a	PO1					
	clethodim	.97	EC	.068	lb ai/a	PO1					
12	untreated					PRE	1.0	1.7	10.0	8.7	10.0
	phenmedipham	.6	EC	0.08	lb ai/a	PO1					
	desmedipham	.6	EC	0.08		PO1					
	clopyralid	3	L	0.1	lb ai/a	PO1					
	clethodim	.97	EC	.068	lb ai/a	PO1					
13	untreated						2.7	5.0	5.3	1.0	3.7
LSD (P=.05)							2.16	2.08	2.51	2.65	5.12
Standard Deviation							1.28	1.23	1.49	1.57	3.04
CV							40.72	34.58	16.3	18.88	38.96

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	LATH	EBNS	REDBEET	REDBEET	REDBEET
Pest Code											
Crop Code									REDBEET	REDBEET	REDBEET
Rating Date							7/Jun/12	7/Jun/12	9/Jul/12	9/Jul/12	9/Jul/12
Rating Type							RATING	RATING	ROOTS	ROOTS	LEAVES
Rating Unit							1-10	1-10	KG/PLOT	NO.	KG/PLOT
1	s-metolachlor	7.62	EC	0.75	lb ai/a	PRE	7.3	9.7	23.17	147.7	15.15
2	pendimethalin	3.8	CS	0.5	lb ai/a	PRE	5.0	6.0	5.08	17.7	2.81
3	dimethenamid-p	6	EC	0.5	lb ai/a	PRE	9.0	10.0	23.70	116.7	16.69
4	pyrazon	68	DF	2	lb ai/a	PRE	9.0	10.0	25.53	150.0	15.33
5	clomazone	3	ME	0.25	lb ai/a	PRE	10.0	7.0	18.77	105.3	10.80
6	pyroxasulfone	85	WDG	.032	lb ai/a	PRE	3.7	10.0	6.62	39.3	4.51
7	acetochlor	6.4	EC	0.25	lb ai/a	PRE	5.7	10.0	15.10	102.3	12.96
8	ethofumesate	4	SC	2.0	lb ai/a	PRE	9.7	10.0	27.03	183.3	13.74
9	carfentrazone	2	EC	0.1	lb ai/a	PRE	1.0	9.7	2.59	19.0	1.90
10	cycloate	6	EC	3	lb ai/a	PRE	4.7	7.7	22.20	139.7	13.92
11	untreated					PRE	8.0	10.0	31.62	179.3	18.36
	phenmediphan	1.3	L	1	lb ai/a	PO1					
	triflusulfuron	50	WDG	.0156	lb ai/a	PO1					
	clethodim	.97	EC	.068	lb ai/a	PO1					
12	untreated					PRE	7.0	10.0	26.89	170.0	14.66
	phenmedipham	.6	EC	0.08	lb ai/a	PO1					
	desmedipham	.6	EC	0.08		PO1					
	clopyralid	3	L	0.1	lb ai/a	PO1					
	clethodim	.97	EC	.068	lb ai/a	PO1					
13	untreated						1.0	5.3	14.59	92.3	8.68
LSD (P=.05)							2.99	3.77	8.801	44.16	5.489
Standard Deviation							1.77	2.24	5.222	26.20	3.257
CV							28.43	25.2	27.95	23.29	28.32

Weed Control in Beet & Chard – HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	SWCHARD 10/Jul/12 LEAVES KG/PLOT	SUGBEET 8/Oct/12 No./PLOT No.	SUGBEET 8/Oct/12 KG/PLOT KG
	Pest Code								
	Crop Code								
	Rating Date								
	Rating Type								
	Rating Unit								
1	s-metolachlor	7.62	EC	0.75	lb ai/a	PRE	21.68	78.0	43.63
2	pendimethalin	3.8	CS	0.5	lb ai/a	PRE	4.96	12.7	9.48
3	dimethenamid-p	6	EC	0.5	lb ai/a	PRE	18.90	77.0	42.42
4	pyrazon	68	DF	2	lb ai/a	PRE	21.38	82.7	37.88
5	clomazone	3	ME	0.25	lb ai/a	PRE	9.67	56.3	44.22
6	pyroxasulfone	85	WDG	.032	lb ai/a	PRE	12.62	41.7	20.65
7	acetochlor	6.4	EC	0.25	lb ai/a	PRE	17.96	76.0	32.34
8	ethofumesate	4	SC	2.0	lb ai/a	PRE	19.09	78.0	59.27
9	carfentrazone	2	EC	0.1	lb ai/a	PRE	5.01	8.3	4.28
10	cycloate	6	EC	3	lb ai/a	PRE	22.68	84.0	48.93
11	untreated					PRE	25.92	97.0	52.25
	phenmediphan	1.3	L	1	lb ai/a	PO1			
	triflusulfuron	50	WDG	.0156	lb ai/a	PO1			
	clethodim	.97	EC	.068	lb ai/a	PO1			
12	untreated					PRE	24.00	79.0	53.70
	phenmedipham	.6	EC	0.08	lb ai/a	PO1			
	desmedipham	.6	EC	0.08		PO1			
	clopyralid	3	L	0.1	lb ai/a	PO1			
	clethodim	.97	EC	.068	lb ai/a	PO1			
13	untreated						9.36	31.3	12.30
LSD (P=.05)							7.722	23.81	16.035
Standard Deviation							4.582	14.13	9.515
CV							27.94	22.9	26.81

Weed Control in Cabbage & Cauliflower – HTRC 2012

Project Code: 114-12-01 **Location: East Lansing, MI**

Personnel: Bernard H. Zandstra
Crop: Cabbage, Cauliflower **Variety: Artost Cabbage, Candid Charm Cauliflower**
Planting Method: TP **Planting Date: 5/18/2012** **Harvest Date: See data**
Spacing: 22 inch **Row Spacing: 3 ft; one row of each crop/plot**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 5.5 ft wide x 30 ft long

Soil Type: Marlette Fine Sandy Loam **OM: 2.1%** **pH: 7.0**
Sand: 53% **Silt: 27%** **Clay: 20%** **CEC: 9.8**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRT	5/18/12	10:30 am	67/59	F	Dry	1.5 S	36	0% Cloudy	N
POT	5/18/12	3:00 pm	78/72	F	Dry	2-3 SE	20	0% Cloudy	N
PO1	6/7/12	10:30 am	70/65	F	Damp	4.5 NW	51	0% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
5/18	CABBAGE		Post TP	
5/18	CAULIFL = cauliflower		Post TP	
6/7	CABBAGE	4-6″	5-6 leaves	10%
6/7	CAULIFL = cauliflower	4-6″	4-5 leaves	10%
6/7	GRFT = green foxtail	3-4″	2-3 leaves	Moderate
6/7	COLQ = common lambsquarters	1-3″	4-6 leaves	Many
6/7	CORW = common ragweed	2-3″	3-4 leaves	Moderate
6/7	RRPW = redroot pigweed	1-2″	2-4 leaves	Many
	WIBW = wild buckwheat			

Notes and Comments
1. Spray applied with 4 nozzle boom. FF8002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.

Weed Control in Cabbage & Cauliflower – HTRC 2012

Weed Control in Cabbage & Cauliflower - HTRC 2012

Trial ID: 114-12-01 Study Director:
Location: East Lansing, MI Investigator: Dr. Bernard Zandstra

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	CABBAGE 7/Jun/12 RATING 1-10	CAULIFL 7/Jun/12 RATING 1-10	GRFT 7/Jun/12 RATING 1-10	COLQ 7/Jun/12 RATING 1-10	CORW 7/Jun/12 RATING 1-10	RRPW 7/Jun/12 RATING 1-10
1	s-metolachlor	7.62	EC	0.95	lb ai/a	PRT	2.3	1.7	9.7	10.0	10.0	10.0
	oxyfluorfen	4	SC	0.5	lb ai/a	PRT						
2	pendimethalin	3.8	CS	1.9	lb ai/a	PRT	1.3	1.7	10.0	10.0	8.3	10.0
3	pendimethalin	3.8	CS	1.9	lb ai/a	POT	1.7	2.0	10.0	10.0	7.7	10.0
4	napropamide-UV	50	DF	2	lb ai/a	PRT	1.0	1.7	10.0	10.0	10.0	10.0
	oxyfluorfen	4	SC	0.5	lb ai/a	PRT						
5	s-metolachlor	7.62	EC	1.2	lb ai/a	PRT	3.0	3.0	10.0	10.0	10.0	10.0
	clomazone	3	ME	0.5	lb ai/a	PRT						
6	s-metolachlor	7.62	EC	1.2	lb ai/a	PRT	2.3	2.3	10.0	10.0	9.0	10.0
	sulfentrazone	4	F	0.125	lb ai/a	PRT						
7	pyroxasulfone	85	WDG	0.09	lb ai/a	PRT	3.3	3.0	10.0	9.7	9.7	10.0
8	s-metolachlor	7.62	EC	1.2	lb ai/a	POT	1.0	1.0	3.3	3.0	3.7	4.0
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1						
	clethodim	.97	EC	0.1	lb ai/a	PO1						
9	s-metolachlor	7.62	EC	1.2	lb ai/a	PRT	1.3	1.3	10.0	10.0	7.7	10.0
	clopyralid	3	L	0.094	lb ai/a	PO1						
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1						
	clethodim	.97	EC	0.1	lb ai/a	PO1						
10	untreated						1.0	1.0	4.7	3.0	1.7	6.3
LSD (P=.05)							1.19	1.18	3.17	2.22	2.88	3.67
Standard Deviation							0.70	0.69	1.85	1.30	1.68	2.14
CV							37.99	36.74	21.09	15.12	21.62	23.66

Weed Control in Cabbage & Cauliflower – HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	WIBW	CABBAGE	CAULIFL	GRFT	COLQ
Pest Code											
Crop Code											
Rating Date							7/Jun/12	15/Jun/12	15/Jun/12	15/Jun/12	15/Jun/12
Rating Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	s-metolachlor	7.62	EC	0.95	lb ai/a	PRT	10.0	1.7	1.0	9.7	9.3
	oxyfluorfen	4	SC	0.5	lb ai/a	PRT					
2	pendimethalin	3.8	CS	1.9	lb ai/a	PRT	9.0	1.7	1.3	9.0	10.0
3	pendimethalin	3.8	CS	1.9	lb ai/a	POT	10.0	1.3	3.0	9.7	10.0
4	napropamide-UV	50	DF	2	lb ai/a	PRT	10.0	1.0	1.3	10.0	9.7
	oxyfluorfen	4	SC	0.5	lb ai/a	PRT					
5	s-metolachlor	7.62	EC	1.2	lb ai/a	PRT	10.0	2.7	3.0	9.7	9.7
	clomazone	3	ME	0.5	lb ai/a	PRT					
6	s-metolachlor	7.62	EC	1.2	lb ai/a	PRT	9.0	1.7	2.3	10.0	10.0
	sulfentrazone	4	F	0.125	lb ai/a	PRT					
7	pyroxasulfone	85	WDG	0.09	lb ai/a	PRT	7.0	3.0	3.0	9.3	6.7
8	s-metolachlor	7.62	EC	1.2	lb ai/a	POT	4.7	4.0	4.3	8.7	6.7
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1					
	clethodim	.97	EC	0.1	lb ai/a	PO1					
9	s-metolachlor	7.62	EC	1.2	lb ai/a	PRT	6.7	3.0	3.0	10.0	9.0
	clopyralid	3	L	0.094	lb ai/a	PO1					
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1					
	clethodim	.97	EC	0.1	lb ai/a	PO1					
10	untreated						7.0	1.0	1.0	1.0	1.0
LSD (P=.05)							5.13	1.29	1.16	0.76	1.84
Standard Deviation							2.99	0.75	0.67	0.44	1.07
CV							35.87	35.73	28.93	5.09	13.09

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	CORW	RRPW	WIBW	CABBAGE	CAULIFL
Pest Code											
Crop Code											
Rating Date							15/Jun/12	15/Jun/12	15/Jun/12	29/Jun/12	29/Jun/12
Rating Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	s-metolachlor	7.62	EC	0.95	lb ai/a	PRT	9.0	10.0	10.0	1.3	1.0
	oxyfluorfen	4	SC	0.5	lb ai/a	PRT					
2	pendimethalin	3.8	CS	1.9	lb ai/a	PRT	1.3	10.0	9.0	1.7	1.7
3	pendimethalin	3.8	CS	1.9	lb ai/a	POT	2.3	10.0	10.0	2.7	2.7
4	napropamide-UV	50	DF	2	lb ai/a	PRT	9.7	10.0	9.0	1.3	1.0
	oxyfluorfen	4	SC	0.5	lb ai/a	PRT					
5	s-metolachlor	7.62	EC	1.2	lb ai/a	PRT	8.3	10.0	9.0	1.3	1.7
	clomazone	3	ME	0.5	lb ai/a	PRT					
6	s-metolachlor	7.62	EC	1.2	lb ai/a	PRT	5.3	10.0	10.0	2.0	2.0
	sulfentrazone	4	F	0.125	lb ai/a	PRT					
7	pyroxasulfone	85	WDG	0.09	lb ai/a	PRT	6.3	10.0	6.0	4.0	3.7
8	s-metolachlor	7.62	EC	1.2	lb ai/a	POT	8.0	10.0	9.0	2.3	1.7
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1					
	clethodim	.97	EC	0.1	lb ai/a	PO1					
9	s-metolachlor	7.62	EC	1.2	lb ai/a	PRT	10.0	10.0	9.3	1.7	1.7
	clopyralid	3	L	0.094	lb ai/a	PO1					
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1					
	clethodim	.97	EC	0.1	lb ai/a	PO1					
10	untreated						1.0	1.0	1.0	1.7	2.7
LSD (P=.05)							3.63	0.00	2.93	1.57	1.87
Standard Deviation							2.12	0.00	1.71	0.92	1.09
CV							34.53	0.0	20.72	45.85	55.44

Weed Control in Cabbage & Cauliflower – HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	CABBAGE 16/Jul/12 #/PLOT #	CABBAGE 16/Jul/12 KG/PLOT KG	CABBAGE 19/Jul/12 #/PLOT #	CABBAGE 19/Jul/12 KG/PLOT KG	CABBAGE 23/Jul/12 #/PLOT #
1	s-metolachlor	7.62	EC	0.95	lb ai/a	PRT	7.3	10.39	4.0	6.16	9.3
	oxyfluorfen	4	SC	0.5	lb ai/a	PRT					
2	pendimethalin	3.8	CS	1.9	lb ai/a	PRT	9.0	10.49	6.3	8.17	5.3
3	pendimethalin	3.8	CS	1.9	lb ai/a	POT	4.7	5.15	1.0	1.18	12.7
4	napropamide-UV	50	DF	2	lb ai/a	PRT	13.3	16.75	4.0	5.02	5.0
	oxyfluorfen	4	SC	0.5	lb ai/a	PRT					
5	s-metolachlor	7.62	EC	1.2	lb ai/a	PRT	11.0	14.08	3.3	4.28	7.7
	clomazone	3	ME	0.5	lb ai/a	PRT					
6	s-metolachlor	7.62	EC	1.2	lb ai/a	PRT	7.7	8.14	2.3	2.50	12.7
	sulfentrazone	4	F	0.125	lb ai/a	PRT					
7	pyroxasulfone	85	WDG	0.09	lb ai/a	PRT	3.7	3.72	1.3	1.57	11.0
8	s-metolachlor	7.62	EC	1.2	lb ai/a	POT	10.7	12.39	4.0	4.49	5.3
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1					
	clethodim	.97	EC	0.1	lb ai/a	PO1					
9	s-metolachlor	7.62	EC	1.2	lb ai/a	PRT	7.3	10.90	8.0	9.10	6.0
	clopyralid	3	L	0.094	lb ai/a	PO1					
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1					
	clethodim	.97	EC	0.1	lb ai/a	PO1					
10	untreated						5.3	6.91	4.7	5.32	12.0
LSD (P=.05)							4.67	6.737	4.08	5.720	7.16
Standard Deviation							2.72	3.927	2.38	3.334	4.17
CV							34.0	39.7	61.02	69.79	47.98

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	CABBAGE 23/Jul/12 KG/PLOT KG	CABBAGE TOTAL #/PLOT	CABBAGE TOTAL KG/PLOT	CAULIFL 23/Jul/12 #/PLOT #	CAULIFL 23/Jul/12 KG/PLOT KG
1	s-metolachlor	7.62	EC	0.95	lb ai/a	PRT	8.63	20.7	25.18	3.0	3.17
	oxyfluorfen	4	SC	0.5	lb ai/a	PRT					
2	pendimethalin	3.8	CS	1.9	lb ai/a	PRT	5.38	20.7	24.04	2.3	1.68
3	pendimethalin	3.8	CS	1.9	lb ai/a	POT	13.31	18.3	19.64	1.7	1.47
4	napropamide-UV	50	DF	2	lb ai/a	PRT	5.17	22.3	26.95	2.3	1.72
	oxyfluorfen	4	SC	0.5	lb ai/a	PRT					
5	s-metolachlor	7.62	EC	1.2	lb ai/a	PRT	7.53	22.0	25.89	3.3	2.95
	clomazone	3	ME	0.5	lb ai/a	PRT					
6	s-metolachlor	7.62	EC	1.2	lb ai/a	PRT	13.53	22.7	24.17	1.0	0.73
	sulfentrazone	4	F	0.125	lb ai/a	PRT					
7	pyroxasulfone	85	WDG	0.09	lb ai/a	PRT	8.45	16.0	13.75	1.0	1.63
8	s-metolachlor	7.62	EC	1.2	lb ai/a	POT	5.71	20.0	22.59	3.0	2.43
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1					
	clethodim	.97	EC	0.1	lb ai/a	PO1					
9	s-metolachlor	7.62	EC	1.2	lb ai/a	PRT	6.81	21.3	26.80	1.0	0.70
	clopyralid	3	L	0.094	lb ai/a	PO1					
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1					
	clethodim	.97	EC	0.1	lb ai/a	PO1					
10	untreated						11.33	22.0	23.57	2.0	1.15
LSD (P=.05)							6.555	3.76	8.051	4.73	4.328
Standard Deviation							3.821	2.19	4.693	2.75	2.523
CV							44.51	10.65	20.18	133.3	143.18

Weed Control in Cabbage & Cauliflower – HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	CAULIFL 30/Jul/12 COUNT #	CAULIFL 30/Jul/12 KG/PLOT KG	CAULIFL 6/Aug/12 #/PLOT #	CAULIFL 6/Aug/12 KG/PLOT KG	CAULIFL 13/Aug/12 #/PLOT #
1	s-metolachlor	7.62	EC	0.95	lb ai/a	PRT	2.3	1.95	5.7	3.77	4.0
	oxyfluorfen	4	SC	0.5	lb ai/a	PRT					
2	pendimethalin	3.8	CS	1.9	lb ai/a	PRT	3.3	2.34	5.0	3.20	6.0
3	pendimethalin	3.8	CS	1.9	lb ai/a	POT	0.3	0.43	3.7	3.10	4.7
4	napropamide-UV	50	DF	2	lb ai/a	PRT	4.0	3.07	4.3	3.51	6.3
	oxyfluorfen	4	SC	0.5	lb ai/a	PRT					
5	s-metolachlor	7.62	EC	1.2	lb ai/a	PRT	2.7	2.04	3.0	2.20	4.7
	clomazone	3	ME	0.5	lb ai/a	PRT					
6	s-metolachlor	7.62	EC	1.2	lb ai/a	PRT	2.7	2.26	6.0	3.66	3.7
	sulfentrazone	4	F	0.125	lb ai/a	PRT					
7	pyroxasulfone	85	WDG	0.09	lb ai/a	PRT	3.3	2.28	2.0	1.66	3.3
8	s-metolachlor	7.62	EC	1.2	lb ai/a	POT	2.7	1.95	4.3	3.35	5.0
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1					
	clethodim	.97	EC	0.1	lb ai/a	PO1					
9	s-metolachlor	7.62	EC	1.2	lb ai/a	PRT	2.3	1.83	8.3	6.49	4.0
	clopyralid	3	L	0.094	lb ai/a	PO1					
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1					
	clethodim	.97	EC	0.1	lb ai/a	PO1					
10	untreated						2.3	1.84	3.0	1.79	2.3
LSD (P=.05)							3.62	2.823	4.58	3.411	5.77
Standard Deviation							2.11	1.65	2.67	1.988	3.36
CV							81.19	82.34	58.93	60.76	76.47

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	CAULIFL 13/Aug/12 KG/PLOT KG	CAULIFL TOTAL #/PLOT	CAULIFL TOTAL KG/PLOT
1	s-metolachlor	7.62	EC	0.95	lb ai/a	PRT	2.98	15.00	11.87
	oxyfluorfen	4	SC	0.5	lb ai/a	PRT			
2	pendimethalin	3.8	CS	1.9	lb ai/a	PRT	3.21	16.67	10.43
3	pendimethalin	3.8	CS	1.9	lb ai/a	POT	2.27	10.33	7.27
4	napropamide-UV	50	DF	2	lb ai/a	PRT	4.38	17.00	12.69
	oxyfluorfen	4	SC	0.5	lb ai/a	PRT			
5	s-metolachlor	7.62	EC	1.2	lb ai/a	PRT	2.61	13.67	9.80
	clomazone	3	ME	0.5	lb ai/a	PRT			
6	s-metolachlor	7.62	EC	1.2	lb ai/a	PRT	2.48	13.33	9.13
	sulfentrazone	4	F	0.125	lb ai/a	PRT			
7	pyroxasulfone	85	WDG	0.09	lb ai/a	PRT	2.41	9.67	7.98
8	s-metolachlor	7.62	EC	1.2	lb ai/a	POT	2.42	15.00	10.15
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1			
	clethodim	.97	EC	0.1	lb ai/a	PO1			
9	s-metolachlor	7.62	EC	1.2	lb ai/a	PRT	2.68	15.67	11.64
	clopyralid	3	L	0.094	lb ai/a	PO1			
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1			
	clethodim	.97	EC	0.1	lb ai/a	PO1			
10	untreated						2.05	9.67	6.83
LSD (P=.05)							3.698	5.279	5.723
Standard Deviation							2.156	3.077	3.336
CV							78.41	22.63	34.12

Preemergence Weed Control in Carrot – Keilen Farms 2012

Project Code: 107-12-01 **Location: East Lansing, MI**

Personnel: Bernard H. Zandstra
Crop: Carrot **Variety: Bergen**
Planting Method: Seeded **Planting Date: 5/3/12** **Harvest Date: 8/23/2012**
Spacing: 1 inch **Row Spacing: 10 inch**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 3 ft wide x 30 ft long

Soil Type: Houghton much **OM: 68%** **pH: 6.3**
Sand: 14% **Silt: 18%** **Clay: 1%** **CEC:**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	5/10/12	9:00 am	50/50	F	Dry	5-6 NW	53	9% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
5/10	CARROT		some cot. Emerged	10%
5/10	COPU= common purslane		Cotyledon	Many
5/10	LATH = ladysthumb		Cotyledon	Many
5/10	RRPW = redroot pigweed		Cotyledon	Many
5/10	COLQ = common lambsquarters		Cotyledon	Many

Notes and Comments
1. Harvest: 10 ft. of 2 rows
2. Spray applied with 2 nozzle boom. 11002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
3. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.

Preemergence Weed Control in Carrot – Keilen Farms 2012

Preemergence Weed Control in Carrot - Keilen Farms 2012

Trial ID: 107-12-01 Study Director:
Location: East Lansing, MI Investigator: Dr. Bernard Zandstra

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	CARROT 30/May/12 RATING 1-10	COPU 30/May/12 RATING 1-10	LATH 30/May/12 RATING 1-10	RRPW 30/May/12 RATING 1-10	CARROT 7/Jun/12 RATING 1-10
1	pendimethalin	3.8	CS	0.95	lb ai/a	PRE	2.0	2.7	6.3	4.0	1.3
2	pendimethalin	3.8	CS	1.9	lb ai/a	PRE	2.0	5.7	7.7	7.7	2.0
3	pendimethalin	3.8	CS	3.8	lb ai/a	PRE	1.7	7.0	9.7	10.0	2.3
4	linuron	50	DF	1.0	lb ai/a	PRE	2.3	8.3	10.0	10.0	3.0
5	linuron	50	DF	2.0	lb ai/a	PRE	3.3	7.0	10.0	10.0	2.0
6	prometryn	4	L	1.0	lb ai/a	PRE	4.0	8.0	10.0	9.7	3.3
7	prometryn	4	L	2.0	lb ai/a	PRE	5.7	8.0	9.0	10.0	6.0
8	metribuzin	75	DF	0.5	lb ai/a	PRE	3.7	8.3	10.0	9.7	3.0
9	pendimethalin	3.8	CS	0.95	lb ai/a	PRE	2.7	8.7	9.3	10.0	3.0
	linuron	50	DF	1.0	lb ai/a	PRE					
10	s-metolachlor	7.62	EC	1.9	lb ai/a	PRE	7.0	9.3	9.7	10.0	5.7
	linuron	50	DF	1.0	lb ai/a	PRE					
11	s-metolachlor	7.62	EC	1.9	lb ai/a	PRE	8.3	9.3	10.0	9.7	7.3
	prometryn	4	L	1.0	lb ai/a	PRE					
12	pyroxasulfone	85	WDG	0.09	lb ai/a	PRE	2.7	5.7	9.3	9.0	1.3
13	pyroxasulfone	85	WDG	0.18	lb ai/a	PRE	5.3	6.7	9.0	9.3	3.3
14	untreated						1.7	1.0	1.0	1.0	1.0
LSD (P=.05)							2.24	2.96	2.57	2.38	2.40
Standard Deviation							1.33	1.76	1.53	1.42	1.43
CV							35.71	25.8	17.74	16.55	44.83

Preemergence Weed Control in Carrot – Keilen Farms 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	COLQ	COPU	LATH	RRPW	CARROT
Pest Code											
Crop Code											CARROT
Rating Date							7/Jun/12	7/Jun/12	7/Jun/12	7/Jun/12	22/Jun/12
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	pendimethalin	3.8	CS	0.95	lb ai/a	PRE	7.7	1.7	6.0	2.0	2.0
2	pendimethalin	3.8	CS	1.9	lb ai/a	PRE	9.0	6.7	8.7	6.3	2.0
3	pendimethalin	3.8	CS	3.8	lb ai/a	PRE	10.0	8.0	9.3	10.0	2.0
4	linuron	50	DF	1.0	lb ai/a	PRE	10.0	6.7	10.0	9.0	3.0
5	linuron	50	DF	2.0	lb ai/a	PRE	10.0	6.7	10.0	10.0	2.0
6	prometryn	4	L	1.0	lb ai/a	PRE	10.0	7.7	10.0	10.0	3.0
7	prometryn	4	L	2.0	lb ai/a	PRE	10.0	7.3	9.0	9.3	5.0
8	metribuzin	75	DF	0.5	lb ai/a	PRE	10.0	8.7	10.0	10.0	2.3
9	pendimethalin	3.8	CS	0.95	lb ai/a	PRE	10.0	8.7	10.0	10.0	2.3
	linuron	50	DF	1.0	lb ai/a	PRE					
10	s-metolachlor	7.62	EC	1.9	lb ai/a	PRE	10.0	9.0	9.7	10.0	4.3
	linuron	50	DF	1.0	lb ai/a	PRE					
11	s-metolachlor	7.62	EC	1.9	lb ai/a	PRE	10.0	9.3	9.7	9.7	5.0
	prometryn	4	L	1.0	lb ai/a	PRE					
12	pyroxasulfone	85	WDG	0.09	lb ai/a	PRE	9.0	5.3	9.0	9.0	1.7
13	pyroxasulfone	85	WDG	0.18	lb ai/a	PRE	9.0	6.7	8.7	10.0	3.3
14	untreated						7.0	4.0	7.0	6.7	1.7
LSD (P=.05)							2.85	3.78	2.62	2.90	2.01
Standard Deviation							1.70	2.25	1.56	1.73	1.20
CV							18.05	32.73	17.22	19.82	42.32

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	CARROT	RRPW	CARROT
Pest Code									
Crop Code							CARROT		CARROT
Rating Date							2/Jul/12	2/Jul/12	23/Aug/12
Rating Data Type							RATING	RATING	KG/PLOT
Rating Unit							1-10	1-10	KG
1	pendimethalin	3.8	CS	0.95	lb ai/a	PRE	1.7	7.0	10.85
2	pendimethalin	3.8	CS	1.9	lb ai/a	PRE	2.0	9.3	12.07
3	pendimethalin	3.8	CS	3.8	lb ai/a	PRE	2.3	10.0	11.94
4	linuron	50	DF	1.0	lb ai/a	PRE	2.3	10.0	12.27
5	linuron	50	DF	2.0	lb ai/a	PRE	2.0	10.0	12.14
6	prometryn	4	L	1.0	lb ai/a	PRE	2.3	10.0	11.64
7	prometryn	4	L	2.0	lb ai/a	PRE	4.0	10.0	8.94
8	metribuzin	75	DF	0.5	lb ai/a	PRE	1.7	10.0	10.95
9	pendimethalin	3.8	CS	0.95	lb ai/a	PRE	1.7	9.7	10.86
	linuron	50	DF	1.0	lb ai/a	PRE			
10	s-metolachlor	7.62	EC	1.9	lb ai/a	PRE	2.7	10.0	8.74
	linuron	50	DF	1.0	lb ai/a	PRE			
11	s-metolachlor	7.62	EC	1.9	lb ai/a	PRE	4.7	10.0	8.83
	prometryn	4	L	1.0	lb ai/a	PRE			
12	pyroxasulfone	85	WDG	0.09	lb ai/a	PRE	1.7	8.0	12.33
13	pyroxasulfone	85	WDG	0.18	lb ai/a	PRE	3.0	9.0	10.49
14	untreated						1.7	8.3	12.25
LSD (P=.05)							2.17	2.02	4.910
Standard Deviation							1.29	1.20	2.925
CV							53.68	12.81	26.54

Postemergence Weed Control in Carrot – Keilen Farms 2012

Project Code: 107-12-02 **Location: East Lansing, MI**

Personnel: Bernard H. Zandstra
Crop: Carrot **Variety: Bergen**
Planting Method: Seeded **Planting Date: 5/3/12** **Harvest Date: 8/23/2012**
Spacing: 1 inch **Row Spacing: 10 inch, 2 rows/plot**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 3.3 ft wide x 30 ft long

Soil Type: Houghton Muck **OM: 68%** **pH: 6.3**
Sand: 14% **Silt: 18%** **Clay: 1%** **CEC:**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PO1	6/5/12	11:00 am	64/63	F	Dry	5-8 NE	53	70% Cloudy	N
PO2	6/22/12	3:00 pm	82/76	F	Dry	2-4 NW	58	20% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
6/5	CARROT	2-3″	2-3 leaves	5%
6/5	LATH = ladysthumb	1-2″	3-4 leaves	Many
6/5	RRPW = redroot pigweed	2-3″	4-6 leaves	Many
6/22	CARROT		6-10 leaves	
6/22	COPU = common purslane	3-10″		Moderate
6/22	RRPW = redroot pigweed	4-12″		?
	LACG = large crabgrass			

Notes and Comments
1. Harvest: 10 ft. of 2 rows.
1. Spray applied with 2 nozzle boom. FF11002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.

Postemergence Weed Control in Carrot – Keilen Farms 2012

Postemergence Weed Control in Carrot - Keilen Farms 2012

Trial ID: 107-12-02 Study Director:
Location: East Lansing, MI Investigator: Dr. Bernard Zandstra

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	CARROT 11/Jun/12 RATING 1-10	COPU 11/Jun/12 RATING 1-10	RRPW 11/Jun/12 RATING 1-10	CARROT 22/Jun/12 RATING 1-10
1	linuron	50	DF	1.0	lb ai/a	PO1, PO2	2.0	10.0	9.7	2.7
2	metribuzin	75	DF	0.25	lb ai/a	PO1, PO2	2.0	10.0	9.3	1.7
3	metribuzin	75	DF	0.5	lb ai/a	PO1, PO2	2.3	9.7	9.3	2.7
4	prometryn	4	L	1.0	lb ai/a	PO1, PO2	2.7	10.0	9.3	3.3
5	prometryn	4	L	2.0	lb ai/a	PO1, PO2	3.3	10.0	9.0	4.7
6	oxyfluorfen	4	SC	0.063	lb ai/a	PO1, PO2	3.0	9.7	9.3	3.0
7	oxyfluorfen	4	SC	0.125	lb ai/a	PO1, PO2	2.7	10.0	8.3	2.7
8	acifluorfen	2	L	0.125	lb ai/a	PO1, PO2	3.0	10.0	9.3	2.7
9	acifluorfen	2	L	0.25	lb ai/a	PO1, PO2	2.7	9.0	8.7	2.0
10	untreated						2.7	10.0	9.0	2.3
LSD (P=.05)							1.76	1.07	2.44	2.08
Standard Deviation							1.03	0.63	1.42	1.21
CV							38.95	6.37	15.58	43.83

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	LACG 22/Jun/12 RATING 1-10	COPU 22/Jun/12 RATING 1-10	RRPW 22/Jun/12 RATING 1-10	CARROT 28/Jun/12 RATING 1-10
1	linuron	50	DF	1.0	lb ai/a	PO1, PO2	10.0	9.7	9.7	2.7
2	metribuzin	75	DF	0.25	lb ai/a	PO1, PO2	9.3	9.0	7.0	1.7
3	metribuzin	75	DF	0.5	lb ai/a	PO1, PO2	9.7	9.7	8.0	3.0
4	prometryn	4	L	1.0	lb ai/a	PO1, PO2	10.0	9.7	9.3	3.0
5	prometryn	4	L	2.0	lb ai/a	PO1, PO2	10.0	9.7	10.0	4.7
6	oxyfluorfen	4	SC	0.063	lb ai/a	PO1, PO2	9.0	9.7	8.3	3.0
7	oxyfluorfen	4	SC	0.125	lb ai/a	PO1, PO2	10.0	5.7	5.3	3.3
8	acifluorfen	2	L	0.125	lb ai/a	PO1, PO2	5.3	7.3	5.7	2.7
9	acifluorfen	2	L	0.25	lb ai/a	PO1, PO2	5.3	6.7	5.3	2.7
10	untreated						6.0	7.3	5.7	2.3
LSD (P=.05)							3.48	3.56	4.78	2.03
Standard Deviation							2.03	2.08	2.78	1.18
CV							23.98	24.61	37.46	40.85

Postemergence Weed Control in Carrot – Keilen Farms 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	RRPW	CARROT	RRPW	CARROT
Pest Code							RRPW		RRPW	
Crop Code								CARROT		CARROT
Rating Date							28/Jun/12	2/Jul/12	2/Jul/12	23/Aug/12
Rating Data Type							RATING	RATING	RATING	KG/PLOT
Rating Unit							1-10	1-10	1-10	KG
1	linuron	50	DF	1.0	LB A/A	PO1, PO2	10.0	2.7	9.7	11.93
2	metribuzin	75	DF	0.25	LB A/A	PO1, PO2	8.0	1.7	8.7	11.90
3	metribuzin	75	DF	0.5	LB A/A	PO1, PO2	7.7	2.3	8.7	10.82
4	prometryn	4	L	1.0	LB A/A	PO1, PO2	9.0	2.7	9.0	10.63
5	prometryn	4	L	2.0	LB A/A	PO1, PO2	9.3	3.0	9.3	9.59
6	oxyfluorfen	4	SC	0.063	LB A/A	PO1, PO2	8.3	2.7	7.3	11.91
7	oxyfluorfen	4	SC	0.125	LB A/A	PO1, PO2	6.3	2.7	5.7	10.27
8	acifluorfen	2	L	0.125	LB A/A	PO1, PO2	7.0	2.3	6.3	11.29
9	acifluorfen	2	L	0.25	LB A/A	PO1, PO2	7.3	2.0	7.7	10.58
10	untreated						7.3	2.0	9.3	11.19
LSD (P=.05)							3.63	1.54	3.56	2.685
Standard Deviation							2.12	0.90	2.08	1.565
CV							26.36	37.35	25.41	14.22

Weed Control in Celery – Muck Farm 2012

Project Code: 113-12-01 **Location: Laingsburg, MI**

Personnel: Bernard H. Zandstra
Crop: Celery **Variety: CR 1**
Planting Method: Transplant **Planting Date: 6/4/12** **Harvest Date: 8/21/2012**
Spacing: 6 inch **Row Spacing: 3 ft; 2 rows/plot**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 5.5 ft wide x 16.7 ft long

Soil Type: Houghton Muck **OM: 78%** **pH: 6.6**
Sand: 11% **Silt: 11%** **Clay: 1%** **CEC: NA**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRT	6/4/12	11:00 am	72/61	F	Dry	1-3 NW	30	25% Cloudy	N
POT	6/4/12	3:00 pm	72/66	F	Dry	1-3 NW	47	85% Cloudy	N
PO1	6/26/12	10:00 am	77/68	F	Dry	1-3 NW	41	0% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
6/4/12	CELERY			
6/26/12	CELERY	6-8″		10%
6/26/12	YENS = yellow nutsedge	6-8″	8-10 leaves	Moderate
6/26/12	LATH = ladysthumb	1-2″	3-6 leaves	Many
6/26/12	COPU = common purslane	2-6″		Many
6/26/12	RRPW = redroot pigweed	2-4″	4-6 leaves	Many
	COLQ =common lambsquarters			
	LACG = large crabgrass			

Notes and Comments
1. Harvest 10 ft. of 2 rows
2. Spray applied with 4 nozzle boom. FF8002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
3. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.

Weed Control in Celery – Muck Farm 2012

Weed Control in Celery - Muck Farm 2012

Trial ID: 113-12-01 Study Director:
Location: Laingsburg, MI Investigator: Dr. Bernard Zandstra

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	CELERY 22/Jun/12 RATING 1-10	COLQ 22/Jun/12 RATING 1-10	COPU 22/Jun/12 RATING 1-10	LATH 22/Jun/12 RATING 1-10	CELERY 3/Jul/12 RATING 1-10
1	s-metolachlor	7.62	EC	1.9	lb ai/a	PRT	1.3	3.0	4.3	4.0	1.7
	prometryn	4	L	2.0	lb ai/a	PO1					
2	s-metolachlor	7.62	EC	1.9	lb ai/a	PRT	2.0	7.7	7.7	7.3	1.3
	flumioxazin	51	WDG	0.096	lb ai/a	PRT					
	prometryn	4	L	2.0	lb ai/a	PO1					
3	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	2.0	7.3	8.0	6.3	1.3
	flumioxazin	51	WDG	0.096	lb ai/a	POT					
	prometryn	4	L	2.0	lb ai/a	PO1					
4	pendimethalin	3.8	CS	1.9	lb ai/a	PRT	1.0	7.0	7.0	6.0	1.0
	flumioxazin	51	WDG	0.096	lb ai/a	PRT					
	prometryn	4	L	2.0	lb ai/a	PO1					
5	pendimethalin	3.8	CS	1.9	lb ai/a	POT	1.3	8.3	8.3	4.7	1.7
	flumioxazin	51	WDG	0.096	lb ai/a	POT					
	prometryn	4	L	2.0	lb ai/a	PO1					
6	pendimethalin	3.8	CS	1.9	lb ai/a	PRT	1.0	7.0	7.0	2.0	1.3
	prometryn	4	L	2.0	lb ai/a	PO1					
7	pendimethalin	3.8	CS	1.9	lb ai/a	POT	1.3	8.0	8.3	4.0	1.3
	prometryn	4	L	2.0	lb ai/a	PO1					
8	prometryn	4	L	2.0	lb ai/a	POT	1.3	7.0	7.0	4.7	1.3
	linuron	50	DF	1	lb ai/a	PO1					
9	s-metolachlor	7.62	EC	1.9	lb ai/a	PRT	1.7	7.7	8.0	7.0	1.0
	sulfentrazone	4	F	0.125	lb ai/a	PRT					
	prometryn	4	L	2.0	lb ai/a	PO1					
10	s-metolachlor	7.62	EC	1.9	lb ai/a	PRT	1.0	1.3	7.0	5.3	3.0
	sulfentrazone	4	F	0.125	lb ai/a	PO1					
11	pendimethalin	3.8	CS	3.8	lb ai/a	PRT	4.3	9.3	7.3	7.7	1.7
	prometryn	4	L	2.0	lb ai/a	PO1					
12	pyroxasulfone	85	WDG	0.186	lb ai/a	PRT	1.7	6.7	8.7	8.3	2.0
	prometryn	4	L	2.0	lb ai/a	PO1					
13	pyroxasulfone	85	WDG	0.37	lb ai/a	PRT	1.3	8.7	9.3	8.7	2.0
	prometryn	4	L	2.0	lb ai/a	PO1					
14	pyroxasulfone	85	WDG	0.186	lb ai/a	POT	1.7	4.0	8.0	7.0	2.0
	prometryn	4	L	2.0	lb ai/a	PO1					
15	pyroxasulfone	85	WDG	0.37	lb ai/a	POT	1.7	8.7	9.3	9.0	3.0
	prometryn	4	L	2.0	lb ai/a	PO1					
16	s-metolachlor	7.62	EC	1.9	lb ai/a	PRT	1.7	8.0	9.0	8.7	2.0
	flumioxazin	51	WDG	0.096	lb ai/a	PRT					
	linuron	50	DF	1.0	lb ai/a	PO1					
	clethodim	.97	EC	0.12	lb ai/a	PO1					
	COC	100	SL	1	% V/V	PO1					
17	s-metolachlor	7.62	EC	1.9	lb ai/a	PRT	1.3	5.7	6.0	5.7	3.0
	flumioxazin	51	WDG	0.096	lb ai/a	PRT					
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1					
	clethodim	.97	EC	0.12	lb ai/a	PO1					
	COC	100	SL	1	% V/V	PO1					
18	s-metolachlor	7.62	EC	1.9	lb ai/a	PRT	1.0	7.0	8.3	8.3	3.0
	flumioxazin	51	WDG	0.064	lb ai/a	PRT					
	flumioxazin	51	WDG	0.096	lb ai/a	PO1					
19	prometryn	4	L	2.0	lb ai/a	POT	1.0	6.0	7.3	7.7	1.7
	prometryn	4	L	2.0	lb ai/a	PO1					
	COC	100	SL	1	% V/V	PO1					
20	prometryn	4	L	2.0	lb ai/a	POT	1.0	8.3	7.7	8.0	1.7
	handweeded					PO1					
LDS (P=.05)							2.03	2.47	2.15	3.48	0.77
Standard Deviation							1.23	1.50	1.30	2.11	0.47
CV							80.41	21.93	16.98	32.4	25.21

Weed Control in Celery – Muck Farm 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	LACG 3/Jul/12 RATING 1-10	COLQ 3/Jul/12 RATING 1-10	COPU 3/Jul/12 RATING 1-10	LATH 3/Jul/12 RATING 1-10	CELERY 21/Aug/12 KG/PLOT KG	CELERY 21/Aug/12 #/PLOT #
1	s-metolachlor	7.62	EC	1.9	lb ai/a	PRT	9.7	9.7	10.0	8.7	9.45	23.00
	prometryn	4	L	2.0	lb ai/a	PO1						
2	s-metolachlor	7.62	EC	1.9	lb ai/a	PRT	10.0	10.0	10.0	8.3	10.25	27.67
	flumioxazin	51	WDG	0.096	lb ai/a	PRT						
	prometryn	4	L	2.0	lb ai/a	PO1						
3	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	9.7	10.0	10.0	8.7	11.26	27.00
	flumioxazin	51	WDG	0.096	lb ai/a	POT						
	prometryn	4	L	2.0	lb ai/a	PO1						
4	pendimethalin	3.8	CS	1.9	lb ai/a	PRT	7.3	10.0	10.0	8.0	11.16	26.67
	flumioxazin	51	WDG	0.096	lb ai/a	PRT						
	prometryn	4	L	2.0	lb ai/a	PO1						
5	pendimethalin	3.8	CS	1.9	lb ai/a	POT	9.7	10.0	9.3	8.3	9.22	27.33
	flumioxazin	51	WDG	0.096	lb ai/a	POT						
	prometryn	4	L	2.0	lb ai/a	PO1						
6	pendimethalin	3.8	CS	1.9	lb ai/a	PRT	9.7	10.0	10.0	8.3	10.76	27.00
	prometryn	4	L	2.0	lb ai/a	PO1						
7	pendimethalin	3.8	CS	1.9	lb ai/a	POT	9.7	10.0	10.0	8.3	11.50	23.00
	prometryn	4	L	2.0	lb ai/a	PO1						
8	prometryn	4	L	2.0	lb ai/a	POT	8.7	10.0	10.0	9.0	10.78	28.33
	linuron	50	DF	1	lb ai/a	PO1						
9	s-metolachlor	7.62	EC	1.9	lb ai/a	PRT	10.0	10.0	9.7	8.7	10.32	22.00
	sulfentrazone	4	F	0.125	lb ai/a	PRT						
	prometryn	4	L	2.0	lb ai/a	PO1						
10	s-metolachlor	7.62	EC	1.9	lb ai/a	PRT	10.0	3.7	9.7	5.0	7.24	25.67
	sulfentrazone	4	F	0.125	lb ai/a	PO1						
11	pendimethalin	3.8	CS	3.8	lb ai/a	PRT	10.0	10.0	10.0	9.0	10.09	26.33
	prometryn	4	L	2.0	lb ai/a	PO1						
12	pyroxasulfone	85	WDG	0.186	lb ai/a	PRT	10.0	10.0	10.0	8.7	10.07	28.00
	prometryn	4	L	2.0	lb ai/a	PO1						
13	pyroxasulfone	85	WDG	0.37	lb ai/a	PRT	10.0	9.7	10.0	8.0	9.41	24.33
	prometryn	4	L	2.0	lb ai/a	PO1						
14	pyroxasulfone	85	WDG	0.186	lb ai/a	POT	10.0	10.0	10.0	8.3	8.42	23.67
	prometryn	4	L	2.0	lb ai/a	PO1						
15	pyroxasulfone	85	WDG	0.37	lb ai/a	POT	10.0	10.0	10.0	8.7	6.67	25.00
	prometryn	4	L	2.0	lb ai/a	PO1						
16	s-metolachlor	7.62	EC	1.9	lb ai/a	PRT	10.0	10.0	10.0	10.0	10.11	21.00
	flumioxazin	51	WDG	0.096	lb ai/a	PRT						
	linuron	50	DF	1.0	lb ai/a	PO1						
	clethodim	.97	EC	0.12	lb ai/a	PO1						
	COC	100	SL	1	% V/V	PO1						
17	s-metolachlor	7.62	EC	1.9	lb ai/a	PRT	10.0	6.7	10.0	7.7	7.25	23.67
	flumioxazin	51	WDG	0.096	lb ai/a	PRT						
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1						
	clethodim	.97	EC	0.12	lb ai/a	PO1						
	COC	100	SL	1	% V/V	PO1						
18	s-metolachlor	7.62	EC	1.9	lb ai/a	PRT	9.3	7.3	10.0	8.7	8.49	27.00
	flumioxazin	51	WDG	0.064	lb ai/a	PRT						
	flumioxazin	51	WDG	0.096	lb ai/a	PO1						
19	prometryn	4	L	2.0	lb ai/a	POT	9.0	10.0	10.0	9.7	10.65	23.67
	prometryn	4	L	2.0	lb ai/a	PO1						
	COC	100	SL	1	% V/V	PO1						
20	prometryn	4	L	2.0	lb ai/a	POT	1.0	1.0	1.0	1.0	9.37	27.00
	handweeded					PO1						
LSD (P=.05)							1.31	1.57	0.50	1.31	3.101	7.582
Standard Deviation							0.80	0.95	0.30	0.79	1.879	4.595
CV							8.67	10.7	3.18	9.87	19.53	18.11

Weed Control in Celery – Cnossen Farms 2012

Project Code: 113-12-02 **Location: Dorr, MI**

Personnel: Bernard H. Zandstra
Crop: Celery **Variety: CR1**
Planting Method: Transplant **Planting Date: 6/4/12** **Harvest Date: 9/19/12**
Spacing: 6 inch **Row Spacing:20 inch, 2 rows/plot**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 3.3 ft wide x 40 ft long

Soil Type: Houghton muck **OM: 61.4%** **pH: 6.6**
Sand: 19% **Silt: 19%** **Clay: 1%** **CEC:**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
POT	6/19/12	11:30 am	86/70	F	Damp	5-9 SW	55	10% Cloudy	N
PO1	7/17/12	10:am	91/75	F	Dry	3-7 SW	47	0% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
7/17	CELERY	6-7″	Foliar	Goond
	COPU = common purslane	8-12″	Flower	Many
	RRPW = redroot pigweed	6-18″	Foliar	Moderate

Notes and Comments
1. Spray applied with 2 nozzle boom. FF11002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.

Weed Control in Celery – Cnossen Farms 2012

Weed Control in Celery – Cnossen Farms 2012

Trial ID: 113-12-01 Study Director:
Location: Laingsburg, MI Investigator: Dr. Bernard Zandstra

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	CELERY 17/Jul/12 RATING 1-10	COPU 17/Jul/12 RATING 1-10	RRPW 17/Jul/12 RATING 1-10	CELERY 26/Jul/12 RATING 1-10
1	prometryn	4	L	1	lb ai/a	POT	1.0	1.0	6.3	2.0
	prometryn	4	L	1	lb ai/a	PO1				
	COC	100	SL	1.0	% v/v	PO1				
2	prometryn	4	L	2	lb ai/a	POT	1.0	2.3	8.7	2.0
	prometryn	4	L	2	lb ai/a	PO1				
	COC	100	SL	1.0	% v/v	PO1				
3	flumioxazin	51	WDG	0.096	lb ai/a	POT	1.3	3.0	3.7	2.0
	prometryn	4	L	2	lb ai/a	PO1				
	COC	100	SL	1.0	% v/v	PO1				
4	flumioxazin	51	WDG	0.096	lb ai/a	POT	1.7	5.7	7.3	1.7
	prometryn	4	L	1	lb ai/a	POT				
	prometryn	4	L	2	lb ai/a	PO1				
	COC	100	SL	1.0	% v/v	PO1				
5	flumioxazin	51	WDG	0.096	lb ai/a	POT	1.0	8.7	7.3	2.3
	pendimethalin	3.8	CS	1.9	lb ai/a	POT				
	prometryn	4	L	2	lb ai/a	PO1				
	COC	100	SL	1.0	% v/v	PO1				
6	pyroxasulfone	85	WDG	.186	lb ai/a	POT	1.0	7.3	8.3	1.0
	prometryn	4	L	2	lb ai/a	PO1				
	COC	100	SL	1.0	% v/v	PO1				
7	flumioxazin	51	WDG	0.096	lb ai/a	POT	2.7	8.3	8.0	2.0
	s-metolachlor	7.62	EC	1.9	lb ai/a	POT				
	prometryn	4	L	2	lb ai/a	PO1				
	COC	100	SL	1.0	% v/v	PO1				
8	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	1.0	6.0	8.0	2.0
	linuron	50	DF	2	lb ai/a	PO1				
	COC	100	SL	1.0	% v/v	PO1				
9	sulfentrazone	4	F	0.125	lb ai/a	POT	1.0	6.0	5.3	2.7
	linuron	50	DF	2	lb ai/a	PO1				
	COC	100	SL	1.0	% v/v	PO1				
10	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	1.0	6.3	6.7	3.0
	sulfentrazone	4	F	0.125	lb ai/a	PO1				
	COC	100	SL	1.0	% v/v	PO1				
11	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	1.0	6.7	6.7	1.3
	prometryn	4	L	2	lb ai/a	POT				
	linuron	50	DF	1	lb ai/a	PO1				
	COC	100	SL	1.0	% v/v	PO1				
12	untreated handweeded					POT PO1	1.0	1.0	1.7	2.0
LSD (P=.05)							0.70	2.30	3.31	0.85
Standard Deviation							0.41	1.36	1.96	0.50
CV							33.9	26.16	30.09	25.0

Weed Control in Celery – Cnossen Farms 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	COPU 26/Jul/12 RATING 1-10	CELERY 19/Sep/12 TOTAL No./PLOT	CELERY 19/Sep/12 TOTAL KG/PLOT
1	prometryn	4	L	1	lb ai/a	POT	2.0	30.0	27.38
	prometryn	4	L	1	lb ai/a	PO1			
	COC	100	SL	1.0	% v/v	PO1			
2	prometryn	4	L	2	lb ai/a	POT	5.7	29.0	30.76
	prometryn	4	L	2	lb ai/a	PO1			
	COC	100	SL	1.0	% v/v	PO1			
3	flumioxazin	51	WDG	0.096	lb ai/a	POT	4.7	32.0	30.17
	prometryn	4	L	2	lb ai/a	PO1			
	COC	100	SL	1.0	% v/v	PO1			
4	flumioxazin	51	WDG	0.096	lb ai/a	POT	5.7	30.0	33.21
	prometryn	4	L	1	lb ai/a	POT			
	prometryn	4	L	2	lb ai/a	PO1			
	COC	100	SL	1.0	% v/v	PO1			
5	flumioxazin	51	WDG	0.096	lb ai/a	POT	8.0	31.0	35.02
	pendimethalin	3.8	CS	1.9	lb ai/a	POT			
	prometryn	4	L	2	lb ai/a	PO1			
	COC	100	SL	1.0	% v/v	PO1			
6	pyroxasulfone	85	WDG	.186	lb ai/a	POT	6.0	32.3	39.11
	prometryn	4	L	2	lb ai/a	PO1			
	COC	100	SL	1.0	% v/v	PO1			
7	flumioxazin	51	WDG	0.096	lb ai/a	POT	8.7	30.0	32.94
	s-metolachlor	7.62	EC	1.9	lb ai/a	POT			
	prometryn	4	L	2	lb ai/a	PO1			
	COC	100	SL	1.0	% v/v	PO1			
8	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	7.7	29.0	31.67
	linuron	50	DF	2	lb ai/a	PO1			
	COC	100	SL	1.0	% v/v	PO1			
9	sulfentrazone	4	F	0.125	lb ai/a	POT	6.3	32.3	36.27
	linuron	50	DF	2	lb ai/a	PO1			
	COC	100	SL	1.0	% v/v	PO1			
10	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	8.3	28.0	31.13
	sulfentrazone	4	F	0.125	lb ai/a	PO1			
	COC	100	SL	1.0	% v/v	PO1			
11	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	6.0	30.3	33.27
12	untreated					POT	7.7	32.3	34.57
	handweeded					PO1			
LSD (P=.05)							2.35	2.89	6.200
Standard Deviation							1.39	1.70	3.661
CV							21.74	5.58	11.11

Weed Control in Sweet Corn – HTRC 2012

Project Code: 106-12-01 **Location: East Lansing, MI**

Personnel: Bernard H. Zandstra
Crop: Sweet Corn **Variety: BC 0805, GSS 0966**
Planting Method: Seeded **Planting Date: 5/16/12** **Harvest Date: See data**
Spacing: 10 inch **Row Spacing: 28 inch**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 5.5 ft wide x 30 ft long

Soil Type: Marlette Fine Sandy Loam **OM: 1.4%** **pH: 6.4**
Sand: 51% **Silt: 23%** **Clay: 26%** **CEC: 10.9**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	5/18/12	9:00 am	58/58	F	Dry	3-4 SE	60	0% Cloudy	N
PO1	6/11/12	2:15 pm	83/82	F	Dry	6-8 S	58	10% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
6/11	SWCO = sweet corn	4-8″	4 leaves	5%
6/11	GRFT = green foxtail	3-4″	3-5 leaves	Many
6/11	YENS = yellow nutsedge	3-4″	8-10 leaves	Moderate
6/11	RRPW = redroot pigweed	2-5″	8-10 leaves	Many
	BYGR = barnyardgrass			
	COLQ = common lambsquarters			
	LACG = large crabgrass			
	LATH = ladysthumb			

Notes and Comments
1. GSS 0966 was planted in the right row. BC 0805 was planted in the left row.
2. Spray applied with 4 nozzle boom. FF8002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
3. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.
4. Extremely hot, dry weather resulted in irregular germination and irregular yields.

