Winter barley field trial results and general observations

Martin Nagelkirk, MSU Extension

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Hop and Barley Conference
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Winter barley field trial

Purpose:

- to note winter survival
- to observe grain yield and quality in response to
  - fungicide
  - elevated N fertilizer
  - growth regulator (Palisade)


2144

Materials

- Fertilizer Nitrogen *[urea broadcasted at green-up; extra N applied as 28% at tillering]*

- Prosaro, 8 oz per ac (prothioconazole + tebuconazole) *[a competitive product , Caramba, does equally well in reducing Fus. Head scab and foliar fungal diseases]*

- Palisade (trinexpac-ethyl) *[a growth regulator used to reduce plant lodging by thickening stems and reducing height]*

Treatments

1) control *(75 lbs/ac N)*

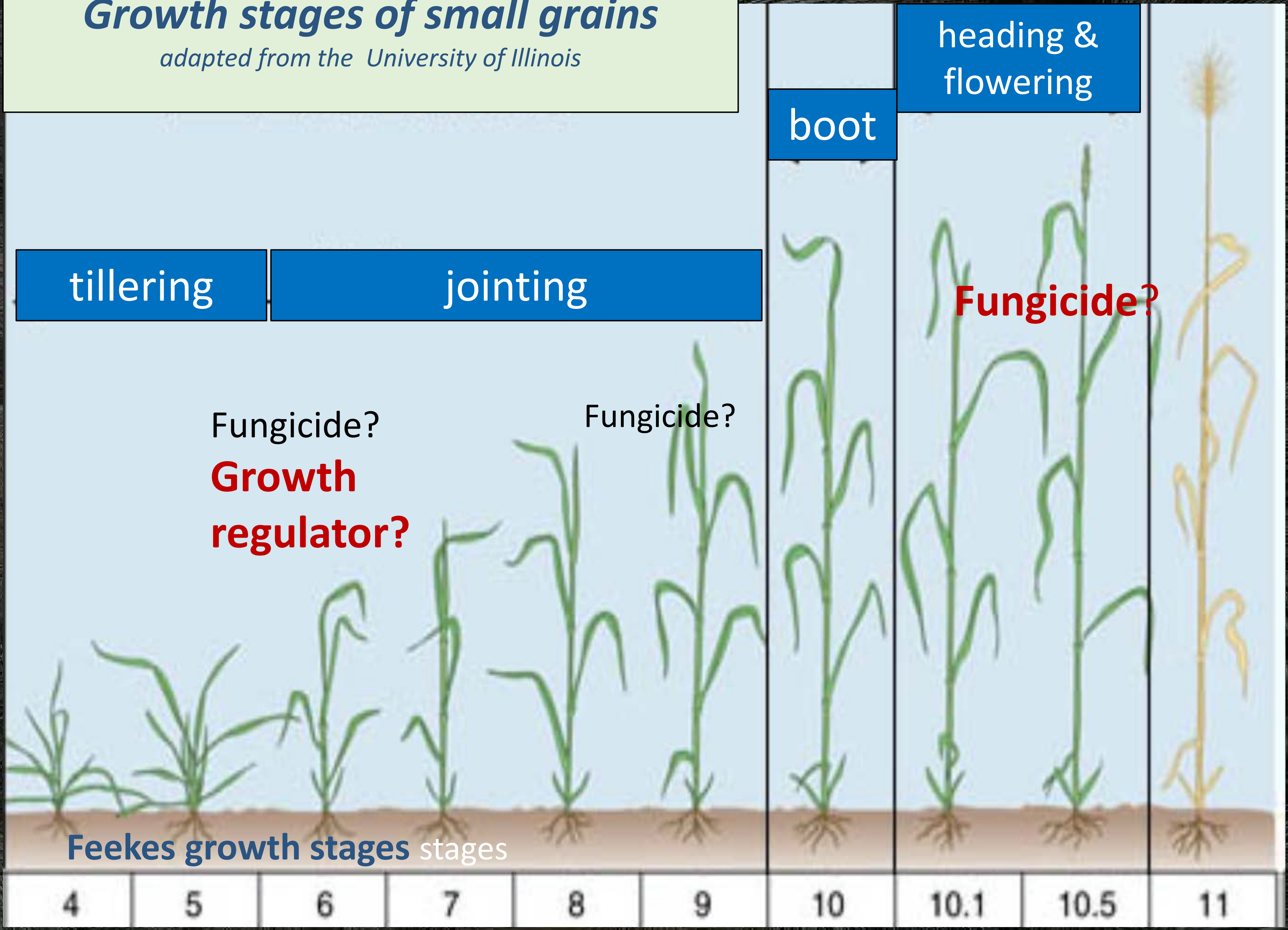
2) Prosaro

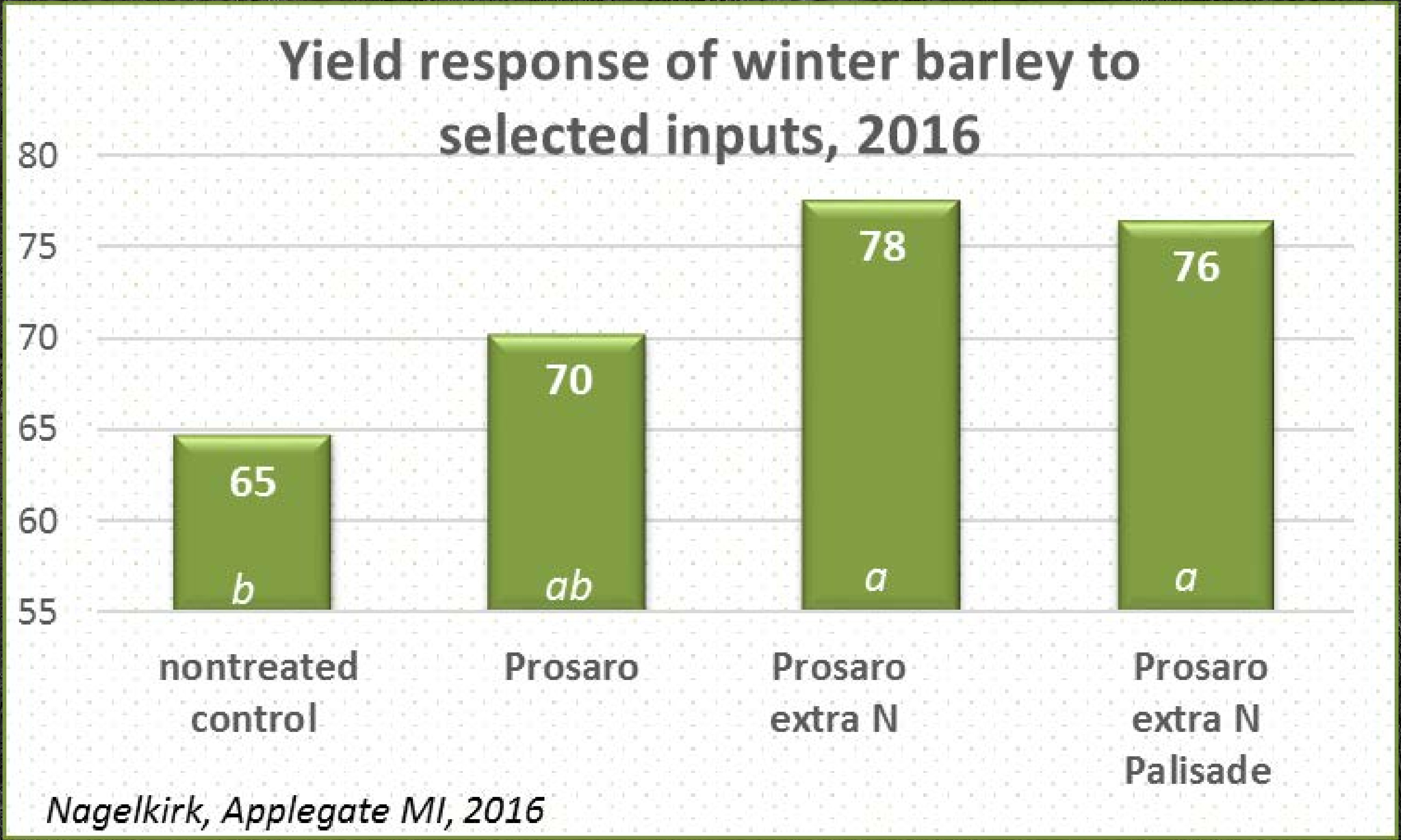
3) Prosaro & extra N *(105 lbs total)*

4) Prosaro & extra N & Palisade

Growth stages of small grains

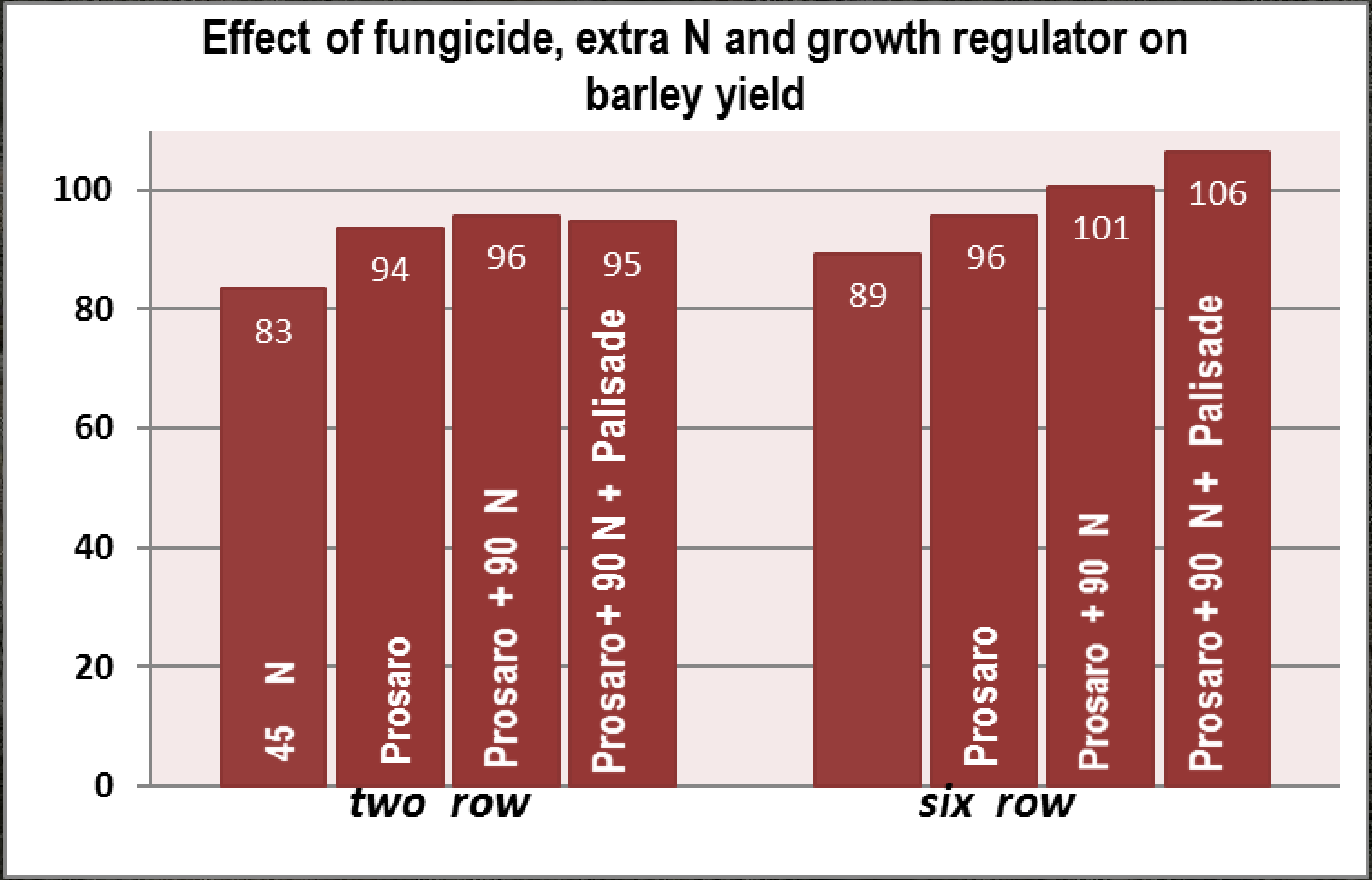
adapted from the University of Illinois