Weed Control in Sweet Corn – HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
Pest Code									GRFT	YENS	COLQ
Crop Code							BC 0805	GSS 0966			
Rating Date							11/Jun/12	11/Jun/12	11/Jun/12	11/Jun/12	11/Jun/12
Rating Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	s-metolachlor	7.62	EC	1.9	lb ai/a	PRE	5.0	5.7	10.0	10.0	5.0
2	dimethenamid-p	6	EC	0.98	lb ai/a	PRE	5.3	3.0	7.3	7.3	6.3
3	pyroxasulfone	85	WDG	.186	lb ai/a	PRE	3.0	4.0	7.7	7.0	9.7
4	acetochlor	6.4	EC	2	lb ai/a	PRE	5.7	3.0	9.0	9.3	9.3
5	saflufenacil	70	WG	.045	lb ai/a	PRE	2.7	5.3	3.0	3.7	7.0
6	mesotrione	4	SC	.188	lb ai/a	PRE	3.7	3.7	4.7	5.3	10.0
7	atrazine	4	F	2	lb ai/a	PRE	3.0	3.3	8.7	5.0	10.0
8	pendimethalin	3.8	CS	1.9	lb ai/a	PRE	2.7	3.0	10.0	4.3	10.0
9	s-metolachlor	2.68	L	2	lb ai/a	PRE	2.0	1.3	10.0	9.3	10.0
	atrazine	1	L	0.75							
	mesotrione	.27	L	0.2							
10	halosulfuron	75	WG	0.023	lb ai/a	PO1	3.0	2.3	1.0	1.3	1.0
11	tembotrione	3.5	SC	.082	lb ai/a	PO1	2.7	2.0	1.0	1.0	1.0
12	foramsulfuron	35	WDG	.038	lb ai/a	PO1	2.0	2.3	3.0	8.7	1.3
13	atrazine	80	DF	1.0	lb ai/a	PO1	2.3	3.7	1.0	5.3	1.0
14	glufosinate	2.34	L	0.37	lb ai/a	PO1	2.0	2.0	1.7	5.0	1.0
	AMS	100	SG	1.5	lb ai/a	PO1					
15	carfentrazone	2	EC	0.031	lb ai/a	PO1	2.0	2.0	1.7	4.7	1.0
16	untreated						1.7	3.3	1.0	4.0	1.3
LSD (P=.05)							3.63	3.15	3.23	5.12	2.69
Standard Deviation							2.18	1.89	1.94	3.07	1.61
CV							71.54	60.54	38.45	53.75	30.39

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
Pest Code							RRPW			BYGR	GRFT
Crop Code								BC 0805	GSS 0966		
Rating Date							11/Jun/12	20/Jun/12	20/Jun/12	20/Jun/12	20/Jun/12
Rating Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	s-metolachlor	7.62	EC	1.9	lb ai/a	PRE	9.0	4.7	4.7	9.7	8.3
2	dimethenamid-p	6	EC	0.98	lb ai/a	PRE	9.0	3.7	1.3	5.3	7.7
3	pyroxasulfone	85	WDG	.186	lb ai/a	PRE	10.0	2.7	3.3	9.7	9.0
4	acetochlor	6.4	EC	2	lb ai/a	PRE	10.0	4.3	2.0	10.0	9.7
5	saflufenacil	70	WG	.045	lb ai/a	PRE	5.3	2.7	6.3	2.0	1.0
6	mesotrione	4	SC	.188	lb ai/a	PRE	9.3	3.7	4.0	2.0	2.3
7	atrazine	4	F	2	lb ai/a	PRE	10.0	1.3	1.3	8.7	7.3
8	pendimethalin	3.8	CS	1.9	lb ai/a	PRE	10.0	1.7	2.0	9.0	9.7
9	s-metolachlor	2.68	L	2	lb ai/a	PRE	10.0	2.0	1.0	9.7	9.0
	atrazine	1	L	0.75							
	mesotrione	.27	L	0.2							
10	halosulfuron	75	WG	0.023	lb ai/a	PO1	1.0	2.3	1.7	3.7	4.7
11	tembotrione	3.5	SC	.082	lb ai/a	PO1	1.0	2.0	1.7	5.3	5.3
12	foramsulfuron	35	WDG	.038	lb ai/a	PO1	1.3	1.7	3.0	1.3	5.7
13	atrazine	80	DF	1.0	lb ai/a	PO1	1.0	2.3	4.0	5.7	4.7
14	glufosinate	2.34	L	0.37	lb ai/a	PO1	1.0	2.0	2.0	9.0	10.0
	AMS	100	SG	1.5	lb ai/a	PO1					
15	carfentrazone	2	EC	0.031	lb ai/a	PO1	1.3	3.0	3.0	5.3	1.7
16	untreated						1.7	1.7	2.7	1.0	1.7
LSD (P=.05)							1.86	3.13	2.89	3.58	3.46
Standard Deviation							1.12	1.87	1.73	2.15	2.08
CV							19.61	72.0	63.06	35.34	34.0

Weed Control in Sweet Corn – HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	LACG	COLQ	LATH	RRPW	BC 0805
Pest Code											
Crop Code											
Rating Date							20/Jun/12	20/Jun/12	20/Jun/12	20/Jun/12	29/Jun/12
Rating Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	s-metolachlor	7.62	EC	1.9	lb ai/a	PRE	10.0	5.3	6.3	8.3	3.0
2	dimethenamid-p	6	EC	0.98	lb ai/a	PRE	9.3	4.7	6.7	9.0	3.7
3	pyroxasulfone	85	WDG	.186	lb ai/a	PRE	10.0	8.3	7.7	9.3	1.7
4	acetochlor	6.4	EC	2	lb ai/a	PRE	10.0	7.7	7.7	10.0	3.7
5	saflufenacil	70	WG	.045	lb ai/a	PRE	2.3	7.0	9.3	4.3	2.3
6	mesotrione	4	SC	.188	lb ai/a	PRE	4.7	10.0	10.0	8.7	3.0
7	atrazine	4	F	2	lb ai/a	PRE	7.0	10.0	10.0	10.0	1.7
8	pendimethalin	3.8	CS	1.9	lb ai/a	PRE	10.0	10.0	10.0	9.0	1.7
9	s-metolachlor	2.68	L	2	lb ai/a	PRE	10.0	10.0	10.0	10.0	1.3
	atrazine	1	L	0.75							
	mesotrione	.27	L	0.2							
10	halosulfuron	75	WG	0.023	lb ai/a	PO1	4.7	3.0	9.3	8.3	2.7
11	tembotrione	3.5	SC	.082	lb ai/a	PO1	4.7	5.3	9.7	7.7	2.7
12	foramsulfuron	35	WDG	.038	lb ai/a	PO1	6.0	4.0	10.0	9.7	2.0
13	atrazine	80	DF	1.0	lb ai/a	PO1	3.7	9.3	10.0	9.7	2.0
14	glufosinate	2.34	L	0.37	lb ai/a	PO1	10.0	10.0	10.0	10.0	2.0
	AMS	100	SG	1.5	lb ai/a	PO1					
15	carfentrazone	2	EC	0.031	lb ai/a	PO1	1.0	10.0	10.0	10.0	2.3
16	untreated						3.3	1.0	1.0	1.3	2.3
LSD (P=.05)							4.34	3.41	1.65	2.67	2.12
Standard Deviation							2.60	2.04	0.99	1.60	1.27
CV							39.07	28.27	11.5	18.97	53.65

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	GSS 0966	GRFT	COLQ	GSS 0966	GSS 0966
Pest Code											
Crop Code											
Rating Date							29/Jun/12	29/Jun/12	29/Jun/12	3/Aug/12	3/Aug/12
Rating Type							RATING	RATING	RATING	#/PLOT	KG/PLOT
Rating Unit							1-10	1-10	1-10	#	KG
1	s-metolachlor	7.62	EC	1.9	lb ai/a	PRE	3.3	9.0	7.3	18.7	4.50
2	dimethenamid-p	6	EC	0.98	lb ai/a	PRE	2.0	7.7	7.3	28.3	6.39
3	pyroxasulfone	85	WDG	.186	lb ai/a	PRE	3.0	9.0	9.0	19.7	4.66
4	acetochlor	6.4	EC	2	lb ai/a	PRE	1.7	9.7	7.7	28.3	6.80
5	saflufenacil	70	WG	.045	lb ai/a	PRE	5.3	4.0	9.7	11.0	2.36
6	mesotrione	4	SC	.188	lb ai/a	PRE	3.7	4.7	10.0	13.3	2.94
7	atrazine	4	F	2	lb ai/a	PRE	1.3	8.7	9.3	27.7	6.55
8	pendimethalin	3.8	CS	1.9	lb ai/a	PRE	1.7	9.3	9.7	27.3	6.81
9	s-metolachlor	2.68	L	2	lb ai/a	PRE	1.0	10.0	10.0	37.0	9.22
	atrazine	1	L	0.75							
	mesotrione	.27	L	0.2							
10	halosulfuron	75	WG	0.023	lb ai/a	PO1	2.3	6.0	9.0	20.7	4.97
11	tembotrione	3.5	SC	.082	lb ai/a	PO1	2.0	5.3	8.3	21.0	4.98
12	foramsulfuron	35	WDG	.038	lb ai/a	PO1	2.7	7.0	6.3	20.3	4.60
13	atrazine	80	DF	1.0	lb ai/a	PO1	3.0	9.3	10.0	22.0	5.88
14	glufosinate	2.34	L	0.37	lb ai/a	PO1	1.3	10.0	10.0	29.7	7.70
	AMS	100	SG	1.5	lb ai/a	PO1					
15	carfentrazone	2	EC	0.031	lb ai/a	PO1	3.0	3.7	9.3	15.3	3.51
16	untreated						4.0	4.0	3.7	18.0	4.30
LSD (P=.05)							2.55	2.98	2.46	13.46	3.586
Standard Deviation							1.53	1.79	1.48	8.07	2.151
CV							59.11	24.4	17.28	36.05	39.94

Weed Control in Sweet Corn – HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage		
Pest Code								
Crop Code							BC 0805	BC 0805
Rating Date							8/Aug/12	8/Aug/12
Rating Type							#/PLOT	KG/PLOT
Rating Unit							#	KG
1	s-metolachlor	7.62	EC	1.9	lb ai/a	PRE	25.0	8.89
2	dimethenamid-p	6	EC	0.98	lb ai/a	PRE	17.0	5.66
3	pyroxasulfone	85	WDG	.186	lb ai/a	PRE	26.0	7.93
4	acetochlor	6.4	EC	2	lb ai/a	PRE	23.0	7.49
5	saflufenacil	70	WG	.045	lb ai/a	PRE	24.0	7.83
6	mesotrione	4	SC	.188	lb ai/a	PRE	18.0	5.89
7	atrazine	4	F	2	lb ai/a	PRE	29.7	9.81
8	pendimethalin	3.8	CS	1.9	lb ai/a	PRE	38.0	12.44
9	s-metolachlor	2.68	L	2	lb ai/a	PRE	36.3	12.00
	atrazine	1	L	0.75				
	mesotrione	.27	L	0.2				
10	halosulfuron	75	WG	0.023	lb ai/a	PO1	25.3	7.94
11	tembotrione	3.5	SC	.082	lb ai/a	PO1	25.0	7.54
12	foramsulfuron	35	WDG	.038	lb ai/a	PO1	29.0	10.06
13	atrazine	80	DF	1.0	lb ai/a	PO1	27.0	8.36
14	glufosinate	2.34	L	0.37	lb ai/a	PO1	26.7	9.15
	AMS	100	SG	1.5	lb ai/a	PO1		
15	carfentrazone	2	EC	0.031	lb ai/a	PO1	24.7	7.74
16	untreated						23.7	7.70
LSD (P=.05)							13.32	5.363
Standard Deviation							7.99	3.217
CV							30.56	37.73

Weed Control in Pickling Cucumber – HTRC 2012

Project Code: 108-12-01 **Location: East Lansing, MI**

Personnel: Bernard H. Zandstra
Crop: Cucumber **Variety: Expedition**
Planting Method: **Planting Date: 5/24/2012** **Harvest Date: 7/20/2012**
Spacing: 3 inch **Row Spacing: 14 inch, 3 rows/plot**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 16 ft wide x 40 ft long

Soil Type: Marlette Fine Sandy Loam **OM: 2%** **pH: 6.5**
Sand: 44% **Silt: 22%** **Clay: 34%** **CEC: 11.1**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	5/24/12	10:00 am	88/72	F	Dry	3-4 SW	38	20% Cloudy	N
PO1	6/11/12	9:00 am	72/72	F	Dry	0	67	100% Cloudy	N
PO2	6/15/12	3:15 pm	88/83	F	Moist	2-5 SW	24	0% Cloudy	N
PO3	6/22/12	1:45 pm	82/83	F	Dry	1-3 NW	44	20% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
6/11	CUCUMBER	1-2″	1 leaf	Good
6/17	CUCUMBER	3-4″	2-3 leaves	Good
6/22	CUCUMBER	5-6″	3-5 leaves	Good

GRFT = green foxtail
YENS = yellow nutsedge
COLQ = common lambsquarters
COPU = common purslane
CORW = common ragweed

Notes and Comments
1. Harvest was delayed 8-10 days to allow late-emerging cucumber to produce fruit. This resulted in a large amount of oversized fruit in some plots.
2. Harvest: 40 ft. of 3 rows
3. Spray applied with tractor 12 nozzle boom. FF8002, 20 gpa, 30 psi, 3.2 mph, CO2.
4. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.

Weed Control in Pickling Cucumber – HTRC 2012

Weed Control in Pickling Cucumber - HTRC 2012

Trial ID: 108-12-01 Study Director:
Location: East Lansing, MI Investigator: Dr. Bernard Zandstra

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	CUCUMBER	GRFT	YENS	COLQ	CORW
	Rating Date						20/Jun/12	20/Jun/12	20/Jun/12	20/Jun/12	20/Jun/12
	Rating Type						RATING	RATING	RATING	RATING	RATING
	Rating Unit						1-10	1-10	1-10	1-10	1-10
1	ethalfluralin	3	EC	1.13	lb ai/a	PRE	2.0	8.7	9.7	9.7	9.0
2	ethalfluralin	3	EC	1.13	lb ai/a	PRE	2.0	7.3	7.0	10.0	7.7
	clomazone	3	ME	0.25	lb ai/a	PRE					
3	ethalfluralin	3	EC	0.75	lb ai/a	PRE	2.3	9.0	9.0	10.0	10.0
	clomazone	3	ME	0.25	lb ai/a	PRE					
4	ethalfluralin	1.6	SE	4.6	pt/a	PRE	2.7	10.0	5.3	10.0	9.7
	clomazone	.5	SE	1.41	pt/a	PRE					
5	ethalfluralin	3	EC	0.75	lb ai/a	PRE	2.7	9.3	9.3	10.0	9.3
	clomazone	3	ME	0.25	lb ai/a	PRE					
5	halosulfuron	75	WG	0.023	lb ai/a	PRE					
6	ethalfluralin	3	EC	0.75	lb ai/a	PRE	2.7	9.7	9.3	10.0	10.0
	clomazone	3	ME	0.25	lb ai/a	PRE					
	halosulfuron	75	WG	0.023	lb ai/a	PO2					
7	ethalfluralin	3	EC	0.75	lb ai/a	PRE	2.3	9.3	7.0	10.0	9.0
	clomazone	3	ME	0.25	lb ai/a	PRE					
	halosulfuron	75	WG	0.023	lb ai/a	PO3					
8	ethalfluralin	3	EC	0.75	lb ai/a	PRE	3.0	9.3	8.0	10.0	9.3
	clomazone	3	ME	0.25	lb ai/a	PRE					
	s-metolachlor	7.62	EC	0.5	lb ai/a	PRE					
9	s-metolachlor	7.62	EC	0.5	lb ai/a	PRE	4.0	9.3	8.7	8.7	8.0
10	s-metolachlor	7.62	EC	0.5	lb ai/a	PRE	3.3	9.0	7.7	10.0	10.0
	halosulfuron	75	WG	0.023	lb ai/a	PO2					
11	s-metolachlor	7.62	EC	.67	lb ai/a	PRE	3.7	9.3	7.3	9.0	7.3
12	ethalfluralin	3	EC	0.75	lb ai/a	PRE	5.3	9.7	7.0	10.0	10.0
	clomazone	3	ME	0.25	lb ai/a	PRE					
	s-metolachlor	7.62	EC	.67	lb ai/a	PO1					
13	ethalfluralin	1.6	SE	4.6	pt/a	PRE	1.7	9.3	5.7	10.0	9.0
	clomazone	.5	SE	1.41	pt/a	PRE					
	halosulfuron	75	WG	0.023	lb ai/a	PO3					
14	untreated handweeded					PRE PO1, 2, 3	1.0	1.0	6.3	1.7	1.3
LSD (P=.05)							1.61	1.94	4.95	0.77	2.74
Standard Deviation							0.96	1.15	2.95	0.46	1.63
CV							34.75	13.42	38.48	4.96	19.07

Weed Control in Pickling Cucumber – HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	RRPW		GRFT	YENS	COLQ
Pest Code											
Crop Code								CUCUMBER			
Rating Date							20/Jun/12	2/Jul/12	2/Jul/12	2/Jul/12	2/Jul/12
Rating Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	ethalfluralin	3	EC	1.13	lb ai/a	PRE	10.0	3.0	6.3	7.0	9.0
2	ethalfluralin	3	EC	1.13	lb ai/a	PRE	9.7	2.7	7.3	7.0	9.0
	clomazone	3	ME	0.25	lb ai/a	PRE					
3	ethalfluralin	3	EC	0.75	lb ai/a	PRE	10.0	2.7	7.0	7.0	9.3
	clomazone	3	ME	0.25	lb ai/a	PRE					
4	ethalfluralin	1.6	SE	4.6	pt/a	PRE	10.0	2.0	10.0	4.0	9.7
	clomazone	.5	SE	1.41	pt/a	PRE					
5	ethalfluralin	3	EC	0.75	lb ai/a	PRE	10.0	2.0	7.3	7.3	10.0
	clomazone	3	ME	0.25	lb ai/a	PRE					
5	halosulfuron	75	WG	0.023	lb ai/a	PRE					
6	ethalfluralin	3	EC	0.75	lb ai/a	PRE	10.0	2.3	9.3	10.0	10.0
	clomazone	3	ME	0.25	lb ai/a	PRE					
	halosulfuron	75	WG	0.023	lb ai/a	PO2					
7	ethalfluralin	3	EC	0.75	lb ai/a	PRE	10.0	2.3	6.7	9.0	10.0
	clomazone	3	ME	0.25	lb ai/a	PRE					
	halosulfuron	75	WG	0.023	lb ai/a	PO3					
8	ethalfluralin	3	EC	0.75	lb ai/a	PRE	10.0	2.3	6.3	9.3	10.0
	clomazone	3	ME	0.25	lb ai/a	PRE					
	s-metolachlor	7.62	EC	0.5	lb ai/a	PRE					
9	s-metolachlor	7.62	EC	0.5	lb ai/a	PRE	10.0	2.7	4.7	10.0	6.7
10	s-metolachlor	7.62	EC	0.5	lb ai/a	PRE	10.0	3.3	5.3	9.7	7.0
	halosulfuron	75	WG	0.023	lb ai/a	PO2					
11	s-metolachlor	7.62	EC	.67	lb ai/a	PRE	9.7	2.7	4.7	4.0	6.0
12	ethalfluralin	3	EC	0.75	lb ai/a	PRE	10.0	5.3	8.3	7.0	9.3
	clomazone	3	ME	0.25	lb ai/a	PRE					
	s-metolachlor	7.62	EC	.67	lb ai/a	PO1					
13	ethalfluralin	1.6	SE	4.6	pt/a	PRE	10.0	1.3	8.0	7.7	10.0
	clomazone	.5	SE	1.41	pt/a	PRE					
	halosulfuron	75	WG	0.023	lb ai/a	PO3					
14	untreated handweeded					PRE PO1, 2, 3	1.7	2.0	1.0	7.0	1.7
LSD (P=.05)							0.65	1.69	3.12	6.59	2.21
Standard Deviation							0.39	1.01	1.86	3.92	1.32
CV							4.12	38.43	28.22	51.82	15.65

Weed Control in Pickling Cucumber – HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	COPU	CORW	RRPW	CUCUMBER	CUCUMBER
Pest Code											
Crop Code										CUCUMBER	CUCUMBER
Rating Date							2/Jul/12	2/Jul/12	2/Jul/12	20/Jul/12	20/Jul/12
Rating Type							RATING	RATING	RATING	PLANT WT/PL	FRUIT WT/PL
Rating Unit							1-10	1-10	1-10	KG	KG
1	ethalfluralin	3	EC	1.13	lb ai/a	PRE	9.3	3.0	9.3	27.63	43.13
2	ethalfluralin	3	EC	1.13	lb ai/a	PRE	10.0	5.3	7.7	33.59	40.90
	clomazone	3	ME	0.25	lb ai/a	PRE					
3	ethalfluralin	3	EC	0.75	lb ai/a	PRE	10.0	5.3	9.0	35.43	59.14
	clomazone	3	ME	0.25	lb ai/a	PRE					
4	ethalfluralin	1.6	SE	4.6	pt/a	PRE	9.7	7.0	9.0	35.50	59.45
	clomazone	.5	SE	1.41	pt/a	PRE					
5	ethalfluralin	3	EC	0.75	lb ai/a	PRE	10.0	10.0	10.0	48.34	57.74
	clomazone	3	ME	0.25	lb ai/a	PRE					
5	halosulfuron	75	WG	0.023	lb ai/a	PRE					
6	ethalfluralin	3	EC	0.75	lb ai/a	PRE	10.0	10.0	10.0	35.77	55.57
	clomazone	3	ME	0.25	lb ai/a	PRE					
	halosulfuron	75	WG	0.023	lb ai/a	PO2					
7	ethalfluralin	3	EC	0.75	lb ai/a	PRE	10.0	10.0	10.0	35.22	62.62
	clomazone	3	ME	0.25	lb ai/a	PRE					
	halosulfuron	75	WG	0.023	lb ai/a	PO3					
8	ethalfluralin	3	EC	0.75	lb ai/a	PRE	10.0	4.3	9.0	40.26	73.65
	clomazone	3	ME	0.25	lb ai/a	PRE					
	s-metolachlor	7.62	EC	0.5	lb ai/a	PRE					
9	s-metolachlor	7.62	EC	0.5	lb ai/a	PRE	9.7	1.7	6.3	34.04	46.94
10	s-metolachlor	7.62	EC	0.5	lb ai/a	PRE	10.0	10.0	10.0	34.94	58.61
	halosulfuron	75	WG	0.023	lb ai/a	PO2					
11	s-metolachlor	7.62	EC	.67	lb ai/a	PRE	10.0	1.7	7.7	29.40	41.23
12	ethalfluralin	3	EC	0.75	lb ai/a	PRE	9.7	6.0	9.3	31.46	25.82
	clomazone	3	ME	0.25	lb ai/a	PRE					
	s-metolachlor	7.62	EC	.67	lb ai/a	PO1					
13	ethalfluralin	1.6	SE	4.6	pt/a	PRE	10.0	10.0	10.0	42.66	83.14
	clomazone	.5	SE	1.41	pt/a	PRE					
	halosulfuron	75	WG	0.023	lb ai/a	PO3					
14	untreated handweeded					PRE PO1, 2, 3	1.0	1.0	1.0	32.02	30.82
LSD (P=.05)							0.69	2.85	2.13	13.586	25.892
Standard Deviation							0.41	1.70	1.27	8.093	15.424
CV							4.42	27.89	15.01	22.83	29.23

Weed Control in Pickling Cucumber – HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage				
Pest Code										
Crop Code							CUCUMBER	CUCUMBER	CUCUMBER	CUCUMBER
Rating Date							20/Jul/12	20/Jul/12	20/Jul/12	20/Jul/12
Rating Type							#1	#2	#3	#4
Rating Unit							KG	KG	KG	KG
1	ethalfluralin	3	EC	1.13	lb ai/a	PRE	1.37	3.70	16.00	20.39
2	ethalfluralin	3	EC	1.13	lb ai/a	PRE	1.48	4.05	16.85	19.18
	clomazone	3	ME	0.25	lb ai/a	PRE				
3	ethalfluralin	3	EC	0.75	lb ai/a	PRE	1.21	4.02	23.83	27.89
	clomazone	3	ME	0.25	lb ai/a	PRE				
4	ethalfluralin	1.6	SE	4.6	pt/a	PRE	1.37	4.31	18.33	33.43
	clomazone	.5	SE	1.41	pt/a	PRE				
5	ethalfluralin	3	EC	0.75	lb ai/a	PRE	1.33	5.08	23.26	36.91
	clomazone	3	ME	0.25	lb ai/a	PRE				
5	halosulfuron	75	WG	0.023	lb ai/a	PRE				
6	ethalfluralin	3	EC	0.75	lb ai/a	PRE	1.51	4.72	22.50	25.99
	clomazone	3	ME	0.25	lb ai/a	PRE				
	halosulfuron	75	WG	0.023	lb ai/a	PO2				
7	ethalfluralin	3	EC	0.75	lb ai/a	PRE	1.19	5.31	22.58	30.79
	clomazone	3	ME	0.25	lb ai/a	PRE				
	halosulfuron	75	WG	0.023	lb ai/a	PO3				
8	ethalfluralin	3	EC	0.75	lb ai/a	PRE	1.07	4.20	28.45	36.28
	clomazone	3	ME	0.25	lb ai/a	PRE				
	s-metolachlor	7.62	EC	0.5	lb ai/a	PRE				
9	s-metolachlor	7.62	EC	0.5	lb ai/a	PRE	1.38	5.40	22.00	16.54
10	s-metolachlor	7.62	EC	0.5	lb ai/a	PRE	1.49	5.50	25.08	24.19
	halosulfuron	75	WG	0.023	lb ai/a	PO2				
11	s-metolachlor	7.62	EC	.67	lb ai/a	PRE	1.56	5.46	19.40	12.96
12	ethalfluralin	3	EC	0.75	lb ai/a	PRE	1.98	7.71	13.70	3.85
	clomazone	3	ME	0.25	lb ai/a	PRE				
	s-metolachlor	7.62	EC	.67	lb ai/a	PO1				
13	ethalfluralin	1.6	SE	4.6	pt/a	PRE	1.24	3.82	26.84	47.16
	clomazone	.5	SE	1.41	pt/a	PRE				
	halosulfuron	75	WG	0.023	lb ai/a	PO3				
14	untreated					PRE	1.24	4.16	16.70	14.50
	handweeded					PO1, 2, 3				
LSD (P=.05)							0.551	1.562	9.425	20.472
Standard Deviation							0.328	0.930	5.614	12.195
CV							23.7	19.31	26.6	48.77

Weed Control in Basil – Van Drunen Farms 2012

Project Code: 117-12-03 **Location: Momence, IL**

Personnel: Bernard H. Zandstra
Crop: Basil **Variety: See Notes**
Planting Method: Seeded **Planting Date: 5/15/2012** **Harvest Date: 7/11/12**
Spacing: 2 inch **Row Spacing: 10 inch, 4 rows/plot**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 5.5 ft wide x 30 ft long

Soil Type: Clay Loam **OM: 7.8%** **pH: 4.9**
Sand: 24% **Silt: 38%** **Clay: 38%** **CEC: 32.2**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	5/17/12	2:00 pm	75/67	F	Dry	3-4 SE	27	0% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
5/17/12	BASIL		Just seeded	

CAWE = carpet weed
COLQ = common lambsquarters
COPU = common purslane
RRPW = redroot pigweed

Notes and Comments
1. Varieties east to west: Genovese, Superior, Millita, and Sanremo. 1 row each/plot.
2. Spray applied with 4 nozzle boom. FF8002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
3. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.

Weed Control in Basil – Van Drunen Farms 2012

Weed Control in Basil - Van Drunen Farms 2012

Trial ID: 117-12-03 Study Director:
Location: Momence, IL Investigator: Dr. Bernard Zandstra

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	GENOVESE 14/Jun/12 RATING 1-10	SUPERIOR 14/Jun/12 RATING 1-10	MILLITA 14/Jun/12 RATING 1-10	SANREMO 14/Jun/12 RATING 1-10
1	napropamide	50	DF	1.0	lb ai/a	PRE	1.7	1.3	1.3	1.3
2	napropamide-UV	50	DF	1.0	lb ai/a	PRE	1.0	1.0	1.0	1.3
3	napropamide-UV	50	DF	2.0	lb ai/a	PRE	1.3	1.0	1.0	1.3
4	napropamide-UV	2	SC	1.0	lb ai/a	PRE	1.3	1.0	1.0	1.3
5	linuron	50	DF	0.25	lb ai/a	PRE	1.3	1.3	1.3	1.7
6	clomazone	3	ME	0.25	lb ai/a	PRE	1.0	1.0	1.0	1.7
7	carfentrazone	2	EC	0.1	lb ai/a	PRE	3.3	2.7	3.0	2.7
8	carfentrazone	2	EC	0.2	lb ai/a	PRE	2.3	2.3	2.3	5.0
9	pyroxasulfone	85	WDG	0.05	lb ai/a	PRE	7.7	6.7	8.0	7.7
10	untreated						1.3	1.3	1.3	1.3
LSD (P=.05)							2.17	2.06	2.16	3.16
Standard Deviation							1.27	1.20	1.26	1.84
CV							56.7	61.03	59.09	72.75

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	CAWE 14/Jun/12 RATING 1-10	COLQ 14/Jun/12 RATING 1-10	COPU 14/Jun/12 RATING 1-10	RRPW 14/Jun/12 RATING 1-10	GENOVESE 11/Jul/12 KG/PLOT KG
1	napropamide	50	DF	1.0	lb ai/a	PRE	6.3	1.7	9.0	7.3	8.06
2	napropamide-UV	50	DF	1.0	lb ai/a	PRE	8.3	2.7	7.0	7.3	8.81
3	napropamide-UV	50	DF	2.0	lb ai/a	PRE	10.0	2.7	8.0	9.3	10.35
4	napropamide-UV	2	SC	1.0	lb ai/a	PRE	8.7	1.3	9.0	6.0	8.76
5	linuron	50	DF	0.25	lb ai/a	PRE	9.0	1.7	5.7	8.7	9.02
6	clomazone	3	ME	0.25	lb ai/a	PRE	9.0	6.3	10.0	7.0	10.82
7	carfentrazone	2	EC	0.1	lb ai/a	PRE	9.7	5.3	10.0	10.0	7.36
8	carfentrazone	2	EC	0.2	lb ai/a	PRE	10.0	8.7	10.0	10.0	6.86
9	pyroxasulfone	85	WDG	0.05	lb ai/a	PRE	10.0	7.3	10.0	10.0	1.58
10	untreated						9.3	1.0	6.0	8.3	7.92
LSD (P=.05)							2.95	2.17	3.97	2.36	4.684
Standard Deviation							1.72	1.27	2.31	1.37	2.730
CV							19.04	32.79	27.33	16.35	34.33

Weed Control in Basil – Van Drunen Farms 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	SUPERIOR 11/Jul/12 KG/PLOT KG	MILLITA 11/Jul/12 KG/PLOT KG	SANREMO 11/Jul/12 KG/PLOT KG	BASIL 11/Jul/12 TOTAL KG/PLOT
	Pest Code									
	Crop Code									
	Rating Date									
	Rating Data Type									
	Rating Unit									
1	napropamide	50	DF	1.0	lb ai/a	PRE	7.72	7.45	8.47	31.69
2	napropamide-UV	50	DF	1.0	lb ai/a	PRE	8.07	7.35	7.47	31.69
3	napropamide-UV	50	DF	2.0	lb ai/a	PRE	8.17	9.61	7.67	35.80
4	napropamide-UV	2	SC	1.0	lb ai/a	PRE	8.19	8.69	8.89	34.53
5	linuron	50	DF	0.25	lb ai/a	PRE	7.91	8.28	6.50	31.72
6	clomazone	3	ME	0.25	lb ai/a	PRE	9.55	7.54	9.66	37.57
7	carfentrazone	2	EC	0.1	lb ai/a	PRE	7.69	6.25	8.95	30.26
8	carfentrazone	2	EC	0.2	lb ai/a	PRE	6.87	5.52	5.88	25.12
9	pyroxasulfone	85	WDG	0.05	lb ai/a	PRE	4.85	1.41	2.43	10.28
10	untreated						7.18	6.90	7.24	29.57
LSD (P=.05)							2.950	3.470	4.127	13.569
Standard Deviation							1.719	2.023	2.406	7.910
CV							22.56	29.32	32.89	26.52

Weed Control in Cilantro, Dill, Fennel & Parsley – Van Drunen Farms 2012

Project Code: 117-12-04 **Location: Momence, IL**

Personnel: Bernard H. Zandstra
Crop: See notes **Variety: See notes**
Planting Method: Seeded **Planting Date: 5/15/2012** **Harvest Date: See data**
Spacing: 1 inch **Row Spacing: 10 inch; 1 row of each crop/plot**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 5.5 ft wide x 30 ft long

Soil Type: Clay Loam **OM: 7.8%** **pH: 4.9**
Sand: 24% **Silt: 38%** **Clay: 38%** **CEC: 32.2**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	5/17/12	1:30 pm	75/67	F	Dry	3-4 SE	27	0% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
5/17	CILANTRO			
5/17	DILL			
5/17	FENNEL			
5/17	PARSLEY			

GIFT = giant foxtail
CAWE = carpet weed
COLQ = common lambsquarters
COPU = common purslane
RRPW = redrood pigweed
SPSP = spotted spurge

Notes and Comments
1. Crops: Cilantro, dill, fennel, and parsley
2. Varieties: Long Standing, Greensleeves, Selma Fino, Gigante Italia
3. Fennel stand was too poor for good data so it was not harvested. Parsley was small and sparse at harvest.
4. Spray applied with 4 nozzle boom. FF8002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
5. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.

Weed Control in Cilantro, Dill, Fennel & Parsley – Van Drunen Farms 2012

Weed Control in Cilantro, Dill, Fennel & Parsley - Van Drunen Farms 2012

Trial ID: 117-12-04 Study Director:
Location: Momence, IL Investigator: Dr. Bernard Zandstra

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	CILANTRO 14/Jun/12 RATING 1-10	DILL 14/Jun/12 RATING 1-10	FENNEL 14/Jun/12 RATING 1-10	PARSLEY 14/Jun/12 RATING 1-10	CAWE 14/Jun/12 RATING 1-10
1	linuron	50	DF	0.25	lb ai/a	PRE	1.7	1.3	5.3	1.3	6.3
2	linuron	50	DF	0.5	lb ai/a	PRE	2.7	1.3	7.7	3.7	7.0
3	prometryn	4	L	1.0	lb ai/a	PRE	2.7	3.3	8.0	6.7	10.0
4	s-metolachlor	7.62	EC	0.5	lb ai/a	PRE	1.7	1.3	7.3	2.7	10.0
5	pendimethalin	3.8	CS	0.5	lb ai/a	PRE	1.7	3.0	6.3	3.3	4.0
6	clomazone	3	ME	0.25	lb ai/a	PRE	1.7	1.3	7.3	5.0	4.3
7	pyroxasulfone	85	WDG	0.05	lb ai/a	PRE	2.3	6.3	8.0	4.7	10.0
8	carfentrazone	2	EC	0.1	lb ai/a	PRE	4.0	7.0	7.3	9.3	4.3
9	carfentrazone	2	EC	0.2	lb ai/a	PRE	8.7	9.3	9.3	10.0	8.0
10	untreated						2.0	1.0	7.0	5.3	3.3
LSD (P=.05)							2.43	2.21	3.49	5.60	4.65
Standard Deviation							1.42	1.29	2.04	3.26	2.71
CV							48.86	36.42	27.64	62.73	40.25

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	COLQ 14/Jun/12 RATING 1-10	RRPW 14/Jun/12 RATING 1-10	CILANTRO 11/Jul/12 RATING 1-10	DILL 11/Jul/12 RATING 1-10	FENNEL 11/Jul/12 RATING 1-10
1	linuron	50	DF	0.25	lb ai/a	PRE	3.0	6.7	2.3	2.3	7.0
2	linuron	50	DF	0.5	lb ai/a	PRE	3.3	8.3	1.7	1.0	6.3
3	prometryn	4	L	1.0	lb ai/a	PRE	5.7	9.7	2.0	1.7	9.3
4	s-metolachlor	7.62	EC	0.5	lb ai/a	PRE	6.7	8.7	1.0	1.0	7.7
5	pendimethalin	3.8	CS	0.5	lb ai/a	PRE	2.3	7.0	2.0	1.7	7.0
6	clomazone	3	ME	0.25	lb ai/a	PRE	7.3	2.3	1.0	1.0	6.0
7	pyroxasulfone	85	WDG	0.05	lb ai/a	PRE	7.3	9.0	1.7	5.3	8.7
8	carfentrazone	2	EC	0.1	lb ai/a	PRE	5.0	8.3	3.7	4.3	7.3
9	carfentrazone	2	EC	0.2	lb ai/a	PRE	7.7	9.7	7.7	9.0	8.3
10	untreated						1.0	1.7	2.3	1.0	6.7
LSD (P=.05)							3.47	3.88	2.42	3.02	3.95
Standard Deviation							2.02	2.26	1.41	1.76	2.30
CV							41.04	31.7	55.77	62.07	30.94

Weed Control in Cilantro, Dill, Fennel & Parsley – Van Drunen Farms 2012

Pest Code								GIFT	CAWE	COLQ	COPU
Crop Code							PARSLEY				
Rating Date							11/Jul/12	11/Jul/12	11/Jul/12	11/Jul/12	11/Jul/12
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
1	linuron	50	DF	0.25	lb ai/a	PRE	3.0	6.0	4.7	3.0	10.0
2	linuron	50	DF	0.5	lb ai/a	PRE	3.7	9.0	4.7	6.3	10.0
3	prometryn	4	L	1.0	lb ai/a	PRE	6.0	8.7	8.7	4.7	7.0
4	s-metolachlor	7.62	EC	0.5	lb ai/a	PRE	2.0	10.0	8.7	5.0	10.0
5	pendimethalin	3.8	CS	0.5	lb ai/a	PRE	3.3	8.3	2.3	6.0	7.0
6	clomazone	3	ME	0.25	lb ai/a	PRE	4.7	9.3	4.7	4.0	10.0
7	pyroxasulfone	85	WDG	0.05	lb ai/a	PRE	5.0	6.7	10.0	7.7	10.0
8	carfentrazone	2	EC	0.1	lb ai/a	PRE	8.7	3.3	1.0	2.3	4.7
9	carfentrazone	2	EC	0.2	lb ai/a	PRE	10.0	9.3	4.0	3.7	10.0
10	untreated						5.0	9.0	4.7	3.7	9.7
LSD (P=.05)							4.92	4.57	3.56	5.04	4.90
Standard Deviation							2.87	2.67	2.08	2.94	2.86
CV							55.9	33.46	38.93	63.44	32.34

Pest Code							RRPW	SPSP			
Crop Code									DILL	CILANTRO	PARSLEY
Rating Date							11/Jul/12	11/Jul/12	11/Jul/12	11/Jul/12	7/Aug/12
Rating Data Type							RATING	RATING	KG/PLOT	KG/PLOT	KG/PLOT
Rating Unit							1-10	1-10	KG	KG	KG
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
1	linuron	50	DF	0.25	lb ai/a	PRE	8.7	7.0	7.11	7.79	1.45
2	linuron	50	DF	0.5	lb ai/a	PRE	8.0	6.0	6.95	7.55	0.75
3	prometryn	4	L	1.0	lb ai/a	PRE	10.0	6.3	5.34	6.33	0.77
4	s-metolachlor	7.62	EC	0.5	lb ai/a	PRE	8.3	10.0	9.81	8.59	1.56
5	pendimethalin	3.8	CS	0.5	lb ai/a	PRE	3.3	10.0	6.02	7.98	1.02
6	clomazone	3	ME	0.25	lb ai/a	PRE	6.0	2.3	8.03	9.08	0.81
7	pyroxasulfone	85	WDG	0.05	lb ai/a	PRE	9.0	10.0	3.03	7.56	0.81
8	carfentrazone	2	EC	0.1	lb ai/a	PRE	10.0	4.3	2.43	4.43	0.07
9	carfentrazone	2	EC	0.2	lb ai/a	PRE	8.7	1.7	0.17	0.74	0.00
10	untreated						5.7	4.0	9.13	7.67	0.88
LSD (P=.05)							4.17	6.26	5.078	6.209	1.487
Standard Deviation							2.43	3.65	2.960	3.619	0.867
CV							31.28	59.19	51.0	53.45	106.85

Weed Control in Lettuce – Van Dyk Farms 2012

Project Code: 116-12-01 **Location: Imlay City, MI**

Personnel: Bernard H. Zandstra
Crop: Lettuce **Variety: Salad King Romaine**
Planting Method: Seeded **Planting Date: 6/4/12** **Harvest Date: 8/1/12**
Spacing: 10 inch **Row Spacing: 24 inch**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 3 ft wide x 30 ft long

Soil Type: Muck **OM: 73%** **pH: 6.9**
Sand: 10% **Silt: 15%** **Clay: 2%** **CEC: N/A**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	6/6/12	3:00 pm	75/68	F	Damp	6-7 NW	30	0% Cloudy	N

Crop and Weed Information at Application

	Height or Diameter	Growth Stage	Density

COPU = common purslane
RRPW = redroot pigweed

Notes and Comments
1. Harvest: 30 ft. of 2 rows
2. Spray applied with 2 nozzle boom. FF11002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
3. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.

Weed Control in Lettuce – Van Dyk Farms 2012

Weed Control in Lettuce - Van Dyk Farms 2012

Trial ID: 116-12-01 Study Director:
Location: Imlay City, MI Investigator: Dr. Bernard Zandstra

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
Pest Code								COPU	RRPW		
Crop Code							LETTUCE			LETTUCE	LETTUCE
Rating Date							28/Jun/12	28/Jun/12	28/Jun/12	1/Aug/12	1/Aug/12
Rating Data Type							RATING	RATING	RATING	KG/PLOT	#/PLOT
Rating Unit							1-10	1-10	1-10	KG	#
1	pronamide	50	WP	6.0	lb ai/a	PRE	1.3	5.7	5.7	53.39	62.7
2	sulfentrazone	4	F	0.094	lb ai/a	PRE	2.0	3.0	9.3	48.87	62.0
3	sulfentrazone	4	F	0.125	lb ai/a	PRE	3.0	4.7	10.0	40.71	49.7
4	sulfentrazone	4	F	0.156	lb ai/a	PRE	3.3	3.7	10.0	38.07	48.7
5	sulfentrazone	4	F	0.188	lb ai/a	PRE	3.7	4.7	10.0	43.20	55.0
6	sulfentrazone	4	F	0.25	lb ai/a	PRE	6.0	5.0	7.0	34.39	42.3
7	pyroxasulfone	85	WDG	0.05	lb ai/a	PRE	2.3	1.3	6.7	47.96	64.0
8	untreated						1.7	1.0	1.0	40.08	53.3
LSD (P=.05)							2.23	1.63	3.93	15.924	19.99
Standard Deviation							1.27	0.93	2.25	9.092	11.42
CV							43.71	25.63	30.12	20.98	20.87

Preemergence Weed Control in Onion on Mineral Soil–Vogel Farms 2012

Project Code: 112-12-03 **Location: Fremont, MI**

Personnel: Bernard H. Zandstra
Crop: Onion **Variety: Sherman**
Planting Method: Seeded **Planting Date: 3/27/12** **Harvest Date: 8/15/12**
Spacing: 1.5 inch **Row Spacing: 10 inch, 4 rows/plot**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 5.5 ft wide x 30 ft long

Soil Type: Pipestone Sand **OM: 2.7%** **pH: 6.0**
Sand: 90% **Silt: 5%** **Clay: 5%** **CEC: 6.9**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	4/6/12	2:00 pm	59/60	F	Good	0-3 W	12	0% Cloudy	N
PO1	5/16/12	11:30 am	67/62	F	Dry	1-2 NW	36	50% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
4/6	ONION		Just planted	
5/16	ONION		2 leaves	Good
5/16	COCW = common chickweed	1-2″	3-6 leaves	Few
5/16	COLQ = common lambsquarters	1-3″	3-4 leaves	Moderate
5/16	EBNS = eastern black nightshade	.5-1″	2-3 leaves	Few
	RRPW = redroot pigweed			

Notes and Comments
1. Harvest: 30 ft. of 4 rows
2. Spray applied with 4 nozzle boom. FF8002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
3. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.

Preemergence Weed Control in Onion on Mineral Soil- Vogel Farms 2012

Preemergence Weed Control in Onion on Mineral Soil - Vogel Farms 2012

Trial ID: 112-12-03 Study Director:
Location: Fremont, MI Investigator: Dr. Bernard Zandstra

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage				
Pest Code								COCW	COLQ	
Crop Code							ONION			ONION
Rating Date							16/May/12	16/May/12	16/May/12	29/May/12
Rating Data Type							RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10
1	pendimethalin	3.8	CS	0.75	lb ai/a	PRE, PO1	1.0	9.0	9.3	1.3
2	pendimethalin	3.8	CS	0.95	lb ai/a	PRE, PO1	1.0	10.0	10.0	1.0
3	pendimethalin	3.8	CS	1.50	lb ai/a	PRE, PO1	1.7	10.0	10.0	2.3
4	s-metolachlor	7.62	EC	0.95	lb ai/a	PRE, PO1	5.7	10.0	6.3	4.7
5	acetochlor	6.4	EC	0.5	lb ai/a	PRE, PO1	6.0	9.3	4.7	5.0
6	pyroxasulfone	85	WDG	0.09	lb ai/a	PRE, PO1	5.3	9.7	8.7	6.0
7	pyroxasulfone	85	WDG	0.18	lb ai/a	PRE, PO1	7.3	10.0	8.7	8.3
8	ethofumesate	4	SC	1.0	lb ai/a	PRE, PO1	2.0	8.7	9.3	2.3
9	pendimethalin	3.8	CS	0.75	lb ai/a	PRE	1.3	9.7	10.0	2.0
	flumioxazin	51	WDG	0.032	lb ai/a	PO1				
10	pendimethalin	3.8	CS	0.75	lb ai/a	PRE	1.0	9.0	9.3	1.3
	pyroxasulfone	85	WDG	0.09	lb ai/a	PO1				
11	pendimethalin	3.8	CS	0.75	lb ai/a	PRE	1.3	9.7	9.7	1.7
	pyroxasulfone	85	WDG	0.18	lb ai/a	PO1				
12	untreated						1.0	3.7	1.7	1.0
LSD (P=.05)							1.00	2.39	3.32	1.37
Standard Deviation							0.59	1.41	1.96	0.81
CV							20.36	15.61	24.1	26.33

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
Pest Code							COLQ	EBNS	RRPW		
Crop Code										ONION	ONION
Rating Date							29/May/12	29/May/12	29/May/12	26/Jun/12	15/Aug/12
Rating Data Type							RATING	RATING	RATING	RATING	KG/PLOT
Rating Unit							1-10	1-10	1-10	1-10	KG
1	pendimethalin	3.8	CS	0.75	lb ai/a	PRE, PO1	10.0	8.3	9.7	1.3	81.80
2	pendimethalin	3.8	CS	0.95	lb ai/a	PRE, PO1	9.3	10.0	9.0	1.7	79.01
3	pendimethalin	3.8	CS	1.50	lb ai/a	PRE, PO1	10.0	10.0	9.7	2.3	76.06
4	s-metolachlor	7.62	EC	0.95	lb ai/a	PRE, PO1	7.3	10.0	10.0	4.3	52.31
5	acetochlor	6.4	EC	0.5	lb ai/a	PRE, PO1	9.7	10.0	9.7	4.3	52.82
6	pyroxasulfone	85	WDG	0.09	lb ai/a	PRE, PO1	7.3	10.0	10.0	4.0	49.64
7	pyroxasulfone	85	WDG	0.18	lb ai/a	PRE, PO1	7.3	10.0	10.0	6.3	24.51
8	ethofumesate	4	SC	1.0	lb ai/a	PRE, PO1	7.7	10.0	9.3	1.7	69.76
9	pendimethalin	3.8	CS	0.75	lb ai/a	PRE	9.0	10.0	10.0	1.7	83.93
	flumioxazin	51	WDG	0.032	lb ai/a	PO1					
10	pendimethalin	3.8	CS	0.75	lb ai/a	PRE	4.7	6.7	9.0	2.3	72.31
	pyroxasulfone	85	WDG	0.09	lb ai/a	PO1					
11	pendimethalin	3.8	CS	0.75	lb ai/a	PRE	8.3	10.0	9.7	2.0	78.32
	pyroxasulfone	85	WDG	0.18	lb ai/a	PO1					
12	untreated						2.3	1.7	5.3	3.0	64.36
LSD (P=.05)							2.55	2.88	2.12	1.19	9.339
Standard Deviation							1.51	1.70	1.25	0.70	5.515
CV							19.45	19.15	13.52	24.06	8.43

Preemergence Weed Control in Onion – Keilen Farms 2012

Project Code: 112-12-04 **Location: East Lansing, MI**

Personnel: Bernard H. Zandstra
Crop: Onion **Variety: Livingston**
Planting Method: Seeded **Planting Date: 4/9/12** **Harvest Date: 8/20/2012**
Spacing: 1.5 inch **Row Spacing: 10 inch**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 3.3 ft wide x 35 ft long, 2 rows/plot

Soil Type: Houghton muck **OM: 68%** **pH: 6.3**
Sand: 14% **Silt: 18%** **Clay: 1%** **CEC:**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	4/13/12	1:00 pm	65/54	F	Dry	6-8 S	28	75% Cloudy	N
PO1	5/21/12	11:00 am	66/66	F	Dry	5-6 NW	70	100% Cloudy	N
PO2	6/19/12	9:30 am	84/72	F	Dry	8-10 SW	53	0% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
5/21	ONION			
6/19	ONION	12-18″	4-6 leaves	
6/19	LATH = ladysthumb	4-6″		Many
6/19	COPU = common purslane	1-2″		Very few
6/19	CORW = common ragweed	2-3″		Very few
6/19	RRPW = redroot pigweed	6-8″		Few

Notes and Comments
1. Spray applied with 2 nozzle boom. FF11002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.

Preemergence Weed Control in Onion – Keilen Farms 2012

Preemergence Weed Control in Onion - Keilen Farms 2012

Trial ID: 112-12-04 Study Director:
Location: East Lansing, MI Investigator: Dr. Bernard Zandstra

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
Pest Code								LATH		LATH	
Crop Code							ONION		ONION		ONION
Rating Date							15/May/12	15/May/12	21/May/12	21/May/12	30/May/12
Rating Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	pendimethalin	3.8	CS	1.9	lb ai/a	PRE, 1-2	1.0	1.7	2.3	4.3	2.0
2	pendimethalin	3.8	CS	3.8	lb ai/a	PRE, 1-2	1.0	1.3	1.7	4.3	1.7
3	pendimethalin	3.8	CS	3.8	lb ai/a	PRE	1.0	1.3	1.3	2.7	1.0
	s-metolachlor	7.62	EC	2.67	lb ai/a	PO1					
	dimethenamid-p	6	EC	0.98	lb ai/a	PO2					
4	pendimethalin	3.8	CS	1.9	lb ai/a	PRE, 1-2	1.0	3.3	1.3	5.0	1.3
	flumioxazin	51	WDG	0.032	lb ai/a	PRE, 1-2					
5	pendimethalin	3.8	CS	3.8	lb ai/a	PRE	1.0	4.7	1.7	6.3	1.3
	flumioxazin	51	WDG	0.032	lb ai/a	PRE					
	pendimethalin	3.8	CS	1.9	lb ai/a	PO1					
	flumioxazin	51	WDG	.032	lb ai/a	PO1					
	dimethenamid-p	6	EC	0.98	lb ai/a	PO2					
6	pendimethalin	3.8	CS	1.9	lb ai/a	PRE, 1	1.0	3.0	1.7	3.0	1.3
	flumioxazin	51	WDG	.032	lb ai/a	PO1					
	pendimethalin	3.8	CS	1.9	lb ai/a	PO2					
	flumioxazin	51	WDG	.064	lb ai/a	PO2					
7	pendimethalin	3.8	CS	1.9	lb ai/a	PRE	1.0	4.0	1.7	4.7	1.7
	pendimethalin	3.8	CS	1.9	lb ai/a	PO1					
	flumioxazin	51	WDG	.032	lb ai/a	PO1					
	acetochlor	6.4	EC	1	lb ai/a	PO2					
8	pendimethalin	3.8	CS	1.9	lb ai/a	PRE	1.0	4.0	1.7	4.7	1.7
	acetochlor	6.4	EC	1	lb ai/a	PO1, 2					
9	pendimethalin	3.8	CS	1.9	lb ai/a	PRE	1.0	1.7	1.7	3.3	2.0
	cetochlor	6.4	EC	2	lb ai/a	PO1, 2					
10	pyroxasulfone	85	WDG	0.18	lb ai/a	PRE	2.3	3.7	4.0	6.0	3.7
	pendimethalin	3.8	CS	3.8	lb ai/a	PO1, 2					
11	pyroxasulfone	85	WDG	0.36	lb ai/a	PRE	2.3	5.7	4.0	6.0	3.7
	pendimethalin	3.8	CS	3.8	lb ai/a	PO1, 2					
12	pendimethalin	3.8	CS	3.8	lb ai/a	PRE	1.0	2.0	1.7	2.7	2.0
	pyroxasulfone	85	WDG	0.18	lb ai/a	PO1, 2					
13	pendimethalin	3.8	CS	3.8	lb ai/a	PRE	1.0	1.0	1.0	2.0	1.3
	s-metolachlor	7.62	EC	2.67	lb ai/a	PO1					
	dimethenamid-p	6	EC	0.98	lb ai/a	PO2					
14	pendimethalin	3.8	CS	3.8	lb ai/a	PRE	1.0	3.3	1.7	3.7	1.3
	flumioxazin	51	WDG	0.096	lb ai/a	PO1					
	dimethenamid-p	6	EC	.98	lb ai/a	PO2					
15	handweeded						1.0	1.0	1.3	1.7	2.0
LSD (P=.05)									1.3	1.7	2.0
Standard Deviation							0.68	3.44	1.31	3.11	1.30
CV							0.41	2.05	0.78	1.86	0.78
							34.5	73.97	40.96	46.22	41.66

Preemergence Weed Control in Onion – Keilen Farms 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	LATH	ONION	ONION	LATH	RRPW	ONION
Pest Code							LATH			LATH	RRPW	
Crop Code								ONION	ONION			ONION
Rating Date							30/May/12	22/Jun/12	2/Jul/12	2/Jul/12	2/Jul/12	20/Aug/12
Rating Type							RATING	RATING	RATING	RATING	RATING	KG/PLOT
Rating Unit							1-10	1-10	1-10	1-10	1-10	KG
1	pendimethalin	3.8	CS	1.9	lb ai/a	PRE, 1-2	4.7	1.7	1.7	9.0	9.3	37.00
2	pendimethalin	3.8	CS	3.8	lb ai/a	PRE, 1-2	5.0	1.7	1.3	9.7	9.0	39.26
3	pendimethalin	3.8	CS	3.8	lb ai/a	PRE	6.7	1.0	1.0	7.7	8.7	42.56
	s-metolachlor	7.62	EC	2.67	lb ai/a	PO1						
	dimethenamid-p	6	EC	.98	lb ai/a	PO2						
4	pendimethalin	3.8	CS	1.9	lb ai/a	PRE, 1-2	5.3	2.0	2.3	7.7	10.0	46.67
	flumioxazin	51	WDG	.032	lb ai/a	PRE, 1-2						
5	pendimethalin	3.8	CS	3.8	lb ai/a	PRE	7.3	1.0	1.0	7.7	9.0	48.06
	flumioxazin	51	WDG	.032	lb ai/a	PRE						
	pendimethalin	3.8	CS	1.9	lb ai/a	PO1						
	flumioxazin	51	WDG	.032	lb ai/a	PO1						
	dimethenamid-p	6	EC	.98	lb ai/a	PO2						
6	pendimethalin	3.8	CS	1.9	lb ai/a	PRE, 1	3.3	1.7	2.0	8.0	8.7	47.40
	flumioxazin	51	WDG	.032	lb ai/a	PO1						
	pendimethalin	3.8	CS	1.9	lb ai/a	PO2						
	flumioxazin	51	WDG	.064	lb ai/a	PO2						
7	pendimethalin	3.8	CS	1.9	lb ai/a	PRE	6.0	2.0	1.7	8.3	8.7	47.00
	pendimethalin	3.8	CS	1.9	lb ai/a	PO1						
	flumioxazin	51	WDG	.032	lb ai/a	PO1						
	acetochlor	6.4	EC	1	lb ai/a	PO2						
8	pendimethalin	3.8	CS	1.9	lb ai/a	PRE	4.7	1.7	2.0	8.0	9.0	43.65
	acetochlor	6.4	EC	1	lb ai/a	PO1, 2						
9	pendimethalin	3.8	CS	1.9	lb ai/a	PRE	4.3	1.7	1.3	8.0	9.7	37.16
	acetochlor	6.4	EC	2	lb ai/a	PO1, 2						
10	pyroxasulfone	85	WDG	0.18	lb ai/a	PRE	6.7	2.0	2.0	7.7	9.7	27.04
	pendimethalin	3.8	CS	3.8	lb ai/a	PO1, 2						
11	pyroxasulfone	85	WDG	.36	lb ai/a	PRE	6.0	2.3	2.3	5.0	10.0	41.91
	pendimethalin	3.8	CS	3.8	lb ai/a	PO1, 2						
12	pendimethalin	3.8	CS	3.8	lb ai/a	PRE	5.7	1.3	1.7	8.0	8.3	46.66
	pyroxasulfone	85	WDG	0.18	lb ai/a	PO1, 2						
13	pendimethalin	3.8	CS	3.8	lb ai/a	PRE	5.7	1.0	1.3	7.3	8.7	45.80
	s-metolachlor	7.629	EC	2.67	lb ai/a	PO1						
14	pendimethalin	3.8	CS	3.8	lb ai/a	PRE		1.7	1.7	7.3	9.0	46.48
	flumioxazin	51	WDG	0.096	lb ai/a	PO1	4.3					
	dimethenamid-p	6	EC	.98	lb ai/a	PO2						
15	handweeded							2.7	3.3	6.0	6.3	33.54
LSD (P=.05)							2.97	1.0	1.35	1.91	1.64	12.454
Standard Deviation							1.78	1.0	0.81	1.14	0.98	7.448
CV							34.78	37.37	45.54	14.85	10.95	17.73

Postemergence Weed Control in Onion – Keilen Farms 2012

Project Code: 112-12-05 **Location: East Lansing, MI**

Personnel: Bernard H. Zandstra
Crop: Onion **Variety: Livingston**
Planting Method: Seeded **Planting Date: 4/9/12** **Harvest Date: 8/20/2012**
Spacing: 1.5 inch **Row Spacing: 10 inch, 2 rows/plot**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 3.3 ft wide x 35 ft long

Soil Type: Houghton muck **OM: 68%** **pH: 6.3**
Sand: 14% **Silt: 18%** **Clay: 1%** **CEC:**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PO1	5/15/12	9:30 am	67/56	F	Dry	4-5 SW	35	0% Cloudy	N
PO2	5/21/12	10:00 am	64/66	F	Dry	4-5 NW	70	100% Cloudy	N
PO3	6/19/12	1:30 pm	94/74	F	Dry	6-8SW	42	100% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
5/15	ONION	3-4″	1 leaf	5%
5/15	LATH = ladysthumb	1-3″	3-4 leaves	
5/21	ONION	3-5″	2 leaves	5%
5/21	LATH = ladysthumb	3-4″	4-5 leaves	Many
	RRPW = redroot pigweed			

Notes and Comments
1. Whole field sprayed with Prowl H20 1.9 lb/a on 4/12/12.
2. Spray applied with 2 nozzle boom. FF11002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
3. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.
4. Harvest 30 ft. of 2 rows

Postemergence Weed Control in Onion – Keilen Farms 2012

Postemergence Weed Control in Onion - Keilen Farms 2012

Trial ID:	112-12-05	Study Director:	
Location:	East Lansing, MI	Investigator:	Dr. Bernard Zandstra

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	ONION 30/May/12 RATING 1-10	LATH 30/May/12 RATING 1-10	ONION 22/Jun/12 RATING 1-10	LATH 22/Jun/12 RATING 1-10
1	oxyfluorfen	4	SC	0.063	lb ai/a	PO1, 2-3	2.0	4.7	2.0	8.7
2	oxyfluorfen	4	SC	0.125	lb ai/a	PO1, 2-3	1.7	6.3	1.3	7.0
3	flumioxazin	51	WDG	0.032	lb ai/a	PO1, 2-3	1.3	3.7	2.0	8.3
4	oxyfluorfen	4	SC	0.063	lb ai/a	PO1, 2-3	1.7	6.0	1.7	8.3
	fluroxypyr	2.8	L	0.061	lb ai/a	PO2, 3				
5	oxyfluorfen	4	SC	0.125	lb ai/a	PO1, 2-3	3.0	8.3	2.0	10.0
	fluroxypyr	2.8	L	0.123	lb ai/a	PO2, 3				
6	oxyfluorfen	4	SC	0.063	lb ai/a	PO2, 3	1.3	7.7	2.0	9.0
	bromoxynil	2	EC	0.125	lb ai/a	PO2, 3				
7	oxyfluorfen	4	SC	0.063	lb ai/a	PO1, 2-3	2.7	5.3	1.7	9.0
	flumioxazin	51	WDG	0.032	lb ai/a	PO1, 2-3				
8	oxyfluorfen	4	SC	0.063	lb ai/a	PO1, 2-3	2.0	6.3	1.3	9.3
	flumioxazin	51	WDG	0.032	lb ai/a	PO2, 3				
9	oxyfluorfen	4	SC	0.063	lb ai/a	PO2, 3	2.0	5.0	2.7	8.7
	flumioxazin	51	WDG	0.032	lb ai/a	PO2				
	flumioxazin	51	WDG	0.064	lb ai/a	PO3				
10	oxyfluorfen	4	SC	0.063	lb ai/a	PO2, 3	2.3	6.3	1.7	8.7
	clethodim	.97	EC	0.12	lb ai/a	PO2, 3				
11	oxyfluorfen	4	SC	0.125	lb ai/a	PO1	1.0	4.7	2.0	8.7
	fluroxypyr	2.8	L	0.063	lb ai/a	PO2, 3				
12	oxyfluorfen	4	SC	0.125	lb ai/a	PO1	1.3	5.0	1.7	9.0
	fluroxypyr	2.8	L	0.123	lb ai/a	PO2, 3				
13	oxyfluorfen	4	SC	0.125	lb ai/a	PO1	1.0	4.0	2.3	7.3
	fluroxypyr	2.8	L	0.063	lb ai/a	PO2, 3				
	clethodim	.97	EC	0.12	lb ai/a	PO2, 3				
14	handweeded						2.0	7.7	1.3	7.3
LSD (P=.05)							1.27	2.46	1.29	2.29
Standard Deviation							0.76	1.46	0.77	1.36
CV							41.84	25.29	41.76	15.98

Postemergence Weed Control in Onion – Keilen Farms 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage				
Pest Code								LATH	RRPW	
Crop Code							ONION			ONION
Rating Date							2/Jul/12	2/Jul/12	2/Jul/12	20/Aug/12
Rating Data Type							RATING	RATING	RATING	KG/PLOT
Rating Unit							1-10	1-10	1-10	KG
1	oxyfluorfen	4	SC	0.063	lb ai/a	PO1, 2-3	1.7	8.7	10.0	50.80
2	oxyfluorfen	4	SC	0.125	lb ai/a	PO1, 2-3	1.7	6.7	10.0	48.14
3	flumioxazin	51	WDG	0.032	lb ai/a	PO1, 2-3	2.0	7.7	8.3	55.88
4	oxyfluorfen	4	SC	0.063	lb ai/a	PO1, 2-3	1.0	9.0	10.0	61.44
	fluroxypyr	2.8	L	0.061	lb ai/a	PO2, 3				
5	oxyfluorfen	4	SC	0.125	lb ai/a	PO1, 2-3	1.0	10.0	10.0	57.83
	fluroxypyr	2.8	L	0.123	lb ai/a	PO2, 3				
6	oxyfluorfen	4	SC	0.063	lb ai/a	PO2, 3	1.3	9.3	8.7	55.64
	bromoxynil	2	EC	0.125	lb ai/a	PO2, 3				
7	oxyfluorfen	4	SC	0.063	lb ai/a	PO1, 2-3	1.7	8.0	10.0	52.88
	flumioxazin	51	WDG	0.032	lb ai/a	PO1, 2-3				
8	oxyfluorfen	4	SC	0.063	lb ai/a	PO1, 2-3	1.3	8.7	10.0	55.68
	flumioxazin	51	WDG	0.032	lb ai/a	PO2, 3				
9	oxyfluorfen	4	SC	0.063	lb ai/a	PO2, 3	2.3	8.7	10.0	54.66
	flumioxazin	51	WDG	0.032	lb ai/a	PO2				
	flumioxazin	51	WDG	0.064	lb ai/a	PO3				
10	oxyfluorfen	4	SC	0.063	lb ai/a	PO2, 3	1.3	7.7	10.0	54.21
	clethodim	.97	EC	0.12	lb ai/a	PO2, 3				
11	oxyfluorfen	4	SC	0.125	lb ai/a	PO1	1.7	8.0	8.7	58.15
	fluroxypyr	2.8	L	0.063	lb ai/a	PO2, 3				
12	oxyfluorfen	4	SC	0.125	lb ai/a	PO1	1.3	8.0	8.3	54.88
	fluroxypyr	2.8	L	0.123	lb ai/a	PO2, 3				
13	oxyfluorfen	4	SC	0.125	lb ai/a	PO1	1.3	8.0	7.7	50.58
	fluroxypyr	2.8	L	0.063	lb ai/a	PO2, 3				
	clethodim	.97	EC	0.12	lb ai/a	PO2, 3				
14	handweeded						1.7	4.0	5.7	53.80
LSD (P=.05)							1.10	2.69	2.14	16.701
Standard Deviation							0.65	1.60	1.27	9.949
CV							42.96	19.95	13.99	18.22

Preemergence Weed Control in Established Chives – Van Drunen Farms 2012

Project Code: 117-12-01 **Location: Momence, IL**

Personnel: Bernard H. Zandstra
Crop: Chives **Variety: Purly** **Harvest Date: See data**
Planting Method: Seeded **Planting Date: 2010**
Spacing: 1 inch **Row Spacing: 2 ft**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 5.5 ft wide x 30 ft long

Soil Type: Sandy Loam **OM: 2.2%** **pH: 4.6**
Sand: 80% **Silt: 8%** **Clay: 12%** **CEC: 11.8**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	5/17/12	11:00 am	70/64	F	Dry	4-5 SE	26	0% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
5/17	CHIVES	6-10″		

LACG = large crabgrass

Notes and Comments
1. Harvest: 30 feet of 2 rows with harvester; 3 harvests.
2. Spray applied with 4 nozzle boom. FF8002, 20 gpa, 30 psi, 3.2 mph, CO_2 backpack sprayer.
3. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.

Preemergence Weed Control in Established Chives – Van Drunen Farms 2012

Preemergence Weed Control in Established Chives - Van Drunen Farms 2012

Trial ID: 117-12-01 Study Director:
Location: Momence, IL Investigator: Dr. Bernard Zandstra

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	CHIVE 14/Jun/12 RATING 1-10	LACG 14/Jun/12 RATING 1-10	CHIVE 11/Jul/12 RATING 1-10	LACG 11/Jul/12 RATING 1-10
1	pendimethalin	3.8	CS	0.95	lb ai/a	PRE	1.0	10.0	1.0	8.7
2	pendimethalin	3.8	CS	1.9	lb ai/a	PRE	2.7	10.0	1.0	9.3
3	s-metolachlor	7.62	EC	0.95	lb ai/a	PRE	1.7	10.0	1.0	10.0
4	s-metolachlor	7.62	EC	1.9	lb ai/a	PRE	1.3	10.0	1.3	9.3
5	dimethenamid-p	6	EC	0.98	lb ai/a	PRE	1.3	10.0	1.0	10.0
6	oxyfluorfen	4	SC	0.25	lb ai/a	PRE	1.0	10.0	2.0	4.0
7	ethofumesate	4	SC	2.0	lb ai/a	PRE	2.7	10.0	3.0	10.0
8	pyroxasulfone	85	WDG	0.186	lb ai/a	PRE	3.3	10.0	2.7	10.0
9	acetochlor	6.4	EC	1.0	lb ai/a	PRE	1.3	10.0	1.3	9.3
10	untreated						1.0	4.0	2.3	4.0
LSD (P=.05)							1.19	1.96	1.02	4.11
Standard Deviation							0.69	1.14	0.60	2.39
CV							39.88	12.13	35.78	28.28

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	CHIVE 14/Jun/12 KG/PLOT KG	CHIVE 11/Jul/12 KG/PLOT KG	CHIVE 7/Aug/12 KG/PLOT KG	CHIVE TOTAL KG/PLOT
1	pendimethalin	3.8	CS	0.95	lb ai/a	PRE	7.9	5.1	2.5	15.500
2	pendimethalin	3.8	CS	1.9	lb ai/a	PRE	7.8	5.9	4.2	17.903
3	s-metolachlor	7.62	EC	0.95	lb ai/a	PRE	8.2	7.9	3.8	19.913
4	s-metolachlor	7.62	EC	1.9	lb ai/a	PRE	8.1	5.6	4.4	18.080
5	dimethenamid-p	6	EC	0.98	lb ai/a	PRE	9.3	6.3	4.2	19.783
6	oxyfluorfen	4	SC	0.25	lb ai/a	PRE	8.6	6.4	3.0	18.007
7	ethofumesate	4	SC	2.0	lb ai/a	PRE	7.0	4.7	3.4	15.210
8	pyroxasulfone	85	WDG	0.186	lb ai/a	PRE	5.4	5.7	3.3	13.337
9	acetochlor	6.4	EC	1.0	lb ai/a	PRE	7.9	7.0	4.7	19.627
10	untreated						6.9	5.2	2.4	14.537
LSD (P=.05)							2.40	2.05	2.58	5.5675
Standard Deviation							1.40	1.20	1.50	3.2455
CV							18.16	20.0	41.64	18.88

Preemergence Weed Control in Seeded Chives and Green Onion – Van Drunen Farms 2012

Project Code: 117-12-02 **Location: Momence, IL**

Personnel: Bernard H. Zandstra
Crop: Chives, Green Onion **Variety: Tokyo Long White**
Planting Method: Seeded **Planting Date: 5/15/2012**
Spacing: .5 inch **Row Spacing: 10 inch; 2 rows each variety/plot**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 5.5 ft wide x 30 ft long

Soil Type: Clay Loam **OM: 7.8%** **pH: 4.9**
Sand: 24% **Silt: 38%** **Clay: 38%** **CEC: 32.2**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	5/17/12	1:00 pm	74/67	F	Dry	3-4 SE	27	0% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
5/17	CHIVES, GREEN ONION		Seeded	

LACG = large crabgrass
CAWE = carpet weed
COLQ = common lambsquarters
COPU = common purslane
GIFT = giant foxtail
RRPW = redroot pigweed
SPSP = spotted spurge

Notes and Comments
1. Chives did not germinate, so no chive data was collected.
2. Harvest: 2 rows x 30 ft.
2. Spray applied with 4 nozzle boom. FF8002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
3. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.

Preemergence Weed Control in Seeded Chives and Green Onion – Van Drunen 2012

Preemergence Weed Control in Seeded Chives and Green Onion - Van Drunen Farms 2012

Trial ID: 117-12-02 Study Director:
Location: Momence, IL Investigator: Dr. Bernard Zandstra

Pest Code								LACG	CAWE	COLQ	RRPW
Crop Code							GR ONION				
Rating Date							14/Jun/12	14/Jun/12	14/Jun/12	14/Jun/12	14/Jun/12
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
1	pendimethalin	3.8	CS	0.95	lb ai.a	PRE	1.0	10.0	10.0	9.0	8.7
2	pendimethalin	3.8	CS	1.9	lb ai.a	PRE	1.0	10.0	10.0	9.7	9.7
3	s-metolachlor	7.62	EC	0.95	lb ai.a	PRE	2.7	9.7	3.7	2.0	7.3
4	dimethenamid-p	6	EC	0.5	lb ai.a	PRE	3.0	10.0	10.0	6.7	9.3
5	flumioxazin	51	WDG	0.032	lb ai.a	PRE	1.7	10.0	10.0	3.3	8.7
6	ethofumesate	4	SC	1.0	lb ai.a	PRE	1.7	10.0	3.0	1.7	7.7
7	DCPA	75	WP	6.0	lb ai.a	PRE	1.7	10.0	10.0	4.3	6.7
8	pyroxasulfone	85	WDG	0.186	lb ai.a	PRE	5.0	10.0	10.0	9.3	10.0
9	acetochlor	6.4	EC	0.5	lb ai.a	PRE	2.7	10.0	7.3	6.7	9.3
10	untreated						2.0	7.0	3.7	3.7	4.0
LSD (P=.05)							1.72	2.80	3.94	3.87	3.82
Standard Deviation							1.00	1.63	2.30	2.25	2.22
CV							44.86	16.89	29.57	40.02	27.35

Pest Code								GIFT	CAWE	COLQ	COPU
Crop Code							GR ONION				
Rating Date							11/Jul/12	11/Jul/12	11/Jul/12	11/Jul/12	11/Jul/12
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
1	pendimethalin	3.8	CS	0.95	lb ai.a	PRE	1.0	7.7	7.3	5.7	10.0
2	pendimethalin	3.8	CS	1.9	lb ai.a	PRE	1.7	9.7	7.0	7.7	8.7
3	s-metolachlor	7.62	EC	0.95	lb ai.a	PRE	2.0	8.0	2.3	3.7	9.0
4	dimethenamid-p	6	EC	0.5	lb ai.a	PRE	4.0	9.0	8.0	4.0	9.7
5	flumioxazin	51	WDG	0.032	lb ai.a	PRE	1.7	5.3	9.0	4.0	10.0
6	ethofumesate	4	SC	1.0	lb ai.a	PRE	1.0	7.7	2.3	2.3	9.0
7	DCPA	75	WP	6.0	lb ai.a	PRE	1.0	9.0	7.7	3.7	8.0
8	pyroxasulfone	85	WDG	0.186	lb ai.a	PRE	7.3	9.7	9.7	9.0	10.0
9	acetochlor	6.4	EC	0.5	lb ai.a	PRE	3.0	7.3	6.0	5.7	10.0
10	untreated						2.7	7.0	2.0	3.0	4.3
LSD (P=.05)							2.61	4.32	2.71	3.54	2.41
Standard Deviation							1.52	2.52	1.58	2.06	1.41
CV							60.15	31.32	25.8	42.43	15.85

Preemergence Weed Control in Seeded Chives and Green Onion – Van Drunen 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	RRPW	SPSP	GR ONION
Pest Code							RRPW	SPSP	
Crop Code									GR ONION
Rating Date							11/Jul/12	11/Jul/12	7/Aug/12
Rating Data Type							RATING	RATING	KG/PLOT
Rating Unit							1-10	1-10	KG
1	pendimethalin	3.8	CS	0.95	lb ai.a	PRE	5.7	7.7	7.76
2	pendimethalin	3.8	CS	1.9	lb ai.a	PRE	7.7	7.3	6.24
3	s-metolachlor	7.62	EC	0.95	lb ai.a	PRE	9.0	9.7	4.23
4	dimethenamid-p	6	EC	0.5	lb ai.a	PRE	9.7	9.7	1.90
5	flumioxazin	51	WDG	0.032	lb ai.a	PRE	9.0	4.7	5.62
6	ethofumesate	4	SC	1.0	lb ai.a	PRE	5.0	4.7	3.98
7	DCPA	75	WP	6.0	lb ai.a	PRE	4.7	5.7	5.78
8	pyroxasulfone	85	WDG	0.186	lb ai.a	PRE	10.0	9.3	0.90
9	acetochlor	6.4	EC	0.5	lb ai.a	PRE	8.7	10.0	2.99
10	untreated						4.3	4.0	3.28
LSD (P=.05)							2.83	5.83	4.208
Standard Deviation							1.65	3.40	2.453
CV							22.43	46.79	57.47

Weed Control in Green Onion, Leek, & Shallot – Muck Farm 2012

Project Code: 112-12-06 **Location: Laingsburg, MI**

Personnel: Bernard H. Zandstra
Crop: See Notes **Variety: See Notes**
Planting Method: Seeded **Planting Date: 6/4/12** **Harvest Date: 9/7/12**
Spacing: 1 inch **Row Spacing: 16 inch**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 5.5 ft wide x 16.7 ft long

Soil Type: Houghton Muck **OM: 78%** **pH: 6.6**
Sand: 11% **Silt: 11%** **Clay: 1%** **CEC: N/A**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	6/6/12	2:00 pm	74/67	F	Dry	1-2 N	45	50% Cloudy	N
PO1	7/23/12	10:30 am	86/76	F	Dry	6-8 SW	57	10% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
7/23	GR ONION = green onion	6-8″	3-4 leaves	Good
7/23	LEEK	6-8″	3-4 leaves	Very few
7/23	SHALLOT	6-8″	3-4 leaves	Good
7/23	BYGR = barnyardgrass	6-12″	10-16 leaves	Few
7/23	LACG = large crabgrass	10-12″	Seeded	Moderate
7/23	COLQ = common lambsquarters	6-20″	Foliar flower	Many
7/23	COPU = common purslane	6-16″	Flower	Many
7/23	CORW = common ragweed	12-16″	10-30 leaves	Moderate
7/23	LATH = ladysthumb	6-12″	10-26 leaves	Many
7/23	RRPW = redroot pigweed	6-24″	20-30 leaves	Moderate
7/23	TUPW = tumble pigweed	4-6″, 12-16″	Flower	Moderate

Notes and Comments
1. Varieties: Tokyo long white bunching, Lancelot leek, Mirage shallot
2. Leeks not harvested because of poor stand. Onion and Shallot: harvested 1 row X 16.7 ft. Yields were low due to heavy weed pressure. Harvested whole plants.
2. Spray applied with 4 nozzle boom. FF8002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
3. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.

Weed Control in Green Onion, Leek, & Shallot – Muck Farm 2012

Weed Control in Green Onion, Leek, & Shallot - Muck Farm 2012

Trial ID: 112-12-06 Study Director:
Location: Laingsburg, MI Investigator: Dr. Bernard Zandstra

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	GRONION 16/Jul/12 RATING 1-10	SHALLOT 16/Jul/12 RATING 1-10	BYGR 16/Jul/12 RATING 1-10	COLQ 16/Jul/12 RATING 1-10	COPU 16/Jul/12 RATING 1-10
1	untreated						1.0	1.0	4.0	1.7	2.3
2	pendimethalin	3.8	CS	1.9	lb ai/a	PRE	1.3	1.3	5.3	4.0	3.7
3	pendimethalin	3.8	CS	3.8	lb ai/a	PRE	1.7	2.3	9.7	6.7	5.7
4	flumioxazin	51	WDG	0.032	lb ai/a	PRE	1.3	1.7	9.3	3.3	7.0
5	s-metolachlor	7.62	EC	1.3	lb ai/a	PRE	2.3	2.3	10.0	2.0	5.3
6	propachlor	4	F	2.0	lb ai/a	PRE	1.0	2.7	7.3	2.0	4.7
7	acetochlor	6.4	EC	1.0	lb ai/a	PRE	4.3	6.3	9.0	4.3	6.7
8	pyroxasulfone	85	WDG	0.186	lb ai/a	PRE	3.3	3.7	9.7	6.3	7.3
9	pyroxasulfone	85	WDG	0.36	lb ai/a	PRE	2.7	4.0	9.3	6.7	8.0
10	pendimethalin	3.8	CS	1.9	lb ai/a	PRE	2.7	2.7	9.7	8.0	8.7
	pyroxasulfone	85	WDG	0.186	lb ai/a	PRE					
11	pendimethalin	3.8	CS	1.9	lb ai/a	PRE	2.0	2.3	8.7	3.7	3.7
	pendimethalin	3.8	CS	1.9	lb ai/a	PO1					
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1					
	clethodim	.97	EC	0.12	lb ai/a	PO1					
12	pendimethalin	3.8	CS	1.9	lb ai/a	PRE	1.0	4.3	8.3	4.0	2.3
	pendimethalin	3.8	CS	1.9	lb ai/a	PO1					
	oxyfluorfen	4	SC	0.125	lb ai/a	PO1					
	clethodim	.97	EC	0.12	lb ai/a	PO1					
13	pendimethalin	3.8	CS	1.9	lb ai/a	PRE	1.3	3.0	9.3	4.3	4.3
	pendimethalin	3.8	CS	1.9	lb ai/a	PO1					
	flumioxazin	51	WDG	0.032	lb ai/a	PO1					
	clethodim	.97	EC	0.12	lb ai/a	PO1					
14	pendimethalin	3.8	CS	1.9	lb ai/a	PRE	1.0	3.3	9.3	2.7	3.0
	pendimethalin	3.8	CS	1.9	lb ai/a	PO1					
	flumioxazin	51	WDG	0.064	lb ai/a	PO1					
	clethodim	.97	EC	0.12	lb ai/a	PO1					
15	pendimethalin	3.8	CS	3.8	lb ai/a	PRE	2.3	3.7	9.7	7.0	5.0
LSD (P=.05)							1.64	2.94	2.89	2.77	2.45
Standard Deviation							0.98	1.76	1.73	1.65	1.46
CV							50.24	59.02	20.14	37.22	28.29

Weed Control in Green Onion, Leek, & Shallot – Muck Farm 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	LATH	RRPW	TUPW	GRONION	SHALLOT
Pest Code							LATH	RRPW	TUPW		
Crop Code										GRONION	SHALLOT
Rating Date							16/Jul/12	16/Jul/12	16/Jul/12	27/Jul/12	27/Jul/12
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	untreated						3.7	1.0	1.7	3.7	5.0
2	pendimethalin	3.8	CS	1.9	lb ai/a	PRE	5.3	8.0	8.7	1.7	3.7
3	pendimethalin	3.8	CS	3.8	lb ai/a	PRE	7.7	8.7	10.0	1.0	2.7
4	flumioxazin	51	WDG	0.032	lb ai/a	PRE	4.7	9.0	2.3	3.7	6.0
5	s-metolachlor	7.62	EC	1.3	lb ai/a	PRE	5.0	9.0	6.7	6.3	6.7
6	propachlor	4	F	2.0	lb ai/a	PRE	5.7	6.0	3.0	4.3	6.0
7	acetochlor	6.4	EC	1.0	lb ai/a	PRE	3.3	8.3	9.3	4.7	7.0
8	pyroxasulfone	85	WDG	0.186	lb ai/a	PRE	5.7	9.3	8.3	3.7	5.3
9	pyroxasulfone	85	WDG	0.36	lb ai/a	PRE	6.3	10.0	8.3	3.0	5.0
10	pendimethalin	3.8	CS	1.9	lb ai/a	PRE	6.7	10.0	9.3	2.3	3.7
	pyroxasulfone	85	WDG	0.186	lb ai/a	PRE					
11	pendimethalin	3.8	CS	1.9	lb ai/a	PRE	5.3	6.3	9.0	2.7	2.3
	pendimethalin	3.8	CS	1.9	lb ai/a	PO1					
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1					
	clethodim	.97	EC	0.12	lb ai/a	PO1					
12	pendimethalin	3.8	CS	1.9	lb ai/a	PRE	6.7	5.3	7.7	2.0	2.7
	pendimethalin	3.8	CS	1.9	lb ai/a	PO1					
	oxyfluorfen	4	SC	0.125	lb ai/a	PO1					
	clethodim	.97	EC	0.12	lb ai/a	PO1					
13	pendimethalin	3.8	CS	1.9	lb ai/a	PRE	4.3	6.0	8.3	2.0	3.0
	pendimethalin	3.8	CS	1.9	lb ai/a	PO1					
	flumioxazin	51	WDG	0.032	lb ai/a	PO1					
	clethodim	.97	EC	0.12	lb ai/a	PO1					
14	pendimethalin	3.8	CS	1.9	lb ai/a	PRE	4.7	8.0	10.0	3.0	4.0
	pendimethalin	3.8	CS	1.9	lb ai/a	PO1					
	flumioxazin	51	WDG	0.064	lb ai/a	PO1					
	clethodim	.97	EC	0.12	lb ai/a	PO1					
15	pendimethalin	3.8	CS	3.8	lb ai/a	PRE	7.3	5.7	10.0	3.7	4.7
LSD (P=.05)							2.70	2.52	3.35	2.70	3.13
Standard Deviation							1.61	1.51	2.00	1.61	1.87
CV							29.37	20.46	26.69	50.73	41.55

Weed Control in Green Onion, Leek, & Shallot – Muck Farm 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	GR ONION 7/Sep/12 KG/PLOT KG	SHALLOT 7/Sep/12 KG/PLOT KG
	Pest Code							
	Crop Code							
	Rating Date							
	Rating Data Type							
	Rating Unit							
1	untreated						1.99	0.82
2	pendimethalin	3.8	CS	1.9	lb ai/a	PRE	3.45	1.73
3	pendimethalin	3.8	CS	3.8	lb ai/a	PRE	3.61	1.95
4	flumioxazin	51	WDG	0.032	lb ai/a	PRE	1.72	0.80
5	s-metolachlor	7.62	EC	1.3	lb ai/a	PRE	1.14	0.80
6	propachlor	4	F	2.0	lb ai/a	PRE	1.74	0.91
7	acetochlor	6.4	EC	1.0	lb ai/a	PRE	1.27	0.67
8	pyroxasulfone	85	WDG	0.186	lb ai/a	PRE	1.67	1.24
9	pyroxasulfone	85	WDG	0.36	lb ai/a	PRE	2.40	1.17
10	pendimethalin	3.8	CS	1.9	lb ai/a	PRE	2.77	1.92
	pyroxasulfone	85	WDG	0.186	lb ai/a	PRE		
11	pendimethalin	3.8	CS	1.9	lb ai/a	PRE	2.27	1.05
	pendimethalin	3.8	CS	1.9	lb ai/a	PO1		
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1		
	clethodim	.97	EC	0.12	lb ai/a	PO1		
12	pendimethalin	3.8	CS	1.9	lb ai/a	PRE	2.06	0.73
	pendimethalin	3.8	CS	1.9	lb ai/a	PO1		
	oxyfluorfen	4	SC	0.125	lb ai/a	PO1		
	clethodim	.97	EC	0.12	lb ai/a	PO1		
13	pendimethalin	3.8	CS	1.9	lb ai/a	PRE	3.35	1.34
	pendimethalin	3.8	CS	1.9	lb ai/a	PO1		
	flumioxazin	51	WDG	0.032	lb ai/a	PO1		
	clethodim	.97	EC	0.12	lb ai/a	PO1		
14	pendimethalin	3.8	CS	1.9	lb ai/a	PRE	2.58	0.86
	pendimethalin	3.8	CS	1.9	lb ai/a	PO1		
	flumioxazin	51	WDG	0.064	lb ai/a	PO1		
	clethodim	.97	EC	0.12	lb ai/a	PO1		
15	pendimethalin	3.8	CS	3.8	lb ai/a	PRE	2.24	0.69
LSD (P=.05)							1.815	1.274
Standard Deviation							1.086	0.762
CV							47.52	68.49

Weed Control in Hot Banana and Hot Cherry Pepper – HTRC 2012

Project Code: 101-12-01 **Location: East Lansing, MI**

Personnel: Bernard H. Zandstra
Crop: Banana pepper, cherry **Variety: See notes**
Planting Method: Transplant **Planting Date: 5/21/2012** **Harvest Date: See data**
Spacing: 22 inch **Row Spacing: 3 ft; one row of each crop per plot**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 5.5 ft wide x 35 ft long

Soil Type: Marlette Fine Sandy Loam **OM: 2.2%** **pH: 6.6**
Sand: 57% **Silt: 23%** **Clay: 20%** **CEC: 10.6**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRT	5/21/12	2:30 pm	65/69	F	Dry	3-4 NW	68	100% Cloudy	N
POT	5/22/12	9:00 am	61/61	F	Dry	3-4 NW	70	100% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
5/21	BANANA, CHERRY	5-6″	transplants	
5/22	BANANA, CHERRY	5-6″	transplants	

GRFT = green foxtail
COLQ = common lambsquarters
CORW = common ragweed
EBNS = eastern black nightshade
RRPW = redroot pigweed
WIRA = wild radish

Notes and Comments
1. Varieties: Hungarian yellow wax(hot), Hot red cherry
2. Spray applied with 4 nozzle boom. FF8002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
3. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.

Weed Control in Hot Banana and Hot Cherry Pepper - HTRC 2012

Weed Control in Hot Banana and Hot Cherry Pepper - HTRC 2012

Trial ID: 101-12-01 Study Director:
Location: East Lansing, MI Investigator: Dr. Bernard Zandstra

Pest Code								GRFT	COLQ	CORW
Crop Code						BANANA	CHERRY			
Rating Date						17/Jun/12	17/Jun/12	17/Jun/12	17/Jun/12	17/Jun/12
Rating Type						RATING	RATING	RATING	RATING	RATING
Rating Unit						1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage				
1	handweeded						1.0	1.0	1.0	1.0	1.0
2	napropamide	50	DF	2	lb ai/a	POT	1.3	1.3	8.3	8.7	5.0
3	napropamide-UV	50	DF	2	lb ai/a	POT	1.0	1.0	6.7	7.7	3.0
4	napropamide-UV	2	SC	2	lb ai/a	POT	1.0	1.7	9.3	9.3	4.3
5	s-metolachlor	7.62	EC	0.95	lb ai/a	POT	1.0	1.0	10.0	9.7	2.0
6	pendimethalin	3.8	CS	1.4	lb ai/a	POT	1.0	1.0	10.0	10.0	1.3
7	clomazone	3	ME	0.94	lb ai/a	POT	1.0	1.0	10.0	10.0	10.0
8	clomazone	3	ME	1	lb ai/a	PRT	2.0	1.7	10.0	10.0	9.3
9	fomesafen	2	SL	0.75	lb ai/a	PRT	2.0	2.0	9.7	10.0	10.0
10	oxyfluorfen	4	SC	0.5	lb ai/a	PRT	5.7	6.0	10.0	10.0	10.0
11	pyroxasulfone	85	WDG	0.09	lb ai/a	PRT	2.3	2.0	10.0	9.3	8.7
12	sulfentrazone	4	F	0.188	lb ai/a	PRT	3.0	3.3	9.0	10.0	6.0
LSD (P=.05)							1.43	1.54	0.99	1.35	3.26
Standard Deviation							0.84	0.91	0.58	0.80	1.93
CV							45.26	47.41	6.74	9.04	32.71

Pest Code							EBNS	RRPW	WIRA	BANANA
Crop Code										20/Jun/12
Rating Date							17/Jun/12	17/Jun/12	17/Jun/12	PLANTS/PLOT
Rating Type							RATING	RATING	RATING	#
Rating Unit							1-10	1-10	1-10	
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage				
1	handweeded						1.0	1.7	1.0	20.3
2	napropamide	50	DF	2	lb ai/a	POT	8.7	8.7	3.3	21.7
3	napropamide-UV	50	DF	2	lb ai/a	POT	7.3	7.3	1.0	19.7
4	napropamide-UV	2	SC	2	lb ai/a	POT	7.3	9.0	1.0	21.0
5	s-metolachlor	7.62	EC	0.95	lb ai/a	POT	10.0	10.0	1.7	21.7
6	pendimethalin	3.8	CS	1.4	lb ai/a	POT	10.0	10.0	4.7	17.0
7	clomazone	3	ME	0.94	lb ai/a	POT	10.0	10.0	10.0	20.0
8	clomazone	3	ME	1	lb ai/a	PRT	10.0	10.0	9.3	21.0
9	fomesafen	2	SL	0.75	lb ai/a	PRT	10.0	10.0	10.0	20.0
10	oxyfluorfen	4	SC	0.5	lb ai/a	PRT	10.0	10.0	10.0	15.3
11	pyroxasulfone	85	WDG	0.09	lb ai/a	PRT	10.0	10.0	8.3	17.7
12	sulfentrazone	4	F	0.188	lb ai/a	PRT	10.0	10.0	5.3	17.3
LSD (P=.05)							1.25	1.88	2.30	3.64
Standard Deviation							0.74	1.11	1.36	2.15
CV							8.47	12.49	24.83	11.08

Weed Control in Hot Banana and Hot Cherry Pepper - HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	CHERRY 20/Jun/12 PLANTS/PLOT #	BANANA 2/Jul/12 RATING 1-10	CHERRY 2/Jul/12 RATING 1-10	BANANA 14/Aug/12 KG/PLOT KG
1	handweeded						20.7	2.0	2.0	7.0
2	napropamide	50	DF	2	lb ai/a	POT	19.3	1.0	1.0	9.3
3	napropamide-UV	50	DF	2	lb ai/a	POT	17.3	1.0	1.0	8.0
4	napropamide-UV	2	SC	2	lb ai/a	POT	19.0	1.3	1.3	11.5
5	s-metolachlor	7.62	EC	0.95	lb ai/a	POT	17.0	1.0	2.0	13.1
6	pendimethalin	3.8	CS	1.4	lb ai/a	POT	17.0	3.0	3.0	5.0
7	clomazone	3	ME	0.94	lb ai/a	POT	21.0	1.3	1.7	13.5
8	clomazone	3	ME	1	lb ai/a	PRT	19.0	1.3	1.0	13.9
9	fomesafen	2	SL	0.75	lb ai/a	PRT	19.3	1.7	1.3	12.7
10	oxyfluorfen	4	SC	0.5	lb ai/a	PRT	4.3	4.3	4.3	6.4
11	pyroxasulfone	85	WDG	0.09	lb ai/a	PRT	21.0	2.0	2.3	9.4
12	sulfentrazone	4	F	0.188	lb ai/a	PRT	12.3	2.3	3.0	7.4
LSD (P=.05)							3.30	0.88	1.28	3.68
Standard Deviation							1.95	0.52	0.76	2.17
CV							11.28	27.93	37.94	22.28

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	BANANA 18/Sep/12 KG/PLOT KG	BANANA TOTAL KG/PLOT	CHERRY 22/Aug/12 KG/PLOT KG	CHERRY 25/Sep/12 KG/PLOT KG	CHERRY TOTAL KG/PLOT
1	handweeded						11.2	18.16	4.0	13.5	17.45
2	napropamide	50	DF	2	lb ai/a	POT	12.7	22.00	6.1	13.0	19.15
3	napropamide-UV	50	DF	2	lb ai/a	POT	15.4	23.42	2.8	10.6	13.41
4	napropamide-UV	2	SC	2	lb ai/a	POT	12.1	23.60	7.1	14.1	21.20
5	s-metolachlor	7.62	EC	0.95	lb ai/a	POT	17.4	30.46	6.2	16.1	22.25
6	pendimethalin	3.8	CS	1.4	lb ai/a	POT	12.2	17.19	3.9	11.1	14.98
7	clomazone	3	ME	0.94	lb ai/a	POT	14.3	27.84	8.6	14.7	23.34
8	clomazone	3	ME	1	lb ai/a	PRT	18.1	32.01	9.2	19.9	29.00
9	fomesafen	2	SL	0.75	lb ai/a	PRT	14.6	27.31	8.9	17.0	25.85
10	oxyfluorfen	4	SC	0.5	lb ai/a	PRT	12.9	19.23	4.0	11.4	15.47
11	pyroxasulfone	85	WDG	0.09	lb ai/a	PRT	12.9	22.30	8.3	12.0	20.30
12	sulfentrazone	4	F	0.188	lb ai/a	PRT	8.1	15.49	3.9	9.3	13.19
LSD (P=.05)							6.74	9.077	3.45	6.34	6.632
Standard Deviation							3.98	5.360	2.03	3.74	3.916
CV							29.49	23.05	33.52	27.59	19.95

Weed Control in Bell Pepper and Tomato – HTRC 2012

Project Code: 101-12-02 **Location: East Lansing, MI**

Personnel: Bernard H. Zandstra
Crop: Bell pepper, tomato **Variety: See notes**
Planting Method: Transplant **Planting Date: 5/21/2012** **Harvest Date: see data**
Spacing: 18 inch **Row Spacing: 36 inch**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 5.5 ft wide x 30 ft long

Soil Type: Marlette Fine Sandy Loam **OM: 2.2%** **pH: 6.6**
Sand: 57% **Silt: 23%** **Clay: 20%** **CEC: 10.6**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRT	5/21/12	3:00 pm	66/68	F	Dry	3-4 NW	67	100% Cloudy	N
POT	5/22/12	10:45 am	61/61	F	Dry	3-4 N	70	100% Cloudy	N
PO1	6/18/12	2:40 pm	77/80	F	Damp	6-8 SE	63	0% Cloudy	Y

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
5/21/12	PEPPER			
5/21/12	TOMATO			
5/22/12	PEPPER			
5/22/12	TOMATO			
6/18/12	PEPPER	5-6″	4-6 leaves	5%
6/18/12	TOMATO	6-10″	8-10 leaves	10%
6/18/12	GRFT = green foxtail	2-6″		Many
6/18/12	COLQ = common lambsquarters	2-3″		Few
6/18/12	CORW = common ragweed	2-5″		Many
6/18/12	EBNS = eastern black nightshade	1-2″		Few
6/18/12	RRPW = redroot pigweed	2-4″		Few
6/18/12	WIRA = wild radish	3-4″, 6-10″		Many
	COPU = common purslane			

Notes and Comments
1. Varieties: King Arthur pepper, Sunbrite tomato
2. Spray applied with 4 nozzle boom. FF8002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
3. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.