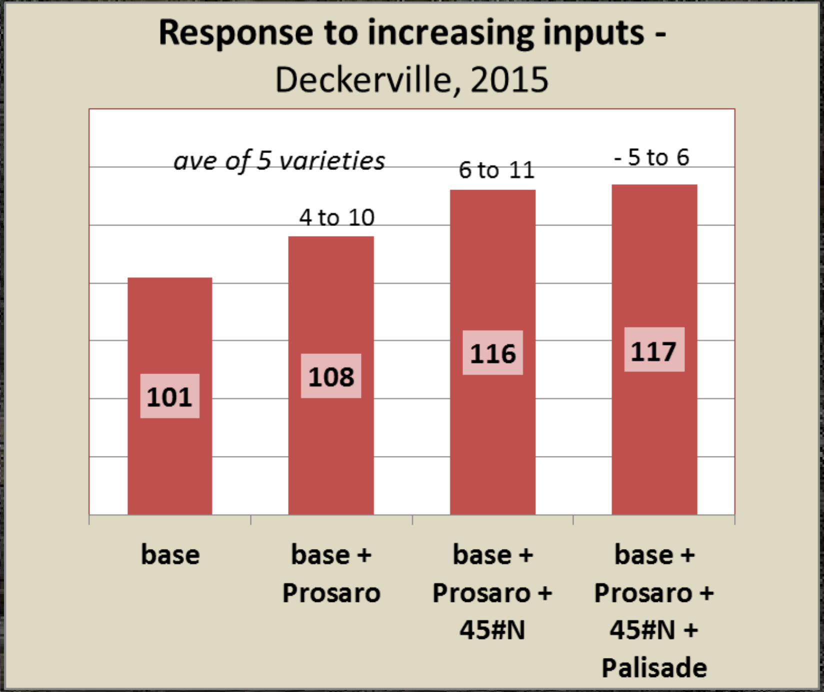

Yield response of winter barley to selected inputs, 2016
80
75
70
65
60
55
65
b
70
ab
78
a
76
a
nontreated control
Prosaro
Prosaro extra N
Prosaro extra N Palisade
Nagelkirk, Applegate MI, 2016

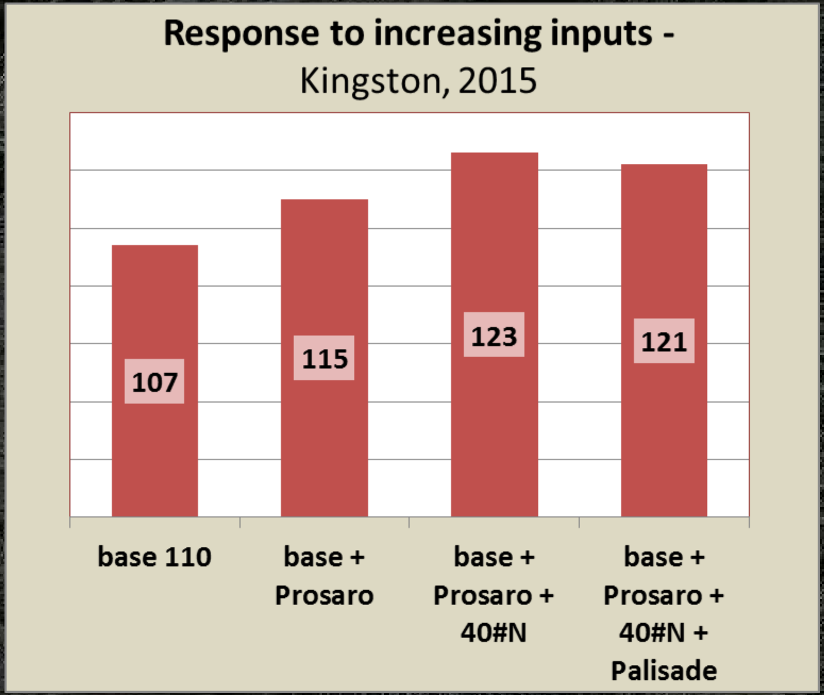
The effect of a fungicide, elevated N rate and growth regulator on the performance of winter barley, *Applegate, MI 2016*