Weed Control in Bell Pepper and Tomato – HTRC 2012

Weed Control in Bell Pepper and Tomato - HTRC 2012

Trial ID: 101-12-02 Study Director:
Location: East Lansing, MI Investigator: Dr. Bernard Zandstra

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	PEPPER 17/Jun/12 RATING 1-10	TOMATO 17/Jun/12 RATING 1-10	GRFT 17/Jun/12 RATING 1-10	COLQ 17/Jun/12 RATING 1-10	CORW 17/Jun/12 RATING 1-10
1	napropamide-UV	50	DF	2	lb ai/a	PRT	1.0	1.0	7.3	8.0	6.7
2	napropamide	50	DF	2	lb ai/a	PRT	1.0	1.0	8.0	9.3	6.0
3	s-metolachlor	7.62	EC	.95	lb ai/a	PRT	1.0	1.7	9.7	9.7	5.3
4	s-metolachlor	7.62	EC	.95	lb ai/a	POT	1.7	1.3	10.0	9.3	4.3
5	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	1.0	1.0	9.7	10.0	5.3
6	pendimethalin	3.8	CS	1.4	lb ai/a	POT	1.3	3.7	9.7	10.0	5.7
7	fomesafen	2	SL	0.5	lb ai/a	PRT	2.0	1.3	9.3	10.0	10.0
8	fomesafen	2	SL	.75	lb ai/a	PRT	2.3	3.0	9.7	10.0	10.0
9	sulfentrazone	4	F	0.25	lb ai/a	PRT	2.7	2.3	8.7	10.0	5.7
10	clomazone	3	ME	0.5	lb ai/a	PRT	1.0	4.0	9.7	10.0	8.7
11	clomazone	3	ME	1	lb ai/a	PRT	1.0	4.7	10.0	10.0	9.7
12	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	1.3	1.3	9.0	10.0	5.7
	rimsulfuron (M)	25	DF	0.031	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
13	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	1.0	1.0	9.0	10.0	4.3
	halosulfuron	75	WG	0.023	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
14	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	8.0	1.3	9.7	10.0	9.7
	metribuzin	75	DF	0.25	lb ai/a	PRT					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	halosulfuron	75	WG	0.023	% v/v	PO1					
15	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	3.0	3.0	9.3	10.0	8.7
	sulfentrazone	4	F	0.25	lb ai/a	PRT					
	halosulfuron	75	WG	0.023	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
16	untreated					PRT	1.0	1.0	1.7	1.0	1.0
LSD (P=.05)							1.11	1.28	1.11	0.74	3.60
Standard Deviation							0.67	0.77	0.67	0.44	2.16
CV							35.11	37.72	7.59	4.79	32.38

Weed Control in Bell Pepper and Tomato – HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	EBNS	RRPW	WIRA	PEPPER
	Pest Code						EBNS	RRPW	WIRA	PEPPER
	Crop Code									20/Jun/12
	Rating Date						17/Jun/12	17/Jun/12	17/Jun/12	PLANTS/PLOT
	Rating Type						RATING	RATING	RATING	No.
	Rating Unit						1-10	1-10	1-10	
1	napropamide-UV	50	DF	2	lb ai/a	PRT	6.3	5.7	5.0	21.7
2	napropamide	50	DF	2	lb ai/a	PRT	8.3	7.7	4.0	20.3
3	s-metolachlor	7.62	EC	.95	lb ai/a	PRT	9.7	10.0	4.0	20.0
4	s-metolachlor	7.62	EC	.95	lb ai/a	POT	9.3	10.0	5.0	21.0
5	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	10.0	10.0	8.7	21.0
6	pendimethalin	3.8	CS	1.4	lb ai/a	POT	10.0	10.0	7.7	21.0
7	fomesafen	2	SL	0.5	lb ai/a	PRT	10.0	10.0	10.0	20.3
8	fomesafen	2	SL	.75	lb ai/a	PRT	10.0	10.0	10.0	19.7
9	sulfentrazone	4	F	0.25	lb ai/a	PRT	10.0	10.0	8.0	18.0
10	clomazone	3	ME	0.5	lb ai/a	PRT	9.7	8.3	9.3	20.7
11	clomazone	3	ME	1	lb ai/a	PRT	10.0	10.0	9.7	20.0
12	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	10.0	10.0	8.0	20.3
	rimsulfuron (M)	25	DF	0.031	lb ai/a	PO1				
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1				
	NIS	100	SL	0.25	% v/v	PO1				
13	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	10.0	10.0	8.3	20.7
	halosulfuron	75	WG	0.023	lb ai/a	PO1				
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1				
	NIS	100	SL	0.25	% v/v	PO1				
14	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	10.0	10.0	10.0	4.0
	metribuzin	75	DF	0.25	lb ai/a	PRT				
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1				
	halosulfuron	75	WG	0.023	% v/v	PO1				
15	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	10.0	10.0	9.3	16.0
	sulfentrazone	4	F	0.25	lb ai/a	PRT				
	halosulfuron	75	WG	0.023	lb ai/a	PO1				
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1				
	NIS	100	SL	0.25	% v/v	PO1				
16	untreated					PRT	3.3	1.0	1.0	21.0
	LSD (P=.05)						1.95	1.49	2.10	3.03
	Standard Deviation						1.17	0.89	1.26	1.82
	CV						12.75	10.0	17.06	9.5

Weed Control in Bell Pepper and Tomato – HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	TOMATO 20/Jun/12 PLANTS/PLOT No.	PEPPER 22/Jun/12 RATING 1-10	TOMATO 22/Jun/12 RATING 1-10	GRFT 22/Jun/12 RATING 1-10	COLQ 22/Jun/12 RATING 1-10
	Pest Code									GRFT	COLQ
	Crop Code						TOMATO	PEPPER	TOMATO		
	Rating Date						20/Jun/12	22/Jun/12	22/Jun/12	22/Jun/12	22/Jun/12
	Rating Type						PLANTS/PLOT	RATING	RATING	RATING	RATING
	Rating Unit						No.	1-10	1-10	1-10	1-10
1	napropamide-UV	50	DF	2	lb ai/a	PRT	21.3	1.0	1.0	5.3	8.0
2	napropamide	50	DF	2	lb ai/a	PRT	21.3	1.0	1.0	5.7	9.7
3	s-metolachlor	7.62	EC	.95	lb ai/a	PRT	18.3	1.3	1.3	9.0	9.3
4	s-metolachlor	7.62	EC	.95	lb ai/a	POT	20.3	1.7	1.3	9.7	10.0
5	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	20.3	1.0	1.0	9.3	10.0
6	pendimethalin	3.8	CS	1.4	lb ai/a	POT	6.0	2.0	6.7	9.3	9.7
7	fomesafen	2	SL	0.5	lb ai/a	PRT	20.7	1.3	1.3	8.7	10.0
8	fomesafen	2	SL	.75	lb ai/a	PRT	18.7	1.7	2.7	9.3	10.0
9	sulfentrazone	4	F	0.25	lb ai/a	PRT	18.0	3.0	2.0	7.0	10.0
10	clomazone	3	ME	0.5	lb ai/a	PRT	15.0	1.3	3.7	9.7	10.0
11	clomazone	3	ME	1	lb ai/a	PRT	20.0	1.0	4.3	9.7	10.0
12	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	17.7	3.0	1.0	10.0	10.0
	rimsulfuron (M)	25	DF	0.031	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
13	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	20.7	3.0	1.3	9.0	10.0
	halosulfuron	75	WG	0.023	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
14	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	21.3	8.0	1.7	9.7	10.0
	metribuzin	75	DF	0.25	lb ai/a	PRT					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	halosulfuron	75	WG	0.023	% v/v	PO1					
15	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	17.7	4.0	3.0	9.7	10.0
	sulfentrazone	4	F	0.25	lb ai/a	PRT					
	halosulfuron	75	WG	0.023	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
16	Untreated					PRT	20.0	1.7	1.0	1.0	4.0
LSD (P=.05)							4.59	1.57	1.56	2.32	1.69
Standard Deviation							2.75	0.94	0.93	1.39	1.01
CV							14.81	41.77	43.56	16.85	10.77

Weed Control in Bell Pepper and Tomato – HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	COPU	CORW	RRPW	WIRA	PEPPER
	Pest Code						COPU	CORW	RRPW	WIRA	
	Crop Code										PEPPER
	Rating Date						22/Jun/12	22/Jun/12	22/Jun/12	22/Jun/12	2/Jul/12
	Rating Type						RATING	RATING	RATING	RATING	RATING
	Rating Unit						1-10	1-10	1-10	1-10	1-10
1	napropamide-UV	50	DF	2	lb ai/a	PRT	5.7	7.0	9.0	4.3	1.3
2	napropamide	50	DF	2	lb ai/a	PRT	7.7	4.7	5.3	2.3	1.3
3	s-metolachlor	7.62	EC	.95	lb ai/a	PRT	10.0	3.7	9.0	1.3	1.3
4	s-metolachlor	7.62	EC	.95	lb ai/a	POT	9.0	4.3	9.3	2.3	1.7
5	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	10.0	4.3	10.0	6.7	1.0
6	pendimethalin	3.8	CS	1.4	lb ai/a	POT	10.0	3.3	10.0	6.3	1.7
7	fomesafen	2	SL	0.5	lb ai/a	PRT	10.0	10.0	10.0	10.0	1.0
8	fomesafen	2	SL	.75	lb ai/a	PRT	10.0	10.0	10.0	10.0	1.7
9	sulfentrazone	4	F	0.25	lb ai/a	PRT	10.0	4.7	10.0	5.7	2.3
10	clomazone	3	ME	0.5	lb ai/a	PRT	10.0	9.0	8.3	9.7	1.3
11	clomazone	3	ME	1	lb ai/a	PRT	10.0	10.0	9.7	10.0	1.3
12	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	10.0	6.3	10.0	9.3	4.3
	rimsulfuron (M)	25	DF	0.031	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
13	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	10.0	7.3	10.0	9.0	2.0
	halosulfuron	75	WG	0.023	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
14	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	10.0	10.0	10.0	10.0	8.3
	metribuzin	75	DF	0.25	lb ai/a	PRT					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	halosulfuron	75	WG	0.023	% v/v	PO1					
15	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	10.0	8.7	10.0	9.7	5.0
	sulfentrazone	4	F	0.25	lb ai/a	PRT					
	halosulfuron	75	WG	0.023	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
16	untreated					PRT	4.7	1.0	3.3	1.7	2.3
	LSD (P=.05)						2.41	3.32	2.61	2.42	1.42
	Standard Deviation						1.45	1.99	1.56	1.45	0.85
	CV						15.76	30.52	17.39	21.41	35.75

Weed Control in Bell Pepper and Tomato – HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	TOMATO 2/Jul/12 RATING 1-10	PEPPER 6/Aug/12 No./PLOT No.	PEPPER 6/Aug/12 KG/PLOT KG	PEPPER 13/Aug/12 No./PLOT No.	PEPPER 13/Aug/12 KG/PLOT KG
	Pest Code										
	Crop Code										
	Rating Date						2/Jul/12	6/Aug/12	6/Aug/12	13/Aug/12	13/Aug/12
	Rating Type						RATING	No./PLOT	KG/PLOT	No./PLOT	KG/PLOT
	Rating Unit						1-10	No.	KG	No.	KG
1	napropamide-UV	50	DF	2	lb ai/a	PRT	1.3	14.3	3.2	40.3	5.9
2	napropamide	50	DF	2	lb ai/a	PRT	1.3	22.3	4.5	37.7	5.8
3	s-metolachlor	7.62	EC	.95	lb ai/a	PRT	2.0	18.7	3.4	28.0	4.5
4	s-metolachlor	7.62	EC	.95	lb ai/a	POT	2.0	20.3	4.1	42.7	6.4
5	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	1.3	30.3	5.8	34.0	5.8
6	pendimethalin	3.8	CS	1.4	lb ai/a	POT	7.7	14.7	2.7	26.3	4.0
7	fomesafen	2	SL	0.5	lb ai/a	PRT	1.7	27.3	5.0	39.3	5.7
8	fomesafen	2	SL	.75	lb ai/a	PRT	2.3	28.0	5.0	41.3	6.3
9	sulfentrazone	4	F	0.25	lb ai/a	PRT	2.0	19.3	3.5	37.0	5.6
10	clomazone	3	ME	0.5	lb ai/a	PRT	3.3	36.3	7.1	49.7	7.9
11	clomazone	3	ME	1	lb ai/a	PRT	3.3	32.0	5.9	49.0	7.6
12	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	1.0	2.7	0.4	20.3	2.6
	rimsulfuron (M)	25	DF	0.031	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
13	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	1.3	11.0	2.0	35.0	4.9
	halosulfuron	75	WG	0.023	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
14	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	1.3	0.0	0.0	1.7	0.2
	metribuzin	75	DF	0.25	lb ai/a	PRT					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	halosulfuron	75	WG	0.023	% v/v	PO1					
15	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	2.7	4.0	0.9	23.3	3.3
	sulfentrazone	4	F	0.25	lb ai/a	PRT					
	halosulfuron	75	WG	0.023	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
16	untreated					PRT	3.0	7.0	1.5	20.0	2.9
	LSD (P=.05)						1.67	12.18	2.50	24.46	3.62
	Standard Deviation						1.00	7.30	1.50	14.67	2.17
	CV						42.6	40.53	43.73	44.66	43.8

Weed Control in Bell Pepper and Tomato – HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	PEPPER 28/Aug/12 #/PLOT #	PEPPER 28/Aug/12 KG/PLOT KG	PEPPER 1/Oct/12 No./PLOT No.	PEPPER 1/Oct/12 No./PLOT No.	PEPPER TOTAL No./PLOT
1	napropamide-UV	50	DF	2	lb ai/a	PRT	70.3	12.4	58.7	7.8	258.0
2	napropamide	50	DF	2	lb ai/a	PRT	72.0	15.2	69.0	8.2	281.3
3	s-metolachlor	7.62	EC	.95	lb ai/a	PRT	105.7	18.1	54.3	6.9	261.3
4	s-metolachlor	7.62	EC	.95	lb ai/a	POT	80.0	13.9	52.0	6.7	270.3
5	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	93.7	16.6	45.7	6.2	296.0
6	pendimethalin	3.8	CS	1.4	lb ai/a	POT	83.0	14.2	64.0	7.8	271.7
7	fomesafen	2	SL	0.5	lb ai/a	PRT	90.3	15.2	47.7	5.5	300.3
8	fomesafen	2	SL	.75	lb ai/a	PRT	72.3	12.4	43.3	5.8	254.3
9	sulfentrazone	4	F	0.25	lb ai/a	PRT	61.3	9.9	46.7	5.8	233.0
10	clomazone	3	ME	0.5	lb ai/a	PRT	103.3	17.6	46.3	6.2	305.3
11	clomazone	3	ME	1	lb ai/a	PRT	116.3	20.3	40.3	5.7	308.7
12	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	55.0	9.9	55.7	7.2	208.0
	rimsulfuron (M)	25	DF	0.031	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
13	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	87.0	13.8	36.0	4.8	241.7
	halosulfuron	75	WG	0.023	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
14	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	13.3	2.5	6.3	0.9	36.7
	metribuzin	75	DF	0.25	lb ai/a	PRT					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	halosulfuron	75	WG	0.023	% v/v	PO1					
15	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	77.0	12.1	42.7	4.9	216.3
	sulfentrazone	4	F	0.25	lb ai/a	PRT					
	halosulfuron	75	WG	0.023	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
16	untreated					PRT	69.0	11.9	66.0	8.2	234.0
LSD (P=.05)							37.88	6.57	31.33	3.94	66.25
Standard Deviation							22.72	3.94	18.79	2.36	39.73
CV							29.09	29.19	38.81	38.39	15.99

Weed Control in Bell Pepper and Tomato – HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	PEPPER TOTAL KG/PLOT	TOMATO 13/Aug/12 KG/PLOT KG	TOMATO 20/Aug/12 KG/PLOT KG	TOMATO 27/Aug/12 KG/PLOT KG	TOMATO 4/Sep/12 KG/PLOT KG
	Pest Code										
	Crop Code										
	Rating Date										
	Rating Type										
	Rating Unit										
1	napropamide-UV	50	DF	2	lb ai/a	PRT	42.03	2.5	10.2	32.1	43.0
2	napropamide	50	DF	2	lb ai/a	PRT	45.70	2.7	7.2	38.4	33.7
3	s-metolachlor	7.62	EC	.95	lb ai/a	PRT	41.80	2.6	9.3	25.3	31.0
4	s-metolachlor	7.62	EC	.95	lb ai/a	POT	44.61	4.2	10.9	32.7	38.3
5	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	49.22	2.8	12.8	37.5	41.5
6	pendimethalin	3.8	CS	1.4	lb ai/a	POT	43.00	0.0	1.1	2.3	2.9
7	fomesafen	2	SL	0.5	lb ai/a	PRT	44.57	3.5	10.6	33.9	50.7
8	fomesafen	2	SL	.75	lb ai/a	PRT	40.88	2.5	8.6	28.6	40.4
9	sulfentrazone	4	F	0.25	lb ai/a	PRT	35.96	2.6	11.4	32.3	29.4
10	clomazone	3	ME	0.5	lb ai/a	PRT	49.91	0.8	6.6	18.9	28.7
11	clomazone	3	ME	1	lb ai/a	PRT	50.79	0.5	5.6	21.5	36.2
12	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	33.43	2.7	9.3	32.8	44.9
	rimsulfuron (M)	25	DF	0.031	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
13	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	36.52	4.0	12.0	42.4	41.0
	halosulfuron	75	WG	0.023	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
14	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	6.40	3.3	12.1	43.6	42.8
	metribuzin	75	DF	0.25	lb ai/a	PRT					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	halosulfuron	75	WG	0.023	% v/v	PO1					
15	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	32.65	2.4	9.7	30.4	33.1
	sulfentrazone	4	F	0.25	lb ai/a	PRT					
	halosulfuron	75	WG	0.023	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
16	untreated					PRT	36.47	2.5	5.6	17.0	20.1
LSD (P=.05)							9.988	2.25	4.25	12.10	14.03
Standard Deviation							5.991	1.35	2.55	7.26	8.41
CV							15.12	54.52	28.5	24.72	24.13

Weed Control in Bell Pepper and Tomato – HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	TOMATO 10/Sep/12 KG/PLOT KG	TOMATO 17/Sep/12 KG/PLOT KG	TOMATO 24/Sep/12 KG/PLOT KG	TOMATO TOTAL KG/PLOT
1	napropamide-UV	50	DF	2	lb ai/a	PRT	11.1	10.9	26.7	136.64
2	napropamide	50	DF	2	lb ai/a	PRT	12.0	10.7	22.7	127.51
3	s-metolachlor	7.62	EC	.95	lb ai/a	PRT	9.8	9.0	27.7	114.65
4	s-metolachlor	7.62	EC	.95	lb ai/a	POT	13.6	12.1	23.7	135.48
5	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	9.7	11.2	25.5	141.01
6	pendimethalin	3.8	CS	1.4	lb ai/a	POT	0.8	1.7	5.8	14.53
7	fomesafen	2	SL	0.5	lb ai/a	PRT	11.5	12.8	17.2	140.16
8	fomesafen	2	SL	.75	lb ai/a	PRT	11.2	16.5	24.3	131.97
9	sulfentrazone	4	F	0.25	lb ai/a	PRT	19.2	16.4	28.8	140.20
10	clomazone	3	ME	0.5	lb ai/a	PRT	16.6	21.8	17.3	110.77
11	clomazone	3	ME	1	lb ai/a	PRT	23.2	19.7	21.5	128.28
12	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	8.4	10.8	20.2	129.11
	rimsulfuron (M)	25	DF	0.031	lb ai/a	PO1				
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1				
	NIS	100	SL	0.25	% v/v	PO1				
13	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	13.4	10.6	22.7	146.10
	halosulfuron	75	WG	0.023	lb ai/a	PO1				
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1				
	NIS	100	SL	0.25	% v/v	PO1				
14	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	11.7	14.3	31.6	159.69
	metribuzin	75	DF	0.25	lb ai/a	PRT				
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1				
	halosulfuron	75	WG	0.023	% v/v	PO1				
15	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	13.1	19.5	28.6	136.79
	sulfentrazone	4	F	0.25	lb ai/a	PRT				
	halosulfuron	75	WG	0.023	lb ai/a	PO1				
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1				
	NIS	100	SL	0.25	% v/v	PO1				
16	untreated					PRT	14.0	16.2	30.0	105.51
LSD (P=.05)							8.41	7.84	11.69	26.168
Standard Deviation							5.04	4.71	7.01	15.695
CV							40.45	35.17	29.97	12.57

Weed Control in Pumpkin and Squash
-HTRC 2012

Project Code: 108-12-02 **Location: East Lansing, MI**

Personnel: Bernard H. Zandstra
Crop: Pumpkin and Squash **Variety: See notes**
Planting Method: Seeded **Planting Date: 5/29/12** **Harvest Date: See notes**
Spacing: 2 ft **Row Spacing: 5 ft, 3 rows/plot**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 16 ft wide x 50 ft long

Soil Type: Marlette fine sandy loam **OM: 2.1%** **pH: 6.5**
Sand: 53% **Silt: 27%** **Clay: 20%** **CEC: 7.4**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	5/31/12	9:30 am	53/63	F	Dry	3-4 NE	66	100% Cloudy	N

Crop and Weed Information at Application

	Height or Diameter	Growth Stage	Density

GRFT = green foxtail
COLQ = common lambsquarters
RRPW = redroot pigweed
VELE = velvetleaf

Notes and Comments
1. Harvested pumpkin on Sep. 24 and squash on Sep. 26.
2. Varieties: Howden pumpkin, Burgess buttercup, Golden Hubbard
3. Spray applied with 12 nozzle boom. FF8002, 20 gpa, 30 psi, 3.2 mph, CO2 tractor sprayer.
4. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.

Weed Control in Pumpkin and Squash -HTRC 2012

Weed Control in Pumpkin and Squash – HTRC 2012

Trial ID: 108-12-02 Study Director:
Location: East Lansing, MI Investigator: Dr. Bernard Zandstra

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
Pest Code										GRFT	COLQ
Crop Code							BUTRCUP	HOWDEN	HUBBARD		
Crop Variety											
Rating Date							20/Jun/12	20/Jun/12	20/Jun/12	20/Jun/12	20/Jun/12
Rating Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	ethalfluralin	3	EC	1.13	lb ai/a	PRE	1.3	1.0	2.0	9.7	8.3
2	ethalfluralin	3	EC	1.13	lb ai/a	PRE	1.0	1.0	1.0	10.0	9.7
	clomazone	3	ME	0.5	lb ai/a	PRE					
3	ethalfluralin	1.6	SE	4.6	pt/a	PRE	1.0	1.3	1.3	9.7	10.0
	clomazone	.5	SE	1.41							
4	ethalfluralin	3	EC	1.13	lb ai/a	PRE	3.0	2.3	3.0	9.0	9.7
	halosulfuron	75	WG	0.023	lb ai/a	PRE					
5	s-metolachlor	7.62	EC	0.95	lb ai/a	PRE	1.3	1.0	2.3	10.0	10.0
	clomazone	3	ME	0.5	lb ai/a	PRE					
6	s-metolachlor	7.62	EC	0.95	lb ai/a	PRE	3.3	2.7	3.7	9.3	10.0
	halosulfuron	75	WG	0.023	lb ai/a	PRE					
7	ethalfluralin	3	EC	0.75	lb ai/a	PRE	1.3	2.0	1.3	10.0	10.0
	fomesafen	2	SL	0.5	lb ai/a	PRE					
8	s-metolachlor	7.62	EC	0.95	lb ai/a	PRE	2.0	1.3	2.0	10.0	10.0
	clomazone	3	ME	0.5	lb ai/a	PRE					
	fomesafen	2	SL	0.25	lb ai/a	PRE					
9	ethalfluralin	3	EC	0.75	lb ai/a	PRE	2.3	2.0	2.0	10.0	10.0
	clomazone	3	ME	0.25	lb ai/a	PRE					
	fomesafen	2	SL	0.25	lb ai/a	PRE					
	halosulfuron	75	WG	0.023	lb ai/a	PRE					
10	fomesafen	2	SL	0.5	lb ai/a	PRE	1.3	1.7	1.7	10.0	10.0
11	pyroxasulfone	85	WDG	0.05	lb ai/a	PRE	1.7	1.7	2.7	9.3	9.0
12	untreated cultivated						1.0	1.0	1.0	4.7	1.0
LSD (P=.05)							0.90	0.99	1.48	1.31	0.69
Standard Deviation							0.53	0.58	0.87	0.77	0.41
CV							31.02	36.88	43.74	8.3	4.52

Weed Control in Pumpkin and Squash
-HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	RRPW	BUTRCUP	HOWDEN	HUBBARD	GRFT
	Crop Code										
	Crop Variety										
	Rating Date						20/Jun/12	2/Jul/12	2/Jul/12	2/Jul/12	2/Jul/12
	Rating Type						RATING	RATING	RATING	RATING	RATING
	Rating Unit						1-10	1-10	1-10	1-10	1-10
1	ethalfluralin	3	EC	1.13	lb ai/a	PRE	9.3	1.0	1.0	1.0	10.0
2	ethalfluralin	3	EC	1.13	lb ai/a	PRE	10.0	1.3	1.3	1.3	10.0
	clomazone	3	ME	0.5	lb ai/a	PRE					
3	ethalfluralin	1.6	SE	4.6	pt/a	PRE	9.7	1.3	1.3	1.3	9.3
	clomazone	.5	SE	1.41							
4	ethalfluralin	3	EC	1.13	lb ai/a	PRE	10.0	3.7	2.3	3.0	8.7
	halosulfuron	75	WG	0.023	lb ai/a	PRE					
5	s-metolachlor	7.62	EC	0.95	lb ai/a	PRE	10.0	1.7	1.3	1.7	9.7
	clomazone	3	ME	0.5	lb ai/a	PRE					
6	s-metolachlor	7.62	EC	0.95	lb ai/a	PRE	10.0	3.3	2.0	3.3	9.3
	halosulfuron	75	WG	0.023	lb ai/a	PRE					
7	ethalfluralin	3	EC	0.75	lb ai/a	PRE	10.0	1.7	1.7	1.0	10.0
	fomesafen	2	SL	0.5	lb ai/a	PRE					
8	s-metolachlor	7.62	EC	0.95	lb ai/a	PRE	10.0	1.7	1.3	1.3	10.0
	clomazone	3	ME	0.5	lb ai/a	PRE					
	fomesafen	2	SL	0.25	lb ai/a	PRE					
9	ethalfluralin	3	EC	0.75	lb ai/a	PRE	10.0	2.7	1.7	2.0	9.7
	clomazone	3	ME	0.25	lb ai/a	PRE					
	fomesafen	2	SL	0.25	lb ai/a	PRE					
	halosulfuron	75	WG	0.023	lb ai/a	PRE					
10	fomesafen	2	SL	0.5	lb ai/a	PRE	10.0	1.3	1.7	1.7	8.7
11	pyroxasulfone	85	WDG	0.05	lb ai/a	PRE	10.0	2.7	2.3	2.7	9.3
12	untreated cultivated						1.0	3.3	2.7	2.3	3.0
LSD (P=.05)							0.39	1.08	1.02	1.10	1.32
Standard Deviation							0.23	0.64	0.60	0.65	0.78
CV							2.51	29.81	34.89	34.38	8.66

Weed Control in Pumpkin and Squash -HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	COLQ	VELE	PUMPKIN Orange	PUMPKIN Orange	PUMPKIN Green
Pest Code							COLQ	VELE			
Crop Code									PUMPKIN	PUMPKIN	PUMPKIN
Crop Variety									Orange	Orange	Green
Rating Date							2/Jul/12	2/Jul/12	24/Sep/12	24/Sep/12	24/Sep/12
Rating Type							RATING	RATING	No./PLOT	KG/PLOT	No./PLOT
Rating Unit							1-10	1-10	No.	KG	No.
1	ethalfluralin	3	EC	1.13	lb ai/a	PRE	6.0	7.7	18.3	105.33	4.3
2	ethalfluralin	3	EC	1.13	lb ai/a	PRE	9.3	10.0	26.7	166.86	4.0
	clomazone	3	ME	0.5	lb ai/a	PRE					
3	ethalfluralin	1.6	SE	4.6	pt/a	PRE	8.0	10.0	27.0	180.26	4.0
	clomazone	.5	SE	1.41							
4	ethalfluralin	3	EC	1.13	lb ai/a	PRE	8.7	10.0	22.0	158.58	4.3
	halosulfuron	75	WG	0.023	lb ai/a	PRE					
5	s-metolachlor	7.62	EC	0.95	lb ai/a	PRE	9.3	10.0	28.7	174.07	5.0
	clomazone	3	ME	0.5	lb ai/a	PRE					
6	s-metolachlor	7.62	EC	0.95	lb ai/a	PRE	9.3	10.0	21.3	154.47	4.0
	halosulfuron	75	WG	0.023	lb ai/a	PRE					
7	ethalfluralin	3	EC	0.75	lb ai/a	PRE	10.0	7.3	21.0	136.57	9.0
	fomesafen	2	SL	0.5	lb ai/a	PRE					
8	s-metolachlor	7.62	EC	0.95	lb ai/a	PRE	9.0	10.0	26.3	164.58	6.0
	clomazone	3	ME	0.5	lb ai/a	PRE					
	fomesafen	2	SL	0.25	lb ai/a	PRE					
9	ethalfluralin	3	EC	0.75	lb ai/a	PRE	10.0	10.0	27.3	185.29	8.3
	clomazone	3	ME	0.25	lb ai/a	PRE					
	fomesafen	2	SL	0.25	lb ai/a	PRE					
	halosulfuron	75	WG	0.023	lb ai/a	PRE					
10	fomesafen	2	SL	0.5	lb ai/a	PRE	9.7	10.0	25.7	189.82	3.3
11	pyroxasulfone	85	WDG	0.05	lb ai/a	PRE	8.7	9.3	26.7	173.81	2.7
12	untreated cultivated						1.0	7.0	15.7	92.63	10.0
LSD (P=.05)							1.59	4.14	6.30	54.311	4.37
Standard Deviation							0.94	2.44	3.72	32.072	2.58
CV							11.41	26.33	15.57	20.45	47.67

Weed Control in Pumpkin and Squash
-HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	PUMPKIN Green KG/PLOT KG	SQUASH Buttercup No./PLOT No.	SQUASH Buttercup KG/PLOT KG	SQUASH Hubbard No./PLOT No.	SQUASH Hubbard KG/PLOT KG
	Pest Code										
	Crop Code						PUMPKIN	SQUASH	SQUASH	SQUASH	SQUASH
	Crop Variety						Green	Buttercup	Buttercup	Hubbard	Hubbard
	Rating Date						24/Sep/12	26/Sep/12	26/Sep/12	26/Sep/12	26/Sep/12
	Rating Type						KG/PLOT	No./PLOT	KG/PLOT	No./PLOT	KG/PLOT
	Rating Unit						KG	No.	KG	No.	KG
1	ethalfluralin	3	EC	1.13	lb ai/a	PRE	16.48	27.7	53.97	48.7	54.21
2	ethalfluralin	3	EC	1.13	lb ai/a	PRE	12.87	42.0	100.46	77.7	86.47
	clomazone	3	ME	0.5	lb ai/a	PRE					
3	ethalfluralin	1.6	SE	4.6	pt/a	PRE	15.55	40.3	93.70	67.0	78.08
	clomazone	.5	SE	1.41							
4	ethalfluralin	3	EC	1.13	lb ai/a	PRE	18.93	41.0	87.83	54.7	60.23
	halosulfuron	75	WG	0.023	lb ai/a	PRE					
5	s-metolachlor	7.62	EC	0.95	lb ai/a	PRE	18.93	40.7	99.85	75.3	89.55
	clomazone	3	ME	0.5	lb ai/a	PRE					
6	s-metolachlor	7.62	EC	0.95	lb ai/a	PRE	18.15	28.3	73.69	59.7	69.09
	halosulfuron	75	WG	0.023	lb ai/a	PRE					
7	ethalfluralin	3	EC	0.75	lb ai/a	PRE	39.00	38.0	96.54	86.7	98.06
	fomesafen	2	SL	0.5	lb ai/a	PRE					
8	s-metolachlor	7.62	EC	0.95	lb ai/a	PRE	26.81	40.7	98.18	71.3	81.34
	clomazone	3	ME	0.5	lb ai/a	PRE					
	fomesafen	2	SL	0.25	lb ai/a	PRE					
9	ethalfluralin	3	EC	0.75	lb ai/a	PRE	27.06	42.0	89.70	73.3	87.50
	clomazone	3	ME	0.25	lb ai/a	PRE					
	fomesafen	2	SL	0.25	lb ai/a	PRE					
	halosulfuron	75	WG	0.023	lb ai/a	PRE					
10	fomesafen	2	SL	0.5	lb ai/a	PRE	12.84	44.3	109.40	79.3	95.11
11	pyroxasulfone	85	WDG	0.05	lb ai/a	PRE	11.97	26.3	62.09	65.7	80.46
12	untreated Cultivated						34.32	18.0	30.27	30.7	35.61
LSD (P=.05)							17.327	17.90	36.866	23.08	30.477
Standard Deviation							10.232	10.57	21.770	13.63	17.997
CV							48.55	29.55	26.24	20.7	23.58

Fall Weed Control in Strawberry – HTRC 2011-2012

Project Code: 126-12-01 **Location: East Lansing, MI**

Personnel: Bernard H. Zandstra
Crop: Strawberry **Variety: Jewel**
Planting Method: Transplant **Planting Date: 4/28/2010** **Harvest Date: See data**
Spacing: 2 ft **Row Spacing: 6 ft**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 5.5 ft wide x 30 ft long

Soil Type: Thetford Loamy Sand **OM: 1.4%** **pH: 7.0**
Sand: 88% **Silt: 8%** **Clay: 4%** **CEC: 4.1**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
FALL	11/7/11	2:30 pm	58/51	F	Good	.5 SW	64	100% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
11/7/11	STBE = strawberry		Green-red, dormant	
11/7/11	WIRA = wild radish	4-6″		Moderate
11/7/11	QUGR = quackgrass	4-10″		Many
11/7/11	WHCA = white campion	2-5″	Rosette	Many
	YERO = yellow rocket	4-6″	Rosette	Moderate

Notes and Comments
1. Spray applied with 4 nozzle boom. FF8002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.
3. 4/13/12 whole field sprayed with Select Max .12 plus COC and AMS to kill QUGR

Fall Weed Control in Strawberry – HTRC 2011-2012

Fall Weed Control in Strawberry - HTRC 2012

Trial ID: 126-12-01 Study Director:
Location: East Lansing, MI Investigator: Dr. Bernard Zandstra

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	STBE 13/Apr/12 RATING 1-10	QUGR 13/Apr/12 RATING 1-10	WHCA 13/Apr/12 RATING 1-10	YERO 13/Apr/12 RATING 1-10	STBE 7/May/12 RATING 1-10
1	terbacil	80	WDG	0.4	lb ai/a	FALL	1.0	4.7	3.3	9.3	1.0
2	sulfentrazone	4	F	0.25	lb ai/a	FALL	1.7	6.7	2.0	3.3	1.7
3	acifluorfen	2	L	0.375	lb ai/a	FALL	1.0	5.3	2.0	3.3	1.0
4	flumioxazin	51	WDG	0.096	lb ai/a	FALL	2.7	6.0	2.3	6.0	1.3
5	napropamide- UV	50	DF	4	lb ai/a	FALL	1.0	8.0	3.7	5.0	1.0
6	pendimethalin	3.8	CS	1.5	lb ai/a	FALL	2.3	3.7	1.3	1.0	1.7
7	indaziflam	1.67	SC	0.065	lb ai/a	FALL	1.3	8.7	7.3	8.3	1.0
8	flazasulfuron	25	WG	0.033	lb ai/a	FALL	7.3	9.0	9.3	8.3	6.3
9	s-metolachlor	7.62	EC	1.3	lb ai/a	FALL	1.0	4.0	1.7	1.3	1.7
10	untreated						1.0	5.0	1.0	3.3	1.3
LSD (P=.05)							1.06	5.41	2.57	4.43	1.39
Standard Deviation							0.62	3.15	1.50	2.58	0.81
CV							30.38	51.72	43.99	52.34	44.98

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	COCW 7/May/12 RATING 1-10	WHCA 7/May/12 RATING 1-10	YERO 7/May/12 RATING 1-10	STBE 5/Jun/12 RATING 1-10	QUGR 5/Jun/12 RATING 1-10
1	terbacil	80	WDG	0.4	lb ai/a	FALL	10.0	1.0	8.7	2.3	4.3
2	sulfentrazone	4	F	0.25	lb ai/a	FALL	6.3	1.0	2.0	2.7	6.0
3	acifluorfen	2	L	0.375	lb ai/a	FALL	3.7	1.3	2.7	1.7	4.0
4	flumioxazin	51	WDG	0.096	lb ai/a	FALL	10.0	1.3	5.0	3.3	5.3
5	napropamide- UV	50	DF	4	lb ai/a	FALL	9.0	2.0	3.0	1.0	7.7
6	pendimethalin	3.8	CS	1.5	lb ai/a	FALL	9.3	1.0	1.0	3.0	4.3
7	indaziflam	1.67	SC	0.065	lb ai/a	FALL	9.3	3.0	3.3	2.0	9.7
8	flazasulfuron	25	WG	0.033	lb ai/a	FALL	10.0	7.0	2.7	7.3	6.3
9	s-metolachlor	7.62	EC	1.3	lb ai/a	FALL	10.0	1.7	1.0	3.0	6.3
10	untreated						9.0	1.3	3.7	2.3	8.7
LSD (P=.05)							2.27	1.82	4.43	2.26	6.04
Standard Deviation							1.32	1.06	2.58	1.32	3.52
CV							15.24	51.26	78.22	45.88	56.15

Fall Weed Control in Strawberry – HTRC 2011-2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
Pest Code							WHCA				
Crop Code								STBE	STBE	STBE	STBE
Rating Date							5/Jun/12	8/Jun/12	11/Jun/12	15/Jun/12	18/Jun/12
Rating Data Type							RATING	G/PLOT	G/PLOT	G/PLOT	G/PLOT
Rating Unit							1-10	G	G	G	G
1	terbacil	80	WDG	0.4	lb ai/a	FALL	5.0	910.7	1209.3	1168.0	996.7
2	sulfentrazone	4	F	0.25	lb ai/a	FALL	2.0	490.7	601.3	663.3	623.3
3	acifluorfen	2	L	0.375	lb ai/a	FALL	1.7	607.3	1255.3	826.7	757.3
4	flumioxazin	51	WDG	0.096	lb ai/a	FALL	5.0	228.0	319.3	624.0	417.3
5	napropamide- UV	50	DF	4	lb ai/a	FALL	1.0	697.0	998.7	1597.3	548.0
6	pendimethalin	3.8	CS	1.5	lb ai/a	FALL	3.7	224.7	598.7	540.7	401.3
7	indaziflam	1.67	SC	0.065	lb ai/a	FALL	1.3	847.3	1078.7	1442.0	851.3
8	flazasulfuron	25	WG	0.033	lb ai/a	FALL	7.3	6.0	0.0	36.0	44.7
9	s-metolachlor	7.62	EC	1.3	lb ai/a	FALL	2.3	254.0	476.0	737.3	670.7
10	untreated						1.3	384.7	615.3	832.0	745.3
LSD (P=.05)							3.31	448.46	748.23	728.35	513.86
Standard Deviation							1.93	261.42	436.17	424.58	299.55
CV							62.97	56.22	60.98	50.14	49.46

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage			
Pest Code									
Crop Code							STBE	STBE	STBE
Rating Date							20/Jun/12	22/Jun/12	
Rating Data Type							G/PLOT	G/PLOT	TOTAL
Rating Unit							G	G	KG/PLOT
1	terbacil	80	WDG	0.4	lb ai/a	FALL	668.7	259.3	5.21
2	sulfentrazone	4	F	0.25	lb ai/a	FALL	178.7	191.3	2.75
3	acifluorfen	2	L	0.375	lb ai/a	FALL	578.0	262.0	4.29
4	flumioxazin	51	WDG	0.096	lb ai/a	FALL	280.0	210.7	2.08
5	napropamide- UV	50	DF	4	lb ai/a	FALL	416.7	304.0	4.58
6	pendimethalin	3.8	CS	1.5	lb ai/a	FALL	242.0	190.7	2.20
7	indaziflam	1.67	SC	0.065	lb ai/a	FALL	546.0	289.3	5.06
8	flazasulfuron	25	WG	0.033	lb ai/a	FALL	14.7	12.7	0.11
9	s-metolachlor	7.62	EC	1.3	lb ai/a	FALL	383.3	160.7	2.68
10	untreated						356.0	192.0	3.13
LSD (P=.05)							390.07	189.33	2.578
Standard Deviation							227.38	110.37	1.503
CV							62.06	53.25	46.85

Spring Weed Control in Everbearing Strawberry – HTRC 2012

Project Code: 126-12-02 **Location: East Lansing, MI**

Personnel: Bernard H. Zandstra
Crop: Strawberry **Variety: Seascape**
Planting Method: Transplant **Planting Date: 2010** **Harvest Date: See data**
Spacing: 2 ft **Row Spacing: 6 ft**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 5.5 ft wide x 30 ft long

Soil Type: Thetford Loamy Sand **OM: 1.4%** **pH: 7.0**
Sand: 88% **Silt: 8%** **Clay: 4%** **CEC: 4.1**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
EPRE	3/19/12	3:30 pm	85/85	F	Good	2 SE	43	90% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
3/19	STBE = strawberry		Greened up	
3/19	BYGR = barnyardgrass	4-6″		Many
3/19	MECW = mouseear chickweed	6-12″		Moderate
3/19	WHCA = white campion	1-3″, 3-6″		Many
3/19	WIRA = wild radish	2-4″, 2-5″		Many
	QUGR = quackgrass			
	YERO = yellow rocket			

Notes and Comments
1. Spray applied with 4 nozzle boom. FF8002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer.
2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.
3. 4/13/12 whole field sprayed with Select Max .12 plus COC and AMS to kill QUGR

Spring Weed Control in Everbearing Strawberry – HTRC 2012

Spring Weed Control in Everbearing Strawberry - HTRC 2012

Trial ID: 126-12-02 Study Director:
Location: East Lansing, MI Investigator: Dr. Bernard Zandstra

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	STBE	QUGR	COCW	WHCA	YERO
	Rating Date						13/Apr/12	13/Apr/12	13/Apr/12	13/Apr/12	13/Apr/12
	Rating Data Type						RATING	RATING	RATING	RATING	RATING
	Rating Unit						1-10	1-10	1-10	1-10	1-10
1	handweeded						1.3	4.0	9.3	2.3	1.0
2	fomesafen	2	SL	0.125	lb ai/a	EPRE	3.3	3.7	6.3	4.3	9.3
3	fomesafen	2	SL	0.25	lb ai/a	EPRE	3.3	4.3	4.0	4.0	10.0
4	fomesafen	2	SL	.375	lb ai/a	EPRE	3.0	6.3	4.7	2.3	10.0
5	fomesafen	2	SL	0.5	lb ai/a	EPRE	3.7	2.7	1.7	3.0	10.0
6	fomesafen	2	SL	.75	lb ai/a	EPRE	4.0	1.7	2.0	2.0	10.0
7	sulfentrazone	4	F	0.25	lb ai/a	EPRE	6.0	2.7	6.0	6.0	8.3
8	terbacil	80	WDG	0.2	lb ai/a	EPRE	2.0	6.0	10.0	5.3	10.0
9	napropamide – UV	50	DF	4	lb ai/a	EPRE	4.0	2.3	4.7	2.7	4.0
10	pendimethalin	3.8	CS	1.4	lb ai/a	EPRE	1.7	4.3	7.3	1.3	2.3
LSD (P=.05)							3.14	4.42	4.44	3.28	2.13
Standard Deviation							1.83	2.58	2.59	1.91	1.24
CV							56.59	67.87	46.18	57.42	16.57

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	STBE	COCW	WHCA	YERO	STBE
	Rating Date						7/May/12	7/May/12	7/May/12	7/May/12	5/Jun/12
	Rating Data Type						RATING	RATING	RATING	RATING	RATING
	Rating Unit						1-10	1-10	1-10	1-10	1-10
1	handweeded						1.0	3.7	2.3	1.0	2.3
2	fomesafen	2	SL	0.125	lb ai/a	EPRE	2.0	3.7	5.3	8.7	3.3
3	fomesafen	2	SL	0.25	lb ai/a	EPRE	1.0	1.0	2.0	10.0	3.0
4	fomesafen	2	SL	.375	lb ai/a	EPRE	1.0	1.7	3.7	9.7	3.3
5	fomesafen	2	SL	0.5	lb ai/a	EPRE	2.0	1.0	6.0	10.0	4.3
6	fomesafen	2	SL	.75	lb ai/a	EPRE	3.0	2.7	4.0	10.0	4.7
7	sulfentrazone	4	F	0.25	lb ai/a	EPRE	3.3	1.3	4.3	8.7	5.7
8	terbacil	80	WDG	0.2	lb ai/a	EPRE	1.3	10.0	5.0	9.3	2.7
9	napropamide – UV	50	DF	4	lb ai/a	EPRE	2.3	6.7	1.0	2.0	4.3
10	pendimethalin	3.8	CS	1.4	lb ai/a	EPRE	1.7	6.3	2.7	2.0	3.7
LSD (P=.05)							2.50	3.21	3.83	1.61	2.33
Standard Deviation							1.46	1.87	2.23	0.94	1.36
CV							78.04	49.18	61.43	13.13	36.34

Spring Weed Control in Everbearing Strawberry – HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	QUGR 5/Jun/12 RATING 1-10	WHCA 5/Jun/12 RATING 1-10	STBE 7/Jun/12 WT/PLOT GRAMS	STBE 11/Jun/12 WT/PLOT GRAMS	STBE 18/Jun/12 WT/PLOT GRAMS
1	handweeded						3.0	6.3	102.7	128.0	125.3
2	fomesafen	2	SL	0.125	lb ai/a	EPRE	1.7	7.3	114.7	180.7	122.7
3	fomesafen	2	SL	0.25	lb ai/a	EPRE	5.3	1.7	218.0	215.3	166.0
4	fomesafen	2	SL	.375	lb ai/a	EPRE	6.0	5.3	259.3	366.0	112.7
5	fomesafen	2	SL	0.5	lb ai/a	EPRE	3.0	5.7	77.3	182.7	106.7
6	fomesafen	2	SL	.75	lb ai/a	EPRE	1.0	5.7	54.0	73.3	49.3
7	sulfentrazone	4	F	0.25	lb ai/a	EPRE	1.0	4.3	97.3	141.3	77.3
8	terbacil	80	WDG	0.2	lb ai/a	EPRE	8.0	6.0	285.3	289.3	150.0
9	napropamide – UV	50	DF	4	lb ai/a	EPRE	1.7	3.7	98.7	141.3	106.7
10	pendimethalin	3.8	CS	1.4	lb ai/a	EPRE	5.7	4.7	107.3	240.0	128.7
LSD (P=.05)							4.11	5.26	156.96	176.76	123.51
Standard Deviation							2.40	3.06	91.50	103.04	72.00
CV							65.97	60.46	64.68	52.63	62.86

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	STBE G/PLOT TOTAL
1	handweeded						356.0
2	fomesafen	2	SL	0.125	lb ai/a	EPRE	418.0
3	fomesafen	2	SL	0.25	lb ai/a	EPRE	599.3
4	fomesafen	2	SL	.375	lb ai/a	EPRE	738.0
5	fomesafen	2	SL	0.5	lb ai/a	EPRE	366.7
6	fomesafen	2	SL	.75	lb ai/a	EPRE	176.7
7	sulfentrazone	4	F	0.25	lb ai/a	EPRE	410.7
8	terbacil	80	WDG	0.2	lb ai/a	EPRE	724.7
9	napropamide – UV	50	DF	4	lb ai/a	EPRE	344.7
10	pendimethalin	3.8	CS	1.4	lb ai/a	EPRE	476.0
LSD (P=.05)							381.72
Standard Deviation							222.52
CV							48.26

Fall Weed Control in Apple – CRC 2011-12

Project Code: 128-12-01 **Location: Clarksville, MI**

Personnel: Bernard H. Zandstra
Crop: Apple **Variety: See notes**
Planting Method: Transplant **Planting Date: 2005** **Harvest Date:**
Spacing: 12 ft **Row Spacing: 18 ft**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 11 ft wide x 50 ft long

Soil Type: Lapeer Sandy Loam **OM: 2.7%** **pH: 5.9**
Sand: 39% **Silt: 45%** **Clay: 16%** **CEC: 6.0**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
FALL	11/1/11	12:30 pm	52/52	F	Good	5-7 SW	38	10% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
11/1/11	APPLE		Post-Harvest	
11/1/11	PERG = perennial ryegrass	2-3″		Few
11/1/11	TAFE = tall fescue	2-3″		Few
11/1/11	COMA = common mallow	2-3″		Moderate
11/1/11	DAND = dandelion	1-2″, 3-5″		Many
11/1/11	WHCA = white campion	2-5″		Many
11/1/11	WHCL = white clover	1-3″		Many
	ANBG = annual bluegrass			
	COGR = common groundsel			
	COLQ = common lambsquarters			
	HOWE = horseweed			
	SHPU = shepherdspurse			
	BYGR = barnyardgrass			
	VIPW = Virginia pepperweed			
	LACG = large crabgrass			
	PRKW = prostrate knotweed			
	FAPA = fall panicum			
	YEFT = yellow foxtail			

Notes and Comments
1. Varieties: Red Delicious, Gala, Fuji
2. Spray applied with 4 nozzle boom. FF8002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer. One pass on each side of row.
3. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.

Fall Weed Control in Apple – CRC 2011-12

Fall Weed Control in Apple – CRC 2011-2012

Trial ID: 128-12-01 Study Director:
Location: Clarksville. MI Investigator: Dr. Bernard Zandstra

Pest Code							ANBG	PERG	COGR	DAND	WHCL
Crop Code						APPLE					
Rating Date						30/Apr/12	30/Apr/12	30/Apr/12	30/Apr/12	30/Apr/12	30/Apr/12
Rating Type						RATING	RATING	RATING	RATING	RATING	RATING
Rating Unit						1-10	1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
1	flumioxazin	51	WDG	.383	lb ai/a	FALL	1.0	10.0	10.0	10.0	8.7	7.0
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
2	indaziflam	1.67	SC	.065	lb ai/a	FALL	1.0	10.0	10.0	10.0	9.3	7.7
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
3	isoxaben	75	DF	1	lb ai/a	FALL	1.0	6.0	9.3	9.0	8.3	6.7
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
4	oxyfluorfen	3.93	SC	1.47	lb ai/a	FALL	1.0	9.7	10.0	10.0	9.0	8.0
	penoxsulam	.083	SC	.031								
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
5	rimsulfuron (M)	25	DF	.063	lb ai/a	FALL	1.0	9.7	10.0	9.3	10.0	7.7
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
6	mesotrione	4	SC	.188	lb ai/a	FALL	1.0	9.3	10.0	7.0	8.3	9.7
	simazine	90	WDG	4	lb ai/a	FALL						
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
7	terbacil	80	WDG	2.4	lb ai/a	FALL	1.0	10.0	9.7	2.7	9.0	9.0
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
8	terbacil	80	WDG	2.4	lb ai/a	FALL	1.0	7.3	10.0	3.3	7.3	5.3
	sulfentrazone	4	F	0.375	lb ai/a	FALL						
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
9	sulfentrazone	4	F	0.375	lb ai/a	FALL	1.0	6.3	9.7	4.0	8.0	5.3
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
10	pendimethalin	3.8	CS	3.8	lb ai/a	FALL	1.0	10.0	10.0	8.0	9.3	3.3
	halosulfuron	75	WG	.047	lb ai/a	FALL						
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
11	flazasulfuron	25	WG	.045	lb ai/a	FALL	1.0	10.0	10.0	10.0	9.3	9.0
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
12	glyphosate	5.4	L	1.35	lb ai/a	FALL	1.0	2.3	8.7	3.0	6.3	1.0
	AMS	100	SG	0.17	lb/gal	FALL						
LSD (P=.05)							0.00	3.36	0.92	4.08	1.79	2.71
Standard Deviation							0.00	1.98	0.54	2.41	1.06	1.60
CV							0.0	23.65	5.54	33.52	12.34	24.13

Fall Weed Control in Apple – CRC 2011-12

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
Pest Code								ANBG	GRFT	PERG	COGR
Crop Code							APPLE				
Rating Date							29/May/12	29/May/12	29/May/12	29/May/12	29/May/12
Rating Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	flumioxazin	51	WDG	.383	lb ai/a	FALL	1.0	9.3	9.0	10.0	9.0
	glyphosate	5.4	L	1.35	lb ai/a	FALL					
	AMS	100	SG	0.17	lb/gal	FALL					
2	indaziflam	1.67	SC	.065	lb ai/a	FALL	1.0	10.0	10.0	9.7	10.0
	glyphosate	5.4	L	1.35	lb ai/a	FALL					
	AMS	100	SG	0.17	lb/gal	FALL					
3	isoxaben	75	DF	1	lb ai/a	FALL	1.0	1.7	5.7	8.7	5.3
	glyphosate	5.4	L	1.35	lb ai/a	FALL					
	AMS	100	SG	0.17	lb/gal	FALL					
4	oxyfluorfen	3.93	SC	1.47	lb ai/a	FALL	1.0	8.7	10.0	9.7	10.0
	penoxsulam	.083	SC	.031							
	glyphosate	5.4	L	1.35	lb ai/a	FALL					
	AMS	100	SG	0.17	lb/gal	FALL					
5	rimsulfuron (M)	25	DF	.063	lb ai/a	FALL	1.0	9.0	10.0	10.0	5.3
	glyphosate	5.4	L	1.35	lb ai/a	FALL					
	AMS	100	SG	0.17	lb/gal	FALL					
6	mesotrione	4	SC	.188	lb ai/a	FALL	1.0	7.0	4.3	9.3	3.7
	simazine	90	WDG	4	lb ai/a	FALL					
	glyphosate	5.4	L	1.35	lb ai/a	FALL					
	AMS	100	SG	0.17	lb/gal	FALL					
7	terbacil	80	WDG	2.4	lb ai/a	FALL	1.0	10.0	10.0	10.0	1.7
	glyphosate	5.4	L	1.35	lb ai/a	FALL					
	AMS	100	SG	0.17	lb/gal	FALL					
8	terbacil	80	WDG	2.4	lb ai/a	FALL	1.0	8.7	9.0	10.0	3.0
	sulfentrazone	4	F	0.375	lb ai/a	FALL					
	glyphosate	5.4	L	1.35	lb ai/a	FALL					
	AMS	100	SG	0.17	lb/gal	FALL					
9	sulfentrazone	4	F	0.375	lb ai/a	FALL	1.0	3.0	8.7	8.3	1.7
	glyphosate	5.4	L	1.35	lb ai/a	FALL					
	AMS	100	SG	0.17	lb/gal	FALL					
10	pendimethalin	3.8	CS	3.8	lb ai/a	FALL	1.0	9.0	10.0	10.0	5.0
	halosulfuron	75	WG	.047	lb ai/a	FALL					
	glyphosate	5.4	L	1.35	lb ai/a	FALL					
	AMS	100	SG	0.17	lb/gal	FALL					
11	flazasulfuron	25	WG	.045	lb ai/a	FALL	1.0	6.3	10.0	10.0	8.7
	glyphosate	5.4	L	1.35	lb ai/a	FALL					
	AMS	100	SG	0.17	lb/gal	FALL					
12	glyphosate	5.4	L	1.35	lb ai/a	FALL	1.0	1.7	5.3	6.7	3.3
	AMS	100	SG	0.17	lb/gal	FALL					
LSD (P=.05)							0.00	3.76	3.98	2.43	4.63
Standard Deviation							0.00	2.22	2.35	1.43	2.73
CV							0.0	31.59	27.65	15.33	49.19

Fall Weed Control in Apple – CRC 2011-12

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	COLQ	DAND	HOWE	SHPU	WHCL
Pest Code											
Crop Code											
Rating Date							29/May/12	29/May/12	29/May/12	29/May/12	29/May/12
Rating Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	flumioxazin	51	WDG	.383	lb ai/a	FALL	10.0	5.0	10.0	10.0	3.0
	glyphosate	5.4	L	1.35	lb ai/a	FALL					
	AMS	100	SG	0.17	lb/gal	FALL					
2	indaziflam	1.67	SC	.065	lb ai/a	FALL	9.3	6.7	10.0	10.0	3.0
	glyphosate	5.4	L	1.35	lb ai/a	FALL					
	AMS	100	SG	0.17	lb/gal	FALL					
3	isoxaben	75	DF	1	lb ai/a	FALL	4.7	3.7	10.0	10.0	1.7
	glyphosate	5.4	L	1.35	lb ai/a	FALL					
	AMS	100	SG	0.17	lb/gal	FALL					
4	oxyfluorfen	3.93	SC	1.47	lb ai/a	FALL	10.0	6.3	9.7	10.0	7.3
	penoxsulam	.083	SC	.031							
	glyphosate	5.4	L	1.35	lb ai/a	FALL					
	AMS	100	SG	0.17	lb/gal	FALL					
5	rimsulfuron (M)	25	DF	.063	lb ai/a	FALL	3.3	7.3	3.0	7.3	5.7
	glyphosate	5.4	L	1.35	lb ai/a	FALL					
	AMS	100	SG	0.17	lb/gal	FALL					
6	mesotrione	4	SC	.188	lb ai/a	FALL	1.7	4.0	10.0	6.7	6.3
	simazine	90	WDG	4	lb ai/a	FALL					
	glyphosate	5.4	L	1.35	lb ai/a	FALL					
	AMS	100	SG	0.17	lb/gal	FALL					
7	terbacil	80	WDG	2.4	lb ai/a	FALL	7.0	6.0	10.0	10.0	9.0
	glyphosate	5.4	L	1.35	lb ai/a	FALL					
	AMS	100	SG	0.17	lb/gal	FALL					
8	terbacil	80	WDG	2.4	lb ai/a	FALL	10.0	5.0	10.0	10.0	9.3
	sulfentrazone	4	F	0.375	lb ai/a	FALL					
	glyphosate	5.4	L	1.35	lb ai/a	FALL					
	AMS	100	SG	0.17	lb/gal	FALL					
9	sulfentrazone	4	F	0.375	lb ai/a	FALL	10.0	4.0	3.3	1.0	1.7
	glyphosate	5.4	L	1.35	lb ai/a	FALL					
	AMS	100	SG	0.17	lb/gal	FALL					
10	pendimethalin	3.8	CS	3.8	lb ai/a	FALL	10.0	4.7	10.0	2.0	1.0
	halosulfuron	75	WG	.047	lb ai/a	FALL					
	glyphosate	5.4	L	1.35	lb ai/a	FALL					
	AMS	100	SG	0.17	lb/gal	FALL					
11	flazasulfuron	25	WG	.045	lb ai/a	FALL	10.0	7.7	5.0	9.3	7.7
	glyphosate	5.4	L	1.35	lb ai/a	FALL					
	AMS	100	SG	0.17	lb/gal	FALL					
12	glyphosate	5.4	L	1.35	lb ai/a	FALL	1.0	1.3	5.7	1.0	1.0
	AMS	100	SG	0.17	lb/gal	FALL					
LSD (P=.05)							3.72	4.94	3.35	3.42	4.38
Standard Deviation							2.20	2.92	1.98	2.02	2.58
CV							30.28	56.73	24.58	27.78	54.73

Fall Weed Control in Apple – CRC 2011-12

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage		BYGR	QUGR	COGR	COLQ	DAND
Pest Code												
Crop Code							APPLE					
Rating Date							5/Jul/12	5/Jul/12	5/Jul/12	5/Jul/12	5/Jul/12	5/Jul/12
Rating Type							RATING	RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10	1-10
1	flumioxazin	51	WDG	.383	lb ai/a	FALL	1.0	6.7	9.0	8.7	10.0	3.7
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
2	indaziflam	1.67	SC	.065	lb ai/a	FALL	1.0	10.0	8.7	10.0	9.0	4.3
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
3	isoxaben	75	DF	1	lb ai/a	FALL	1.3	5.7	6.0	7.0	3.7	1.7
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
4	oxyfluorfen	3.93	SC	1.47	lb ai/a	FALL	1.0	6.0	9.3	8.7	10.0	2.7
	penoxsulam	.083	SC	.031								
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
5	rimsulfuron (M)	25	DF	.063	lb ai/a	FALL	1.0	9.0	9.3	6.0	4.0	7.7
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
6	mesotrione	4	SC	.188	lb ai/a	FALL	1.0	2.3	8.7	6.0	1.0	3.3
	simazine	90	WDG	4	lb ai/a	FALL						
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
7	terbacil	80	WDG	2.4	lb ai/a	FALL	1.0	9.0	10.0	1.0	5.3	8.7
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
8	terbacil	80	WDG	2.4	lb ai/a	FALL	1.0	7.7	9.3	2.3	10.0	5.3
	sulfentrazone	4	F	0.375	lb ai/a	FALL						
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
9	sulfentrazone	4	F	0.375	lb ai/a	FALL	1.0	9.3	7.3	3.7	10.0	5.7
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
10	pendimethalin	3.8	CS	3.8	lb ai/a	FALL	1.0	7.0	9.0	4.7	9.0	5.3
	halosulfuron	75	WG	.047	lb ai/a	FALL						
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
11	flazasulfuron	25	WG	.045	lb ai/a	FALL	1.0	5.0	9.3	7.7	10.0	4.7
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
12	glyphosate	5.4	L	1.35	lb ai/a	FALL	1.0	10.0	2.3	7.0	1.0	5.0
	AMS	100	SG	0.17	lb/gal	FALL						
LSD (P=.05)							0.28	4.34	2.82	4.86	3.17	4.77
Standard Deviation							0.17	2.56	1.67	2.87	1.87	2.82
CV							16.22	35.05	20.34	47.38	27.08	58.3