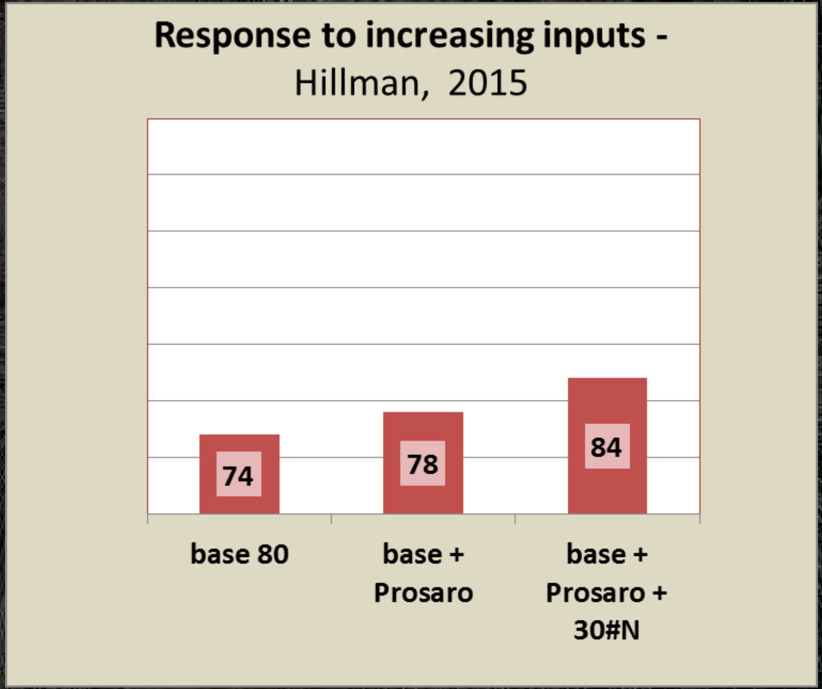
treatment	moist. %	test wt. lbs/bu	yield bu/ac 13%		plant ht. inches
nontreated control	14.7	49	65	b	25
Prosaro	14.5	49	70	ab	25
Prosaro, extra N	14.6	49	78	a	25
Prosaro, extra N, Palisad	14.5	49	76	a	24
P value	*0.701*	*0.705*	*0.018*		*0.330*