Fall Weed Control in Apple – CRC 2011-12

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	HOWE	VIPW	WHCL	APPLE	BYGR	LACG
Pest Code												
Crop Code										APPLE		
Rating Date							5/Jul/12	5/Jul/12	5/Jul/12	24/Jul/12	24/Jul/12	24/Jul/12
Rating Type							RATING	RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10	1-10
1	flumioxazin	51	WDG	.383	lb ai/a	FALL	9.3	10.0	2.0	1.0	5.0	4.7
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
2	indaziflam	1.67	SC	.065	lb ai/a	FALL	10.0	10.0	3.3	1.3	7.7	9.3
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
3	isoxaben	75	DF	1	lb ai/a	FALL	7.0	10.0	2.0	1.0	2.7	7.0
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
4	oxyfluorfen	3.93	SC	1.47	lb ai/a	FALL	6.0	7.0	3.0	1.3	2.7	5.3
	penoxsulam	.083	SC	.031								
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
5	rimsulfuron (M)	25	DF	.063	lb ai/a	FALL	1.0	7.0	6.7	1.3	7.7	9.0
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
6	mesotrione	4	SC	.188	lb ai/a	FALL	8.3	10.0	10.0	1.7	1.3	6.0
	simazine	90	WDG	4	lb ai/a	FALL						
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
7	terbacil	80	WDG	2.4	lb ai/a	FALL	10.0	10.0	5.3	1.3	9.0	8.0
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
8	terbacil	80	WDG	2.4	lb ai/a	FALL	10.0	10.0	6.0	1.3	5.7	8.0
	sulfentrazone	4	F	0.375	lb ai/a	FALL						
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
9	sulfentrazone	4	F	0.375	lb ai/a	FALL	2.0	7.7	2.3	1.3	7.3	9.3
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
10	pendimethalin	3.8	CS	3.8	lb ai/a	FALL	3.3	7.7	1.3	1.0	8.0	10.0
	halosulfuron	75	WG	.047	lb ai/a	FALL						
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
11	flazasulfuron	25	WG	.045	lb ai/a	FALL	3.3	8.3	7.0	1.7	1.7	10.0
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
12	glyphosate	5.4	L	1.35	lb ai/a	FALL	4.7	10.0	1.7	1.0	9.3	10.0
	AMS	100	SG	0.17	lb/gal	FALL						
LSD (P=.05)							2.97	4.62	5.39	0.78	3.47	4.26
Standard Deviation							1.76	2.73	3.18	0.46	2.05	2.51
CV							28.1	30.43	75.34	35.83	36.19	31.22

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Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	COLQ	COMA	DAND	HOWE	PRKW	WHCL
Pest Code												
Crop Code												
Rating Date							24/Jul/12	24/Jul/12	24/Jul/12	24/Jul/12	24/Jul/12	24/Jul/12
Rating Type							RATING	RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10	1-10
1	flumioxazin	51	WDG	.383	lb ai/a	FALL	10.0	10.0	4.3	9.0	7.0	4.0
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
2	indaziflam	1.67	SC	.065	lb ai/a	FALL	7.3	10.0	5.7	9.7	10.0	3.0
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
3	isoxaben	75	DF	1	lb ai/a	FALL	4.0	10.0	5.7	7.7	4.7	4.7
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
4	oxyfluorfen	3.93	SC	1.47	lb ai/a	FALL	10.0	7.0	1.3	7.3	6.7	5.3
	penoxsulam	.083	SC	.031								
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
5	rimsulfuron (M)	25	DF	.063	lb ai/a	FALL	2.3	4.7	7.7	2.3	4.7	8.3
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
6	mesotrione	4	SC	.188	lb ai/a	FALL	2.3	10.0	5.3	8.3	7.0	8.7
	simazine	90	WDG	4	lb ai/a	FALL						
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
7	terbacil	80	WDG	2.4	lb ai/a	FALL	5.7	8.3	8.7	10.0	10.0	9.0
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
8	terbacil	80	WDG	2.4	lb ai/a	FALL	10.0	10.0	6.0	8.7	7.7	6.3
	sulfentrazone	4	F	0.375	lb ai/a	FALL						
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
9	sulfentrazone	4	F	0.375	lb ai/a	FALL	9.3	8.3	5.7	2.3	5.7	3.7
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
10	pendimethalin	3.8	CS	3.8	lb ai/a	FALL	10.0	7.7	5.3	3.7	10.0	1.7
	halosulfuron	75	WG	.047	lb ai/a	FALL						
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
11	flazasulfuron	25	WG	.045	lb ai/a	FALL	10.0	10.0	6.7	4.3	9.0	7.0
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	AMS	100	SG	0.17	lb/gal	FALL						
12	glyphosate	5.4	L	1.35	lb ai/a	FALL	2.7	10.0	6.7	5.3	3.7	6.0
	AMS	100	SG	0.17	lb/gal	FALL						
LSD (P=.05)							3.51	4.47	4.37	3.80	6.20	4.22
Standard Deviation							2.07	2.64	2.58	2.25	3.66	2.49
CV							29.69	29.9	44.9	34.26	51.08	44.19

Fall Weed Control in Apple – CRC 2011-12

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage		BYGR	FAPA	LACG	YEFT	DAND	WHCL
Pest Code													
Crop Code							APPLE						
Rating Date							6/Sep/12	6/Sep/12	6/Sep/12	6/Sep/12	6/Sep/12	6/Sep/12	6/Sep/12
Rating Type							RATING	RATING	RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10	1-10	1-10
1	flumioxazin	51	WDG	.383	lb ai/a	FALL	1.0	7.3	4.7	4.3	7.3	4.0	2.7
	glyphosate	5.4	L	1.35	lb ai/a	FALL							
	AMS	100	SG	0.17	lb/gal	FALL							
2	indaziflam	1.67	SC	.065	lb ai/a	FALL	1.0	9.3	6.7	8.3	7.7	7.3	2.7
	glyphosate	5.4	L	1.35	lb ai/a	FALL							
	AMS	100	SG	0.17	lb/gal	FALL							
3	isoxaben	75	DF	1	lb ai/a	FALL	1.0	5.0	4.0	1.0	3.3	4.0	4.3
	glyphosate	5.4	L	1.35	lb ai/a	FALL							
	AMS	100	SG	0.17	lb/gal	FALL							
4	oxyfluorfen	3.93	SC	1.47	lb ai/a	FALL	1.0	5.0	8.0	1.3	9.3	1.0	6.7
	penoxsulam	.083	SC	.031									
	glyphosate	5.4	L	1.35	lb ai/a	FALL							
	AMS	100	SG	0.17	lb/gal	FALL							
5	rimsulfuron (M)	25	DF	.063	lb ai/a	FALL	1.0	8.7	5.0	5.3	8.7	7.3	8.7
	glyphosate	5.4	L	1.35	lb ai/a	FALL							
	AMS	100	SG	0.17	lb/gal	FALL							
6	mesotrione	4	SC	.188	lb ai/a	FALL	1.0	4.0	1.0	6.3	10.0	2.0	10.0
	simazine	90	WDG	4	lb ai/a	FALL							
	glyphosate	5.4	L	1.35	lb ai/a	FALL							
	AMS	100	SG	0.17	lb/gal	FALL							
7	terbacil	80	WDG	2.4	lb ai/a	FALL	1.0	7.3	4.0	1.0	7.7	7.0	10.0
	glyphosate	5.4	L	1.35	lb ai/a	FALL							
	AMS	100	SG	0.17	lb/gal	FALL							
8	terbacil	80	WDG	2.4	lb ai/a	FALL	1.0	6.7	6.7	4.3	10.0	4.3	9.0
	sulfentrazone	4	F	0.375	lb ai/a	FALL							
	glyphosate	5.4	L	1.35	lb ai/a	FALL							
	AMS	100	SG	0.17	lb/gal	FALL							
9	sulfentrazone	4	F	0.375	lb ai/a	FALL	1.3	7.3	4.0	2.0	7.7	4.3	2.3
	glyphosate	5.4	L	1.35	lb ai/a	FALL							
	AMS	100	SG	0.17	lb/gal	FALL							
10	pendimethalin	3.8	CS	3.8	lb ai/a	FALL	1.3	8.3	10.0	9.7	9.3	3.3	1.0
	halosulfuron	75	WG	.047	lb ai/a	FALL							
	glyphosate	5.4	L	1.35	lb ai/a	FALL							
	AMS	100	SG	0.17	lb/gal	FALL							
11	flazasulfuron	25	WG	.045	lb ai/a	FALL	1.0	9.0	4.0	5.0	3.7	6.7	10.0
	glyphosate	5.4	L	1.35	lb ai/a	FALL							
	AMS	100	SG	0.17	lb/gal	FALL							
12	glyphosate	5.4	L	1.35	lb ai/a	FALL	1.0	7.3	6.7	6.3	9.3	8.0	7.0
	AMS	100	SG	0.17	lb/gal	FALL							
LSD (P=.05)							0.41	4.66	5.09	4.02	3.96	5.31	3.88
Standard Deviation							0.24	2.75	3.01	2.38	2.34	3.14	2.29
CV							22.83	38.66	55.8	51.83	29.84	63.46	36.95

Fall & Spring Weed Control in Apple with Pindar – CRC 2011-2012

Project Code: 128-12-02 **Location: Clarksville, MI**

Personnel: Bernard H. Zandstra
Crop: Apple **Variety: Red Del., Gala, Fuji**
Planting Method: Transplant **Planting Date: 2005** **Harvest Date:**
Spacing: 12 ft **Row Spacing: 18 ft**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 11 ft wide x 50 ft long

Soil Type: Lapeer Sandy Loam **OM: 2.7%** **pH: 5.9**
Sand: 39% **Silt: 45%** **Clay: 16%** **CEC: 6.0**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
FALL	11/1/11	12:30 pm	64/50	F	Good	4-7 S	63	90% Cloudy	N
EPRE	4/5/12	11:00 am	43/47	F	Damp	7-9 E	25	25% Cloudy	N
LPRE	4/27/12	12:15 pm	54/49	F	Damp	2-3 NW	52	0% Cloudy	N
LPOS	6/19/12	2:30 pm	91/77	F	Dry	4-5 SW	47	0% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
11/1/11	APPLE			
11/1/11	COMA = common mallow	2-3″		Few
11/1/11	DAND = dandelion	2-3″, 3-5″		Many
11/1/11	PERG = perennial ryegrass	2-3″		Few
11/1/11	WHCA = white campion	2-4″, 3-5″		Many
11/1/11	WHCL = white clover	1-3″		Many
4/5/12	APPLE			
4/5/12	ANBG = annual bluegrass	3-5″		Moderate
4/5/12	PERG = perennial ryegrass	3-5″		Moderate
4/5/12	COCW = common chickweed	4-6″, 1-2″		Many
4/5/12	COGR = common groundsel	4-8″, 2-4″		Many
4/5/12	DAND = dandelion	6-8″, 3-6″		Many
4/5/12	HOWE = horseweed	1-2″, 3-4″		Few
4/5/12	RRPW = redroot pigweed	6-10″		Few
	BYGR = barnyardgrass			
	LACG = large crabgrass			
	COLQ = common lambsquarters			
	PRKW = prostrate knotweed			
	SHPU = shepherdspurse			
	YEHW = yellow hawkweed			

Notes and Comments
1. Treatments 5-11 applied in 2012.
1. Spray applied with 4 nozzle boom. FF8002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer, one pass on each side of row.
2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.

Fall & Spring Weed Control in Apple with Pindar - CRC 2011-2012

Fall & Spring Weed Control in Apple with Pindar - CRC 2011-12

Trial ID: 128-12-02 Study Director:
Location: Clarksville, MI Investigator: Dr. Bernard Zandstra

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	APPLE	ANBG	PERG	COCW	COGR
	Pest Code							ANBG	PERG	COCW	COGR
	Crop Code						APPLE				
	Rating Date						30/Apr/12	30/Apr/12	30/Apr/12	30/Apr/12	30/Apr/12
	Rating Type						RATING	RATING	RATING	RATING	RATING
	Rating Unit						1-10	1-10	1-10	1-10	1-10
1	oxyfluorfen	3.93	SC	1.47	lb ai/a	FALL11	1.0	9.3	10.0	10.0	10.0
	penoxsulam	.083	SC	.031							
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
2	oxyfluorfen	4	SC	1.5	lb ai/a	FALL11	1.0	9.3	9.3	9.7	10.0
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
3	flumioxazin	51	WDG	0.383	lb ai/a	FALL11	1.0	10.0	10.0	10.0	10.0
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
4	glyphosate	5.4	L	1.35	lb ai/a	FALL11	1.0	2.0	10.0	7.0	5.0
	AMS	100	SG	0.17	lb/gal	FALL11					
5	glyphosate	5.4	L	1.35	lb ai/a	FALL11	1.0	3.3	9.3	8.0	7.3
	AMS	100	SG	0.17	lb/gal	FALL11					
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS					
	AMS	100	SG	0.17	lb/gal	LPRE,LPOS					
6	oxyfluorfen	3.93	SC	1.47	lb ai/a	EPRE	1.0	10.0	10.0	10.0	10.0
	penoxsulam	.083	SC	.031							
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
	AMS	100	SG	0.17	lb/gal	EPRE					
7	oxyfluorfen	4	SC	1.5	lb ai/a	EPRE	1.0	10.0	10.0	10.0	10.0
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
	AMS	100	SG	0.17	lb/gal	EPRE					
8	isoxaben	75	DF	1	lb ai/a	EPRE	1.0	10.0	10.0	10.0	10.0
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
	AMS	100	SG	0.17	lb/gal	EPRE					
9	rimsulfuron (M)	25	DF	.063	lb ai/a	EPRE	1.0	10.0	10.0	10.0	10.0
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
	AMS	100	SG	0.17	lb/gal	EPRE					
10	glyphosate	5.4	L	1.35	lb ai/a	EPRE, LPOS	1.0	10.0	10.0	10.0	10.0
	AMS	100	SG	0.17	lb/gal	EPRE, LPOS					
11	terbacil	80	WDG	2.4	lb ai/a	EPRE	1.0	10.0	9.7	10.0	9.7
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
	AMS	100	SG	0.17	lb/gal	EPRE					
12	untreated					ALL	1.0	1.0	3.7	1.0	1.3
LSD (P=.05)							0.00	1.39	2.44	2.57	2.10
Standard Deviation							0.00	0.82	1.44	1.52	1.24
CV							0.0	10.37	15.41	17.22	14.39

Fall & Spring Weed Control in Apple with Pindar - CRC 2011-2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	DAND	PRKW	WHCL	APPLE	ANBG
Pest Code											
Crop Code											
Rating Date							30/Apr/12	30/Apr/12	30/Apr/12	29/May/12	29/May/12
Rating Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	oxyfluorfen	3.93	SC	1.47	lb ai/a	FALL11	10.0	10.0	9.3	1.0	7.3
	penoxsulam	.083	SC	.031							
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
2	oxyfluorfen	4	SC	1.5	lb ai/a	FALL11	9.0	10.0	8.0	1.0	4.7
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
3	flumioxazin	51	WDG	0.383	lb ai/a	FALL11	5.3	10.0	4.7	1.0	8.3
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
4	glyphosate	5.4	L	1.35	lb ai/a	FALL11	6.7	10.0	6.7	1.0	1.7
	AMS	100	SG	0.17	lb/gal	FALL11					
5	glyphosate	5.4	L	1.35	lb ai/a	FALL11	6.7	4.7	6.3	1.0	10.0
	AMS	100	SG	0.17	lb/gal	FALL11					
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS					
	AMS	100	SG	0.17	lb/gal	LPRE,LPOS					
6	oxyfluorfen	3.93	SC	1.47	lb ai/a	EPRE	10.0	10.0	9.3	1.0	10.0
	penoxsulam	.083	SC	.031							
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
	AMS	100	SG	0.17	lb/gal	EPRE					
7	oxyfluorfen	4	SC	1.5	lb ai/a	EPRE	10.0	10.0	8.3	1.0	10.0
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
	AMS	100	SG	0.17	lb/gal	EPRE					
8	isoxaben	75	DF	1	lb ai/a	EPRE	10.0	10.0	3.7	1.0	10.0
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
	AMS	100	SG	0.17	lb/gal	EPRE					
9	rimsulfuron (M)	25	DF	.063	lb ai/a	EPRE	10.0	10.0	5.3	1.0	9.7
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
	AMS	100	SG	0.17	lb/gal	EPRE					
10	glyphosate	5.4	L	1.35	lb ai/a	EPRE, LPOS	10.0	10.0	5.0	1.0	9.3
	AMS	100	SG	0.17	lb/gal	EPRE, LPOS					
11	terbacil	80	WDG	2.4	lb ai/a	EPRE	10.0	10.0	9.0	1.0	10.0
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
	AMS	100	SG	0.17	lb/gal	EPRE					
12	untreated					ALL	1.0	9.3	1.0	1.0	3.7
LSD (P=.05)							2.17	2.34	3.45	0.00	3.03
Standard Deviation							1.28	1.38	2.04	0.00	1.79
CV							15.62	14.57	31.88	0.0	22.68

Fall & Spring Weed Control in Apple with Pindar – CRC 2011-2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	PERG	COGR	COLQ	DAND	HOWE
	Pest Code										
	Crop Code										
	Rating Date						29/May/12	29/May/12	29/May/12	29/May/12	29/May/12
	Rating Type						RATING	RATING	RATING	RATING	RATING
	Rating Unit						1-10	1-10	1-10	1-10	1-10
1	oxyfluorfen	3.93	SC	1.47	lb ai/a	FALL11	9.3	10.0	10.0	6.0	8.7
	penoxsulam	.083	SC	.031							
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
2	oxyfluorfen	4	SC	1.5	lb ai/a	FALL11	10.0	10.0	10.0	4.7	7.0
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
3	flumioxazin	51	WDG	0.383	lb ai/a	FALL11	10.0	10.0	10.0	2.3	10.0
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
4	glyphosate	5.4	L	1.35	lb ai/a	FALL11	9.7	2.3	10.0	4.0	10.0
	AMS	100	SG	0.17	lb/gal	FALL11					
5	glyphosate	5.4	L	1.35	lb ai/a	FALL11	10.0	10.0	8.7	6.0	10.0
	AMS	100	SG	0.17	lb/gal	FALL11					
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS					
	AMS	100	SG	0.17	lb/gal	LPRE,LPOS					
6	oxyfluorfen	3.93	SC	1.47	lb ai/a	EPRE	10.0	10.0	10.0	10.0	10.0
	penoxsulam	.083	SC	.031							
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
	AMS	100	SG	0.17	lb/gal	EPRE					
7	oxyfluorfen	4	SC	1.5	lb ai/a	EPRE	10.0	10.0	10.0	10.0	10.0
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
	AMS	100	SG	0.17	lb/gal	EPRE					
8	isoxaben	75	DF	1	lb ai/a	EPRE	10.0	10.0	10.0	10.0	10.0
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
	AMS	100	SG	0.17	lb/gal	EPRE					
9	rimsulfuron (M)	25	DF	.063	lb ai/a	EPRE	10.0	10.0	10.0	10.0	10.0
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
	AMS	100	SG	0.17	lb/gal	EPRE					
10	glyphosate	5.4	L	1.35	lb ai/a	EPRE, LPOS	10.0	10.0	8.7	10.0	10.0
	AMS	100	SG	0.17	lb/gal	EPRE, LPOS					
11	terbacil	80	WDG	2.4	lb ai/a	EPRE	10.0	9.0	10.0	9.3	10.0
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
	AMS	100	SG	0.17	lb/gal	EPRE					
12	untreated					ALL	1.0	7.0	10.0	1.3	10.0
LSD (P=.05)							0.61	2.63	0.82	2.57	2.68
Standard Deviation							0.36	1.55	0.48	1.52	1.59
CV							3.91	17.18	4.93	21.75	16.45

Fall & Spring Weed Control in Apple with Pindar - CRC 2011-2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	SHPU	WHCL	APPLE	BYGR	COGR
	Pest Code						SHPU	WHCL		BYGR	COGR
	Crop Code								APPLE		
	Rating Date						29/May/12	29/May/12	5/Jul/12	5/Jul/12	5/Jul/12
	Rating Type						RATING	RATING	RATING	RATING	RATING
	Rating Unit						1-10	1-10	1-10	1-10	1-10
1	oxyfluorfen	3.93	SC	1.47	lb ai/a	FALL11	10.0	7.0	1.0	7.3	10.0
	penoxsulam	.083	SC	.031							
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
2	oxyfluorfen	4	SC	1.5	lb ai/a	FALL11	10.0	3.0	1.0	6.7	8.7
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
3	flumioxazin	51	WDG	0.383	lb ai/a	FALL11	10.0	1.7	1.0	4.3	10.0
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
4	glyphosate	5.4	L	1.35	lb ai/a	FALL11	1.0	3.3	1.0	10.0	9.0
	AMS	100	SG	0.17	lb/gal	FALL11					
5	glyphosate	5.4	L	1.35	lb ai/a	FALL11	9.7	7.7	1.0	10.0	10.0
	AMS	100	SG	0.17	lb/gal	FALL11					
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS					
	AMS	100	SG	0.17	lb/gal	LPRE,LPOS					
6	oxyfluorfen	3.93	SC	1.47	lb ai/a	EPRE	10.0	9.7	1.0	4.7	10.0
	penoxsulam	.083	SC	.031							
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
	AMS	100	SG	0.17	lb/gal	EPRE					
7	oxyfluorfen	4	SC	1.5	lb ai/a	EPRE	10.0	5.7	1.0	4.0	10.0
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
	AMS	100	SG	0.17	lb/gal	EPRE					
8	isoxaben	75	DF	1	lb ai/a	EPRE	10.0	6.7	1.0	5.3	10.0
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
	AMS	100	SG	0.17	lb/gal	EPRE					
9	rimsulfuron (M)	25	DF	.063	lb ai/a	EPRE	10.0	7.7	1.0	6.7	10.0
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
	AMS	100	SG	0.17	lb/gal	EPRE					
10	glyphosate	5.4	L	1.35	lb ai/a	EPRE, LPOS	9.3	6.0	1.0	10.0	10.0
	AMS	100	SG	0.17	lb/gal	EPRE, LPOS					
11	terbacil	80	WDG	2.4	lb ai/a	EPRE	10.0	10.0	1.0	10.0	6.7
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
	AMS	100	SG	0.17	lb/gal	EPRE					
12	untreated					ALL	7.0	1.0	1.0	10.0	9.0
LSD (P=.05)							2.62	2.90	0.00	4.50	1.53
Standard Deviation							1.55	1.71	0.00	2.66	0.90
CV							17.35	29.66	0.0	35.83	9.56

Fall & Spring Weed Control in Apple with Pindar - CRC 2011-2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	DAND 5/Jul/12 RATING 1-10	HOWE 5/Jul/12 RATING 1-10	WHCL 5/Jul/12 RATING 1-10	APPLE 24/Jul/12 RATING 1-10	BYGR 24/Jul/12 RATING 1-10
1	oxyfluorfen	3.93	SC	1.47	lb ai/a	FALL11	7.3	8.0	9.0	1.0	5.0
	penoxsulam	.083	SC	.031							
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
2	oxyfluorfen	4	SC	1.5	lb ai/a	FALL11	2.0	6.3	1.0	1.0	6.3
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
3	flumioxazin	51	WDG	0.383	lb ai/a	FALL11	2.7	8.7	3.0	1.3	4.3
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
4	glyphosate	5.4	L	1.35	lb ai/a	FALL11	5.0	4.7	1.7	1.0	10.0
	AMS	100	SG	0.17	lb/gal	FALL11					
5	glyphosate	5.4	L	1.35	lb ai/a	FALL11	8.3	10.0	9.3	1.0	9.7
	AMS	100	SG	0.17	lb/gal	FALL11					
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS					
	AMS	100	SG	0.17	lb/gal	LPRE,LPOS					
6	oxyfluorfen	3.93	SC	1.47	lb ai/a	EPRE	10.0	9.7	8.0	1.0	4.0
	penoxsulam	.083	SC	.031							
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
	AMS	100	SG	0.17	lb/gal	EPRE					
7	oxyfluorfen	4	SC	1.5	lb ai/a	EPRE	7.0	9.0	1.3	1.0	4.7
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
	AMS	100	SG	0.17	lb/gal	EPRE					
8	isoxaben	75	DF	1	lb ai/a	EPRE	9.3	10.0	1.3	1.3	4.0
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
	AMS	100	SG	0.17	lb/gal	EPRE					
9	rimsulfuron (M)	25	DF	.063	lb ai/a	EPRE	9.3	8.0	4.7	1.0	3.0
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
	AMS	100	SG	0.17	lb/gal	EPRE					
10	glyphosate	5.4	L	1.35	lb ai/a	EPRE, LPOS	9.7	10.0	9.0	1.0	7.3
	AMS	100	SG	0.17	lb/gal	EPRE, LPOS					
11	terbacil	80	WDG	2.4	lb ai/a	EPRE	8.0	10.0	10.0	1.3	9.7
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
	AMS	100	SG	0.17	lb/gal	EPRE					
12	untreated					ALL	4.0	10.0	1.0	1.0	9.3
LSD (P=.05)							4.07	2.14	1.63	0.51	4.70
Standard Deviation							2.40	1.27	0.96	0.30	2.78
CV							34.89	14.56	19.42	27.83	43.11

Fall & Spring Weed Control in Apple with Pindar - CRC 2011-2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	LACG	COLQ	COMA	DAND	HOWE
Pest Code											
Crop Code											
Rating Date							24/Jul/12	24/Jul/12	24/Jul/12	24/Jul/12	24/Jul/12
Rating Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	oxyfluorfen	3.93	SC	1.47	lb ai/a	FALL11	4.7	10.0	7.0	5.7	6.0
	penoxsulam	.083	SC	.031							
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
2	oxyfluorfen	4	SC	1.5	lb ai/a	FALL11	6.0	9.3	9.0	4.7	7.3
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
3	flumioxazin	51	WDG	0.383	lb ai/a	FALL11	2.3	10.0	10.0	1.7	10.0
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
4	glyphosate	5.4	L	1.35	lb ai/a	FALL11	10.0	8.3	10.0	6.0	4.7
	AMS	100	SG	0.17	lb/gal	FALL11					
5	glyphosate	5.4	L	1.35	lb ai/a	FALL11	9.7	9.7	10.0	8.3	7.7
	AMS	100	SG	0.17	lb/gal	FALL11					
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS					
	AMS	100	SG	0.17	lb/gal	LPRE,LPOS					
6	oxyfluorfen	3.93	SC	1.47	lb ai/a	EPRE	3.7	10.0	7.0	8.3	10.0
	penoxsulam	.083	SC	.031							
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
	AMS	100	SG	0.17	lb/gal	EPRE					
7	oxyfluorfen	4	SC	1.5	lb ai/a	EPRE	4.0	10.0	7.0	7.3	10.0
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
	AMS	100	SG	0.17	lb/gal	EPRE					
8	isoxaben	75	DF	1	lb ai/a	EPRE	4.3	10.0	10.0	9.7	10.0
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
	AMS	100	SG	0.17	lb/gal	EPRE					
9	rimsulfuron (M)	25	DF	.063	lb ai/a	EPRE	6.3	10.0	7.7	9.7	9.0
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
	AMS	100	SG	0.17	lb/gal	EPRE					
10	glyphosate	5.4	L	1.35	lb ai/a	EPRE, LPOS	7.7	10.0	10.0	10.0	9.3
	AMS	100	SG	0.17	lb/gal	EPRE, LPOS					
11	terbacil	80	WDG	2.4	lb ai/a	EPRE	9.3	10.0	10.0	6.7	10.0
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
	AMS	100	SG	0.17	lb/gal	EPRE					
12	untreated					ALL	10.0	10.0	7.0	3.7	7.7
LSD (P=.05)							4.24	1.46	5.39	3.69	3.67
Standard Deviation							2.51	0.86	3.18	2.18	2.17
CV							38.55	8.84	36.47	32.04	25.57

Fall & Spring Weed Control in Apple with Pindar - CRC 2011-2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	PRKW	WHCL	YEHW	APPLE	BYGR
Pest Code											
Crop Code											
Rating Date							24/Jul/12	24/Jul/12	24/Jul/12	6/Sep/12	6/Sep/12
Rating Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	oxyfluorfen	3.93	SC	1.47	lb ai/a	FALL11	10.0	9.0	9.7	1.0	6.0
	penoxsulam	.083	SC	.031							
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
2	oxyfluorfen	4	SC	1.5	lb ai/a	FALL11	10.0	3.3	9.0	1.0	4.3
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
3	flumioxazin	51	WDG	0.383	lb ai/a	FALL11	10.0	1.3	10.0	1.0	5.3
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
4	glyphosate	5.4	L	1.35	lb ai/a	FALL11	7.0	3.3	5.3	1.0	8.7
	AMS	100	SG	0.17	lb/gal	FALL11					
5	glyphosate	5.4	L	1.35	lb ai/a	FALL11	10.0	7.0	10.0	1.0	6.7
	AMS	100	SG	0.17	lb/gal	FALL11					
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS					
	AMS	100	SG	0.17	lb/gal	LPRE,LPOS					
6	oxyfluorfen	3.93	SC	1.47	lb ai/a	EPRE	10.0	6.3	9.7	1.0	1.3
	penoxsulam	.083	SC	.031							
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
	AMS	100	SG	0.17	lb/gal	EPRE					
7	oxyfluorfen	4	SC	1.5	lb ai/a	EPRE	10.0	1.3	9.3	1.0	2.7
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
	AMS	100	SG	0.17	lb/gal	EPRE					
8	isoxaben	75	DF	1	lb ai/a	EPRE	10.0	2.0	8.7	1.0	3.7
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
	AMS	100	SG	0.17	lb/gal	EPRE					
9	rimsulfuron (M)	25	DF	.063	lb ai/a	EPRE	7.3	6.0	9.7	1.0	2.3
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
	AMS	100	SG	0.17	lb/gal	EPRE					
10	glyphosate	5.4	L	1.35	lb ai/a	EPRE, LPOS	10.0	7.0	10.0	1.0	6.7
	AMS	100	SG	0.17	lb/gal	EPRE, LPOS					
11	terbacil	80	WDG	2.4	lb ai/a	EPRE	10.0	9.7	9.0	1.0	10.0
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
	AMS	100	SG	0.17	lb/gal	EPRE					
12	untreated					ALL	7.0	1.0	3.0	1.0	10.0
LSD (P=.05)							4.25	3.94	2.96	0.00	4.52
Standard Deviation							2.51	2.33	1.75	0.00	2.67
CV							27.05	48.67	20.31	0.0	47.32

Fall & Spring Weed Control in Apple with Pindar - CRC 2011-2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	FAPA	LACG	YEFT	DAND	WHCL
Pest Code											
Crop Code											
Rating Date							6/Sep/12	6/Sep/12	6/Sep/12	6/Sep/12	6/Sep/12
Rating Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	oxyfluorfen	3.93	SC	1.47	lb ai/a	FALL11	5.0	3.3	3.7	5.0	8.7
	penoxsulam	.083	SC	.031							
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
2	oxyfluorfen	4	SC	1.5	lb ai/a	FALL11	4.3	2.7	7.3	2.3	4.3
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
3	flumioxazin	51	WDG	0.383	lb ai/a	FALL11	5.7	3.0	7.0	3.0	4.3
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
4	glyphosate	5.4	L	1.35	lb ai/a	FALL11	8.7	7.7	8.3	2.7	3.3
	AMS	100	SG	0.17	lb/gal	FALL11					
5	glyphosate	5.4	L	1.35	lb ai/a	FALL11	4.3	1.7	10.0	4.7	5.0
	AMS	100	SG	0.17	lb/gal	FALL11					
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS					
	AMS	100	SG	0.17	lb/gal	LPRE,LPOS					
6	oxyfluorfen	3.93	SC	1.47	lb ai/a	EPRE	2.0	2.3	4.7	7.7	5.3
	penoxsulam	.083	SC	.031							
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
	AMS	100	SG	0.17	lb/gal	EPRE					
7	oxyfluorfen	4	SC	1.5	lb ai/a	EPRE	1.7	1.7	5.3	8.0	5.7
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
	AMS	100	SG	0.17	lb/gal	EPRE					
8	isoxaben	75	DF	1	lb ai/a	EPRE	1.3	1.3	4.0	6.7	1.0
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
	AMS	100	SG	0.17	lb/gal	EPRE					
9	rimsulfuron (M)	25	DF	.063	lb ai/a	EPRE	4.7	2.0	6.7	8.0	5.0
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
	AMS	100	SG	0.17	lb/gal	EPRE					
10	glyphosate	5.4	L	1.35	lb ai/a	EPRE, LPOS	8.7	3.3	8.3	7.0	7.3
	AMS	100	SG	0.17	lb/gal	EPRE, LPOS					
11	terbacil	80	WDG	2.4	lb ai/a	EPRE	9.3	9.7	10.0	4.7	10.0
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
	AMS	100	SG	0.17	lb/gal	EPRE					
12	untreated					ALL	10.0	9.0	9.3	3.0	4.7
LSD (P=.05)							4.21	3.40	4.55	5.02	5.50
Standard Deviation							2.49	2.01	2.69	2.96	3.25
CV							45.43	50.62	38.06	56.73	60.32

Apple Tolerance To Pindar GT – CRC 2011 - 2012

Project Code: 128-12-03 **Location:** Clarksville, MI

Personnel: Bernard H. Zandstra
Crop: Apple **Variety:** Honey Crisp, Golden Del., Gala
Planting Method: Transplant **Planting Date:** 2005 **Harvest Date:**
Spacing: 12 ft **Row Spacing:** 18 ft
Tillage Type: Conventional **Study Design:** RCB **Replications:** 3
Plot Size: 11 ft wide x 30 ft long

Soil Type: Lapeer Sandy Loam **OM:** 2.7% **pH:** 5.9
Sand: 39% **Silt:** 45% **Clay:** 16% **CEC:** 6.0

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
FALL	11/2/11	12:30 pm	64/50	F	Good	4-7 S	63	90% Cloudy	N
EPRE	4/5/12	10:00 am	43/47	F	Damp	7-9 E	53	25% Cloudy	N
LPRE	4/27/12	11:30 am	52/49	F	Damp	2 NW	54	0% Cloudy	N
LPOS	6/19/12	2:30 pm	91/77	F	Dry	4-5 SW	47	0% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
11/2	APPLE		Post-harvest	
11/2	COMA = common mallow	1-3″, 1-6″		Many
11/2	DAND = dandelion	1-2″, 3-5″		Many
11/2	WHCA = white campion	2-5″		Moderate
11/2	WHCL = white clover	1-3‟		Many
4/5	APPLE		Post-bud brk	
4/5	COCW = common chickweed	4-6″, 1-2′		Many
4/5	COMA = common mallow	1-3″, 1-6″		Moderate/Few
4/5	DAND = dandelion	1-6″, 3-6″		Many
4/5	MECR = mouseear cress	4-8″, 2-4″		Moderate
4/5	PERG = perennial ryegrass	2-5″		Moderate
4/5	SHPU = shepherdspurse	6-10″		Moderate
4/5	WHCL – white clover	1-3″, 6-12″		Many
4/27	APPLE			
4/27	ANBG = annual bluegrass	2-3″		Moderate
4/27	PERG = perennial ryegrass	6-8″		Few
4/27	COCW = common chickweed	3-5″		Moderate
4/27	COGR = common groundsel	6-10″	Flower	Moderate
4/27	COMA = common mallow	6-7″		Moderate
4/27	WHCL = white clover	1-6″		Moderate
4/27	DAND = dandelion	3-6″	Blossom	Few
6/19	APPLE			
6/19	LACG = large crabgrass	6-10″		Moderate
6/19	COGR = common groundsel	12-16″		Many
6/19	COLQ = common lambsquarters	4-20″		Moderate
6/19	COMA = common mallow	4-10″		Moderate
6/19	DAND = dandelion	6-12″		Many
6/19	HOWE = horseweed	10-15″	Foliar	Moderate
6/19	RRPW = redrood pigweed	6-15″	Foliar	Many
6/19	WHCL = white clover	6-10″	Flower	Many
	BYGR = barnyardgrass			
	GRFT = green foxtail			
	YEFT = yellow foxtail			
	FAPA = fall panicum			
	PAWE = pineappleweed			
	PRKW = prostrate knotweed			

Notes and Comments
1. Spray applied with 4 nozzle boom. FF8002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer. One pass on each side of row. All treatments included AMS @ 0.17 lb/gal.
2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.

Apple Tolerance To Pindar GT – CRC 2011 - 2012

Apple Tolerance to Pindar GT - CRC 2011-2014

Trial ID: 128-12-03 Study Director:
Location: Clarksville, MI Investigator: Dr. Bernard Zandstra

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	APPLE	ANBG	PERG	COCW	COGR	COLQ
	Pest Code							ANBG	PERG	COCW	COGR	COLQ
	Crop Code						APPLE					
	Rating Date						30/Apr/12	30/Apr/12	30/Apr/12	30/Apr/12	30/Apr/12	30/Apr/12
	Rating Type						RATING	RATING	RATING	RATING	RATING	RATING
	Rating Unit						1-10	1-10	1-10	1-10	1-10	1-10
1	oxyfluorfen	3.93	SC	1.47	lb ai/a	FALL	1.0	8.5	9.0	10.0	10.0	10.0
	penoxsulam	.083	SC	.031								
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS						
2	oxyfluorfen	3.93	SC	2.94	lb ai/a	FALL	1.0	9.3	9.7	9.3	10.0	10.0
	penoxsulam	.083	SC	.062								
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS						
3	oxyfluorfen	4	SC	1.5	lb ai/a	FALL	1.0	8.0	9.0	8.0	10.0	10.0
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS						
4	oxyfluorfen	4	SC	3	lb ai/a	FALL	1.0	9.0	9.3	9.7	10.0	10.0
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS						
5	glyphosate	5.4	L	1.35	lb ai/a	FALL	1.0	4.7	8.3	6.7	6.0	10.0
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS						
6	terbacil	80	WDG	2.4	lb ai/a	FALL	1.0	8.7	9.0	10.0	7.7	10.0
	sulfentrazone	4	F	0.25	lb ai/a	FALL						
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS						
7	oxyfluorfen	3.93	SC	1.47	lb ai/a	EPRE	1.0	9.7	9.7	10.0	10.0	10.0
	penoxsulam	.083	SC	.031								
	glyphosate	5.4	L	1.35	lb ai/a	EPRE						
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS						
8	oxyfluorfen	3.93	SC	2.94	lb ai/a	EPRE	1.0	9.0	9.3	10.0	10.0	10.0
	penoxsulam	.083	SC	.062								
	glyphosate	5.4	L	1.35	lb ai/a	EPRE						
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS						
9	oxyfluorfen	4	SC	1.5	lb ai/a	EPRE	1.0	9.0	9.7	10.0	10.0	10.0
	glyphosate	5.4	L	1.35	lb ai/a	EPRE						
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS						
10	oxyfluorfen	4	SC	3	lb ai/a	EPRE	1.0	10.0	10.0	10.0	10.0	10.0
	glyphosate	5.4	L	1.35	lb ai/a	EPRE						
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS						
11	glyphosate	5.4	L	1.35	lb/gal	EPRE	1.0	8.7	9.3	10.0	10.0	10.0
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS						
12	glyphosate	5.4	L	1.35	lb ai/a	FALL	1.0	5.0	9.3	10.0	7.0	7.0
	untreated					SPRING						
LSD (P=.05)							0.00	2.67	1.24	1.80	3.00	2.19
Standard Deviation							0.00	1.57	0.73	1.06	1.77	1.29
CV							0.0	18.94	7.82	11.19	19.17	13.21

Apple Tolerance To Pindar GT – CRC 2011 - 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	DAND	PRKW	WHCL	APPLE	ANBG	GRFT
Pest Code												
Crop Code										APPLE		
Rating Date							30/Apr/12	30/Apr/12	30/Apr/12	29/May/12	29/May/12	29/May/12
Rating Type							RATING	RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10	1-10
1	oxyfluorfen	3.93	SC	1.47	lb ai/a	FALL	10.0	10.0	9.0	1.0	10.0	6.7
	penoxsulam	.083	SC	.031								
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS						
2	oxyfluorfen	3.93	SC	2.94	lb ai/a	FALL	10.0	10.0	10.0	1.0	10.0	8.0
	penoxsulam	.083	SC	.062								
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS						
3	oxyfluorfen	4	SC	1.5	lb ai/a	FALL	10.0	10.0	9.7	1.0	10.0	7.7
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS						
4	oxyfluorfen	4	SC	3	lb ai/a	FALL	10.0	10.0	8.7	1.0	10.0	8.7
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS						
5	glyphosate	5.4	L	1.35	lb ai/a	FALL	10.0	6.3	9.0	1.0	10.0	1.3
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS						
6	terbacil	80	WDG	2.4	lb ai/a	FALL	9.3	10.0	9.7	1.0	9.3	9.3
	sulfentrazone	4	F	0.25	lb ai/a	FALL						
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS						
7	oxyfluorfen	3.93	SC	1.47	lb ai/a	EPRE	10.0	10.0	10.0	1.0	10.0	10.0
	penoxsulam	.083	SC	.031								
	glyphosate	5.4	L	1.35	lb ai/a	EPRE						
8	oxyfluorfen	3.93	SC	2.94	lb ai/a	EPRE	9.7	10.0	10.0	1.0	10.0	10.0
	penoxsulam	.083	SC	.062								
	glyphosate	5.4	L	1.35	lb ai/a	EPRE						
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS						
9	oxyfluorfen	4	SC	1.5	lb ai/a	EPRE	10.0	10.0	10.0	1.0	10.0	10.0
	glyphosate	5.4	L	1.35	lb ai/a	EPRE						
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS						
10	oxyfluorfen	4	SC	3	lb ai/a	EPRE	10.0	10.0	9.7	1.0	10.0	10.0
	glyphosate	5.4	L	1.35	lb ai/a	EPRE						
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS						
11	glyphosate	5.4	L	1.35	lb ai/a	EPRE	10.0	10.0	4.7	1.0	10.0	1.7
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS						
12	glyphosate	5.4	L	1.35	lb ai/a	FALL	10.0	7.0	8.3	1.0	1.7	7.0
	untreated					SPRING						
LSD (P=.05)							0.40	3.63	1.27	0.00	0.83	3.72
Standard Deviation							0.24	2.14	0.75	0.00	0.49	2.20
CV							2.38	22.63	8.27	0.0	5.32	29.2

Apple Tolerance To Pindar GT – CRC 2011 - 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	COLQ	DAND	PAWE	RRPW	SHPU	WHCL
Pest Code												
Crop Code												
Rating Date							29/May/12	29/May/12	29/May/12	29/May/12	29/May/12	29/May/12
Rating Type							RATING	RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10	1-10
1	oxyfluorfen	3.93	SC	1.47	lb ai/a	FALL	10.0	10.0	10.0	10.0	10.0	9.0
	penoxsulam	.083	SC	.031								
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS						
2	oxyfluorfen	3.93	SC	2.94	lb ai/a	FALL	10.0	10.0	10.0	10.0	10.0	10.0
	penoxsulam	.083	SC	.062								
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS						
3	oxyfluorfen	4	SC	1.5	lb ai/a	FALL	10.0	9.7	10.0	10.0	10.0	8.0
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS						
4	oxyfluorfen	4	SC	3	lb ai/a	FALL	10.0	8.7	10.0	10.0	10.0	9.0
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS						
5	glyphosate	5.4	L	1.35	lb ai/a	FALL	7.0	9.7	10.0	1.7	10.0	10.0
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS						
6	terbacil	80	WDG	2.4	lb ai/a	FALL	10.0	9.0	10.0	9.0	10.0	10.0
	sulfentrazone	4	F	0.25	lb ai/a	FALL						
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS						
7	oxyfluorfen	3.93	SC	1.47	lb ai/a	EPRE	10.0	10.0	10.0	10.0	10.0	10.0
	penoxsulam	.083	SC	.031								
	glyphosate	5.4	L	1.35	lb ai/a	EPRE						
8	oxyfluorfen	3.93	SC	2.94	lb ai/a	EPRE	10.0	10.0	10.0	10.0	10.0	10.0
	penoxsulam	.083	SC	.062								
	glyphosate	5.4	L	1.35	lb ai/a	EPRE						
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS						
9	oxyfluorfen	4	SC	1.5	lb ai/a	EPRE	10.0	10.0	10.0	10.0	10.0	9.3
	glyphosate	5.4	L	1.35	lb ai/a	EPRE						
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS						
10	oxyfluorfen	4	SC	3	lb ai/a	EPRE	10.0	10.0	10.0	9.7	10.0	9.3
	glyphosate	5.4	L	1.35	lb ai/a	EPRE						
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS						
11	glyphosate	5.4	L	1.35	lb ai/a	EPRE	8.3	10.0	10.0	4.7	10.0	8.3
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS						
12	glyphosate	5.4	L	1.35	lb ai/a	FALL	3.7	7.7	1.0	9.7	1.0	1.7
	untreated					SPRING						
LSD (P=.05)							2.72	0.92	0.00	2.56	0.00	1.78
Standard Deviation							1.61	0.54	0.00	1.51	0.00	1.05
CV							17.69	5.66	0.0	17.36	0.0	12.04

Apple Tolerance To Pindar GT – CRC 2011 - 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage						
Pest Code								WHCL		BYGR	LACG	RRPW
Crop Code							APPLE		APPLE			
Rating Date							5/Jul/12	5/Jul/12	24/Jul/12	24/Jul/12	24/Jul/12	24/Jul/12
Rating Type							RATING	RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10	1-10
1	oxyfluorfen	3.93	SC	1.47	lb ai/a	FALL	1.3	10.0	1.7	10.0	6.3	7.7
	penoxsulam	.083	SC	.031								
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS						
2	oxyfluorfen	3.93	SC	2.94	lb ai/a	FALL	1.3	9.7	1.3	10.0	7.0	8.0
	penoxsulam	.083	SC	.062								
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS						
3	oxyfluorfen	4	SC	1.5	lb ai/a	FALL	1.3	9.0	1.3	9.7	8.3	6.0
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS						
4	oxyfluorfen	4	SC	3	lb ai/a	FALL	2.0	9.3	1.7	10.0	7.3	8.0
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS						
5	glyphosate	5.4	L	1.35	lb ai/a	FALL	1.0	10.0	1.3	9.3	6.3	8.7
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS						
6	terbacil	80	WDG	2.4	lb ai/a	FALL	2.0	10.0	1.7	10.0	6.7	9.0
	sulfentrazone	4	F	0.25	lb ai/a	FALL						
	glyphosate	5.4	L	1.35	lb ai/a	FALL						
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS						
7	oxyfluorfen	3.93	SC	1.47	lb ai/a	EPRE	1.0	10.0	1.0	10.0	6.7	7.7
	penoxsulam	.083	SC	.031								
	glyphosate	5.4	L	1.35	lb ai/a	EPRE						
8	oxyfluorfen	3.93	SC	2.94	lb ai/a	EPRE	1.7	10.0	2.3	9.3	7.7	8.7
	penoxsulam	.083	SC	.062								
	glyphosate	5.4	L	1.35	lb ai/a	EPRE						
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS						
9	oxyfluorfen	4	SC	1.5	lb ai/a	EPRE	1.7	10.0	1.3	10.0	6.7	7.3
	glyphosate	5.4	L	1.35	lb ai/a	EPRE						
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS						
10	oxyfluorfen	4	SC	3	lb ai/a	EPRE	2.3	9.3	1.7	10.0	7.0	6.7
	glyphosate	5.4	L	1.35	lb ai/a	EPRE						
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS						
11	glyphosate	5.4	L	1.35	lb ai/a	EPRE	1.7	9.7	1.3	10.0	7.7	8.3
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS						
12	glyphosate	5.4	L	1.35	lb ai/a	FALL	2.7	8.0	1.7	10.0	8.0	9.0
	untreated					SPRING						
LSD (P=.05)							0.98	0.85	1.05	0.78	2.07	2.91
Standard Deviation							0.58	0.50	0.62	0.46	1.22	1.71
CV							34.64	5.22	40.55	4.64	17.14	21.62

Apple Tolerance To Pindar GT – CRC 2011 - 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage		BYGR	LACG	YEFT	FAPA	RRPW	WHCL
Pest Code													
Crop Code							APPLE						
Rating Date							6/Sep/12	6/Sep/12	6/Sep/12	6/Sep/12	6/Sep/12	6/Sep/12	6/Sep/12
Rating Type							RATING	RATING	RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10	1-10	1-10
1	oxyfluorfen	3.93	SC	1.47	lb ai/a	FALL	1.3	7.0	1.0	10.0	3.3	4.0	10.0
	penoxsulam	.083	SC	.031									
	glyphosate	5.4	L	1.35	lb ai/a	FALL							
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS							
2	oxyfluorfen	3.93	SC	2.94	lb ai/a	FALL	2.3	6.0	2.7	10.0	5.7	5.0	9.3
	penoxsulam	.083	SC	.062									
	glyphosate	5.4	L	1.35	lb ai/a	FALL							
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS							
3	oxyfluorfen	4	SC	1.5	lb ai/a	FALL	1.7	10.0	4.0	10.0	7.3	1.0	10.0
	glyphosate	5.4	L	1.35	lb ai/a	FALL							
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS							
4	oxyfluorfen	4	SC	3	lb ai/a	FALL	2.0	5.0	1.7	10.0	6.0	6.0	7.7
	glyphosate	5.4	L	1.35	lb ai/a	FALL							
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS							
5	glyphosate	5.4	L	1.35	lb ai/a	FALL	1.0	9.3	1.3	10.0	7.7	2.3	10.0
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS							
6	terbacil	80	WDG	2.4	lb ai/a	FALL	1.7	10.0	4.3	10.0	8.3	5.0	10.0
	sulfentrazone	4	F	0.25	lb ai/a	FALL							
	glyphosate	5.4	L	1.35	lb ai/a	FALL							
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS							
7	oxyfluorfen	3.93	SC	1.47	lb ai/a	EPRE	1.3	8.7	1.3	9.0	7.3	4.7	10.0
	penoxsulam	.083	SC	.031									
	glyphosate	5.4	L	1.35	lb ai/a	EPRE							
8	oxyfluorfen	3.93	SC	2.94	lb ai/a	EPRE	2.3	4.3	1.3	9.3	8.0	7.7	10.0
	penoxsulam	.083	SC	.062									
	glyphosate	5.4	L	1.35	lb ai/a	EPRE							
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS							
9	oxyfluorfen	4	SC	1.5	lb ai/a	EPRE	2.0	10.0	2.3	10.0	8.3	4.3	8.3
	glyphosate	5.4	L	1.35	lb ai/a	EPRE							
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS							
10	oxyfluorfen	4	SC	3	lb ai/a	EPRE	2.3	10.0	2.0	10.0	6.0	7.3	7.0
	glyphosate	5.4	L	1.35	lb ai/a	EPRE							
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS							
11	glyphosate	5.4	L	1.35	lb ai/a	EPRE	1.7	10.0	1.0	10.0	9.0	3.0	10.0
	glyphosate	5.4	L	1.35	lb ai/a	LPRE,LPOS							
12	glyphosate	5.4	L	1.35	lb ai/a	FALL	3.3	7.0	1.3	10.0	7.3	3.3	10.0
	untreated					SPRING							
LSD (P=.05)							1.87	5.34	2.51	1.04	5.70	4.17	2.53
Standard Deviation							1.10	3.15	1.48	0.61	3.37	2.46	1.50
CV							57.62	38.89	73.18	6.22	47.93	55.04	15.99

Spring Weed Control in Apple – HTRC 2012

Project Code: 128-12-04 **Location: East Lansing, MI**

Personnel: Bernard H. Zandstra
Crop: Apple **Variety: See notes**
Planting Method: Transplant **Planting Date: 2006** **Harvest Date:**
Spacing: 12 ft **Row Spacing: 18 ft**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 11 ft wide x 50 ft long

Soil Type: Marlette Fine Sandy Loam **OM: 2.1%** **pH: 6.8**
Sand: 60% **Silt: 25%** **Clay: 15%** **CEC: 6.3**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
EPRE	4/4/12	3:00 pm	58/56	F	Damp	7-9 N	37	5% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
4/4	APPLE		Blossoms gone	
4/4	PERG = perennial ryegrass	2-5″		Many
4/4	QUGR = quackgrass	2-5″		Many
4/4	BHPL = buckhorn plantain	2-4″, 2-3″		Moderate
4/4	CUDO = curly dock	4-8″		Moderate
4/4	DAND = dandelion	2-3″, 6-8″		Many
4/4	HOWE = horseweed	1-2″, 1-2″		Few
4/4	YENS = yellow nutsedge	3-6″		Few
4/4	WHCL = white clover	6-10″, 4-6″		Moderate
4/4	WICA = wild carrot	1-2″, 2-3″		Many
	TAFE = tall fescue			
	ALFA = alfalfa			
	BFTF = birdsfoot treefoil			
	CORW = common ragweed			
	RECL = red clover			

Notes and Comments
1. Varieties: Luckyjon, Spartan, Gala, Honeycrisp, Fuji
2. Spray applied with 4 nozzle boom. FF8002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer. One pass on each side of row.
3. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.