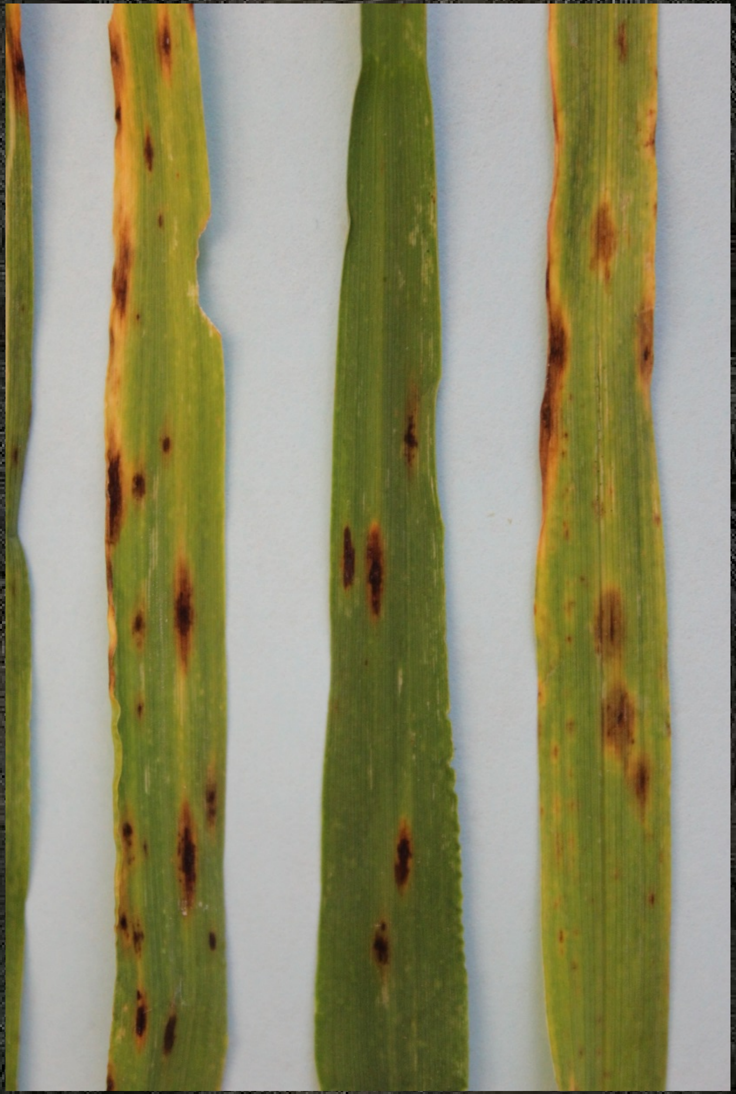


Effect of fungicide, extra N and growth regulator on barley yield
100
80
60
40
20
0
83
94
96
95
89
96
101
106
45 N
Prosaro
Prosaro + 90 N
Prosaro + 90 N + Palisade
Prosaro
Prosaro + 90 N
Prosaro + 90 N + Palisade
two row
six row


Response to increasing inputs -
Deckerville, 2015
ave of 5 varieties
4 to 10
6 to 11
- 5 to 6
101
108
116
117
base
base + Prosaro
base + Prosaro + 45#N
base + Prosaro + 45#N + Palisade


Response to increasing inputs -
Kingston, 2015
107
115
123
121
base 110
base + Prosaro
base + Prosaro + 40#N
base + Prosaro + 40#N + Palisade


Response to increasing inputs -
Hillman, 2015
74
78
84
base 80
base + Prosaro
base + Prosaro + 30#N



Net blotch

Fusarium head scab

The effect of a fungicide, elevated N rate and growth regulator on the quality analysis of winter barley, Applegate, MI 2016

treatment	plump > 6/64	thin ≤ 5/64	RVA	energy 4 mil %	energy 8 mil %	capacity %	Protein dry,%	DON ppm
nontreated control	98.6	1.4	143	98	93	98.8	10.3	< 0.3
Prosaro	98.3	1.5	148	98	96	98.5	9.7	< 0.3
Prosaro, extra N	98.6	1.3	148	98	94	98.5	10.0	< 0.3
Prosaro, extra N, Palisade	98.6	1.1	150	97	95	98.0	10.2	< 0.3
P value	*0.693*	*0.705*	*0.197*	*0.890*	*0.425*	*0.977*	*0.431*	---

Field trial report

Response of winter malting barley to applications of a fungicide, additional nitrogen and a growth regulator

Applegate MI 2016

A field trial was established to measure the effects of a foliar fungicide, a relatively high rate of nitrogen (N) fertilizer and a growth regulator on grain yield and quality.

On September 21, 2015, KWS Scala winter barley was drilled into a non-tiled silt loam soil. The nontreated control plots received 75 lbs/ac of N. The remaining treatments entailed a progression of additional inputs: Prosaro fungicide applied at heading; an additional application of 40lbs/ac N as 28% UAN at tillering; and an application of Palisade plant growth regulator at second joint.

The trial was harvested in mid-July using an International 2144 combine equipped with a 15-foot wide head and a Juniper HarvestMaster system that provided grain weight, test weight, and moisture. Samples were collected on four of the six replications and sent to the MSU Barley Quality Lab. for analysis. A statistical analysis was performed by Adam Byrne, MSU Research Assistant.

There was no evidence winter damage to the barley stand following an exceptionally mild winter. However, the stand exhibited very poor uniformity due to poor early-spring drainage and varying soil characteristics.

BACKGROUND

Location	Applegate, MI
Soil Type	Guelph silt loam
Previous crop:	oats
Variety:	KWS Scala
Planting date:	Sept 21, 2015
Seeding rate:	2.8 bu/ac
Harvest date:	July 13, 2016

PLOT DESIGN

Design:	RCB
Replications:	six
Plot area:	15 x 60 ft.