Spring Weed Control in Apple – HTRC 2012

Spring Weed Control in Apple - HTRC 2012

Trial ID: 128-12-04 Study Director:
Location: East Lansing, MI Investigator: Dr. Bernard Zandstra

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	APPLE 2/May/12 RATING 1-10	TAFE 2/May/12 RATING 1-10	ALFA 2/May/12 RATING 1-10	DAND 2/May/12 RATING 1-10	RECL 2/May/12 RATING 1-10
1	untreated						1.0	4.0	1.0	1.0	1.0
2	oryzalin	4	L	3.0	lb ai/a	EPRE	1.0	10.0	8.7	8.7	10.0
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
3	pendimethalin	3.8	CS	3.8	lb ai/a	EPRE	1.0	10.0	8.7	8.0	9.7
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
4	oryzalin	4	L	3.0	lb ai/a	EPRE	1.0	8.3	6.7	5.3	9.3
	diuron	80	DF	3.0	lb ai/a	EPRE					
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
5	pendimethalin	3.8	CS	3.8	lb ai/a	EPRE	1.0	8.3	7.3	8.0	10.0
	diuron	80	DF	3.0	lb ai/a	EPRE					
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
6	oryzalin	4	L	3.0	lb ai/a	EPRE	1.0	10.0	9.0	9.0	10.0
	rimsulfuron (M)	25	DF	0.063	lb ai/a	EPRE					
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
7	pendimethalin	3.8	CS	3.8	lb ai/a	EPRE	1.0	9.7	8.3	8.0	9.7
	rimsulfuron (M)	25	DF	0.063	lb ai/a	EPRE					
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
8	norflurazon	80	DF	2.4	lb ai/a	EPRE	1.0	9.3	5.3	6.7	9.0
	simazine	90	WDG	1.8	lb ai/a	EPRE					
	paraquat	2	SL	0.5	lb ai/a	EPRE					
9	indaziflam	1.67	SC	0.085	lb ai/a	EPRE	1.0	10.0	9.3	9.7	10.0
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
10	isoxaben	75	DF	1.0	lb ai/a	EPRE	1.0	9.7	9.0	8.7	9.7
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
11	flazasulfuron	25	WG	0.045	lb ai/a	EPRE	1.0	10.0	6.0	9.7	10.0
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
12	terbacil	80	WDG	2.4	lb ai/a	EPRE	1.0	9.0	7.3	8.7	10.0
	halosulfuron	75	WG	0.047	lb ai/a	EPRE					
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
LSD (P=.05)							0.00	2.33	3.19	1.60	1.13
Standard Deviation							0.00	1.38	1.88	0.94	0.67
CV							0.0	15.23	26.06	12.4	7.38

Spring Weed Control in Apple – HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	WICA	APPLE	QUGR	ALFA	BFTF
Pest Code							WICA		QUGR	ALFA	BFTF
Crop Code								APPLE			
Rating Date							2/May/12	5/Jun/12	5/Jun/12	5/Jun/12	5/Jun/12
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	untreated						1.0	1.0	3.3	1.0	1.0
2	oryzalin	4	L	3.0	lb ai/a	EPRE	9.0	1.0	10.0	4.0	4.3
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
3	pendimethalin	3.8	CS	3.8	lb ai/a	EPRE	9.3	1.0	10.0	7.0	2.3
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
4	oryzalin	4	L	3.0	lb ai/a	EPRE	8.7	1.0	9.7	1.0	1.0
	diuron	80	DF	3.0	lb ai/a	EPRE					
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
5	pendimethalin	3.8	CS	3.8	lb ai/a	EPRE	9.7	1.0	10.0	2.0	4.0
	diuron	80	DF	3.0	lb ai/a	EPRE					
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
6	oryzalin	4	L	3.0	lb ai/a	EPRE	9.3	1.0	10.0	7.0	6.0
	rimsulfuron (M)	25	DF	0.063	lb ai/a	EPRE					
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
7	pendimethalin	3.8	CS	3.8	lb ai/a	EPRE	9.7	1.0	10.0	5.7	6.7
	rimsulfuron (M)	25	DF	0.063	lb ai/a	EPRE					
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
8	norflurazon	80	DF	2.4	lb ai/a	EPRE	9.3	1.0	9.0	4.0	4.0
	simazine	90	WDG	1.8	lb ai/a	EPRE					
	paraquat	2	SL	0.5	lb ai/a	EPRE					
9	indaziflam	1.67	SC	0.085	lb ai/a	EPRE	9.3	1.0	10.0	7.0	6.7
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
10	isoxaben	75	DF	1.0	lb ai/a	EPRE	9.7	1.0	9.3	3.7	3.0
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
11	flazasulfuron	25	WG	0.045	lb ai/a	EPRE	10.0	1.0	10.0	5.0	6.0
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
12	terbacil	80	WDG	2.4	lb ai/a	EPRE	10.0	1.0	10.0	1.3	2.3
	halosulfuron	75	WG	0.047	lb ai/a	EPRE					
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
LSD (P=.05)							1.38	0.00	2.26	4.22	3.75
Standard Deviation							0.82	0.00	1.33	2.49	2.22
CV							9.33	0.0	14.37	61.52	56.16

Spring Weed Control in Apple – HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	CUDO	DAND	RECL	WICA	YENS	APPLE
Pest Code												
Crop Code												
Rating Date							5/Jun/12	5/Jun/12	5/Jun/12	5/Jun/12	5/Jun/12	2/Jul/12
Rating Data Type							RATING	RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10	1-10
1	untreated						1.0	1.0	1.0	1.0	7.0	1.0
2	oryzalin	4	L	3.0	lb ai/a	EPRE	10.0	9.7	10.0	8.0	6.0	1.0
	glyphosate	5.5	L	1.0	lb ai/a	EPRE						
3	pendimethalin	3.8	CS	3.8	lb ai/a	EPRE	10.0	9.0	10.0	3.0	7.0	1.0
	glyphosate	5.5	L	1.0	lb ai/a	EPRE						
4	oryzalin	4	L	3.0	lb ai/a	EPRE	7.7	6.3	10.0	9.0	9.3	1.0
	diuron	80	DF	3.0	lb ai/a	EPRE						
	glyphosate	5.5	L	1.0	lb ai/a	EPRE						
5	pendimethalin	3.8	CS	3.8	lb ai/a	EPRE	8.0	9.0	10.0	7.0	7.0	1.0
	diuron	80	DF	3.0	lb ai/a	EPRE						
	glyphosate	5.5	L	1.0	lb ai/a	EPRE						
6	oryzalin	4	L	3.0	lb ai/a	EPRE	9.7	10.0	10.0	9.7	6.7	1.0
	rimsulfuron (M)	25	DF	0.063	lb ai/a	EPRE						
	glyphosate	5.5	L	1.0	lb ai/a	EPRE						
7	pendimethalin	3.8	CS	3.8	lb ai/a	EPRE	9.3	9.3	10.0	9.3	7.0	1.0
	rimsulfuron (M)	25	DF	0.063	lb ai/a	EPRE						
	glyphosate	5.5	L	1.0	lb ai/a	EPRE						
8	norflurazon	80	DF	2.4	lb ai/a	EPRE	6.0	3.3	9.0	7.3	6.3	1.0
	simazine	90	WDG	1.8	lb ai/a	EPRE						
	paraquat	2	SL	0.5	lb ai/a	EPRE						
9	indaziflam	1.67	SC	0.085	lb ai/a	EPRE	10.0	10.0	10.0	7.7	6.7	1.0
	glyphosate	5.5	L	1.0	lb ai/a	EPRE						
10	isoxaben	75	DF	1.0	lb ai/a	EPRE	10.0	10.0	9.7	8.0	3.0	1.0
	glyphosate	5.5	L	1.0	lb ai/a	EPRE						
11	flazasulfuron	25	WG	0.045	lb ai/a	EPRE	10.0	10.0	10.0	10.0	8.3	1.0
	glyphosate	5.5	L	1.0	lb ai/a	EPRE						
12	terbacil	80	WDG	2.4	lb ai/a	EPRE	9.0	8.7	9.7	10.0	7.7	1.0
	halosulfuron	75	WG	0.047	lb ai/a	EPRE						
	glyphosate	5.5	L	1.0	lb ai/a	EPRE						
LSD (P=.05)							3.25	2.35	0.93	1.93	6.60	0.00
Standard Deviation							1.92	1.39	0.55	1.14	3.90	0.00
CV							22.87	17.3	6.02	15.18	57.06	0.0

Spring Weed Control in Apple – HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	QUGR	ALFA	BFTF	RECL	WICA	APPLE
Pest Code												
Crop Code												
Rating Date							2/Jul/12	2/Jul/12	2/Jul/12	2/Jul/12	2/Jul/12	6/Aug/12
Rating Data Type							RATING	RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10	1-10
1	untreated						5.3	3.3	1.0	1.0	1.0	1.7
2	oryzalin	4	L	3.0	lb ai/a	EPRE	9.3	7.7	3.0	9.3	5.7	1.0
	glyphosate	5.5	L	1.0	lb ai/a	EPRE						
3	pendimethalin	3.8	CS	3.8	lb ai/a	EPRE	9.7	7.7	2.7	10.0	2.0	1.7
	glyphosate	5.5	L	1.0	lb ai/a	EPRE						
4	oryzalin	4	L	3.0	lb ai/a	EPRE	9.0	5.7	1.0	10.0	6.7	1.0
	diuron	80	DF	3.0	lb ai/a	EPRE						
	glyphosate	5.5	L	1.0	lb ai/a	EPRE						
5	pendimethalin	3.8	CS	3.8	lb ai/a	EPRE	10.0	4.0	3.0	10.0	4.3	1.0
	diuron	80	DF	3.0	lb ai/a	EPRE						
	glyphosate	5.5	L	1.0	lb ai/a	EPRE						
6	oryzalin	4	L	3.0	lb ai/a	EPRE	8.0	9.3	5.0	10.0	9.3	1.3
	rimsulfuron (M)	25	DF	0.063	lb ai/a	EPRE						
	glyphosate	5.5	L	1.0	lb ai/a	EPRE						
7	pendimethalin	3.8	CS	3.8	lb ai/a	EPRE	9.0	5.7	5.3	9.7	8.0	1.7
	rimsulfuron (M)	25	DF	0.063	lb ai/a	EPRE						
	glyphosate	5.5	L	1.0	lb ai/a	EPRE						
8	norflurazon	80	DF	2.4	lb ai/a	EPRE	10.0	6.7	6.3	8.0	8.3	1.3
	simazine	90	WDG	1.8	lb ai/a	EPRE						
	paraquat	2	SL	0.5	lb ai/a	EPRE						
9	indaziflam	1.67	SC	0.085	lb ai/a	EPRE	9.3	6.0	5.7	9.3	4.7	1.0
	glyphosate	5.5	L	1.0	lb ai/a	EPRE						
10	isoxaben	75	DF	1.0	lb ai/a	EPRE	9.0	7.3	2.0	9.0	4.7	1.0
	glyphosate	5.5	L	1.0	lb ai/a	EPRE						
11	flazasulfuron	25	WG	0.045	lb ai/a	EPRE	9.3	5.3	4.7	10.0	10.0	1.0
	glyphosate	5.5	L	1.0	lb ai/a	EPRE						
12	terbacil	80	WDG	2.4	lb ai/a	EPRE	10.0	4.0	5.3	9.3	9.3	1.3
	halosulfuron	75	WG	0.047	lb ai/a	EPRE						
	glyphosate	5.5	L	1.0	lb ai/a	EPRE						
LSD (P=.05)							2.67	5.03	3.73	2.20	3.11	1.11
Standard Deviation							1.58	2.97	2.20	1.30	1.84	0.66
CV							17.51	49.09	58.76	14.78	29.77	52.57

Spring Weed Control in Apple – HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	YEFT	BFTF	CORW	WICA	APPLE
Pest Code							YEFT	BFTF	CORW	WICA	
Crop Code											APPLE
Rating Date							6/Aug/12	6/Aug/12	6/Aug/12	6/Aug/12	9/Sep/12
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	untreated						10.0	1.0	10.0	1.0	1.0
2	oryzalin	4	L	3.0	lb ai/a	EPRE	7.3	1.0	9.0	5.7	1.0
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
3	pendimethalin	3.8	CS	3.8	lb ai/a	EPRE	10.0	3.3	4.3	1.3	1.0
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
4	oryzalin	4	L	3.0	lb ai/a	EPRE	10.0	2.0	10.0	5.0	1.0
	diuron	80	DF	3.0	lb ai/a	EPRE					
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
5	pendimethalin	3.8	CS	3.8	lb ai/a	EPRE	10.0	3.0	9.0	3.7	1.0
	diuron	80	DF	3.0	lb ai/a	EPRE					
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
6	oryzalin	4	L	3.0	lb ai/a	EPRE	4.7	4.0	6.3	7.3	1.0
	rimsulfuron (M)	25	DF	0.063	lb ai/a	EPRE					
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
7	pendimethalin	3.8	CS	3.8	lb ai/a	EPRE	7.0	4.7	7.3	6.7	1.0
	rimsulfuron (M)	25	DF	0.063	lb ai/a	EPRE					
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
8	norflurazon	80	DF	2.4	lb ai/a	EPRE	9.0	4.0	10.0	6.7	1.0
	simazine	90	WDG	1.8	lb ai/a	EPRE					
	paraquat	2	SL	0.5	lb ai/a	EPRE					
9	indaziflam	1.67	SC	0.085	lb ai/a	EPRE	7.7	6.0	9.3	4.0	1.0
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
10	isoxaben	75	DF	1.0	lb ai/a	EPRE	3.3	2.3	10.0	5.0	1.0
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
11	flazasulfuron	25	WG	0.045	lb ai/a	EPRE	4.0	5.7	9.0	8.7	1.0
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
12	terbacil	80	WDG	2.4	lb ai/a	EPRE	9.0	4.7	10.0	8.7	1.0
	halosulfuron	75	WG	0.047	lb ai/a	EPRE					
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
LSD (P=.05)							4.78	4.12	4.26	2.93	0.00
Standard Deviation							2.82	2.44	2.52	1.73	0.00
CV							36.81	70.13	28.94	32.63	0.0

Spring Weed Control in Apple – HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	TAFE	YEFT	YENS	DAND	WICA
Pest Code											
Crop Code											
Rating Date							9/Sep/12	9/Sep/12	9/Sep/12	9/Sep/12	9/Sep/12
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	untreated						2.3	8.3	7.0	2.3	3.0
2	oryzalin	4	L	3.0	lb ai/a	EPRE	9.3	7.0	7.0	5.0	4.3
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
3	pendimethalin	3.8	CS	3.8	lb ai/a	EPRE	9.3	10.0	7.0	9.0	1.0
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
4	oryzalin	4	L	3.0	lb ai/a	EPRE	10.0	6.7	7.7	6.0	4.3
	diuron	80	DF	3.0	lb ai/a	EPRE					
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
5	pendimethalin	3.8	CS	3.8	lb ai/a	EPRE	9.0	6.3	7.0	7.3	5.3
	diuron	80	DF	3.0	lb ai/a	EPRE					
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
6	oryzalin	4	L	3.0	lb ai/a	EPRE	9.7	1.3	4.3	10.0	8.7
	rimsulfuron (M)	25	DF	0.063	lb ai/a	EPRE					
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
7	pendimethalin	3.8	CS	3.8	lb ai/a	EPRE	9.3	5.7	7.0	8.3	7.7
	rimsulfuron (M)	25	DF	0.063	lb ai/a	EPRE					
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
8	norflurazon	80	DF	2.4	lb ai/a	EPRE	8.7	9.0	7.7	3.3	8.0
	simazine	90	WDG	1.8	lb ai/a	EPRE					
	paraquat	2	SL	0.5	lb ai/a	EPRE					
9	indaziflam	1.67	SC	0.085	lb ai/a	EPRE	10.0	7.3	6.0	10.0	6.0
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
10	isoxaben	75	DF	1.0	lb ai/a	EPRE	9.3	3.3	9.7	9.3	6.7
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
11	flazasulfuron	25	WG	0.045	lb ai/a	EPRE	9.3	4.0	7.3	9.3	10.0
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
12	terbacil	80	WDG	2.4	lb ai/a	EPRE	9.3	7.3	8.3	5.0	9.7
	halosulfuron	75	WG	0.047	lb ai/a	EPRE					
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
LSD (P=.05)							1.85	4.81	5.93	3.55	3.41
Standard Deviation							1.09	2.84	3.50	2.10	2.01
CV							12.41	44.69	48.87	29.62	32.35

Fall Weed Control in Blueberry – Nye Farm 2011 - 2012

Project Code: 127-12-01 **Location: Fennville, MI**

Personnel: Bernard H. Zandstra
Crop: Blueberry **Variety: Jersey**
Planting Method: Transplant **Planting Date: Unknown** **Harvest Date: N/A**
Spacing: 6 ft **Row Spacing: 12 ft**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 6.6 ft wide x 35 ft long

Soil Type: Pipestone Sand **OM: 5.0%** **pH: 5.2**
Sand: 85% **Silt: 7%** **Clay: 8%** **CEC: 8.9**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
FALL	11/23/11	11:00 am	51/44	F	Wet	0 W	57	90% Cloudy	Y

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
11/23	BLBE = blueberry	6-8′, 3-5′	100% dormant	
11/23	ANBG = annual bluegrass	1-3″		Many
11/23	REFE = red fescue	3-5″		Moderate
11/23	YENS = yellow nutsedge	6-12″		Few
11/23	COMA = common mallow	1-2″, 12″		Many
11/23	DAND = dandelion	4-6″		Moderate
11/23	RESO = red sorrel	3-6″		Moderate
11/23	WHCA = white campion	3-4″		Moderate
11/23	WHCL = white clover	1-2″		Many
	CUDO = curly dock			
	FIVI = field violet			
	BRPL = broadleaf plantain			

Notes and Comments
1. Spray applied with 2 nozzle boom. FF11002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer. One pass on each side of row.
2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.

Fall Weed Control in Blueberry – Nye Farm 2011 - 2012

Fall Weed Control in Blueberry - Nye Farm 2011-2012

Trial ID: 127-12-01 Study Director:
Location: Fennville, MI Investigator: Dr. Bernard Zandstra

Pest Code							ANGB	QUGR	CUDO	FIVI
Crop Code						BLBE				
Rating Date						11/May/12	11/May/12	11/May/12	11/May/12	11/May/12
Rating Type						RATING	RATING	RATING	RATING	RATING
Rating Unit						1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage				
1	diuron	80	DF	1.6	lb ai/a	FALL11	1.0	8.3	9.0	10.0	6.3
	terbacil	80	WDG	1.6	lb ai/a	FALL11					
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
2	dichlobenil	1.4	CS	3	lb ai/a	FALL11	1.0	8.0	9.0	7.7	5.0
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
3	indaziflam	1.67	SC	0.085	lb ai/a	FALL11	1.0	8.7	9.3	8.7	7.0
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
4	flazasulfuron	25	WG	.045	lb ai/a	FALL11	1.0	8.0	9.7	8.7	7.7
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
5	flumioxazin	51	WDG	0.383	lb ai/a	FALL11	1.0	8.7	7.3	6.3	8.3
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
6	mesotrione	4	SC	.188	lb ai/a	FALL11	1.0	9.0	9.7	8.3	8.0
	norflurazon	80	DF	2	lb ai/a	FALL11					
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
7	rimsulfuron (M)	25	DF	.063	lb ai/a	FALL11	1.0	5.7	9.7	9.0	6.0
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
8	oryzalin	4	L	4	lb ai/a	FALL11	1.0	8.0	9.3	9.3	5.3
	halosulfuron	75	WG	.047	lb ai/a	FALL11					
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
9	oxyfluorfen	3.93	SC	1.47	lb ai/a	FALL11	1.0	4.0	8.0	8.0	8.3
	penoxsulam	.083	SC	.031							
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
10	isoxaben	75	DF	1	lb ai/a	FALL11	1.0	5.0	8.3	8.3	8.0
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
11	hexazinone	2	L	1	lb ai/a	FALL11	1.0	3.7	8.3	5.7	3.0
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
12	glyphosate	5.4	L	1.35	lb ai/a	FALL11	1.0	3.7	9.3	2.3	3.3
	AMS	100	SG	0.17	lb/gal	FALL11					
LSD (P=.05)							0.00	3.95	1.93	2.59	3.46
Standard Deviation							0.00	2.33	1.14	1.53	2.04
CV							0.0	34.69	12.76	19.84	32.14

Fall Weed Control in Blueberry – Nye Farm 2011 - 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	BLBE	BRPL	FIVI	REFE	WHCL
Pest Code											
Crop Code							BLBE				
Rating Date							8/Jun/12	8/Jun/12	8/Jun/12	8/Jun/12	8/Jun/12
Rating Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	diuron	80	DF	1.6	lb ai/a	FALL11	1.0	6.3	5.3	8.0	8.7
	terbacil	80	WDG	1.6	lb ai/a	FALL11					
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
2	dichlobenil	1.4	CS	3	lb ai/a	FALL11	1.0	5.0	5.7	5.0	3.3
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
3	indaziflam	1.67	SC	0.085	lb ai/a	FALL11	1.0	7.3	6.0	8.7	7.7
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
4	flazasulfuron	25	WG	.045	lb ai/a	FALL11	1.0	7.0	5.3	8.0	8.0
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
5	flumioxazin	51	WDG	0.383	lb ai/a	FALL11	1.0	6.7	9.0	8.0	1.7
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
6	mesotrione	4	SC	.188	lb ai/a	FALL11	1.0	7.3	7.3	8.7	2.3
	norflurazon	80	DF	2	lb ai/a	FALL11					
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
7	rimsulfuron (M)	25	DF	.063	lb ai/a	FALL11	1.0	7.3	2.3	7.3	4.3
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
8	oryzalin	4	L	4	lb ai/a	FALL11	1.0	6.7	4.3	7.3	5.7
	halosulfuron	75	WG	.047	lb ai/a	FALL11					
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
9	oxyfluorfen	3.93	SC	1.47	lb ai/a	FALL11	1.0	6.7	7.7	8.7	3.3
	penoxsulam	.083	SC	.031							
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
10	isoxaben	75	DF	1	lb ai/a	FALL11	1.0	8.0	7.0	6.0	9.7
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
11	hexazinone	2	L	1	lb ai/a	FALL11	1.0	6.7	1.7	7.0	5.3
	glyphosate	5.4	L	1.35	lb ai/a	FALL11					
	AMS	100	SG	0.17	lb/gal	FALL11					
12	glyphosate	5.4	L	1.35	lb ai/a	FALL11	1.0	7.0	2.0	6.0	3.3
	AMS	100	SG	0.17	lb/gal	FALL11					
LSD (P=.05)							0.00	5.85	2.91	4.01	4.75
Standard Deviation							0.00	3.45	1.72	2.37	2.80
CV							0.0	50.52	32.43	32.08	53.12

Spring Weed Control in Blueberry – SWMREC

Project Code: 127-12-02 **Location: Benton Harbor, MI**

Personnel: Bernard H. Zandstra
Crop: Blueberry **Variety: Blue Crop**
Planting Method: Seedlings **Planting Date: 1990** **Harvest Date: N/A**
Spacing: 3 ft **Row Spacing: 10 ft**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 6 ft wide x 35 ft long

Soil Type: Sandy Loam **OM: 2.3%** **pH: 4.2**
Sand: 66% **Silt: 20%** **Clay: .4%** **CEC: 11.4**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
EPRE	3/27/12	1:00 pm	57/52	F	Moist	3-5 N	94	100% Cloudy	N
LPRE	5/11/12	11:20 am	71/59	F	Dry	3.6 SW	29	0% Cloudy	N
EPOS	5/11/12	11:20 am	71/59	F	Dry	3/6 SW	29	0% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
3/27	BLBE = blueberry		Post-bud break	
3/27	QUGR = quackgrass	6-10″		Many
3/27	DAND = dandelion	6-10″		Many
3/27	HOWE = horseweed	1-2″,		Moderate
3/27	MECR = mouseear cress	4-8″,		Moderate
3/27	PUDN = purple deadnettle	4-7″		Many
3/27	RESO = red sorrel	4-6″,		Many
3/27	WHCL = white clover	3-6″		Moderate
3/27	Brambles	1′-4′		Many
5/11	BLBE = blueberry		50% leaf out	
5/11	QUGR = quackgrass	6-8″		Few
5/11	BHPL = buckhorn plantain	6-10″		Moderate
5/11	HOWE = horseweed	3-4″	10-12 leaves	Moderate
5/11	REFE = red fescue	6-18″		Many
5/11	RESO = red sorrel	6-12″	Flower	Many
5/11	YEHW = yellow hawkweed	8-12″	Flower	
	LACG = large crabgrass			
	TAFE = tall fescue			
	HONE = horsenettle			
	POIV = poison ivy			
	VICR = Virginia creeper			

Notes and Comments
1. Spray applied with 2 nozzle boom. FF11002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer; one pass on each side of row.
2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.

Spring Weed Control in Blueberry – SWMREC

Spring Weed Control in Blueberry - SWMREC 2012

Trial ID: 127-12-02 Study Director:
Location: Benton Harbor, MI Investigator: Dr. Bernard Zandstra

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	BLBE	QUGR	BHPL	HOWE	RESO
	Rating Date						11/May/12	11/May/12	11/May/12	11/May/12	11/May/12
	Rating Type						RATING	RATING	RATING	RATING	RATING
	Rating Unit						1-10	1-10	1-10	1-10	1-10
1	hexazinone	2	L	1	lb ai/a	EPRE	1.0	8.0	7.7	9.0	8.7
2	hexazinone	2	L	1	lb ai/a	EPRE	1.0	8.0	10.0	9.3	6.7
	rimsulfuron (M)	25	DF	.063	lb ai/a	EPOS					
	NIS	100	SL	0.25	% v/v	EPOS					
3	diuron	80	DF	1.6	lb ai/a	EPRE	1.0	8.3	10.0	10.0	10.0
	terbacil	80	WDG	1.6	lb ai/a	EPRE					
	rimsulfuron (M)	25	DF	.063	lb ai/a	EPOS					
	NIS	100	SL	0.25	% v/v	EPOS					
4	diuron	80	DF	3.2	lb ai/a	EPRE	1.0	5.0	4.0	4.3	10.0
	rimsulfuron (M)	25	DF	.063	lb ai/a	EPOS					
	NIS	100	SL	0.25	% v/v	EPOS					
5	indaziflam	1.67	SC	0.033	lb ai/a	EPRE	1.0	5.3	10.0	10.0	9.7
	glufosinate	2.34	L	1	lb ai/a	EPRE					
6	indaziflam	1.67	SC	.065	lb ai/a	EPRE	1.0	7.0	10.0	7.3	8.0
	glufosinate	2.34	L	1	lb ai/a	EPRE					
7	indaziflam	1.67	SC	0.13	lb ai/a	EPRE	1.0	8.0	10.0	9.3	9.0
	glufosinate	2.34	L	1	lb ai/a	EPRE					
8	flumioxazin	51	WDG	.383	lb ai/a	EPRE	1.0	10.0	10.0	10.0	8.7
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
9	carfentrazone	0.35	SE	.0273	lb ai/a	LPRE	1.0	4.7	3.3	3.0	1.0
	sulfentrazone	3.15	SE	0.246	lb ai/a	LPRE					
	rimsulfuron (M)	25	DF	0.0175	lb ai/a	LPRE					
	sethoxydim	1.53	EC	.188	lb ai/a	LPRE					
	COC	100	SL	1	% v/v	LPRE					
10	carfentrazone	0.35	SE	.0273	lb ai/a	LPRE	1.0	3.7	4.0	3.7	4.0
	sulfentrazone	3.15	SE	0.246	lb ai/a	LPRE					
	norflurazon	80	DF	1.96	lb ai/a	LPRE					
	sethoxydim	1.53	EC	.188	lb ai/a	LPRE					
	COC	100	SL	1	% v/v	LPRE					
11	carfentrazone	0.35	SE	.0273	lb ai/a	LPRE	1.0	4.7	1.0	1.7	1.0
	sulfentrazone	3.15	SE	.246	lb ai/a	LPRE					
	mesotrione	4	SC	.188	lb ai/a	LPRE					
	sethoxydim	1.53	EC	.188	lb ai/a	LPRE					
	COC	100	SL	1	% v/v	LPRE					
12	untreated						1.0	1.7	4.7	7.3	1.0
LSD (P=.05)							0.00	4.66	5.26	4.23	3.40
Standard Deviation							0.00	2.75	3.10	2.50	2.01
CV							0.0	44.38	43.99	35.29	30.98

Spring Weed Control in Blueberry – SWMREC

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	TAFE	YEHW		REFE	QUGR
Pest Code											
Crop Code									BLBE		
Rating Date							11/May/12	11/May/12	8/Jun/12	8/Jun/12	8/Jun/12
Rating Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	hexazinone	2	L	1	lb ai/a	EPRE	10.0	6.7	1.7	9.3	9.3
2	hexazinone	2	L	1	lb ai/a	EPRE	10.0	9.7	1.0	10.0	9.7
	rimsulfuron (M)	25	DF	.063	lb ai/a	EPOS					
	NIS	100	SL	0.25	% v/v	EPOS					
3	diuron	80	DF	1.6	lb ai/a	EPRE	10.0	9.7	1.7	10.0	10.0
	terbacil	80	WDG	1.6	lb ai/a	EPRE					
	rimsulfuron (M)	25	DF	.063	lb ai/a	EPOS					
	NIS	100	SL	0.25	% v/v	EPOS					
4	diuron	80	DF	3.2	lb ai/a	EPRE	5.7	4.0	1.3	9.7	10.0
	rimsulfuron (M)	25	DF	.063	lb ai/a	EPOS					
	NIS	100	SL	0.25	% v/v	EPOS					
5	indaziflam	1.67	SC	0.033	lb ai/a	EPRE	8.7	9.3	1.3	7.7	9.0
	glufosinate	2.34	L	1	lb ai/a	EPRE					
6	indaziflam	1.67	SC	.065	lb ai/a	EPRE	9.3	8.3	1.0	9.3	8.0
	glufosinate	2.34	L	1	lb ai/a	EPRE					
7	indaziflam	1.67	SC	0.13	lb ai/a	EPRE	8.7	8.3	1.0	8.0	8.3
	glufosinate	2.34	L	1	lb ai/a	EPRE					
8	flumioxazin	51	WDG	.383	lb ai/a	EPRE	10.0	8.7	1.3	10.0	9.7
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
9	carfentrazone	0.35	SE	.0273	lb ai/a	LPRE	2.3	1.0	1.7	6.7	8.7
	sulfentrazone	3.15	SE	0.246	lb ai/a	LPRE					
	rimsulfuron (M)	25	DF	0.0175	lb ai/a	LPRE					
	sethoxydim	1.53	EC	.188	lb ai/a	LPRE					
	COC	100	SL	1	% v/v	LPRE					
10	carfentrazone	0.35	SE	.0273	lb ai/a	LPRE	3.0	1.0	1.0	3.7	7.0
	sulfentrazone	3.15	SE	0.246	lb ai/a	LPRE					
	norflurazon	80	DF	1.96	lb ai/a	LPRE					
	sethoxydim	1.53	EC	.188	lb ai/a	LPRE					
	COC	100	SL	1	% v/v	LPRE					
11	carfentrazone	0.35	SE	.0273	lb ai/a	LPRE	1.7	1.0	1.0	6.0	8.3
	sulfentrazone	3.15	SE	.246	lb ai/a	LPRE					
	mesotrione	4	SC	.188	lb ai/a	LPRE					
	sethoxydim	1.53	EC	.188	lb ai/a	LPRE					
	COC	100	SL	1	% v/v	LPRE					
12	untreated						1.0	7.0	1.0	3.0	6.7
LSD (P=.05)							2.66	3.59	1.07	2.90	2.75
Standard Deviation							1.57	2.12	0.63	1.71	1.62
CV							23.5	34.11	50.69	22.03	18.61

Spring Weed Control in Blueberry – SWMREC

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	BHPL	HONE	HOWE	POIV	RESO
Pest Code							BHPL	HONE	HOWE	POIV	RESO
Crop Code											
Rating Date							8/Jun/12	8/Jun/12	8/Jun/12	8/Jun/12	8/Jun/12
Rating Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	hexazinone	2	L	1	lb ai/a	EPRE	9.0	10.0	9.7	7.0	8.3
2	hexazinone	2	L	1	lb ai/a	EPRE	10.0	10.0	10.0	7.7	9.3
	rimsulfuron (M)	25	DF	.063	lb ai/a	EPOS					
	NIS	100	SL	0.25	% v/v	EPOS					
3	diuron	80	DF	1.6	lb ai/a	EPRE	10.0	10.0	10.0	10.0	10.0
	terbacil	80	WDG	1.6	lb ai/a	EPRE					
	rimsulfuron (M)	25	DF	.063	lb ai/a	EPOS					
	NIS	100	SL	0.25	% v/v	EPOS					
4	diuron	80	DF	3.2	lb ai/a	EPRE	2.0	10.0	8.7	7.0	10.0
	rimsulfuron (M)	25	DF	.063	lb ai/a	EPOS					
	NIS	100	SL	0.25	% v/v	EPOS					
5	indaziflam	1.67	SC	0.033	lb ai/a	EPRE	9.7	10.0	10.0	7.0	7.7
	glufosinate	2.34	L	1	lb ai/a	EPRE					
6	indaziflam	1.67	SC	.065	lb ai/a	EPRE	10.0	7.0	7.3	10.0	8.3
	glufosinate	2.34	L	1	lb ai/a	EPRE					
7	indaziflam	1.67	SC	0.13	lb ai/a	EPRE	10.0	9.0	9.0	10.0	5.3
	glufosinate	2.34	L	1	lb ai/a	EPRE					
8	flumioxazin	51	WDG	.383	lb ai/a	EPRE	10.0	10.0	10.0	10.0	9.0
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
9	carfentrazone	0.35	SE	.0273	lb ai/a	LPRE	10.0	10.0	9.7	10.0	9.0
	sulfentrazone	3.15	SE	0.246	lb ai/a	LPRE					
	rimsulfuron (M)	25	DF	0.0175	lb ai/a	LPRE					
	sethoxydim	1.53	EC	.188	lb ai/a	LPRE					
	COC	100	SL	1	% v/v	LPRE					
10	carfentrazone	0.35	SE	.0273	lb ai/a	LPRE	7.0	7.3	5.7	10.0	9.0
	sulfentrazone	3.15	SE	0.246	lb ai/a	LPRE					
	norflurazon	80	DF	1.96	lb ai/a	LPRE					
	sethoxydim	1.53	EC	.188	lb ai/a	LPRE					
	COC	100	SL	1	% v/v	LPRE					
11	carfentrazone	0.35	SE	.0273	lb ai/a	LPRE	9.0	10.0	10.0	10.0	8.3
	sulfentrazone	3.15	SE	.246	lb ai/a	LPRE					
	mesotrione	4	SC	.188	lb ai/a	LPRE					
	sethoxydim	1.53	EC	.188	lb ai/a	LPRE					
	COC	100	SL	1	% v/v	LPRE					
12	untreated						10.0	10.0	9.0	10.0	1.0
LSD (P=.05)							2.51	3.24	3.43	4.59	3.60
Standard Deviation							1.48	1.91	2.02	2.71	2.12
CV							16.67	20.25	22.29	29.96	26.74

Spring Weed Control in Blueberry – SWMREC

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	YEHW		LACG	QUGR	BHPL
Pest Code							YEHW		LACG	QUGR	BHPL
Crop Code								BLBE			
Rating Date							8/Jun/12	9/Jul/12	9/Jul/12	9/Jul/12	9/Jul/12
Rating Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	hexazinone	2	L	1	lb ai/a	EPRE	8.0	1.3	5.3	7.7	9.0
2	hexazinone	2	L	1	lb ai/a	EPRE	10.0	1.0	7.0	9.3	10.0
	rimsulfuron (M)	25	DF	.063	lb ai/a	EPOS					
	NIS	100	SL	0.25	% v/v	EPOS					
3	diuron	80	DF	1.6	lb ai/a	EPRE	10.0	1.0	9.3	10.0	9.7
	terbacil	80	WDG	1.6	lb ai/a	EPRE					
	rimsulfuron (M)	25	DF	.063	lb ai/a	EPOS					
	NIS	100	SL	0.25	% v/v	EPOS					
4	diuron	80	DF	3.2	lb ai/a	EPRE	9.3	1.0	4.0	9.3	1.3
	rimsulfuron (M)	25	DF	.063	lb ai/a	EPOS					
	NIS	100	SL	0.25	% v/v	EPOS					
5	indaziflam	1.67	SC	0.033	lb ai/a	EPRE	10.0	1.0	2.7	9.3	10.0
	glufosinate	2.34	L	1	lb ai/a	EPRE					
6	indaziflam	1.67	SC	.065	lb ai/a	EPRE	10.0	1.0	4.0	8.7	10.0
	glufosinate	2.34	L	1	lb ai/a	EPRE					
7	indaziflam	1.67	SC	0.13	lb ai/a	EPRE	10.0	1.0	7.0	8.3	10.0
	glufosinate	2.34	L	1	lb ai/a	EPRE					
8	flumioxazin	51	WDG	.383	lb ai/a	EPRE	10.0	1.0	4.3	10.0	9.3
	glyphosate	5.4	L	1.35	lb ai/a	EPRE					
9	carfentrazone	0.35	SE	.0273	lb ai/a	LPRE	10.0	1.0	1.7	8.7	4.3
	sulfentrazone	3.15	SE	0.246	lb ai/a	LPRE					
	rimsulfuron (M)	25	DF	0.0175	lb ai/a	LPRE					
	sethoxydim	1.53	EC	.188	lb ai/a	LPRE					
	COC	100	SL	1	% v/v	LPRE					
10	carfentrazone	0.35	SE	.0273	lb ai/a	LPRE	5.7	1.0	5.3	9.3	9.0
	sulfentrazone	3.15	SE	0.246	lb ai/a	LPRE					
	norflurazon	80	DF	1.96	lb ai/a	LPRE					
	sethoxydim	1.53	EC	.188	lb ai/a	LPRE					
	COC	100	SL	1	% v/v	LPRE					
11	carfentrazone	0.35	SE	.0273	lb ai/a	LPRE	9.0	1.0	1.7	8.7	9.0
	sulfentrazone	3.15	SE	.246	lb ai/a	LPRE					
	mesotrione	4	SC	.188	lb ai/a	LPRE					
	sethoxydim	1.53	EC	.188	lb ai/a	LPRE					
	COC	100	SL	1	% v/v	LPRE					
12	untreated						7.0	1.0	5.3	7.0	9.0
LSD (P=.05)							3.96	0.28	4.59	2.76	3.10
Standard Deviation							2.34	0.17	2.71	1.63	1.83
CV							25.73	16.22	56.4	18.39	21.85

Spring Weed Control in Blueberry – SWMREC

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	HONE	HOWE	POIV	RESO	VICR	YEHW
	Pest Code						HONE	HOWE	POIV	RESO	VICR	YEHW
	Crop Code											
	Rating Date						9/Jul/12	9/Jul/12	9/Jul/12	9/Jul/12	9/Jul/12	9/Jul/12
	Rating Type						RATING	RATING	RATING	RATING	RATING	RATING
	Rating Unit						1-10	1-10	1-10	1-10	1-10	1-10
1	hexazinone	2	L	1	lb ai/a	EPRE	7.3	8.3	7.0	8.7	7.3	10.0
2	hexazinone	2	L	1	lb ai/a	EPRE	7.7	10.0	7.0	8.3	7.0	10.0
	rimsulfuron (M)	25	DF	.063	lb ai/a	EPOS						
	NIS	100	SL	0.25	% v/v	EPOS						
3	diuron	80	DF	1.6	lb ai/a	EPRE	10.0	9.3	5.3	10.0	4.7	10.0
	terbacil	80	WDG	1.6	lb ai/a	EPRE						
	rimsulfuron (M)	25	DF	.063	lb ai/a	EPOS						
	NIS	100	SL	0.25	% v/v	EPOS						
4	diuron	80	DF	3.2	lb ai/a	EPRE	7.7	7.3	10.0	9.3	10.0	10.0
	rimsulfuron (M)	25	DF	.063	lb ai/a	EPOS						
	NIS	100	SL	0.25	% v/v	EPOS						
5	indaziflam	1.67	SC	0.033	lb ai/a	EPRE	8.0	8.0	4.3	7.0	10.0	10.0
	glufosinate	2.34	L	1	lb ai/a	EPRE						
6	indaziflam	1.67	SC	.065	lb ai/a	EPRE	7.0	7.3	10.0	5.0	7.7	9.3
	glufosinate	2.34	L	1	lb ai/a	EPRE						
7	indaziflam	1.67	SC	0.13	lb ai/a	EPRE	7.0	10.0	10.0	4.3	10.0	10.0
	glufosinate	2.34	L	1	lb ai/a	EPRE						
8	flumioxazin	51	WDG	.383	lb ai/a	EPRE	8.0	8.7	10.0	7.0	7.3	8.7
	glyphosate	5.4	L	1.35	lb ai/a	EPRE						
9	carfentrazone	0.35	SE	.0273	lb ai/a	LPRE	7.7	6.7	10.0	2.7	7.3	7.0
	sulfentrazone	3.15	SE	0.246	lb ai/a	LPRE						
	rimsulfuron (M)	25	DF	0.0175	lb ai/a	LPRE						
	sethoxydim	1.53	EC	.188	lb ai/a	LPRE						
	COC	100	SL	1	% v/v	LPRE						
10	carfentrazone	0.35	SE	.0273	lb ai/a	LPRE	7.0	3.7	10.0	6.3	10.0	4.0
	sulfentrazone	3.15	SE	0.246	lb ai/a	LPRE						
	norflurazon	80	DF	1.96	lb ai/a	LPRE						
	sethoxydim	1.53	EC	.188	lb ai/a	LPRE						
	COC	100	SL	1	% v/v	LPRE						
11	carfentrazone	0.35	SE	.0273	lb ai/a	LPRE	8.0	10.0	10.0	6.7	10.0	7.7
	sulfentrazone	3.15	SE	.246	lb ai/a	LPRE						
	mesotrione	4	SC	.188	lb ai/a	LPRE						
	sethoxydim	1.53	EC	.188	lb ai/a	LPRE						
	COC	100	SL	1	% v/v	LPRE						
12	untreated						10.0	6.0	10.0	1.7	9.7	6.3
	LSD (P=.05)						6.96	4.80	4.83	5.67	5.73	4.43
	Standard Deviation						4.11	2.84	2.85	3.35	3.38	2.62
	CV						51.7	35.71	32.98	52.2	40.21	30.47

Season-long Weed Control in Grape – Cronenwett Farms 2012

Project Code: 132-12-01 **Location: Lawton, MI**

Personnel: Bernard H. Zandstra
Crop: Grape **Variety: Concord**
Planting Method: **Planting Date:** **Harvest Date:**
Spacing: 8 ft **Row Spacing: 9 ft**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 6 ft wide x 30 ft long

Soil Type: Sand **OM: 1.3%** **pH: 5.7**
Sand: 91% **Silt: 2%** **Clay: 7%** **CEC: 4.1**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
LPRE	5/8/12	11:00 am	57/59	F	Damp	7-8 SW	83	100% Cloudy	Y
EPOS	5/23/12	4:30 pm	82/76	F	Dry	4 SW	31	0% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
5/8	GRAPE		Leafed out	
5/8	HOWE = horseweed	3-4″		Moderate
5/8	PUDN = purple deadnettle	4-8″		Moderate
5/8	RECL = red clover	8-10″		Many
5/8	SFGE = smallflower geranium	6-8″		Many
5/8	TRCV = trailing crownvetch	6-12″		Moderate
	LACG = large crabgrass			
	PRKW = prostrate knotweed			
	WHCL = white clover			
	QUGR = quackgrass			

Notes and Comments
1. Spray applied with 2 nozzle boom. FF11002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer, one pass on each side of row.
2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.

Season-long Weed Control in Grape – Cronenwett Farms 2012

Season-long Weed Control in Grape –Cronenwett Farms 2012

Trial ID: 132-12-01 Study Director:
Location: Lawton, MI Investigator: Dr. Bernard Zandstra

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage		HOWE	WHCL	
	Crop Code						GRAPE			GRAPE
	Rating Date						8/Jun/12	8/Jun/12	8/Jun/12	9/Jul/12
	Rating Type						RATING	RATING	RATING	RATING
	Rating Unit						1-10	1-10	1-10	1-10
1	untreated						1.0	1.7	3.3	1.0
2	flumioxazin	51	WDG	.383	lb ai/a	LPRE	1.0	9.7	8.7	1.0
	glyphosate	5.5	L	1	lb ai/a	LPRE				
3	oxyfluorfen	4	SC	1.5	lb ai/a	LPRE	1.0	1.7	5.0	1.0
4	flazasulfuron	25	WG	0.033	lb ai/a	LPRE	1.0	10.0	9.7	1.0
	glyphosate	5.5	L	1	lb ai/a	LPRE				
5	indaziflam	1.67	SC	.065	lb ai/a	LPRE	1.0	4.0	6.0	1.0
	paraquat	2	SL	0.88	lb ai/a	LPRE				
6	diuron	80	DF	4	lb ai/a	LPRE	1.0	10.0	10.0	1.0
	glyphosate	5.5	L	1	lb ai/a	LPRE				
7	rimsulfuron (M)	25	DF	.063	lb ai/a	LPRE	1.0	10.0	9.7	1.0
	glyphosate	5.5	L	1	lb ai/a	LPRE				
8	simazine	90	WDG	4	lb ai/a	LPRE	1.0	10.0	7.0	1.0
	oryzalin	4	L	4	lb ai/a	LPRE				
	glyphosate	5.5	L	1	lb ai/a	LPRE				
9	diuron	80	DF	4	lb ai/a	LPRE	1.0	9.3	10.0	1.0
	glyphosate	5.5	L	1	lb ai/a	LPRE				
	carfentrazone	2	EC	0.031	lb ai/a	EPOS				
	pyraflufen	.177	SC	.00553	lb ai/a	EPOS				
10	carfentrazone	0.35	SE	.0273	lb ai/a	LPRE	1.0	7.7	6.7	1.0
	sulfentrazone	3.15	SE	.246	lb ai.a	LPRE				
	norflurazon	80	DF	1.96	lb ai/a	LPRE				
11	oxyfluorfen	3.93	SC	0.37	lb ai/a	LPRE	1.0	6.0	7.3	1.0
	penoxsulam	.083	SC	.0078	lb ai/a	LPRE				
12	oxyfluorfen	3.93	SC	0.74	lb ai/a	LPRE	1.0	6.3	10.0	1.3
	penoxsulam	.083	SC	.0155	lb ai/a	LPRE				
13	oxyfluorfen	3.93	SC	1.47	lb ai/a	LPRE	1.0	7.0	10.0	1.7
	penoxsulam	.083	SC	.031	lb ai/a	LPRE				
LSD (P=.05)							0.00	4.15	3.53	0.37
Standard Deviation							0.00	2.46	2.09	0.22
CV							0.0	34.29	26.36	20.59

Season-long Weed Control in Grape – Cronenwett Farms 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	WHCL	PRKW	HOWE	GRAPE
Pest Code							WHCL	PRKW	HOWE	
Crop Code										GRAPE
Rating Date							9/Jul/12	9/Jul/12	9/Jul/12	16/Aug/12
Rating Type							RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10
1	untreated						6.3	3.0	5.7	1.0
2	flumioxazin	51	WDG	.383	lb ai/a	LPRE	9.3	9.3	10.0	1.0
	glyphosate	5.5	L	1	lb ai/a	LPRE				
3	oxyfluorfen	4	SC	1.5	lb ai/a	LPRE	7.0	3.0	3.3	1.3
4	flazasulfuron	25	WG	0.033	lb ai/a	LPRE	10.0	9.0	9.7	1.0
	glyphosate	5.5	L	1	lb ai/a	LPRE				
5	indaziflam	1.67	SC	.065	lb ai/a	LPRE	9.7	3.7	6.3	1.0
	paraquat	2	SL	0.88	lb ai/a	LPRE				
6	diuron	80	DF	4	lb ai/a	LPRE	8.3	9.0	10.0	1.0
	glyphosate	5.5	L	1	lb ai/a	LPRE				
7	rimsulfuron (M)	25	DF	.063	lb ai/a	LPRE	9.7	9.3	9.7	1.0
	glyphosate	5.5	L	1	lb ai/a	LPRE				
8	simazine	90	WDG	4	lb ai/a	LPRE	8.0	8.3	10.0	1.0
	oryzalin	4	L	4	lb ai/a	LPRE				
	glyphosate	5.5	L	1	lb ai/a	LPRE				
9	diuron	80	DF	4	lb ai/a	LPRE	9.7	7.3	10.0	1.0
	glyphosate	5.5	L	1	lb ai/a	LPRE				
	carfentrazone	2	EC	0.031	lb ai/a	EPOS				
	pyraflufen	.177	SC	.00553	lb ai/a	EPOS				
10	carfentrazone	0.35	SE	.0273	lb ai/a	LPRE	7.7	5.0	8.0	1.0
	sulfentrazone	3.15	SE	.246	lb ai.a	LPRE				
	norflurazon	80	DF	1.96	lb ai/a	LPRE				
11	oxyfluorfen	3.93	SC	0.37	lb ai/a	LPRE	8.0	4.7	7.7	1.3
	penoxsulam	.0823	SC	.0078	lb ai/a	LPRE				
12	oxyfluorfen	3.93	SC	0.74	lb ai/a	LPRE	8.7	3.7	7.0	1.0
	penoxsulam	.083	SC	.0155	lb ai/a	LPRE				
13	oxyfluorfen	3.93	SC	1.47	lb ai/a	LPRE	5.7	5.3	8.0	1.0
	penoxsulam	.083	SC	.031	lb ai/a	LPRE				
LSD (P=.05)							4.18	4.52	4.19	0.39
Standard Deviation							2.48	2.68	2.48	0.23
CV							29.84	43.21	30.66	21.99

Season-long Weed Control in Grape – Cronenwett Farms 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	LACG	QUGR	HOWE	PRKW	WHCL
Pest Code											
Crop Code											
Rating Date							16/Aug/12	16/Aug/12	16/Aug/12	16/Aug/12	16/Aug/12
Rating Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	untreated						3.7	7.0	5.3	4.3	3.7
2	flumioxazin	51	WDG	.383	lb ai/a	LPRE	7.0	10.0	9.3	8.3	6.0
	glyphosate	5.5	L	1	lb ai/a	LPRE					
3	oxyfluorfen	4	SC	1.5	lb ai/a	LPRE	4.0	9.3	3.3	3.3	6.0
4	flazasulfuron	25	WG	0.033	lb ai/a	LPRE	7.7	10.0	9.3	8.0	10.0
	glyphosate	5.5	L	1	lb ai/a	LPRE					
5	indaziflam	1.67	SC	.065	lb ai/a	LPRE	8.0	10.0	4.7	6.0	8.0
	paraquat	2	SL	0.88	lb ai/a	LPRE					
6	diuron	80	DF	4	lb ai/a	LPRE	5.3	10.0	9.7	9.0	9.0
	glyphosate	5.5	L	1	lb ai/a	LPRE					
7	rimsulfuron (M)	25	DF	.063	lb ai/a	LPRE	6.7	10.0	8.7	6.3	10.0
	glyphosate	5.5	L	1	lb ai/a	LPRE					
8	simazine	90	WDG	4	lb ai/a	LPRE	8.3	10.0	8.7	8.3	8.3
	oryzalin	4	L	4	lb ai/a	LPRE					
	glyphosate	5.5	L	1	lb ai/a	LPRE					
9	diuron	80	DF	4	lb ai/a	LPRE	5.7	10.0	8.3	7.7	10.0
	glyphosate	5.5	L	1	lb ai/a	LPRE					
	carfentrazone	2	EC	0.031	lb ai/a	EPOS					
	pyraflufen	.177	SC	.00553	lb ai/a	EPOS					
10	carfentrazone	0.35	SE	.0273	lb ai/a	LPRE	5.7	9.7	7.7	3.3	6.7
	sulfentrazone	3.15	SE	.246	lb ai.a	LPRE					
	norflurazon	80	DF	1.96	lb ai/a	LPRE					
11	oxyfluorfen	3.93	SC	0.37	lb ai/a	LPRE	3.7	9.0	9.0	4.3	5.0
	penoxsulam	.083	SC	.0078	lb ai/a	LPRE					
12	oxyfluorfen	3.93	SC	0.74	lb ai/a	LPRE	5.7	9.3	7.0	5.7	6.7
	penoxsulam	.083	SC	.0155	lb ai/a	LPRE					
13	oxyfluorfen	3.93	SC	1.47	lb ai/a	LPRE	6.7	9.3	8.3	4.7	8.0
	penoxsulam	.083	SC	.031	lb ai/a	LPRE					
LSD (P=.05)							4.92	2.62	4.06	4.97	4.13
Standard Deviation							2.92	1.55	2.41	2.95	2.45
CV							48.62	16.32	31.54	48.33	32.72

Field Bindweed Control in Concord Grape – HTRC 2012

Project Code: 132-12-02 **Location: East Lansing, MI**

Personnel: Bernard H. Zandstra
Crop: Grape **Variety: Concord**
Planting Method: Seedlings **Planting Date: 1967** **Harvest Date:**
Spacing: 7 ft **Row Spacing: 10 ft**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 6 ft wide x 30 ft long

Soil Type: Capac Loam **OM: 2.2%** **pH: 6.7**
Sand: 53% **Silt: 31%** **Clay: 15%** **CEC: 6.6**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
LPRE	4/27/12	11:00 am	50/50	F	Dry	1-2 SE	23	0% Cloudy	N
EPOS	5/22/12	1:30 pm	75/70	F	Dry	1 NW	43	30% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
4/27	GRAPE			
4/27	BYGR = barnyardgrass	1-2′		Moderate
4/27	FIFE = finefescue	6-8″		Few
4/27	QUGR = quackgrass	6-12″		Many
4/27	CATH = Canada thistle	9-12″		Few
4/27	CUDO = curly dock	6-8″		Few
4/27	DAND = dandelion	10-12″, 9-14″	Flower	Moderate
4/27	MECR = mouseear cress	6-8″		Few
4/27	WHCA = white campion	10-12″		Moderate
4/27	WHCL = white clover			Few
4/27	WICA = wild carrot	3-4″		Few
5/22	GRAPE		Fruit set	
5/22	ANBG = annual bluegrass	4-5″	Flower & seed	Moderate
5/22	TAFE = tall fescue	10-12″		Moderate
5/22	QUGR = quackgrass	8-20″	Foliar to flower	Moderate
5/22	CABR = California brome	6-18″	Seeded	Moderate
5/22	DAND = dandelion	8-10″	Flower	Moderate
5/22	FIBW = field bindweed	3-4″	Crawling	Many
5/22	HOWE = horseweed	4-6″	Foliar	Moderate
5/22	WHCL = white clover	3-4″	Flower	Moderate
5/22	WICA = wild carrot	8-10″	Foliar	Moderate
	COMA = common mallow			
	PRKW = prostrate knotweed			

Notes and Comments
1. Spray applied with 2 nozzle boom. FF11002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer. One pass on each side of row.
2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.

Field Bindweed Control in Concord Grape – HTRC 2012

Field Bindweed Control in Concord Grape - HTRC 2012

Trial ID: 132-12-02 Study Director:
Location: East Lansing, MI Investigator: Dr. Bernard Zandstra

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	GRAPE	ANBG	TAFE	DAND	FIBW
	Pest Code							ANBG	TAFE	DAND	FIBW
	Crop Code						GRAPE				
	Rating Date						10/May/12	10/May/12	10/May/12	10/May/12	10/May/12
	Rating Type						RATING	RATING	RATING	RATING	RATING
	Rating Unit						1-10	1-10	1-10	1-10	1-10
1	diuron	80	DF	4	lb ai/a	LPRE	1.0	5.7	7.7	7.3	4.3
	glyphosate	5.5	L	1.37	lb ai/a	LPRE					
	AMS	100	SG	3.4	lb ai/a	LPRE					
2	carfentrazone	0.35	SE	.0273	lb ai/a	LPRE	1.0	5.3	8.0	8.7	9.3
	sulfentrazone	3.15	SE	.246	lb ai.a	LPRE					
	norflurazon	80	DF	1.96	lb ai/a	LPRE					
	glyphosate	5.5	L	1.37	lb ai/a	LPRE					
	AMS	100	SG	3.4	lb ai/a	LPRE					
3	carfentrazone	2	EC	.0156	lb ai/a	LPRE	1.0	6.3	6.3	8.3	9.3
	mesotrione	4	SC	.188	lb ai/a	LPRE					
	glyphosate	5.5	L	1.37	lb ai/a	LPRE					
	AMS	100	SG	3.4	lb ai/a	LPRE					
4	carfentrazone	2	EC	.0156	lb ai/a	LPRE	1.0	7.3	7.7	9.0	9.7
	indaziflam	1.67	SC	.065	lb ai/a	LPRE					
	glyphosate	5.5	L	1.37	lb ai/a	LPRE					
	AMS	100	SG	3.4	lb ai/a	LPRE					
5	carfentrazone	2	EC	.0156	lb ai/a	LPRE	1.0	8.0	8.3	9.0	6.3
	flumioxazin	51	WDG	0.191	lb ai/a	LPRE					
	glyphosate	5.5	L	1.37	lb ai/a	LPRE					
	AMS	100	SG	3.4	lb ai/a	LPRE					
6	pyraflufen	.177	SC	0.0028	lb ai/a	EPOS	1.0	1.0	5.3	1.0	3.7
	NIS	100	SL	0.25	% v/v	EPOS					
7	pyraflufen	.177	SC	0.0055	lb ai/a	EPOS	1.0	1.0	1.0	1.0	1.0
	NIS	100	SL	0.25	% v/v	EPOS					
8	pyraflufen	.177	SC	0.0028	lb ai/a	EPOS	1.0	1.0	3.3	3.0	1.0
	halosulfuron	75	WG	.047	lb ai/a	EPOS					
	NIS	100	SL	0.25	% v/v	EPOS					
9	pyraflufen	.177	SC	0.0028	lb ai/a	EPOS	1.0	1.0	1.0	1.7	1.0
	flazasulfuron	25	WG	.047	lb ai/a	EPOS					
	NIS	100	SL	0.25	% v/v	EPOS					
10	halosulfuron	75	WG	.047	lb ai/a	EPOS	1.0	1.0	1.0	1.0	1.0
	NIS	100	SL	0.25	% v/v	EPOS					
11	flazasulfuron	25	WG	.047	lb ai/a	EPOS	1.0	1.0	4.0	1.3	1.0
	NIS	100	SL	0.25	% v/v	EPOS					
12	untreated						1.0	1.0	1.0	1.0	1.0
LSD (P=.05)							0.00	1.82	3.90	2.20	3.48
Standard Deviation							0.00	1.07	2.30	1.30	2.06
CV							0.0	32.43	50.54	29.85	50.73

Field Bindweed Control in Concord Grape – HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	GRAPE	ANBG	TAFE	QUGR	DAND
	Pest Code							ANBG	TAFE	QUGR	DAND
	Crop Code						GRAPE				
	Rating Date						22/May/12	22/May/12	22/May/12	22/May/12	22/May/12
	Rating Type						RATING	RATING	RATING	RATING	RATING
	Rating Unit						1-10	1-10	1-10	1-10	1-10
1	diuron	80	DF	4	lb ai/a	LPRE	1.0	8.3	9.7	9.0	9.3
	glyphosate	5.5	L	1.37	lb ai/a	LPRE					
	AMS	100	SG	3.4	lb ai/a	LPRE					
2	carfentrazone	0.35	SE	.0273	lb ai/a	LPRE	1.0	8.0	9.3	8.7	10.0
	sulfentrazone	3.15	SE	.246	lb ai.a	LPRE					
	norflurazon	80	DF	1.96	lb ai/a	LPRE					
	glyphosate	5.5	L	1.37	lb ai/a	LPRE					
	AMS	100	SG	3.4	lb ai/a	LPRE					
3	carfentrazone	2	EC	.0156	lb ai/a	LPRE	1.0	9.0	9.3	5.0	9.7
	mesotrione	4	SC	.188	lb ai/a	LPRE					
	glyphosate	5.5	L	1.37	lb ai/a	LPRE					
	AMS	100	SG	3.4	lb ai/a	LPRE					
4	carfentrazone	2	EC	.0156	lb ai/a	LPRE	1.0	10.0	10.0	9.0	9.7
	indaziflam	1.67	SC	.065	lb ai/a	LPRE					
	glyphosate	5.5	L	1.37	lb ai/a	LPRE					
	AMS	100	SG	3.4	lb ai/a	LPRE					
5	carfentrazone	2	EC	.0156	lb ai/a	LPRE	1.0	9.3	10.0	10.0	10.0
	flumioxazin	51	WDG	0.191	lb ai/a	LPRE					
	glyphosate	5.5	L	1.37	lb ai/a	LPRE					
	AMS	100	SG	3.4	lb ai/a	LPRE					
6	pyraflufen	.177	SC	0.0028	lb ai/a	EPOS	1.0	1.0	4.3	3.3	1.0
	NIS	100	SL	0.25	% v/v	EPOS					
7	pyraflufen	.177	SC	0.0055	lb ai/a	EPOS	1.0	1.0	1.0	1.0	3.0
	NIS	100	SL	0.25	% v/v	EPOS					
8	pyraflufen	.177	SC	0.0028	lb ai/a	EPOS	1.0	3.3	1.0	2.3	1.0
	halosulfuron	75	WG	.047	lb ai/a	EPOS					
	NIS	100	SL	0.25	% v/v	EPOS					
9	pyraflufen	.177	SC	0.0028	lb ai/a	EPOS	1.0	3.7	3.0	2.7	1.7
	flazasulfuron	25	WG	.047	lb ai/a	EPOS					
	NIS	100	SL	0.25	% v/v	EPOS					
10	halosulfuron	75	WG	.047	lb ai/a	EPOS	1.0	1.7	1.0	1.0	1.7
	NIS	100	SL	0.25	% v/v	EPOS					
11	flazasulfuron	25	WG	.047	lb ai/a	EPOS	1.0	3.0	5.0	5.3	1.0
	NIS	100	SL	0.25	% v/v	EPOS					
12	untreated						1.0	3.3	3.0	1.0	2.7
LSD (P=.05)							0.00	3.63	3.38	3.30	2.45
Standard Deviation							0.00	2.15	2.00	1.95	1.45
CV							0.0	41.75	35.92	40.1	28.58

Field Bindweed Control in Concord Grape – HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	FIBW	HOWE	WHCL	WICA	GRAPE
	Pest Code										
	Crop Code										
	Rating Date						22/May/12	22/May/12	22/May/12	22/May/12	20/Jun/12
	Rating Type						RATING	RATING	RATING	RATING	RATING
	Rating Unit						1-10	1-10	1-10	1-10	1-10
1	diuron	80	DF	4	lb ai/a	LPRE	3.3	10.0	9.3	7.7	1.0
	glyphosate	5.5	L	1.37	lb ai/a	LPRE					
	AMS	100	SG	3.4	lb ai/a	LPRE					
2	carfentrazone	0.35	SE	.0273	lb ai/a	LPRE	5.0	10.0	9.3	10.0	1.0
	sulfentrazone	3.15	SE	.246	lb ai.a	LPRE					
	norflurazon	80	DF	1.96	lb ai/a	LPRE					
	glyphosate	5.5	L	1.37	lb ai/a	LPRE					
	AMS	100	SG	3.4	lb ai/a	LPRE					
3	carfentrazone	2	EC	.0156	lb ai/a	LPRE	2.3	10.0	10.0	7.7	1.0
	mesotrione	4	SC	.188	lb ai/a	LPRE					
	glyphosate	5.5	L	1.37	lb ai/a	LPRE					
	AMS	100	SG	3.4	lb ai/a	LPRE					
4	carfentrazone	2	EC	.0156	lb ai/a	LPRE	3.0	10.0	10.0	8.7	1.0
	indaziflam	1.67	SC	.065	lb ai/a	LPRE					
	glyphosate	5.5	L	1.37	lb ai/a	LPRE					
	AMS	100	SG	3.4	lb ai/a	LPRE					
5	carfentrazone	2	EC	.0156	lb ai/a	LPRE	6.3	10.0	8.7	10.0	1.0
	flumioxazin	51	WDG	0.191	lb ai/a	LPRE					
	glyphosate	5.5	L	1.37	lb ai/a	LPRE					
	AMS	100	SG	3.4	lb ai/a	LPRE					
6	pyraflufen	.177	SC	0.0028	lb ai/a	EPOS	3.7	7.0	5.3	10.0	1.0
	NIS	100	SL	0.25	% v/v	EPOS					
7	pyraflufen	.177	SC	0.0055	lb ai/a	EPOS	1.0	4.0	4.0	4.0	1.0
	NIS	100	SL	0.25	% v/v	EPOS					
8	pyraflufen	.177	SC	0.0028	lb ai/a	EPOS	1.0	10.0	4.0	10.0	1.0
	halosulfuron	75	WG	.047	lb ai/a	EPOS					
	NIS	100	SL	0.25	% v/v	EPOS					
9	pyraflufen	.177	SC	0.0028	lb ai/a	EPOS	1.0	6.3	1.3	10.0	1.0
	flazasulfuron	25	WG	.047	lb ai/a	EPOS					
	NIS	100	SL	0.25	% v/v	EPOS					
10	halosulfuron	75	WG	.047	lb ai/a	EPOS	1.0	10.0	3.3	7.0	1.0
	NIS	100	SL	0.25	% v/v	EPOS					
11	flazasulfuron	25	WG	.047	lb ai/a	EPOS	1.3	7.0	6.3	10.0	1.0
	NIS	100	SL	0.25	% v/v	EPOS					
12	untreated						3.7	10.0	1.0	7.0	1.0
LSD (P=.05)							4.17	5.12	5.57	5.44	0.00
Standard Deviation							2.46	3.02	3.29	3.21	0.00
CV							90.42	34.76	54.27	37.78	0.0

Field Bindweed Control in Concord Grape – HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	CABR	FIBW	HOWE	WICA	GRAPE
Pest Code											
Crop Code											
Rating Date							20/Jun/12	20/Jun/12	20/Jun/12	20/Jun/12	29/Jun/12
Rating Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	diuron	80	DF	4	lb ai/a	LPRE	10.0	1.0	10.0	9.0	1.0
	glyphosate	5.5	L	1.37	lb ai/a	LPRE					
	AMS	100	SG	3.4	lb ai/a	LPRE					
2	carfentrazone	0.35	SE	.0273	lb ai/a	LPRE	5.3	1.7	10.0	10.0	1.7
	sulfentrazone	3.15	SE	.246	lb ai.a	LPRE					
	norflurazon	80	DF	1.96	lb ai/a	LPRE					
	glyphosate	5.5	L	1.37	lb ai/a	LPRE					
	AMS	100	SG	3.4	lb ai/a	LPRE					
3	carfentrazone	2	EC	.0156	lb ai/a	LPRE	9.3	1.7	10.0	7.7	1.0
	mesotrione	4	SC	.188	lb ai/a	LPRE					
	glyphosate	5.5	L	1.37	lb ai/a	LPRE					
	AMS	100	SG	3.4	lb ai/a	LPRE					
4	carfentrazone	2	EC	.0156	lb ai/a	LPRE	8.3	1.3	9.3	9.0	1.0
	indaziflam	1.67	SC	.065	lb ai/a	LPRE					
	glyphosate	5.5	L	1.37	lb ai/a	LPRE					
	AMS	100	SG	3.4	lb ai/a	LPRE					
5	carfentrazone	2	EC	.0156	lb ai/a	LPRE	7.7	4.0	9.0	8.0	1.0
	flumioxazin	51	WDG	0.191	lb ai/a	LPRE					
	glyphosate	5.5	L	1.37	lb ai/a	LPRE					
	AMS	100	SG	3.4	lb ai/a	LPRE					
6	pyraflufen	.177	SC	0.0028	lb ai/a	EPOS	3.7	5.0	7.7	10.0	1.0
	NIS	100	SL	0.25	% v/v	EPOS					
7	pyraflufen	.177	SC	0.0055	lb ai/a	EPOS	6.0	4.7	9.3	6.0	1.0
	NIS	100	SL	0.25	% v/v	EPOS					
8	pyraflufen	.177	SC	0.0028	lb ai/a	EPOS	7.3	1.3	7.3	10.0	1.0
	halosulfuron	75	WG	.047	lb ai/a	EPOS					
	NIS	100	SL	0.25	% v/v	EPOS					
9	pyraflufen	.177	SC	0.0028	lb ai/a	EPOS	6.0	3.0	9.0	10.0	1.0
	flazasulfuron	25	WG	.047	lb ai/a	EPOS					
	NIS	100	SL	0.25	% v/v	EPOS					
10	halosulfuron	75	WG	.047	lb ai/a	EPOS	6.7	1.0	10.0	10.0	1.0
	NIS	100	SL	0.25	% v/v	EPOS					
11	flazasulfuron	25	WG	.047	lb ai/a	EPOS	8.3	4.7	9.7	10.0	1.0
	NIS	100	SL	0.25	% v/v	EPOS					
12	untreated						3.7	2.7	7.7	9.3	1.0
LSD (P=.05)							3.63	3.27	3.40	3.02	0.56
Standard Deviation							2.14	1.93	2.01	1.79	0.33
CV							31.22	72.47	22.12	19.66	31.58

Field Bindweed Control in Concord Grape – HTRC 2012

Pest Code						FIBW		FIBW	HOWE	PRKW	WICA
Crop Code							GRAPE				
Rating Date						29/Jun/12	7/Aug/12	7/Aug/12	7/Aug/12	7/Aug/12	7/Aug/12
Rating Type						RATING	RATING	RATING	RATING	RATING	RATING
Rating Unit						1-10	1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
1	diuron	80	DF	4	lb ai/a	LPRE	1.0	1.0	1.7	10.0	10.0	8.3
	glyphosate	5.5	L	1.37	lb ai/a	LPRE						
	AMS	100	SG	3.4	lb ai/a	LPRE						
2	carfentrazone	0.35	SE	.0273	lb ai/a	LPRE	2.0	1.3	1.7	10.0	4.7	10.0
	sulfentrazone	3.15	SE	.246	lb ai.a	LPRE						
	norflurazon	80	DF	1.96	lb ai/a	LPRE						
	glyphosate	5.5	L	1.37	lb ai/a	LPRE						
	AMS	100	SG	3.4	lb ai/a	LPRE						
3	carfentrazone	2	EC	.0156	lb ai/a	LPRE	1.3	1.0	1.7	10.0	10.0	8.7
	mesotrione	4	SC	.188	lb ai/a	LPRE						
	glyphosate	5.5	L	1.37	lb ai/a	LPRE						
	AMS	100	SG	3.4	lb ai/a	LPRE						
4	carfentrazone	2	EC	.0156	lb ai/a	LPRE	1.0	1.0	1.7	9.0	7.7	7.3
	indaziflam	1.67	SC	.065	lb ai/a	LPRE						
	glyphosate	5.5	L	1.37	lb ai/a	LPRE						
	AMS	100	SG	3.4	lb ai/a	LPRE						
5	carfentrazone	2	EC	.0156	lb ai/a	LPRE	3.7	1.0	4.7	9.0	6.0	6.0
	flumioxazin	51	WDG	0.191	lb ai/a	LPRE						
	glyphosate	5.5	L	1.37	lb ai/a	LPRE						
	AMS	100	SG	3.4	lb ai/a	LPRE						
6	pyraflufen	.177	SC	0.0028	lb ai/a	EPOS	4.0	1.3	5.0	5.7	7.0	7.0
	NIS	100	SL	0.25	% v/v	EPOS						
7	pyraflufen	.177	SC	0.0055	lb ai/a	EPOS	1.0	1.0	2.0	5.3	9.7	4.0
	NIS	100	SL	0.25	% v/v	EPOS						
8	pyraflufen	.177	SC	0.0028	lb ai/a	EPOS	1.3	1.7	1.7	6.0	7.7	10.0
	halosulfuron	75	WG	.047	lb ai/a	EPOS						
	NIS	100	SL	0.25	% v/v	EPOS						
9	pyraflufen	.177	SC	0.0028	lb ai/a	EPOS	2.0	1.0	1.3	7.0	7.0	10.0
	flazasulfuron	25	WG	.047	lb ai/a	EPOS						
	NIS	100	SL	0.25	% v/v	EPOS						
10	halosulfuron	75	WG	.047	lb ai/a	EPOS	1.7	1.3	3.7	10.0	7.0	7.7
	NIS	100	SL	0.25	% v/v	EPOS						
11	flazasulfuron	25	WG	.047	lb ai/a	EPOS	3.7	1.7	1.7	8.3	7.3	10.0
	NIS	100	SL	0.25	% v/v	EPOS						
12	untreated						4.0	1.3	3.3	4.3	10.0	7.0
LSD (P=.05)							2.85	0.83	3.39	4.72	6.16	5.72
Standard Deviation							1.68	0.49	2.00	2.78	3.64	3.38
CV							75.71	40.07	80.08	35.3	46.42	42.24

Field Bindweed Control in Concord Grape – HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	GRAPE 5/Sep/12 RATING 1-10	COMA 5/Sep/12 RATING 1-10	FIBW 5/Sep/12 RATING 1-10	HOWE 5/Sep/12 RATING 1-10	PRKW 5/Sep/12 RATING 1-10
1	diuron	80	DF	4	lb ai/a	LPRE	1.7	4.0	1.3	9.3	8.3
	glyphosate	5.5	L	1.37	lb ai/a	LPRE					
	AMS	100	SG	3.4	lb ai/a	LPRE					
2	carfentrazone	0.35	SE	.0273	lb ai/a	LPRE	1.0	4.3	3.0	9.3	5.7
	sulfentrazone	3.15	SE	.246	lb ai.a	LPRE					
	norflurazon	80	DF	1.96	lb ai/a	LPRE					
	glyphosate	5.5	L	1.37	lb ai/a	LPRE					
	AMS	100	SG	3.4	lb ai/a	LPRE					
3	carfentrazone	2	EC	.0156	lb ai/a	LPRE	1.0	6.3	3.3	9.3	8.7
	mesotrione	4	SC	.188	lb ai/a	LPRE					
	glyphosate	5.5	L	1.37	lb ai/a	LPRE					
	AMS	100	SG	3.4	lb ai/a	LPRE					
4	carfentrazone	2	EC	.0156	lb ai/a	LPRE	1.0	6.3	2.3	9.7	6.7
	indaziflam	1.67	SC	.065	lb ai/a	LPRE					
	glyphosate	5.5	L	1.37	lb ai/a	LPRE					
	AMS	100	SG	3.4	lb ai/a	LPRE					
5	carfentrazone	2	EC	.0156	lb ai/a	LPRE	1.0	4.7	4.7	9.0	2.7
	flumioxazin	51	WDG	0.191	lb ai/a	LPRE					
	glyphosate	5.5	L	1.37	lb ai/a	LPRE					
	AMS	100	SG	3.4	lb ai/a	LPRE					
6	pyraflufen	.177	SC	0.0028	lb ai/a	EPOS	1.3	4.0	3.3	7.0	6.7
	NIS	100	SL	0.25	% v/v	EPOS					
7	pyraflufen	.177	SC	0.0055	lb ai/a	EPOS	1.7	4.7	2.7	6.7	9.3
	NIS	100	SL	0.25	% v/v	EPOS					
8	pyraflufen	.177	SC	0.0028	lb ai/a	EPOS	2.0	3.0	2.0	8.0	6.0
	halosulfuron	75	WG	.047	lb ai/a	EPOS					
	NIS	100	SL	0.25	% v/v	EPOS					
9	pyraflufen	.177	SC	0.0028	lb ai/a	EPOS	1.3	9.3	2.3	7.0	5.0
	flazasulfuron	25	WG	.047	lb ai/a	EPOS					
	NIS	100	SL	0.25	% v/v	EPOS					
10	halosulfuron	75	WG	.047	lb ai/a	EPOS	1.0	2.0	2.7	9.7	5.7
	NIS	100	SL	0.25	% v/v	EPOS					
11	flazasulfuron	25	WG	.047	lb ai/a	EPOS	1.3	9.0	1.7	6.3	6.3
	NIS	100	SL	0.25	% v/v	EPOS					
12	untreated						1.0	8.7	4.3	6.3	7.7
LSD (P=.05)							0.80	6.29	3.46	4.12	5.57
Standard Deviation							0.47	3.71	2.04	2.43	3.29
CV							37.1	67.15	72.74	29.86	50.2

Weed Control in Grape with Flazasulfuron - HTRC 2012

Project Code: 132-12-03 **Location: East Lansing, MI**

Personnel: Bernard H. Zandstra
Crop: Grape **Variety: See notes**
Planting Method: Transplant **Planting Date: 1996** **Harvest Date:**
Spacing: 7 ft **Row Spacing: 10 ft**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 6 ft wide x 30 ft long

Soil Type: Capac Loam **OM: 2.2%** **pH: 6.7**
Sand: 54% **Silt: 31%** **Clay: 15%** **CEC: 6.6**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
EPRE	4/2/12	4:00 pm	58/60	F	Good	1-3 E	45	36% Cloudy	N
EPOS	5/22/12	2:15 pm	75/65	F	Dry	2-3 N	43	15% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
4/2	GRAPE		Bud-break	
4/2	QUGR = guackgrass	4-6″		Many
4/2	DAND = dandelion	3-4″, 4-6″		Many
4/2	HOWE = horseweed	1-3″, 2-4″		Moderate
4/2	WICA = wild carrot	1-3″, 2-5″		Moderate
4/2	ANBG = annual bluegrass			Many
5/22	GRAPE		Fruit set	
5/22	TAFE = tall fescue	8-10″		Few
5/22	QUGR = quackgrass	6-12″	Seed	Moderate
5/22	CABR = California brome	10-20″	Seed	Moderate
5/22	DAND = dandelion	2-10″	Flower	Moderate
5/22	WHCL = white clover	4-6″	Flower	Moderate
5/22	WICA = wild carrot	3-10″	Foliar	Moderate
	COMA = common mallow			
	PRKW = prostrate knotweed			

Notes and Comments
1. Varieties: Seyval, Vignoles, Frontenac, Marechal Foch
1. Spray applied with 2 nozzle boom. FF11002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer; one pass on each side of row.
2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.

Weed Control in Grape with Flazasulfuron - HTRC 2012

Weed Control in Grape with Flazasulfuron - HTRC 2012

Trial ID: 132-12-03 Study Director:
Location: East Lansing, MI Investigator: Dr. Bernard Zandstra

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage		ANBG	QUGR	DAND	WICA
	Crop Code						GRAPE				
	Rating Date						10/May/12	10/May/12	10/May/12	10/May/12	10/May/12
	Rating Type						RATING	RATING	RATING	RATING	RATING
	Rating Unit						1-10	1-10	1-10	1-10	1-10
1	untreated						1.0	1.7	3.0	1.0	1.0
2	flazasulfuron	25	WG	.045	lb ai/a	EPRE	1.0	6.7	8.7	7.3	1.3
3	flazasulfuron	25	WG	.045	lb ai/a	EPOS	1.0	1.0	6.0	1.0	1.0
	NIS	100	SL	0.25	%v/v	EPOS					
4	flazasulfuron	25	WG	.045	lb ai/a	EPRE	1.0	6.3	6.7	8.7	9.0
	oxyfluorfen	4	SC	1.5	lb ai/a	EPRE					
5	flazasulfuron	25	WG	.045	lb ai/a	EPOS	1.0	1.0	6.0	1.3	1.0
	oxyfluorfen	4	SC	1.5	lb ai/a	EPOS					
	NIS	100	SL	0.25	%v/v	EPOS					
6	flazasulfuron	25	WG	.045	lb ai/a	EPRE	1.0	6.0	6.0	5.7	5.3
	pendimethalin	3.8	CS	6	lb ai/a	EPRE					
7	flumioxazin	51	WDG	.383	lb ai/a	EPRE	1.0	2.3	6.7	4.7	1.0
8	rimsulfuron (M)	25	DF	.063	lb ai/a	EPRE	1.0	8.3	8.0	8.7	8.3
9	indaziflam	1.67	SC	.078	lb ai/a	EPRE	1.0	3.7	8.7	1.0	4.0
10	saflufenacil	70	WG	0.044	lb ai/a	EPOS	1.0	2.0	5.7	4.0	4.0
	MSO	100	SL	1	%v/v	EPOS					
11	flazasulfuron	25	WG	.045	lb ai/a	EPRE	1.0	8.0	8.3	9.0	6.7
	indaziflam	1.67	SC	.078	lb ai/a	EPRE					
12	flazasulfuron	25	WG	.045	lb ai/a	EPOS	1.0	3.3	4.0	4.0	4.0
	saflufenacil	70	WG	0.044	lb ai/a	EPOS					
	MSO	100	SL	1	%v/v	EPOS					
LSD (P=.05)							0.00	4.05	5.43	4.33	5.18
Standard Deviation							0.00	2.39	3.21	2.56	3.06
CV							0.0	56.97	49.57	54.46	78.68

Weed Control in Grape with Flazasulfuron - HTRC 2012

Pest Code							QUGR	TAFE	CABR	DAND
Crop Code						GRAPE				
Rating Date						22/May/12	22/May/12	22/May/12	22/May/12	22/May/12
Rating Type						RATING	RATING	RATING	RATING	RATING
Rating Unit						1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage				
1	untreated						1.0	5.7	9.0	7.0	1.0
2	flazasulfuron	25	WG	.045	lb ai/a	EPRE	1.0	7.7	10.0	7.3	8.7
3	flazasulfuron	25	WG	.045	lb ai/a	EPOS	1.0	8.3	10.0	6.7	1.0
	NIS	100	SL	0.25	%v/v	EPOS					
4	flazasulfuron	25	WG	.045	lb ai/a	EPRE	1.0	6.3	9.3	9.3	9.0
	oxyfluorfen	4	SC	1.5	lb ai/a	EPRE					
5	flazasulfuron	25	WG	.045	lb ai/a	EPOS	1.0	3.7	6.3	3.7	1.0
	oxyfluorfen	4	SC	1.5	lb ai/a	EPOS					
	NIS	100	SL	0.25	%v/v	EPOS					
6	flazasulfuron	25	WG	.045	lb ai/a	EPRE	1.0	2.7	10.0	6.7	7.0
	pendimethalin	3.8	CS	6	lb ai/a	EPRE					
7	flumioxazin	51	WDG	.383	lb ai/a	EPRE	1.0	5.3	9.3	6.0	1.0
8	rimsulfuron (M)	25	DF	.063	lb ai/a	EPRE	1.0	8.3	10.0	7.7	8.7
9	indaziflam	1.67	SC	.078	lb ai/a	EPRE	1.0	7.0	9.3	5.7	1.0
10	saflufenacil	70	WG	0.044	lb ai/a	EPOS	1.0	4.7	8.7	1.7	3.3
	MSO	100	SL	1	%v/v	EPOS					
11	flazasulfuron	25	WG	.045	lb ai/a	EPRE	1.0	6.7	10.0	8.7	8.0
	indaziflam	1.67	SC	.078	lb ai/a	EPRE					
12	flazasulfuron	25	WG	.045	lb ai/a	EPOS	1.0	6.3	9.0	6.7	4.7
	saflufenacil	70	WG	0.044	lb ai/a	EPOS					
	MSO	100	SL	1	%v/v	EPOS					
LSD (P=.05)							0.00	4.90	2.70	4.87	4.34
Standard Deviation							0.00	2.89	1.59	2.88	2.56
CV							0.0	47.75	17.22	44.84	56.56

Weed Control in Grape with Flazasulfuron - HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	WHCL	WICA	GRAPE	QUGR	CABR
Pest Code											
Crop Code									GRAPE		
Rating Date							22/May/12	22/May/12	20/Jun/12	20/Jun/12	20/Jun/12
Rating Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	untreated						4.7	1.0	1.0	5.3	6.3
2	flazasulfuron	25	WG	.045	lb ai/a	EPRE	10.0	6.0	1.0	6.7	10.0
3	flazasulfuron	25	WG	.045	lb ai/a	EPOS	5.0	1.0	1.0	9.3	9.7
	NIS	100	SL	0.25	%v/v	EPOS					
4	flazasulfuron	25	WG	.045	lb ai/a	EPRE	10.0	8.7	1.0	5.3	10.0
	oxyfluorfen	4	SC	1.5	lb ai/a	EPRE					
5	flazasulfuron	25	WG	.045	lb ai/a	EPOS	4.3	4.0	1.0	7.3	7.7
	oxyfluorfen	4	SC	1.5	lb ai/a	EPOS					
	NIS	100	SL	0.25	%v/v	EPOS					
6	flazasulfuron	25	WG	.045	lb ai/a	EPRE	7.0	7.0	1.0	4.0	8.0
	pendimethalin	3.8	CS	6	lb ai/a	EPRE					
7	flumioxazin	51	WDG	.383	lb ai/a	EPRE	4.0	3.0	1.0	7.0	5.7
8	rimsulfuron (M)	25	DF	.063	lb ai/a	EPRE	10.0	6.7	1.0	7.3	10.0
9	indaziflam	1.67	SC	.078	lb ai/a	EPRE	7.7	4.3	1.0	8.7	8.7
10	saflufenacil	70	WG	0.044	lb ai/a	EPOS	7.0	3.0	1.0	8.3	6.3
	MSO	100	SL	1	%v/v	EPOS					
11	flazasulfuron	25	WG	.045	lb ai/a	EPRE	10.0	5.3	1.0	7.0	10.0
	indaziflam	1.67	SC	.078	lb ai/a	EPRE					
12	flazasulfuron	25	WG	.045	lb ai/a	EPOS	7.0	6.3	1.0	7.7	9.7
	saflufenacil	70	WG	0.044	lb ai/a	EPOS					
	MSO	100	SL	1	%v/v	EPOS					
LSD (P=.05)							6.98	6.35	0.00	3.66	3.48
Standard Deviation							4.12	3.75	0.00	2.16	2.06
CV							57.08	79.87	0.0	30.84	24.21

Weed Control in Grape with Flazasulfuron - HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	HOWE	WICA	WHCL		QUGR
Pest Code											
Crop Code										GRAPE	
Rating Date							20/Jun/12	20/Jun/12	20/Jun/12	29/Jun/12	29/Jun/12
Rating Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	untreated						4.7	1.0	7.0	1.0	6.7
2	flazasulfuron	25	WG	.045	lb ai/a	EPRE	5.7	2.0	10.0	1.0	6.7
3	flazasulfuron	25	WG	.045	lb ai/a	EPOS	9.0	4.0	10.0	1.0	8.3
	NIS	100	SL	0.25	%v/v	EPOS					
4	flazasulfuron	25	WG	.045	lb ai/a	EPRE	10.0	7.3	10.0	1.0	4.0
	oxyfluorfen	4	SC	1.5	lb ai/a	EPRE					
5	flazasulfuron	25	WG	.045	lb ai/a	EPOS	9.7	4.3	10.0	1.0	5.3
	oxyfluorfen	4	SC	1.5	lb ai/a	EPOS					
	NIS	100	SL	0.25	%v/v	EPOS					
6	flazasulfuron	25	WG	.045	lb ai/a	EPRE	10.0	5.0	7.0	1.0	3.7
	pendimethalin	3.8	CS	6	lb ai/a	EPRE					
7	flumioxazin	51	WDG	.383	lb ai/a	EPRE	7.0	3.0	4.0	1.0	6.3
8	rimsulfuron (M)	25	DF	.063	lb ai/a	EPRE	6.3	2.0	10.0	1.0	6.7
9	indaziflam	1.67	SC	.078	lb ai/a	EPRE	2.3	7.0	10.0	1.0	8.0
10	saflufenacil	70	WG	0.044	lb ai/a	EPOS	9.7	3.0	10.0	1.0	6.3
	MSO	100	SL	1	%v/v	EPOS					
11	flazasulfuron	25	WG	.045	lb ai/a	EPRE	9.0	10.0	10.0	1.0	6.3
	indaziflam	1.67	SC	.078	lb ai/a	EPRE					
12	flazasulfuron	25	WG	.045	lb ai/a	EPOS	9.7	7.7	10.0	1.0	7.7
	saflufenacil	70	WG	0.044	lb ai/a	EPOS					
	MSO	100	SL	1	%v/v	EPOS					
LSD (P=.05)							4.67	4.37	4.15	0.00	4.35
Standard Deviation							2.76	2.58	2.45	0.00	2.57
CV							35.57	54.93	27.2	0.0	40.61

Weed Control in Grape with Flazasulfuron - HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	DAND	WHCL	WICA	GRAPE	QUGR
Pest Code							DAND	WHCL	WICA		QUGR
Crop Code										GRAPE	
Rating Date							29/Jun/12	29/Jun/12	29/Jun/12	7/Aug/12	7/Aug/12
Rating Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	untreated						4.3	4.3	4.0	1.0	5.0
2	flazasulfuron	25	WG	.045	lb ai/a	EPRE	5.0	8.7	6.3	1.0	5.7
3	flazasulfuron	25	WG	.045	lb ai/a	EPOS	9.0	10.0	3.3	1.0	7.0
	NIS	100	SL	0.25	%v/v	EPOS					
4	flazasulfuron	25	WG	.045	lb ai/a	EPRE	6.0	10.0	7.7	1.3	3.7
	oxyfluorfen	4	SC	1.5	lb ai/a	EPRE					
5	flazasulfuron	25	WG	.045	lb ai/a	EPOS	8.7	9.0	5.7	1.3	6.7
	oxyfluorfen	4	SC	1.5	lb ai/a	EPOS					
	NIS	100	SL	0.25	%v/v	EPOS					
6	flazasulfuron	25	WG	.045	lb ai/a	EPRE	4.7	6.3	4.0	1.0	3.3
	pendimethalin	3.8	CS	6	lb ai/a	EPRE					
7	flumioxazin	51	WDG	.383	lb ai/a	EPRE	4.7	3.7	1.7	1.0	7.0
8	rimsulfuron (M)	25	DF	.063	lb ai/a	EPRE	5.7	6.7	2.3	1.0	6.7
9	indaziflam	1.67	SC	.078	lb ai/a	EPRE	2.0	6.0	5.0	1.0	8.3
10	saflufenacil	70	WG	0.044	lb ai/a	EPOS	8.7	7.0	2.7	1.7	4.7
	MSO	100	SL	1	%v/v	EPOS					
11	flazasulfuron	25	WG	.045	lb ai/a	EPRE	2.3	7.0	7.3	1.0	6.0
	indaziflam	1.67	SC	.078	lb ai/a	EPRE					
12	flazasulfuron	25	WG	.045	lb ai/a	EPOS	9.7	7.7	6.0	1.0	6.0
	saflufenacil	70	WG	0.044	lb ai/a	EPOS					
	MSO	100	SL	1	%v/v	EPOS					
LSD (P=.05)							3.82	6.41	4.95	0.70	4.11
Standard Deviation							2.25	3.78	2.92	0.41	2.43
CV							38.28	52.59	62.67	37.29	41.59

Weed Control in Grape with Flazasulfuron - HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	HOWE	WICA	GRAPE	COMA	HOWE
Pest Code							HOWE	WICA		COMA	HOWE
Crop Code									GRAPE		
Rating Date							7/Aug/12	7/Aug/12	5/Sep/12	5/Sep/12	5/Sep/12
Rating Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	untreated						4.7	3.3	1.0	9.7	7.0
2	flazasulfuron	25	WG	.045	lb ai/a	EPRE	6.3	2.7	1.0	10.0	6.3
3	flazasulfuron	25	WG	.045	lb ai/a	EPOS	6.7	5.7	1.0	10.0	6.7
	NIS	100	SL	0.25	%v/v	EPOS					
4	flazasulfuron	25	WG	.045	lb ai/a	EPRE	10.0	8.0	1.0	10.0	10.0
	oxyfluorfen	4	SC	1.5	lb ai/a	EPRE					
5	flazasulfuron	25	WG	.045	lb ai/a	EPOS	8.0	4.7	1.0	10.0	8.3
	oxyfluorfen	4	SC	1.5	lb ai/a	EPOS					
	NIS	100	SL	0.25	%v/v	EPOS					
6	flazasulfuron	25	WG	.045	lb ai/a	EPRE	5.0	4.7	1.0	10.0	7.7
	pendimethalin	3.8	CS	6	lb ai/a	EPRE					
7	flumioxazin	51	WDG	.383	lb ai/a	EPRE	4.0	3.3	1.0	9.3	6.0
8	rimsulfuron (M)	25	DF	.063	lb ai/a	EPRE	7.3	3.7	1.0	4.3	7.3
9	indaziflam	1.67	SC	.078	lb ai/a	EPRE	2.7	4.0	1.0	10.0	6.0
10	saflufenacil	70	WG	0.044	lb ai/a	EPOS	7.0	4.3	1.7	10.0	8.3
	MSO	100	SL	1	%v/v	EPOS					
11	flazasulfuron	25	WG	.045	lb ai/a	EPRE	8.0	7.7	1.3	10.0	10.0
	indaziflam	1.67	SC	.078	lb ai/a	EPRE					
12	flazasulfuron	25	WG	.045	lb ai/a	EPOS	7.7	8.0	1.0	9.0	8.7
	saflufenacil	70	WG	0.044	lb ai/a	EPOS					
	MSO	100	SL	1	%v/v	EPOS					
LSD (P=.05)							3.57	4.52	0.64	2.56	4.17
Standard Deviation							2.11	2.67	0.38	1.51	2.46
CV							32.69	53.34	35.02	16.15	31.99

Weed Control in Grape with Flazasulfuron - HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	PRKW	WICA
Pest Code							PRKW	WICA
Crop Code								
Rating Date							5/Sep/12	5/Sep/12
Rating Type							RATING	RATING
Rating Unit							1-10	1-10
1	untreated						10.0	2.3
2	flazasulfuron	25	WG	.045	lb ai/a	EPRE	10.0	3.0
3	flazasulfuron	25	WG	.045	lb ai/a	EPOS	7.3	5.3
	NIS	100	SL	0.25	%v/v	EPOS		
4	flazasulfuron	25	WG	.045	lb ai/a	EPRE	7.0	9.0
	oxyfluorfen	4	SC	1.5	lb ai/a	EPRE		
5	flazasulfuron	25	WG	.045	lb ai/a	EPOS	5.3	5.3
	oxyfluorfen	4	SC	1.5	lb ai/a	EPOS		
	NIS	100	SL	0.25	%v/v	EPOS		
6	flazasulfuron	25	WG	.045	lb ai/a	EPRE	7.0	6.7
	pendimethalin	3.8	CS	6	lb ai/a	EPRE		
7	flumioxazin	51	WDG	.383	lb ai/a	EPRE	4.7	3.3
8	rimsulfuron (M)	25	DF	.063	lb ai/a	EPRE	7.0	4.0
9	indaziflam	1.67	SC	.078	lb ai/a	EPRE	7.0	4.3
10	saflufenacil	70	WG	0.044	lb ai/a	EPOS	9.0	4.3
	MSO	100	SL	1	%v/v	EPOS		
11	flazasulfuron	25	WG	.045	lb ai/a	EPRE	10.0	6.3
	indaziflam	1.67	SC	.078	lb ai/a	EPRE		
12	flazasulfuron	25	WG	.045	lb ai/a	EPOS	10.0	8.3
	saflufenacil	70	WG	0.044	lb ai/a	EPOS		
	MSO	100	SL	1	%v/v	EPOS		
LSD (P=.05)							5.53	4.71
Standard Deviation							3.27	2.78
CV							41.54	53.56

IR4 Grape - Mesotrione Efficacy HTRC 2012

Project Code: IR4-12-01 **Location: East Lansing, MI**

Personnel: Bernard H. Zandstra
Crop: Grape **Variety: Concord**
Planting Method: Transplant **Planting Date: 1967** **Harvest Date: 9/9/2012**
Spacing: 7 ft **Row Spacing: 10 ft**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 11 ft wide x 50 ft long

Soil Type: Capac loam **OM: 2.2%** **pH: 6.7**
Sand: 53% **Silt: 31%** **Clay: 15%** **CEC: 6.6**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
	4/26/12	11:20 am	57/53	F	Moist	4-6 NW	76	100% Cloudy	Y
	6/15/12	2:00 pm	88/75	F	Dry	0	43	0% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
4/26	GRAPE			
6/15	GRAPE			

ANBG = annual bluegrass
PERG = perennial ryegrass
TAFE = tall fescue
QUGR = quackgrass
CABR = California brome
COMA = common mallow
DAND = dandelion
FIBW = field bindweed
HOWE = horseweed
PRKW = prostrate knotweed
WHCL = white clover
WICA = wild carrot

Notes and Comments
1. Harvest: Sep. 9, 2012: all fruit from 2 vines/plot
2. Spray applied with 4 nozzle boom. FF8002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer. One pass on each side of row, directed to the soil.
3. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.

IR4 Grape - Mesotrione Efficacy HTRC 2012

IR4 Grape - Mesotrione Efficacy HTRC 2012

Trial ID: IR4-12-01 Study Director:
Location: East Lansing, MI Investigator: Dr. Bernard Zandstra

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage						
Pest Code								ANBG	TAFE	CABR	DAND	FIBW
Crop Code							GRAPE					
Rating Date							8/May/12	8/May/12	8/May/12	8/May/12	8/May/12	8/May/12
Rating Data Type							RATING	RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10	1-10
1	untreated						1.0	1.5	2.5	2.8	1.8	3.3
2	mesotrione	4	SC	0.195	lb ai/a	EPRE	1.0	2.0	2.5	2.5	5.5	6.8
	NIS	100	SL	0.25	% v/v	EPRE						
3	mesotrione	4	SC	0.390	lb ai/a	EPRE	1.0	5.5	4.5	3.0	7.0	5.0
	NIS	100	SL	0.25	% v/v	EPRE						
4	diuron	80	DF	3.0	lb ai/a	EPRE	1.0	6.8	8.0	6.0	7.8	2.0
	glyphosate	5.5	L	1.0	lb ai/a	EPRE						
	NIS	100	SL	0.25	% v/v	EPRE						
LSD (P=.05)							0.00	4.11	3.57	4.03	3.29	4.13
Standard Deviation							0.00	2.57	2.23	2.52	2.05	2.58
CV							0.0	65.33	50.97	70.68	37.36	60.75

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
Pest Code							WHCL		TAFE	CABR	DAND
Crop Code								GRAPE			
Rating Date							8/May/12	22/May/12	22/May/12	22/May/12	22/May/12
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	untreated						1.0	1.0	2.5	1.3	1.0
2	mesotrione	4	SC	0.195	lb ai/a	EPRE	5.0	1.0	4.8	2.5	6.8
	NIS	100	SL	0.25	% v/v	EPRE					
3	mesotrione	4	SC	0.390	lb ai/a	EPRE	5.5	1.0	2.8	1.8	5.5
	NIS	100	SL	0.25	% v/v	EPRE					
4	diuron	80	DF	3.0	lb ai/a	EPRE	8.3	1.0	9.0	7.0	6.3
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
	NIS	100	SL	0.25	% v/v	EPRE					
LSD (P=.05)							1.61	0.00	3.31	3.21	4.53
Standard Deviation							1.00	0.00	2.07	2.01	2.83
CV							20.32	0.0	43.54	64.22	58.12

IR4 Grape - Mesotrione Efficacy HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	FIBW	WHCL	GRAPE	CABR	FIBW
Rating Date							22/May/12	22/May/12	22/Jun/12	22/Jun/12	22/Jun/12
Rating Data Type							RATIGN	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	untreated						3.3	3.3	1.0	4.5	4.3
2	mesotrione	4	SC	0.195	lb ai/a	EPRE	6.0	3.0	1.0	3.5	3.8
	NIS	100	SL	0.25	% v/v	EPRE					
3	mesotrione	4	SC	0.390	lb ai/a	EPRE	2.5	4.3	1.0	2.3	1.5
	NIS	100	SL	0.25	% v/v	EPRE					
4	diuron	80	DF	3.0	lb ai/a	EPRE	1.8	9.3	1.0	6.0	4.0
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
	NIS	100	SL	0.25	% v/v	EPRE					
LSD (P=.05)							4.66	4.90	0.00	4.73	4.39
Standard Deviation							2.91	3.07	0.00	2.95	2.74
CV							86.24	62.08	0.0	72.73	81.29

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	HOWE	GRAPE	PERG	FIBW	HOWE
Rating Date							22/Jun/12	29/Jun/12	29/Jun/12	29/Jun/12	29/Jun/12
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	untreated						4.0	1.0	5.8	4.8	5.5
2	mesotrione	4	SC	0.195	lb ai/a	EPRE	9.0	1.0	4.3	5.5	10.0
	NIS	100	SL	0.25	% v/v	EPRE					
3	mesotrione	4	SC	0.390	lb ai/a	EPRE	10.0	1.0	5.0	2.3	9.5
	NIS	100	SL	0.25	% v/v	EPRE					
4	diuron	80	DF	3.0	lb ai/a	EPRE	10.0	1.0	7.3	6.0	10.0
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
	NIS	100	SL	0.25	% v/v	EPRE					
LSD (P=.05)							3.48	0.00	4.86	2.78	4.38
Standard Deviation							2.17	0.00	3.04	1.74	2.74
CV							26.34	0.0	54.61	37.62	31.3

IR4 Grape - Mesotrione Efficacy HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	WHCL		QUGR	DAND
Pest Code							WHCL		QUGR	DAND
Crop Code								GRAPE		
Rating Date							29/Jun/12	13/Jul/12	13/Jul/12	13/Jul/12
Rating Data Type							RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10
1	untreated						4.5	1.0	5.0	6.5
2	mesotrione	4	SC	0.195	lb ai/a	EPRE	3.0	1.3	3.8	8.8
	NIS	100	SL	0.25	% v/v	EPRE				
3	mesotrione	4	SC	0.390	lb ai/a	EPRE	4.3	1.0	5.3	9.5
	NIS	100	SL	0.25	% v/v	EPRE				
4	diuron	80	DF	3.0	lb ai/a	EPRE	9.3	1.3	10.0	8.8
	glyphosate	5.5	L	1.0	lb ai/a	EPRE				
	NIS	100	SL	0.25	% v/v	EPRE				
LSD (P=.05)							5.18	0.46	5.45	2.98
Standard Deviation							3.24	0.29	3.41	1.86
CV							61.72	25.66	56.79	22.25

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	FIBW	HOWE	WHCL	WICA	GRAPE
Pest Code							FIBW	HOWE	WHCL	WICA	
Crop Code											GRAPE
Rating Date							13/Jul/12	13/Jul/12	13/Jul/12	13/Jul/12	6/Aug/12
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10		1-10
1	untreated						5.0	3.3	3.5	7.8	1.0
2	mesotrione	4	SC	0.195	lb ai/a	EPRE	6.0	10.0	4.8	8.3	1.3
	NIS	100	SL	0.25	% v/v	EPRE					
3	mesotrione	4	SC	0.390	lb ai/a	EPRE	2.5	9.3	8.0	10.0	1.0
	NIS	100	SL	0.25	% v/v	EPRE					
4	diuron	80	DF	3.0	lb ai/a	EPRE	4.8	9.5	10.0	9.5	1.3
	glyphosate	5.5	L	1.0	lb ai/a	EPRE					
	NIS	100	SL	0.25	% v/v	EPRE					
LSD (P=.05)							5.52	3.69	6.33	4.72	0.46
Standard Deviation							3.45	2.31	3.96	2.95	0.29
CV							75.6	28.87	60.33	33.22	25.66

IR4 Grape - Mesotrione Efficacy HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	TAFE	FIBW	PRKW	WHCL	GRAPE	COMA
Pest Code												
Crop Code											GRAPE	
Rating Date							6/Aug/12	6/Aug/12	6/Aug/12	6/Aug/12	5/Sep/12	5/Sep/12
Rating Data Type							RATING	RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10	1-10
1	untreated						4.0	5.3	3.3	4.5	1.0	6.5
2	mesotrione	4	SC	0.195	lb ai/a	EPRE	6.0	4.8	1.0	7.8	1.0	8.8
	NIS	100	SL	0.25	% v/v	EPRE						
3	mesotrione	4	SC	0.390	lb ai/a	EPRE	4.3	2.3	2.3	8.8	1.0	10.0
	NIS	100	SL	0.25	% v/v	EPRE						
4	diuron	80	DF	3.0	lb ai/a	EPRE	9.8	4.0	6.3	10.0	1.3	5.0
	glyphosate	5.5	L	1.0	lb ai/a	EPRE						
	NIS	100	SL	0.25	% v/v	EPRE						
LSD (P=.05)							4.36	4.93	5.00	5.72	0.40	4.65
Standard Deviation							2.73	3.08	3.13	3.57	0.25	2.91
CV							45.47	75.9	98.14	46.12	23.53	38.44

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	FIBW	HOWE	PRKW	GRAPE
Pest Code										
Crop Code										GRAPE
Rating Date							5/Sep/12	5/Sep/12	5/Sep/12	9/Sep/12
Rating Data Type							RATING	RATING	RATING	KG/PLOT
Rating Unit							1-10	1-10	1-10	KG
1	untreated						5.0	4.3	5.0	12.79
2	mesotrione	4	SC	0.195	lb ai/a	EPRE	5.5	10.0	3.3	21.36
	NIS	100	SL	0.25	% v/v	EPRE				
3	mesotrione	4	SC	0.390	lb ai/a	EPRE	4.0	10.0	4.5	12.78
	NIS	100	SL	0.25	% v/v	EPRE				
4	diuron	80	DF	3.0	lb ai/a	EPRE	2.8	10.0	8.3	19.42
	glyphosate	5.5	L	1.0	lb ai/a	EPRE				
	NIS	100	SL	0.25	% v/v	EPRE				
LSD (P=.05)							3.62	3.16	6.40	19.807
Standard Deviation							2.26	1.97	4.00	12.384
CV							52.46	23.05	76.19	74.68

Weed Control in Raspberry – CRC 2012

Project Code: 131-12-01 **Location: Clarksville, MI**

Personnel: Bernard H. Zandstra
Crop: raspberry **Variety: Caroline**
Planting Method: Transplant **Planting Date: 2009** **Harvest Date: See data**
Spacing: solid row **Row Spacing: 10 ft**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 5.5 ft wide x 30 ft long

Soil Type: Lapeer Sandy Loam **OM: 4.0%** **pH: 6.7**
Sand: 35% **Silt: 41%** **Clay: 24%** **CEC: 9.7**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
EPRE	4/5/12	1:00 pm	51/40	F	Damp	9-11 E	46	15% Cloudy	N
EPOS,POSDIR	6/19/12	2:00 pm	95/79	F	Dry	4-8 SW	43	0% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
4/5	RASP = raspberry	4-6″,3-6′	3-5 leaves post green up	
6/19	RASP = raspberry			
6/19	TAFE – tall fescue	3-6″		Moderate
6/19	QUGR = quackgrass	6-10″		Moderate/many
6/19	CATH = Canada thistle	2-5″		Few
6/19	CUDO = curly dock	1-4″, 10-12″		Moderate
6/19	DAND = dandelion	2-5″, 3-10″		Many
6/19	HOWE = horseweed	2-4″		Few
6/19	PUDN = purple deadnettle	3-6″, 2-4″		Many
6/19	WIRA = wild radish	1-3″, 2-5″		Moderate
	YERO = yellow rocket			
	ROFB = rough fleabane			

Notes and Comments
1. Spray applied with 4 nozzle boom. FF8002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer. One pass over the row. EPOSDIR application with 2 nozzle boom on each side of row
2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.
3. Raspberries were mowed down to the soil in spring before herbicide application. Treatments were broadcast over the row before new growth emerged.