VARIABLES

base N rate:	75 lbs/ac (urea)
extra N rate:	40 lbs/ac (UAN)
Prosaro:	8 oz/ac, heading
Palisade	11oz/ac, 2nd joint

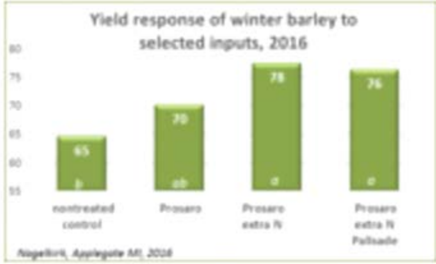


Table 1: The effect of a fungicide, elevated N rate and growth regulator on the performance of winter barley, Applegate, MI 2016

treatment	moist. %	test wt. lbs/bu	yield bu/ac 13%		plant ht. inches
nontreated control	14.7	49	65	b	25
Prosaro	14.5	49	70	ab	25
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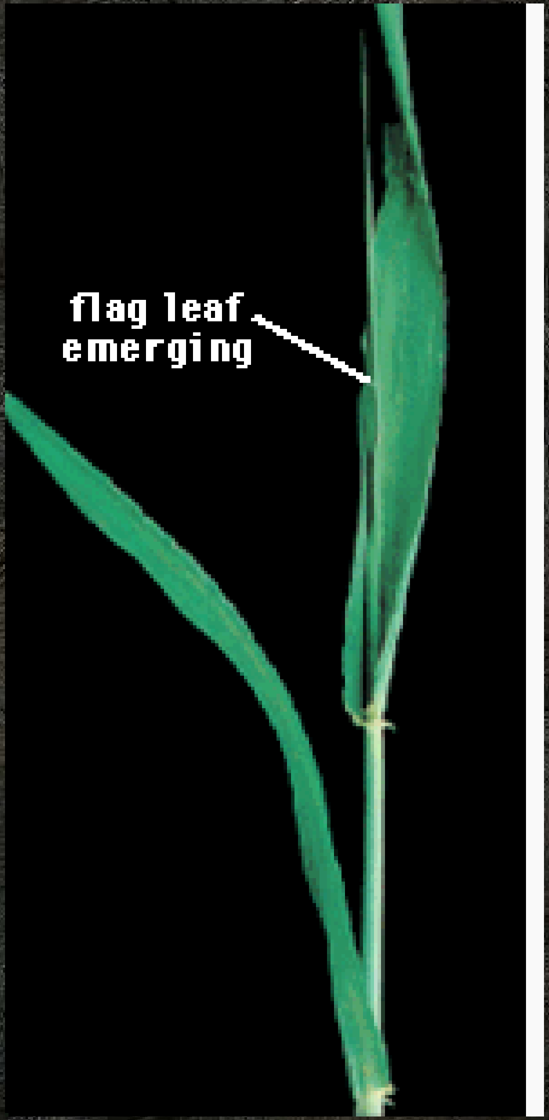
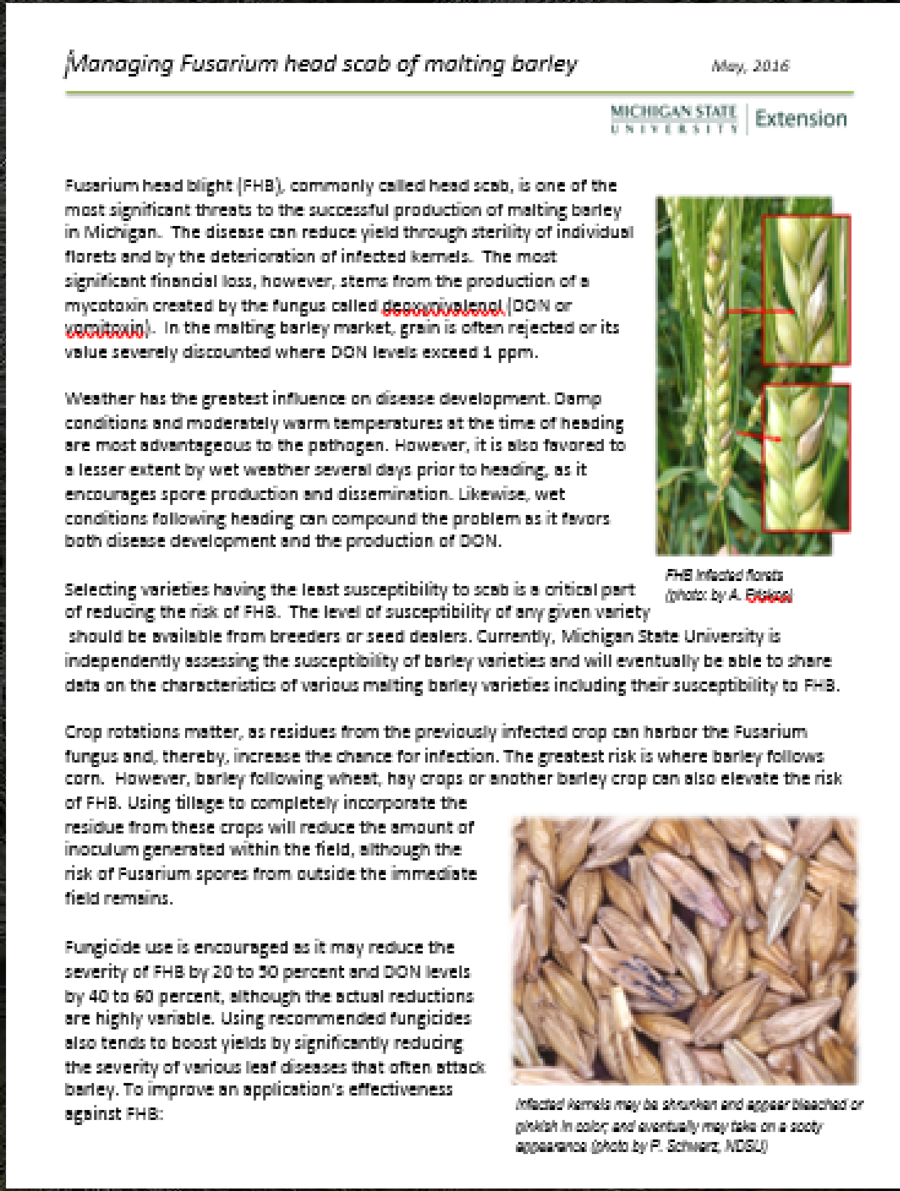