Weed Control in Raspberry – CRC 2012

Weed Control in Raspberry - CRC 2012

Trial ID: 131-12-01 Study Director:
Location: Clarksville, MI Investigator: Dr. Bernard Zandstra

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	RASP	QUGR	TAFE	DAND	YERO
	Pest Code							QUGR	TAFE	DAND	YERO
	Crop Code						RASP				
	Rating Date						16/May/12	16/May/12	16/May/12	16/May/12	16/May/12
	Rating Type						RATING	RATING	RATING	RATING	RATING
	Rating Unit						1-10	1-10	1-10	1-10	1-10
1	untreated						1.0	1.0	1.0	1.0	1.0
2	indaziflam	1.67	SC	0.033	lb ai/a	EPRE	3.7	9.3	8.7	10.0	10.0
	glufosinate	2.34	L	1	lb ai/a	EPRE					
3	indaziflam	1.67	SC	0.065	lb ai/a	EPRE	5.0	9.3	9.7	10.0	10.0
	glufosinate	2.34	L	1	lb ai/a	EPRE					
4	indaziflam	1.67	SC	0.13	lb ai/a	EPRE	5.3	7.0	7.0	10.0	10.0
	glufosinate	2.34	L	1	lb ai/a	EPRE					
5	indaziflam	1.67	SC	0.13	lb ai/a	EPRE	2.7	5.3	5.7	5.7	7.0
6	diuron	80	DF	3	lb ai/a	EPRE	1.3	7.0	8.7	6.0	6.3
7	terbacil	80	WDG	1.6	lb ai/a	EPRE	1.0	9.3	7.7	6.7	10.0
8	rimsulfuron (M)	25	DF	0.063	lb ai/a	EPRE	7.7	10.0	9.7	10.0	10.0
9	isoxaben	75	DF	1	lb ai/a	EPRE	1.0	1.7	3.0	4.3	7.3
10	flazasulfuron	25	WG	0.045	lb ai/a	EPRE	7.7	9.0	9.0	9.7	9.7
11	diuron	80	DF	2	lb ai/a	EPRE	1.0	6.7	4.0	5.7	10.0
	clopyralid	3	L	0.125	lb ai/a	EPOS					
	clethodim	.979	EC	0.12	lb ai/a	EPOS					
12	diuron	80	DF	2	lb ai/a	EPRE	1.0	1.0	1.7	4.3	6.3
	clopyralid	3	L	0.125	lb ai/a	EPOSDIR					
	clethodim	.97	EC	0.12	lb ai/a	EPOSDIR					
LSD (P=.05)							1.36	5.08	3.84	4.16	3.88
Standard Deviation							0.81	3.00	2.27	2.46	2.29
CV							25.22	46.95	35.99	35.35	28.17

Weed Control in Raspberry – CRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	RASP 12/Jun/12 RATING 1-10	QUGR 12/Jun/12 RATING 1-10	HOWE 12/Jun/12 RATING 1-10	ROFB 12/Jun/12 RATING 1-10	RASP 5/Jul/12 RATING 1-10
1	untreated						2.0	1.0	6.0	7.0	2.3
2	indaziflam	1.67	SC	0.033	lb ai/a	EPRE	1.7	7.0	10.0	10.0	1.0
	glufosinate	2.34	L	1	lb ai/a	EPRE					
3	indaziflam	1.67	SC	0.065	lb ai/a	EPRE	3.3	8.0	10.0	10.0	3.0
	glufosinate	2.34	L	1	lb ai/a	EPRE					
4	indaziflam	1.67	SC	0.13	lb ai/a	EPRE	3.3	9.7	10.0	10.0	2.7
	glufosinate	2.34	L	1	lb ai/a	EPRE					
5	indaziflam	1.67	SC	0.13	lb ai/a	EPRE	2.3	6.3	7.0	4.7	2.7
6	diuron	80	DF	3	lb ai/a	EPRE	2.0	7.3	8.7	7.7	2.7
7	terbacil	80	WDG	1.6	lb ai/a	EPRE	1.0	10.0	10.0	10.0	1.3
8	rimsulfuron (M)	25	DF	0.063	lb ai/a	EPRE	5.7	10.0	5.3	10.0	4.3
9	isoxaben	75	DF	1	lb ai/a	EPRE	3.7	1.3	7.3	2.3	4.0
10	flazasulfuron	25	WG	0.045	lb ai/a	EPRE	5.7	9.3	10.0	10.0	5.7
11	diuron	80	DF	2	lb ai/a	EPRE	1.7	7.3	5.0	8.3	2.0
	clopyralid	3	L	0.125	lb ai/a	EPOS					
	clethodim	.979	EC	0.12	lb ai/a	EPOS					
12	diuron	80	DF	2	lb ai/a	EPRE	2.3	2.0	6.3	7.0	2.3
	clopyralid	3	L	0.125	lb ai/a	EPOSDIR					
	clethodim	.97	EC	0.12	lb ai/a	EPOSDIR					
LSD (P=.05)							1.75	4.33	5.54	4.62	2.43
Standard Deviation							1.04	2.56	3.27	2.73	1.43
CV							35.86	38.69	41.01	33.78	50.57

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	QUGR 5/Jul/12 RATING 1-10	HOWE 5/Jul/12 RATING 1-10	ROFB 5/Jul/12 RATING 1-10	RASP 24/Jul/12 RATING 1-10	HOWE 24/Jul/12 RATING 1-10
1	untreated						4.7	5.7	7.0	3.3	4.0
2	indaziflam	1.67	SC	0.033	lb ai/a	EPRE	7.0	8.3	10.0	1.0	7.7
	glufosinate	2.34	L	1	lb ai/a	EPRE					
3	indaziflam	1.67	SC	0.065	lb ai/a	EPRE	5.0	8.7	10.0	2.3	8.7
	glufosinate	2.34	L	1	lb ai/a	EPRE					
4	indaziflam	1.67	SC	0.13	lb ai/a	EPRE	9.3	9.7	10.0	1.7	10.0
	glufosinate	2.34	L	1	lb ai/a	EPRE					
5	indaziflam	1.67	SC	0.13	lb ai/a	EPRE	4.7	6.3	4.0	2.3	7.0
6	diuron	80	DF	3	lb ai/a	EPRE	7.0	6.3	7.3	2.3	6.0
7	terbacil	80	WDG	1.6	lb ai/a	EPRE	10.0	10.0	10.0	1.0	10.0
8	rimsulfuron (M)	25	DF	0.063	lb ai/a	EPRE	9.7	3.0	9.7	3.0	3.0
9	isoxaben	75	DF	1	lb ai/a	EPRE	1.7	6.7	4.0	4.3	5.7
10	flazasulfuron	25	WG	0.045	lb ai/a	EPRE	5.0	8.7	10.0	5.3	6.0
11	diuron	80	DF	2	lb ai/a	EPRE	7.3	6.7	9.3	2.0	8.3
	clopyralid	3	L	0.125	lb ai/a	EPOS					
	clethodim	.979	EC	0.12	lb ai/a	EPOS					
12	diuron	80	DF	2	lb ai/a	EPRE	2.7	4.3	7.0	2.7	6.0
	clopyralid	3	L	0.125	lb ai/a	EPOSDIR					
	clethodim	.97	EC	0.12	lb ai/a	EPOSDIR					
LSD (P=.05)							5.13	5.09	4.58	1.96	4.93
Standard Deviation							3.03	3.00	2.70	1.16	2.91
CV							49.14	42.74	33.01	44.43	42.43

Weed Control in Raspberry – CRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	RASP 16/Aug/12 KG/PLOT KG	RASP 24/Aug/12 KG/PLOT KG	RASP 30/Aug/12 KG/PLOT KG	RASP 6/Sep/12 KG/PLOT KG	RASP 13/Sep/12 KG/PLOT KG
1	untreated						0.245	0.259	0.445	0.526	0.507
2	indaziflam	1.67	SC	0.033	lb ai/a	EPRE	0.001	0.000	0.029	0.168	0.480
	glufosinate	2.34	L	1	lb ai/a	EPRE					
3	indaziflam	1.67	SC	0.065	lb ai/a	EPRE	0.014	0.028	0.028	0.145	0.390
	glufosinate	2.34	L	1	lb ai/a	EPRE					
4	indaziflam	1.67	SC	0.13	lb ai/a	EPRE	0.003	0.017	0.082	0.105	0.440
	glufosinate	2.34	L	1	lb ai/a	EPRE					
5	indaziflam	1.67	SC	0.13	lb ai/a	EPRE	0.083	0.081	0.178	0.191	0.493
6	diuron	80	DF	3	lb ai/a	EPRE	0.180	0.270	0.497	0.444	0.503
7	terbacil	80	WDG	1.6	lb ai/a	EPRE	0.138	0.271	0.582	0.558	0.617
8	rimsulfuron (M)	25	DF	0.063	lb ai/a	EPRE	0.053	0.053	0.112	0.071	0.120
9	isoxaben	75	DF	1	lb ai/a	EPRE	0.235	0.279	0.591	0.375	0.307
10	flazasulfuron	25	WG	0.045	lb ai/a	EPRE	0.019	0.038	0.049	0.050	0.113
11	diuron	80	DF	2	lb ai/a	EPRE	0.130	0.187	0.533	0.621	0.657
	clopyralid	3	L	0.125	lb ai/a	EPOS					
	clethodim	.979	EC	0.12	lb ai/a	EPOS					
12	diuron	80	DF	2	lb ai/a	EPRE	0.321	0.183	0.415	0.409	0.553
	clopyralid	3	L	0.125	lb ai/a	EPOSDIR					
	clethodim	.97	EC	0.12	lb ai/a	EPOSDIR					
LSD (P=.05)							0.1941	0.1751	0.2200	0.2446	0.2837
Standard Deviation							0.1146	0.1034	0.1299	0.1445	0.1675
CV							96.81	74.43	44.03	47.3	38.81

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	RASP 20/Sep/12 KG/PLOT KG	RASP 27/Sep/12 KG/PLOT KG	RASP 4/Oct/12 KG/PLOT KG	RASP TOTAL KG/PLOT
1	untreated						0.450	0.483	0.564	3.478
2	indaziflam	1.67	SC	0.033	lb ai/a	EPRE	0.943	1.213	1.369	4.203
	glufosinate	2.34	L	1	lb ai/a	EPRE				
3	indaziflam	1.67	SC	0.065	lb ai/a	EPRE	0.673	0.733	0.934	2.946
	glufosinate	2.34	L	1	lb ai/a	EPRE				
4	indaziflam	1.67	SC	0.13	lb ai/a	EPRE	0.640	0.620	1.027	2.935
	glufosinate	2.34	L	1	lb ai/a	EPRE				
5	indaziflam	1.67	SC	0.13	lb ai/a	EPRE	0.547	0.873	1.089	3.535
6	diuron	80	DF	3	lb ai/a	EPRE	0.463	0.477	0.631	3.465
7	terbacil	80	WDG	1.6	lb ai/a	EPRE	0.703	0.747	0.937	4.553
8	rimsulfuron (M)	25	DF	0.063	lb ai/a	EPRE	0.197	0.310	0.567	1.483
9	isoxaben	75	DF	1	lb ai/a	EPRE	0.267	0.287	0.313	2.653
10	flazasulfuron	25	WG	0.045	lb ai/a	EPRE	0.080	0.143	0.239	0.731
11	diuron	80	DF	2	lb ai/a	EPRE	0.667	0.807	0.946	4.547
	clopyralid	3	L	0.125	lb ai/a	EPOS				
	clethodim	.979	EC	0.12	lb ai/a	EPOS				
12	diuron	80	DF	2	lb ai/a	EPRE	0.527	0.757	0.779	3.944
	clopyralid	3	L	0.125	lb ai/a	EPOSDIR				
	clethodim	.97	EC	0.12	lb ai/a	EPOSDIR				
LSD (P=.05)							0.2820	0.3569	0.5141	1.5524
Standard Deviation							0.1665	0.2108	0.3036	0.9167
CV							32.45	33.95	38.78	28.59

Crop Safety on Caneberry with Quinclorac – HTRC 2012

Project Code: 131-12-02 **Location: East Lansing, MI**

Personnel: Bernard H. Zandstra
Crop: Caneberry **Variety: Caroline**
Planting Method: Transplant **Planting Date: 2009** **Harvest Date: See data**
Spacing: 1 ft **Row Spacing: 10 ft**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 11 ft wide x 30 ft long; one pass on each side of row

Soil Type: Capac loam **OM: 1.4%** **pH: 7.0**
Sand: 60% **Silt: 24%** **Clay: 15%** **CEC: 6.0**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	3/22/12	3:00 pm	88/64	F	Moist	1-3 SW	42	5% Cloudy	N
LPOS	7/27/12	10:20 am	77/75	F	Moist	1-3 SW	87	50% Cloudy	Light

Crop and Weed Information at Application

	Height or Diameter	Growth Stage	Density

QUGR = Quackgrass
REFE = red fescue
BHPL = buckhorn plantain
DAND = dandelion
MECR = mouseear cress
CATH = Canada thistle
PUDN = purple deadnettle
PEST = perennial sowthistle
COMW = common mallow
WHCL = white clover
WICA = wild carrot

Notes and Comments
1. Spray applied with 4 nozzle boom. FF8002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer. One pass on each side of rows.
2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.

Crop Safety on Caneberry with Quinclorac – HTRC 2012

Crop Safety on Caneberry with Quinclorac – HTRC 2011 - 2012

Trial ID: 131-12-02 Study Director:
Location: East Lansing, MI Investigator: Dr. Bernard Zandstra

Pest Code							QUGR	BHPL	CATH	CUDO
Crop Code						RASP				
Rating Date						18/May/11	18/May/11	18/May/11	18/May/11	18/May/11
Rating Type						RATING	RATING	RATING	RATING	RATING
Rating Unit						1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage				
1	handweeded						1.0	8.3	8.5	8.3	8.0
2	quinclorac	3.8	L	0.375	lb ai/a	PRE, LPOS	1.3	3.5	6.3	7.0	5.8
	COC	100	SL	2.0	pt/a	PRE, LPOS					
3	quinclorac	3.8	L	0.75	lb ai/a	PRE, LPOS	1.5	8.5	9.5	9.3	7.5
	COC	100	SL	2.0	pt/a	PRE, LPOS					
4	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE, LPOS	1.5	5.5	7.5	6.3	6.8
	COC	100	SL	2.0	pt/a	PRE, LPOS					
LSD (P=.05)							1.31	2.62	3.07	4.10	4.68
Standard Deviation							0.82	1.64	1.92	2.56	2.92
CV							62.53	25.4	24.15	33.32	41.79

Pest Code							DAND	WICA		QUGR	CATH
Crop Code									RASP		
Rating Date							18/May/11	18/May/11	26/May/11	26/May/11	26/May/11
Rating Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
1	handweeded						7.3	8.5	1.0	4.5	4.5
2	quinclorac	3.8	L	0.375	lb ai/a	PRE, LPOS	2.8	8.8	1.0	9.0	9.8
	COC	100	SL	2.0	pt/a	PRE, LPOS					
3	quinclorac	3.8	L	0.75	lb ai/a	PRE, LPOS	7.8	10.0	1.0	5.8	8.0
	COC	100	SL	2.0	pt/a	PRE, LPOS					
4	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE, LPOS	4.8	7.5	1.0	5.3	5.3
	COC	100	SL	2.0	pt/a	PRE, LPOS					
LSD (P=.05)							3.63	2.56	0.00	4.32	3.96
Standard Deviation							2.27	1.60	0.00	2.70	2.48
CV							40.3	18.43	0.0	44.13	36.04

Crop Safety on Caneberry with Quinclorac – HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	CUDO	DAND	WICA	RASP	QUGR
	Pest Code										
	Crop Code										
	Rating Date						26/May/11	26/May/11	26/May/11	10/Jun/11	10/Jun/11
	Rating Type						RATING	RATING	RATING	RATING	RATING
	Rating Unit						1-10	1-10	1-10	1-10	1-10
1	handweeded						5.8	4.5	5.8	1.8	6.8
2	quinclorac	3.8	L	0.375	lb ai/a	PRE, LPOS	10.0	8.8	10.0	1.8	5.5
	COC	100	SL	2.0	pt/a	PRE, LPOS					
3	quinclorac	3.8	L	0.75	lb ai/a	PRE, LPOS	6.3	5.8	6.3	1.5	7.3
	COC	100	SL	2.0	pt/a	PRE, LPOS					
4	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE, LPOS	5.3	3.5	5.3	1.3	6.3
	COC	100	SL	2.0	pt/a	PRE, LPOS					
LSD (P=.05)							5.17	3.40	5.17	1.07	2.45
Standard Deviation							3.23	2.13	3.23	0.67	1.53
CV							47.45	37.83	47.45	43.0	23.76

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	BHPL	CUDO	DAND	WICA	RASP
	Pest Code										
	Crop Code										
	Rating Date						10/Jun/11	10/Jun/11	10/Jun/11	10/Jun/11	29/Aug/11
	Rating Type						RATING	RATING	RATING	RATING	RATING
	Rating Unit						1-10	1-10	1-10	1-10	1-10
1	handweeded						7.3	7.3	7.3	7.3	2.8
2	quinclorac	3.8	L	0.375	lb ai/a	PRE, LPOS	5.0	5.0	5.0	5.0	2.3
	COC	100	SL	2.0	pt/a	PRE, LPOS					
3	quinclorac	3.8	L	0.75	lb ai/a	PRE, LPOS	7.5	7.8	7.5	7.8	2.3
	COC	100	SL	2.0	pt/a	PRE, LPOS					
4	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE, LPOS	6.3	6.3	6.3	6.3	2.3
	COC	100	SL	2.0	pt/a	PRE, LPOS					
LSD (P=.05)							2.87	2.97	2.87	2.97	1.03
Standard Deviation							1.80	1.86	1.80	1.86	0.65
CV							27.62	28.31	27.62	28.31	27.18

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	QUGR	BHPL	WHCL	WICA	RASP
	Pest Code										
	Crop Code										
	Rating Date						29/Aug/11	29/Aug/11	29/Aug/11	29/Aug/11	26/Aug/11
	Rating Type						RATING	RATING	RATING	RATING	Harvest
	Rating Unit						1-10	1-10	1-10	1-10	KG/PLOT
1	handweeded						3.0	3.7	7.8	3.5	0.490
2	quinclorac	3.8	L	0.375	lb ai/a	PRE, LPOS	3.3	4.3	7.8	4.0	0.640
	COC	100	SL	2.0	pt/a	PRE, LPOS					
3	quinclorac	3.8	L	0.75	lb ai/a	PRE, LPOS	3.5	4.5	6.8	3.5	0.674
	COC	100	SL	2.0	pt/a	PRE, LPOS					
4	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE, LPOS	3.0	4.8	7.5	3.5	0.697
	COC	100	SL	2.0	pt/a	PRE, LPOS					
LSD (P=.05)							1.77	3.10	1.85	1.48	0.5904

Crop Safety on Caneberry with Quinclorac – HTRC 2012

Standard Deviation						1.11	1.90	1.16	0.93	0.3691
CV						34.78	44.3	15.57	25.6	59.06

Pest Code										QUGR
Crop Code						RASP	RASP	RASP	RASP	
Rating Date						31/Aug/11	8/Sep/11	2011	29/Mar/12	29/Mar/12
Rating Type						Harvest	Harvest	TOTAL	RATING	RATING
Rating Unit						KG/PLOT	KG/PLOT	KG/PLOT	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage				
1	handweeded						1.129	1.575	3.194	1.3	4.5
2	quinclorac	3.8	L	0.375	lb ai/a	PRE, LPOS	1.369	2.144	4.152	1.5	2.5
	COC	100	SL	2.0	pt/a	PRE, LPOS					
3	quinclorac	3.8	L	0.75	lb ai/a	PRE, LPOS	1.640	1.320	3.634	1.3	2.8
	COC	100	SL	2.0	pt/a	PRE, LPOS					
4	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE, LPOS	1.442	1.541	3.679	1.3	2.8
	COC	100	SL	2.0	pt/a	PRE, LPOS					
LSD (P=.05)							1.0261	0.6887	1.7386	0.93	1.94
Standard Deviation							0.6415	0.4306	1.0870	0.58	1.21
CV							45.99	26.18	29.66	44.44	38.83

Pest Code							BHPL	DAND	MECR		QUGR
Crop Code										RASP	
Rating Date							29/Mar/12	29/Mar/12	29/Mar/12	7/Apr/12	7/Apr/12
Rating Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
1	handweeded						5.5	5.5	10.0	1.3	3.0
2	quinclorac	3.8	L	0.375	lb ai/a	PRE, LPOS	4.3	4.3	10.0	1.3	2.5
	COC	100	SL	2.0	pt/a	PRE, LPOS					
3	quinclorac	3.8	L	0.75	lb ai/a	PRE, LPOS	3.5	3.8	10.0	1.3	4.0
	COC	100	SL	2.0	pt/a	PRE, LPOS					
4	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE, LPOS	4.3	2.8	10.0	1.5	3.5
	COC	100	SL	2.0	pt/a	PRE, LPOS					
LSD (P=.05)							2.98	2.23	0.00	1.20	3.39
Standard Deviation							1.86	1.40	0.00	0.75	2.12
CV							42.59	34.39	0.0	57.14	65.27

Pest Code							BHPL	CATH	DAND	PUDN		QUGR
Crop Code											RASP	
Rating Date							7/Apr/12	7/Apr/12	7/Apr/12	7/Apr/12	4/May/12	4/May/12
Rating Type							RATING	RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage						
1	handweeded						7.3	10.0	5.8	8.5	1.8	3.5
2	quinclorac	3.8	L	0.375	lb ai/a	PRE, LPOS	6.3	9.5	5.8	7.5	1.8	3.5
	COC	100	SL	2.0	pt/a	PRE, LPOS						
3	quinclorac	3.8	L	0.75	lb ai/a	PRE, LPOS	6.3	10.0	6.3	8.0	1.8	3.5
	COC	100	SL	2.0	pt/a	PRE, LPOS						
4	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE, LPOS	5.5	10.0	4.5	7.3	1.5	4.8
	COC	100	SL	2.0	pt/a	PRE, LPOS						
LSD (P=.05)							3.52	0.80	2.48	1.77	1.77	3.46
Standard Deviation							2.20	0.50	1.55	1.11	1.11	2.16
CV							34.85	5.06	27.83	14.19	65.7	56.7

Crop Safety on Caneberry with Quinclorac – HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	BHPL	CATH	DAND	RASP	REFE
Pest Code											
Crop Code										RASP	
Rating Date							4/May/12	4/May/12	4/May/12	3/Aug/12	3/Aug/12
Rating Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	handweeded						7.5	9.0	7.0	4.5	6.0
2	quinclorac	3.8	L	0.375	lb ai/a	PRE, LPOS	6.8	8.0	3.3	4.8	5.8
	COC	100	SL	2.0	pt/a	PRE, LPOS					
3	quinclorac	3.8	L	0.75	lb ai/a	PRE, LPOS	7.5	9.5	7.8	4.3	5.8
	COC	100	SL	2.0	pt/a	PRE, LPOS					
4	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE, LPOS	5.5	8.0	5.3	4.8	5.3
	COC	100	SL	2.0	pt/a	PRE, LPOS					
LSD (P=.05)							2.70	2.71	2.39	5.13	3.35
Standard Deviation							1.69	1.69	1.49	3.21	2.10
CV							24.74	19.61	25.69	70.29	36.86

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	BHPL	DAND	HOWE	PEST	WHCL
Pest Code											
Crop Code											
Rating Date							3/Aug/12	3/Aug/12	3/Aug/12	3/Aug/12	3/Aug/12
Rating Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	handweeded						5.3	3.0	5.0	4.3	2.0
2	quinclorac	3.8	L	0.375	lb ai/a	PRE, LPOS	4.8	4.0	4.8	8.8	10.0
	COC	100	SL	2.0	pt/a	PRE, LPOS					
3	quinclorac	3.8	L	0.75	lb ai/a	PRE, LPOS	3.0	6.8	6.3	10.0	10.0
	COC	100	SL	2.0	pt/a	PRE, LPOS					
4	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE, LPOS	4.0	2.0	4.3	4.3	3.8
	COC	100	SL	2.0	pt/a	PRE, LPOS					
LSD (P=.05)							5.28	3.58	6.99	3.40	2.80
Standard Deviation							3.30	2.24	4.37	2.12	1.75
CV							77.64	56.83	86.37	31.16	27.18

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	RASP	REFE	BHPL	HOWE	PEST
Pest Code								REFE	BHPL	HOWE	PEST
Crop Code							RASP				
Rating Date							10/Aug/12	10/Aug/12	10/Aug/12	10/Aug/12	10/Aug/12
Rating Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	handweeded						4.3	5.5	3.8	4.0	3.0
2	quinclorac	3.8	L	0.375	lb ai/a	PRE, LPOS	4.5	4.8	3.0	4.8	6.8
	COC	100	SL	2.0	pt/a	PRE, LPOS					
3	quinclorac	3.8	L	0.75	lb ai/a	PRE, LPOS	4.0	4.5	3.0	5.0	7.0
	COC	100	SL	2.0	pt/a	PRE, LPOS					
4	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE, LPOS	4.3	5.3	2.8	4.5	5.5
	COC	100	SL	2.0	pt/a	PRE, LPOS					
LSD (P=.05)							5.24	2.64	2.63	3.66	3.46
Standard Deviation							3.27	1.65	1.64	2.29	2.16
CV							77.05	33.0	52.53	50.12	38.86

Crop Safety on Caneberry with Quinclorac – HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	COMW	DAND	HOWE	PEST	WHCL
	Pest Code										
	Crop Code										
	Rating Date						31/Aug/12	31/Aug/12	31/Aug/12	31/Aug/12	31/Aug/12
	Rating Type						RATING	RATING	RATING	RATING	RATING
	Rating Unit						1-10	1-10	1-10	1-10	1-10
1	handweeded						7.8	4.8	4.8	2.8	4.0
2	quinclorac	3.8	L	0.375	lb ai/a	PRE, LPOS	10.0	7.3	6.8	6.5	8.0
	COC	100	SL	2.0	pt/a	PRE, LPOS					
3	quinclorac	3.8	L	0.75	lb ai/a	PRE, LPOS	9.5	5.8	4.0	5.0	8.0
	COC	100	SL	2.0	pt/a	PRE, LPOS					
4	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE, LPOS	6.0	6.5	3.3	6.0	6.0
	COC	100	SL	2.0	pt/a	PRE, LPOS					
LSD (P=.05)							2.62	2.53	3.94	3.99	7.46
Standard Deviation							1.64	1.58	2.46	2.50	4.67
CV							19.67	26.12	52.53	49.3	71.79

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	WHCL	WICA	RASP	REFE	BHPL
	Pest Code										
	Crop Code										
	Rating Date						10/Aug/12	10/Aug/12	31/Aug/12	31/Aug/12	31/Aug/12
	Rating Type						RATING	RATING	RATING	RATING	RATING
	Rating Unit						1-10	1-10	1-10	1-10	1-10
1	handweeded						2.5	5.5	4.8	6.0	3.0
2	quinclorac	3.8	L	0.375	lb ai/a	PRE, LPOS	9.5	6.0	4.3	6.5	2.8
	COC	100	SL	2.0	pt/a	PRE, LPOS					
3	quinclorac	3.8	L	0.75	lb ai/a	PRE, LPOS	9.8	7.5	4.0	5.0	2.3
	COC	100	SL	2.0	pt/a	PRE, LPOS					
4	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE, LPOS	3.8	7.8	4.5	5.5	3.3
	COC	100	SL	2.0	pt/a	PRE, LPOS					
LSD (P=.05)							2.98	4.15	4.39	1.89	1.65
Standard Deviation							1.86	2.59	2.74	1.18	1.03
CV							29.23	38.79	62.71	20.5	36.65

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	RASP	RASP	RASP	RASP
	Pest Code									
	Crop Code									
	Rating Date						13/Aug/12	22/Aug/12	29/Aug/12	5/Sep/12
	Rating Type						KG/PLOT	KG/PLOT	KG/PLOT	KG/PLOT
	Rating Unit						KG	KG	KG	KG
1	handweeded						0.244	0.249	0.232	0.289
2	quinclorac	3.8	L	0.375	lb ai/a	PRE, LPOS	0.211	0.302	0.317	0.383
	COC	100	SL	2.0	pt/a	PRE, LPOS				
3	quinclorac	3.8	L	0.75	lb ai/a	PRE, LPOS	0.304	0.323	0.421	0.683
	COC	100	SL	2.0	pt/a	PRE, LPOS				
4	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE, LPOS	0.271	0.289	0.330	0.326
	COC	100	SL	2.0	pt/a	PRE, LPOS				
LSD (P=.05)							0.2977	0.3389	0.3427	0.3364
Standard Deviation							0.1861	0.2119	0.2142	0.2103
CV							72.39	72.9	65.94	50.06

Crop Safety on Caneberry with Quinclorac – HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	RASP 12/Sep/12 KG/PLOT	RASP 2012 TOTAL KG/PLOT
1	handweeded						0.348	1.360
2	quinclorac	3.8	L	0.375	lb ai/a	PRE, LPOS	0.447	1.659
	COC	100	SL	2.0	pt/a	PRE, LPOS		
3	quinclorac	3.8	L	0.75	lb ai/a	PRE, LPOS	0.596	2.326
	COC	100	SL	2.0	pt/a	PRE, LPOS		
4	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE, LPOS	0.393	1.609
	COC	100	SL	2.0	pt/a	PRE, LPOS		
LSD (P=.05)							0.4192	1.502231
Standard Deviation							0.2621	0.939202
CV							58.81	54.03

Crop Safety on Caneberry with Pendimethalin – HTRC 2012

Project Code: 131-12-03 **Location: East Lansing, MI**

Personnel: Bernard H. Zandstra
Crop: Caneberry **Variety: Caroline**
Planting Method: Transplant **Planting Date: 2009** **Harvest Date: See Data**
Spacing: 1 ft **Row Spacing: 10 ft**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 11 ft wide x 30 ft long;one pass on each side of row

Soil Type: Capac loam **OM: 1.4%** **pH: 7.0**
Sand: 60% **Silt: 24%** **Clay: 15%** **CEC: 6.0**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	5/4/12	2:00 pm	72/65	F	Wet	3-5 SE	88	50% Cloudy	N
POSHARV	9/25/12	10:am	60/54	F	Dry	5-6 SW	62	70% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
5/4	Caneberry	3″, 12″		

REFE = red fescue
QUGR = quackgrass
BHPL = buckhorn plantain
CATH = Canada thistle
COMW = common milkweed
CUDO = curly dock
DAND = dandelion
HOWE = horseweed
PEST = perennial sowthistle
WHCL = white clover
WICA = wild carrot

Notes and Comments
1. Spray applied with 4 nozzle boom. FF8002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer. One pass on each sideof row.
2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.

Crop Safety on Caneberry with Pendimethalin – HTRC 2012

Crop Safety on Caneberry with Pendimethalin – HTRC 2012

Trial ID: 131-12-03 Study Director:
Location: East Lansing, MI Investigator: Dr. Bernard Zandstra

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	RASP	QUGR	BHPL	CATH	DAND
	Pest Code							QUGR	BHPL	CATH	DAND
	Crop Code						RASP				
	Rating Date						9/May/11	9/May/11	9/May/11	9/May/11	9/May/11
	Rating Type						RATING	RATING	RATING	RATING	RATING
	Rating Unit						1-10	1-10	1-10	1-10	1-10
1	handweeded						2.0	5.0	6.0	7.5	3.0
2	pendimethalin	3.8	CS	3	lb ai/a	PRE, POSHARV	2.0	5.8	5.5	7.3	3.0
3	pendimethalin	3.8	CS	6	lb ai/a	PRE, POSHARV	2.3	5.3	6.3	9.0	2.3
4	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	2.0	5.5	5.3	7.0	2.3
LSD (P=.05)							1.51	0.96	1.25	1.73	1.33
Standard Deviation							0.95	0.60	0.78	1.08	0.83
CV							45.89	11.18	13.6	14.09	31.75

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	WICA	RASP	QUGR	BHPL	CUDO
	Pest Code						WICA		QUGR	BHPL	CUDO
	Crop Code							RASP			
	Rating Date						9/May/11	10/Jun/11	10/Jun/11	10/Jun/11	10/Jun/11
	Rating Type						RATING	RATING	RATING	RATING	RATING
	Rating Unit						1-10	1-10	1-10	1-10	1-10
1	handweeded						4.0	1.3	4.8	3.8	6.8
2	pendimethalin	3.8	CS	3	lb ai/a	PRE, POSHARV	5.5	1.3	5.5	5.3	8.8
3	pendimethalin	3.8	CS	6	lb ai/a	PRE, POSHARV	6.0	1.0	6.8	5.3	7.7
4	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	5.0	1.0	5.5	6.3	8.0
LSD (P=.05)							1.28	0.60	1.87	1.48	4.73
Standard Deviation							0.80	0.37	1.17	0.93	2.83
CV							15.6	33.13	20.74	18.11	36.33

Crop Safety on Caneberry with Pendimethalin – HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	DAND	WICA	RASP	QUGR	BHPL
Pest Code											
Crop Code									RASP		
Rating Date							10/Jun/11	10/Jun/11	6/Jul/11	6/Jul/11	6/Jul/11
Rating Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	handweeded						5.5	2.5	1.8	3.3	4.0
2	pendimethalin	3.8	CS	3	lb ai/a	PRE, POSHARV	6.3	5.8	1.5	4.3	5.0
3	pendimethalin	3.8	CS	6	lb ai/a	PRE, POSHARV	5.8	5.8	1.0	3.8	5.5
4	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	5.5	6.3	1.0	3.8	5.5
LSD (P=.05)							2.72	2.17	0.93	1.64	1.73
Standard Deviation							1.70	1.36	0.58	1.03	1.08
CV							29.56	26.8	44.44	27.4	21.6

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	CATH	DAND	RASP	QUGR	BHPL
Pest Code											
Crop Code									RASP		
Rating Date							6/Jul/11	6/Jul/11	10/Oct/11	10/Oct/11	10/Oct/11
Rating Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	handweeded						6.8	4.0	2.0	3.5	5.5
2	pendimethalin	3.8	CS	3	lb ai/a	PRE, POSHARV	7.3	4.5	2.5	3.3	6.8
3	pendimethalin	3.8	CS	6	lb ai/a	PRE, POSHARV	7.5	6.8	1.8	3.3	5.0
4	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	8.3	5.8	1.5	4.0	5.8
LSD (P=.05)							2.56	2.53	0.77	2.06	4.65
Standard Deviation							1.60	1.58	0.48	1.26	2.91
CV							21.52	30.12	24.71	35.83	50.54

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	DAND	HOWE	RASP	RASP	RASP
Pest Code											
Crop Code									RASP	RASP	RASP
Rating Date							10/Oct/11	10/Oct/11	26/Aug/11	31/Aug/11	8/Sep/11
Rating Type							RATING	RATING	Harvest	Harvest	Harvest
Rating Unit							1-10	1-10	KG/PLOT	KG/PLOT	KG/PLOT
1	handweeded						6.5	5.5	0.463	1.225	1.783
2	pendimethalin	3.8	CS	3	lb ai/a	PRE, POSHARV	4.0	4.0	0.720	1.316	1.853
3	pendimethalin	3.8	CS	6	lb ai/a	PRE, POSHARV	3.5	3.0	0.611	1.441	1.795
4	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	3.3	4.3	0.583	1.414	1.538
LSD (P=.05)							2.72	3.99	0.3913	0.9779	1.3407
Standard Deviation							1.70	2.50	0.2447	0.6114	0.8382
CV							39.46	59.6	41.15	45.33	48.12

Crop Safety on Caneberry with Pendimethalin – HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	Pest Code	Crop Code	Rating Date	Rating Type	Rating Unit	QUGR	DAND	HOWE
								RASP	RASP					
								2011	4/Jun/12	4/Jun/12	4/Jun/12	4/Jun/12	4/Jun/12	4/Jun/12
								TOTAL	RATING	RATING	RATING	RATING	RATING	RATING
								KG/PLOT	1-10	1-10	1-10	1-10	1-10	1-10
1	handweeded							3.471	2.3	2.0	1.8	2.0		
2	pendimethalin	3.8	CS	3	lb ai/a	PRE, POSHARV		3.889	2.8	1.3	3.5	2.5		
3	pendimethalin	3.8	CS	6	lb ai/a	PRE, POSHARV		3.847	2.0	1.5	3.3	2.3		
4	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE		3.535	2.3	1.8	1.8	2.0		
LSD (P=.05)								1.1201	2.64	1.03	3.11	1.01		
Standard Deviation								0.7003	1.65	0.65	1.95	0.63		
CV								19.0	71.44	39.72	75.92	28.76		

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	Pest Code	Crop Code	Rating Date	Rating Type	Rating Unit	BHPL	QUGR	BHPL	CATH
									RASP						
								4/Jun/12	1/Jul/12	1/Jul/12	1/Jul/12	1/Jul/12	1/Jul/12	1/Jul/12
								RATING	RATING	RATING	RATING	RATING	RATING	RATING
								1-10	1-10	1-10	1-10	1-10	1-10	1-10
1	handweeded							2.5	3.0	1.3	1.8	1.8		
2	pendimethalin	3.8	CS	3	lb ai/a	PRE, POSHARV		3.3	2.8	1.3	4.0	4.0		
3	pendimethalin	3.8	CS	6	lb ai/a	PRE, POSHARV		4.8	2.3	1.0	5.8	5.8		
4	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE		5.3	2.3	1.5	4.5	4.5		
LSD (P=.05)								2.42	1.73	0.65	1.85	1.85		
Standard Deviation								1.51	1.08	0.41	1.15	1.15		
CV								38.39	42.28	32.66	28.87	28.87		

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	Pest Code	Crop Code	Rating Date	Rating Type	Rating Unit	DAND	HOWE	REFE	COMW
									RASP						
								1/Jul/12	1/Jul/12	31/Aug/12	31/Aug/12	31/Aug/12		
								RATING	RATING	RATING	RATING	RATING		
								1-10	1-10	1-10	1-10	1-10		
1	handweeded							1.5	1.8	4.3	3.5	10.0		
2	pendimethalin	3.8	CS	3	lb ai/a	PRE, POSHARV		3.5	3.5	4.3	4.0	10.0		
3	pendimethalin	3.8	CS	6	lb ai/a	PRE, POSHARV		4.5	4.0	4.0	4.5	9.8		
4	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE		4.0	4.5	3.8	5.0	8.0		
LSD (P=.05)								2.12	3.25	2.56	3.09	1.81		
Standard Deviation								1.32	2.03	1.60	1.93	1.13		
CV								39.2	59.03	39.4	45.4	12.01		

Crop Safety on Caneberry with Pendimethalin – HTRC 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	HOWE	PEST	WHCL	RASP	RASP
Pest Code											
Crop Code										RASP	RASP
Rating Date							31/Aug/12	31/Aug/12	31/Aug/12	13/Aug/12	22/Aug/12
Rating Type							RATING	RATING	RATING	KG/PLOT	KG/PLOT
Rating Unit							1-10	1-10	1-10	KG	KG
1	handweeded						3.8	3.8	5.0	0.202	0.286
2	pendimethalin	3.8	CS	3	lb ai/a	PRE, POSHARV	4.5	4.3	4.0	0.298	0.452
3	pendimethalin	3.8	CS	6	lb ai/a	PRE, POSHARV	6.0	4.8	5.8	0.255	0.386
4	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	5.5	6.0	5.5	0.236	0.290
LSD (P=.05)							2.90	3.31	4.43	0.2141	0.2523
Standard Deviation							1.81	2.07	2.77	0.1339	0.1578
CV							36.71	44.16	54.72	54.12	44.66

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	RASP	RASP	RASP	RASP	RASP
Pest Code											
Crop Code											
Rating Date							29/Aug/12	5/Sep/12	12/Sep/12	20/Sep/12	2012
Rating Type							KG/PLOT	KG/PLOT	KG/PLOT	KG/PLOT	TOTAL
Rating Unit							KG	KG	KG	KG	KG/PLOT
1	handweeded						0.322	0.334	0.460	0.287	1.89025
2	pendimethalin	3.8	CS	3	lb ai/a	PRE, POSHARV	0.379	0.512	0.527	0.372	2.53860
3	pendimethalin	3.8	CS	6	lb ai/a	PRE, POSHARV	0.436	0.514	0.596	0.366	2.55200
4	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	0.369	0.471	0.490	0.295	2.15025
LSD (P=.05)							0.3957	0.4025	0.5206	0.2912	1.948703
Standard Deviation							0.2474	0.2517	0.3255	0.1820	1.218338
CV							65.73	54.98	62.81	55.18	53.37

Weed Control in Fir Christmas Trees with Alion – Wahmhoff Farms 2012

Project Code: XMAS 2012-01 **Location: Gobles, MI**

Personnel: Bernard H. Zandstra
Crop: Fir **Variety: Fraser Fir**
Planting Method: Transplant **Planting Date: 2009** **Harvest Date:**
Spacing: 6 ft **Row Spacing: 6 ft**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 6 ft wide x 35 ft long

Soil Type: Sandy loam **OM: 3.4%** **pH: 6.3**
Sand: 81% **Silt: 9%** **Clay: 10%** **CEC: 4.7**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH		Sky	Dew
EPRE	3/20/12	1:00 pm	81/56	F	Dry	5-7 SW	40	40%	Cloudy	N
LPRE	5/8/12	1:30	70/67	F	Damp	4-5 SW	46	10%	Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
3/20	FIR	24-36″		
5/8	FIR		buds .25-1″	
5/8	HOWE = horseweed	3-4″	8-10 leaves	Moderate
5/8	WICA = wild carrot	3-4″, 4-6″	new leaf	Moderate

Notes and Comments
1.Spray applied with 4 nozzle boom. FF8002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer. Treatments applied over the top of trees.
2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.

Weed Control in Fir Christmas Trees with Alion – Wahmhoff Farms 2012

Weed Control in Fir Christmas Trees with Alion – Wahmhoff Farms 2012

Trial ID: XMAS 2012-01 Study Director:
Location: Gobles, MI Investigator: Dr. Bernard Zandstra

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
Pest Code								HOWE	WICA		WICA
Crop Code							FIR			FIR	
Rating Date							11/May/12	11/May/12	11/May/12	23/May/12	23/May/12
Rating Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	-indaziflam	1.67	SC	.071	lb ai/a	EPRE	1.0	8.0	3.7	1.0	6.0
2	indaziflam	1.67	SC	.071	lb ai/a	LPRE	1.0	7.0	1.7	1.0	2.0
3	indaziflam	1.67	SC	.143	lb ai/a	EPRE	1.0	10.0	5.3	1.0	4.7
4	indaziflam	1.67	SC	.143	lb ai/a	LPRE	1.0	10.0	1.0	1.0	1.7
5	WESTAR	75	WDG	8	oz ai/a	EPRE	2.0	9.7	8.7	1.0	10.0
	sulfometuron	75	DG	.0244	lb ai/a	EPRE					
	hexazinone	75	DF	0.257	lb ai/a	EPRE					
6	flumioxazin	51	WDG	.383	lb ai/a	EPRE	1.0	6.0	3.3	1.0	3.7
7	untreated						1.0	1.0	1.0	1.0	2.0
LSD (P=.05)							0.67	5.19	4.19	0.00	4.54
Standard Deviation							0.38	2.92	2.36	0.00	2.55
CV							33.07	39.5	66.89	0.0	59.6

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
Pest Code								HOWE	WICA		CORW
Crop Code							FIR			FIR	
Rating Date							9/Jul/12	9/Jul/12	9/Jul/12	16/Aug/12	16/Aug/12
Rating Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	indaziflam	1.67	SC	.071	lb ai/a	EPRE	1.0	4.3	2.3	1.7	10.0
2	indaziflam	1.67	SC	.071	lb ai/a	LPRE	1.0	6.3	2.3	1.3	6.3
3	indaziflam	1.67	SC	.143	lb ai/a	EPRE	1.3	9.3	1.7	1.0	5.7
4	indaziflam	1.67	SC	.143	lb ai/a	LPRE	2.7	5.3	1.7	2.0	5.0
5	WESTAR			8	oz ai/a	EPRE	2.3	5.7	9.0	1.3	6.7
	sulfometuron	75	DG	.0244	lb ai/a	EPRE					
	hexazinone	75	DF	0.257	lb ai/a	EPRE					
6	flumioxazin	51	WDG	.383	lb ai/a	EPRE	2.3	3.0	3.3	1.7	5.0
7	untreated						1.0	1.0	1.7	1.3	4.0
LSD (P=.05)							2.04	5.35	2.55	0.88	7.29
Standard Deviation							1.14	3.01	1.43	0.50	4.10
CV							68.66	60.13	45.53	33.6	67.25

Weed Control in Fir Christmas Trees with Alion – Wahmhoff Farms 2012

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	HONE	HOWE	WICA
	Pest Code						HONE	HOWE	WICA
	Crop Code								
	Rating Date						16/Aug/12	16/Aug/12	16/Aug/12
	Rating Type						RATING	RATING	RATING
	Rating Unit						1-10	1-10	1-10
1	indaziflam	1.67	SC	.071	lb ai/a	EPRE	3.7	5.7	4.0
2	indaziflam	1.67	SC	.071	lb ai/a	LPRE	6.3	5.0	2.0
3	indaziflam	1.67	SC	.143	lb ai/a	EPRE	2.7	8.0	2.3
4	indaziflam	1.67	SC	.143	lb ai/a	LPRE	5.7	5.3	2.0
5	WESTAR			8	oz ai/a	EPRE	3.0	4.3	8.0
	sulfometuron	75	DG	.0244	lb ai/a	EPRE			
	hexazinone	75	DF	0.257	lb ai/a	EPRE			
6	flumioxazin	51	WDG	.383	lb ai/a	EPRE	4.0	1.7	3.0
7	untreated						2.7	1.0	2.7
LSD (P=.05)							4.21	4.61	3.96
Standard Deviation							2.37	2.59	2.22
CV							59.22	58.55	64.86

Weed Control in Pine Christmas Trees with Alion – Wahmhoff Farms 2012

Project Code: XMAS 2012-03 **Location: Gobles, MI**

Personnel: Bernard H. Zandstra
Crop: Pine **Variety: White Pine**
Planting Method: Transplant **Planting Date: 2009** **Harvest Date:**
Spacing: 6 ft **Row Spacing: 6 ft**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 6 ft wide x 35 ft long

Soil Type: Sandy loam **OM: 4.3%** **pH: 6.1**
Sand: 79% **Silt: 11%** **Clay: 10%** **CEC: 7.9**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
EPRE	3/20/12	12:00 am	79/56	F	Dry	5-7 SW	40	40% Cloudy	N
LPRE	5/8/12	1:30 pm	70/67	F	Damp	4-5 SW	46	10% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
3/20	PINE	36-48″		
5/8	PINE		buds 3-4″	
5/8	HOWE = horseweed	3-4″	8-10 leaves	Moderate
5/8	WICA = wild carrot	3-4″, 4-6″		Moderate
	HONE = horsenettle			

Notes and Comments
1. Spray applied with 4 nozzle boom. FF8002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer. Treatments applied over the top of trees.
2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.

Weed Control in Pine Christmas Trees with Alion – Wahmhoff Farms 2012

Weed Control in Pine Christmas Trees with Alion – Wahmhoff Farms 2012

Trial ID: XMAS 2012-03 Study Director:
Location: Gobles, MI Investigator: Dr. Bernard Zandstra

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
Pest Code								HOWE	WICA		WICA
Crop Code							PINE			PINE	
Rating Date							11/May/12	11/May/12	11/May/12	23/May/12	23/May/12
Rating Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	indaziflam	1.67	SC	.071	lb ai/a	EPRE	1.0	10.0	4.7	1.0	4.7
2	indaziflam	1.67	SC	.071	lb ai/a	LPRE	1.0	10.0	7.7	1.0	9.3
3	indaziflam	1.67	SC	.143	lb ai/a	EPRE	1.0	10.0	10.0	1.0	10.0
4	indaziflam	1.67	SC	.143	lb ai/a	LPRE	1.0	10.0	10.0	1.0	10.0
5	WESTAR	75	WDG	8	oz ai/a	EPRE	1.0	10.0	10.0	1.0	9.7
	sulfometuron	75	DG	.0244	lb ai/a	EPRE					
	hexazinone	75	DF	0.257	lb ai/a	EPRE					
6	flumioxazin	51	WDG	.383	lb ai/a	EPRE	1.0	10.0	8.7	1.0	8.7
7	untreated						1.0	10.0	6.3	1.0	6.0
LSD (P=.05)							0.00	0.00	5.02	0.00	4.32
Standard Deviation							0.00	0.00	2.82	0.00	2.43
CV							0.0	0.0	34.48	0.0	29.16

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage						
Pest Code								HONE	WICA		HONE	WICA
Crop Code							PINE			PINE		
Rating Date							9/Jul/12	9/Jul/12	9/Jul/12	16/Aug/12	16/Aug/12	16/Aug/12
Rating Type							RATING	RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10	1-10
1	indaziflam	1.67	SC	.071	lb ai/a	EPRE	1.0	3.7	6.3	1.0	2.7	5.0
2	indaziflam	1.67	SC	.071	lb ai/a	LPRE	1.3	1.7	8.7	1.0	4.7	7.3
3	indaziflam	1.67	SC	.143	lb ai/a	EPRE	1.0	2.7	8.7	1.0	4.0	7.0
4	indaziflam	1.67	SC	.143	lb ai/a	LPRE	1.0	1.3	10.0	1.0	2.0	7.0
5	WESTAR	75	WDG	8	oz ai/a	EPRE	2.0	6.0	10.0	1.3	3.3	10.0
	sulfometuron	75	DG	.0244	lb ai/a	EPRE						
	hexazinone	75	DF	0.257	lb ai/a	EPRE						
6	flumioxazin	51	WDG	.383	lb ai/a	EPRE	1.0	2.7	6.3	1.0	1.7	8.0
7	untreated						1.3	1.3	4.0	1.3	3.0	6.3
LSD (P=.05)							0.88	2.34	4.79	0.57	2.84	6.37
Standard Deviation							0.50	1.32	2.69	0.32	1.60	3.58
CV							40.06	47.62	34.89	29.33	52.37	49.46

Weed Control in Spruce Christmas Trees with Alion -Wahmhoff Farms 2012

Project Code: XMAS 2012-02 **Location: Gobles, MI**

Personnel: Bernard H. Zandstra
Crop: Spruce **Variety: Blue spruce**
Planting Method: transplant **Planting Date: 2009** **Harvest Date:**
Spacing: 6 ft **Row Spacing: 6 ft**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 6 ft wide x 35 ft long

Soil Type: Sandy loam **OM: 4.3%** **pH: 6.1**
Sand: 79% **Silt: 11%** **Clay: 10%** **CEC: 7.9**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
EPRE	3/20/12	12:05 pm	79/56	F	Dry	5-7 SW	40	40% Cloudy	N
LPRE	5/8/12	1:30 pm	70/67	F	Damp	4-5 SW	46	10% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
3/20	SPRUCE	24-36″		
5/8	SPRUCE		buds 1-2″	
5/8	HOWE = horseweed	3-4″	8-10 leaves	Moderate
5/8	WICA = wild carrot	3-4″, 4-6″		Moderate
	CORW = common ragweed			
	HONE = horsenettle			

Notes and Comments
1. Spray applied with 4 nozzle boom. FF8002, 20 gpa, 30 psi, 3.2 mph, CO2 backpack sprayer. Treatments sprayed over the top of trees.
2. Crop and weed injury ratings on scale of 1-10; 1 = no injury, 10 = complete kill.

Weed Control in Spruce Christmas Trees with Alion -Wahmhoff Farms 2012

Weed Control in Spruce Christmas Trees with Alion – Wahmhoff Farms 2012

Trial ID: XMAS 2012-02 Study Director:
Location: Gobles, MI Investigator: Dr. Bernard Zandstra

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage						
Pest Code								WICA		WICA		CORW
Crop Code							SPRUCE		SPRUCE		SPRUCE	
Rating Date							11/May/12	11/May/12	23/May/12	23/May/12	9/Jul/12	9/Jul/12
Rating Type							RATING	RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10	1-10
1	indaziflam	1.67	SC	.071	lb ai/a	EPRE	1.0	10.0	1.0	9.7	1.3	9.0
2	indaziflam	1.67	SC	.071	lb ai/a	LPRE	1.0	4.0	1.0	4.0	1.7	9.0
3	indaziflam	1.67	SC	.143	lb ai/a	EPRE	1.0	10.0	1.0	10.0	1.3	9.0
4	indaziflam	1.67	SC	.143	lb ai/a	LPRE	1.0	3.0	1.0	4.3	1.7	10.0
5	WESTAR	75	WDG	8	oz ai/a	EPRE	2.0	10.0	1.7	10.0	3.7	10.0
	sulfometuron	75	DG	.0244	lb ai/a	EPRE						
	hexazinone	75	DF	0.257	lb ai/a	EPRE						
6	flumioxazin	51	WDG	.383	lb ai/a	EPRE	1.0	9.7	1.0	10.0	2.3	9.7
7	untreated						1.0	8.3	1.0	7.0	1.0	8.7
LSD (P=.05)							0.67	4.50	0.78	6.07	1.16	2.04
Standard Deviation							0.38	2.53	0.44	3.41	0.65	1.15
CV							33.07	32.19	39.85	43.41	35.25	12.3

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
Pest Code							HONE	WICA		HONE	WICA
Crop Code									SPRUCE		
Rating Date							9/Jul/12	9/Jul/12	16/Aug/12	16/Aug/12	16/Aug/12
Rating Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	indaziflam	1.67	SC	.071	lb ai/a	EPRE	6.7	7.3	2.0	4.7	5.7
2	indaziflam	1.67	SC	.071	lb ai/a	LPRE	8.0	4.0	1.3	5.3	3.0
3	indaziflam	1.67	SC	.143	lb ai/a	EPRE	6.3	8.3	1.3	5.3	7.7
4	indaziflam	1.67	SC	.143	lb ai/a	LPRE	9.0	4.0	1.3	5.0	2.7
5	WESTAR	75	WDG	8	oz ai/a	EPRE	8.3	10.0	3.3	5.3	10.0
	sulfometuron	75	DG	.0244	lb ai/a	EPRE					
	hexazinone	75	DF	0.257	lb ai/a	EPRE					
6	flumioxazin	51	WDG	.383	lb ai/a	EPRE	4.3	8.3	1.7	2.7	9.0
7	untreated						4.3	5.7	1.7	1.3	4.7
LSD (P=.05)							3.98	5.93	1.47	3.75	4.68
Standard Deviation							2.23	3.33	0.83	2.11	2.63
CV							33.28	48.92	45.66	49.74	43.11