flag leaf
emerging


flag leaf
boot


boot
emergence
full head
extendrd

Managing Fusarium head scab of malting barley



Managing Fusarium head scab of malting barley *May, 2016*

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Fusarium head blight (FHB), commonly called head scab, is one of the most significant threats to the successful production of malting barley in Michigan. The disease can reduce yield through sterility of individual florets and by the deterioration of infected kernels. The most significant financial loss, however, stems from the production of a mycotoxin created by the fungus called deoxynivalenol (DON or vomitoxin). In the malting barley market, grain is often rejected or its value severely discounted where DON levels exceed 1 ppm.

FHB infected florets (photo: by A. Eitkins)

Weather has the greatest influence on disease development. Damp conditions and moderately warm temperatures at the time of heading are most advantageous to the pathogen. However, it is also favored to a lesser extent by wet weather several days prior to heading, as it encourages spore production and dissemination. Likewise, wet conditions following heading can compound the problem as it favors both disease development and the production of DON.

Selecting varieties having the least susceptibility to scab is a critical part of reducing the risk of FHB. The level of susceptibility of any given variety should be available from breeders or seed dealers. Currently, Michigan State University is independently assessing the susceptibility of barley varieties and will eventually be able to share data on the characteristics of various malting barley varieties including their susceptibility to FHB.

Crop rotations matter, as residues from the previously infected crop can harbor the Fusarium fungus and, thereby, increase the chance for infection. The greatest risk is where barley follows corn. However, barley following wheat, hay crops or another barley crop can also elevate the risk of FHB. Using tillage to completely incorporate the residue from these crops will reduce the amount of inoculum generated within the field, although the risk of Fusarium spores from outside the immediate field remains.

Fungicide use is encouraged as it may reduce the severity of FHB by 20 to 50 percent and DON levels by 40 to 60 percent, although the actual reductions are highly variable. Using recommended fungicides also tends to boost yields by significantly reducing the severity of various leaf diseases that often attack barley. To improve an application's effectiveness against FHB:

Infected kernels may be shrunken and appear bleached or pinkish in color, and eventually may take on a sooty appearance (photo by P. Schwarz, NDSU)

Thanks !

Martin Nagelkirk
nagelkir@msu.edu
810-404-3400

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