

Insect, Nematode, and Disease Control in Michigan Field Crops

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**This bulletin contains information on the management of field crops insects, nematodes, and diseases, including recommendations for pesticide use. Every attempt is made to verify product names, formulations, use rates, and other important information, but products and labels may change before the field season begins. Always read the label of a product to reconfirm rates, precautions, PPE, and other important information before use.

SEED TREATMENTS for INSECTS

Consult the following tables for registered seed treatments for soil insects. Many commercial formulations contain combinations of ingredients to provide a broader spectrum of protection, particularly fungicides to control diseases.

When and why to treat seed

Corn

Seed treatment for seedcorn maggot is recommended when planting seed into cool, wet soil that delays germination (and exposes the seed to extended insect damage) and especially when planting into soil high in decaying green organic matter (such as a cover crop). Seed treatment for wireworms and grubs is recommended when planting into established fallow/ sod, or in fields that have a history of grub infestation.

Seed treatment for corn rootworm larval control is an alternative to granular insecticides at-planting. Few seed treatments can control rootworm, and the rate is greater than for control of other soil pests.

Dry Beans

Seed treatments protect seeds before germination from early season pests such as maggot and wireworms. Maggot damage can occur under cool, wet conditions that delay germination, particularly in soils with decaying green material (for example, a plowed-in cover crop). Wireworm damage can be expected when planting into fallow ground. Cruiser

Soybeans

Several new seed treatments are registered for soybean. They protect the seed before germination from seedcorn maggot and wireworms. Maggot damage can occur under cool, wet conditions that delay germination, particularly in soils with decaying green material (for example, a plowed-in cover crop). Wireworm damage can be expected when planting into fallow ground. Cruiser and Gaucho are systemic, and move up into the growing plant to protect against certain foliar pests. However, the above-ground protection lasts a limited time – generally 35 to 40 days after planting – and damage can occur after the product runs out.

CORN Seed Treatments registered for soil insect pests

Trade name	Insecticide common name	Contains a fungicide?	Signal word	Corn rootworm	Seedcorn maggot	White grubs	Wireworm	REI hrs
Agrox Premiere	diazinon lindane	captan metalaxyl	danger	--	3.6 oz/ 100 lbs	--	--	96
Concur	imidacloprid	metalaxyl	caution	-	3.6 oz/ 100 lbs	3.6 oz/ 100 lbs	3.6 oz/ 100 lbs	24
Cruiser 5FS	thiamethoxam	no	caution	5.1-9.0 oz/ 100 lbs	1.28-5.1 oz/ 100 lbs	1.28-5.1 oz/ 100 lbs	1.28-5.1 oz/ 100 lbs	12
Cruiser Extreme	thiamethoxam	fludioxonil mefenoxam azoxystrobin	caution	1.25 mg a.i. per seed	0.25 mg a.i. per seed	0.25 mg a.i. per seed	0.25 mg a.i. per seed	48
Diazinon 50W CleanCrop	diazinon	no	caution	--	0.5 oz/ bushel	--	--	--
Gaucht 600	imidacloprid	no	caution	_	0.16-1.34 mg/ kernel	0.16-1.34 mg/ kernel	0.16-1.34 mg/ kernel	12
Germate Plus	diazinon, lindane	vitavax	caution	--	2 oz/ bushel	--	2 oz/ bushel	12
Kernel Guard	diazinon lindane	captan	danger	--	2 oz/ bushel	--	2 oz/ bushel	12
Kernel Guard Supreme	permethrin	vitavax	caution	--	2 oz/ bushel	--	2 oz/ bushel	12
Kickstart	diazinon, lindane	carboxin	caution	--	2 oz/ bushel	--	2 oz/ bushel	12
Kickstart VP	permethrin	carboxin	caution	--	3.6 oz/ 100 lbs	--	3.6 oz/ 100 lbs	12
Latitude	imidacloprid	carboxin metalaxyl	caution	--	3.6 oz/ 100 lbs	--	3.6 oz/ 100 lbs	24
Lorsban 50SL	chlorpyrifos	no	warning	--	2 oz/ 100 lbs	--	--	--
Poncho 250 and 1250	clothianidin	no	caution	1.25 mg ai/ kernel	0.25 mg ai/ kernel	0.25 mg ai/ kernel	0.25 mg ai/ kernel	
Seedmate Isotox F	lindane	captan	danger	--	8 oz/ 100 lbs	--	4 to 8 oz/ 100 lbs	96
Sorghum Guard	lindane	no	danger	--	--	--	8 oz/ 100 lbs	12

DRY BEAN Seed Treatments registered for soil insect pests

Trade name	Common name	Contains a fungicide?	Signal word	Seedcorn maggot	Wireworm	Mex. Bean beetle	Potato leafhopper	REI hrs	Notes
Cruiser 5FS	thiamethoxam	no	caution	1.28 oz per 100 lbs seed	1.28 oz per 100 lbs seed	1.28 oz per 100 lbs seed	1.28 oz per 100 lbs seed	12	Protects against maggots; protection against MBB and PLH runs out during the season.
Lorsban 30F	chlorpyrifos	no		2.75 fl oz/100 lbs seed	--	--	--	--	Applied as a slurry by a commercial seed treater
Lorsban 50SL	chlorpyrifos	no	Danger	2.0 oz per 100 lbs seed	--	--	--	--	Applied as a slurry by a commercial seed treater

SOYBEAN Seed Treatments registered for soil insect pests

Trade name	Common name	Contains a fungicide?	Signal word	Seedcorn maggot	Wireworm	Soybean aphid	Bean leaf beetle	REI hrs	Notes
Cruiser 5FS	thiamethoxam	no	caution	1.28 oz per 100 lbs seed	1.28 oz per 100 lbs seed	1.28 oz per 100 lbs seed	1.28 oz per 100 lbs seed	12	Sold as Cruiser Maxx Pak when combined with ApronMaxx.
Gaucho SB Flowable	imidacloprid	no	caution	2-4 oz/ 100 wt of seed	--	2-4 oz/ 100 wt of seed	2-4 oz/ 100 wt of seed	12	Protects against maggot damage; <u>reduces</u> damage from aphids and BLB. Check label for important plant-back restriction.

TRANSGENIC OPTIONS for INSECT CONTROL

Several transgenic options are now available to control European corn boere (ECB) or Corn rootworm (CRW) in corn. These options contain genes for selective toxins derived from *Bacillus thuringiensis* (Bt), a common soil bacteria. The biotech traits are available alone, double-stacked, or stacked with the gene for glyphosate tolerance ('Round-up Ready'). Biotech seed to control CRW also come treated with a product such as Poncho or Cruiser to control other soil insects.

Product	Company	Gene	Bt protein	Controls ECB?	Controls Rootworm?	Herbicide tolerant?
Agrisure CB (formerly Yieldgard)	NK Seeds/ Syngenta (licensed to many seed companies)	Bt 11	Cry 1Ab	Yes	No	LL
Agrisure GT/CB		Bt 11	Cry 1Ab	Yes	No	LL and RR
Yieldgard	Monsanto (licensed to many seed companies)	MON 810	Cry 1Ab	Yes	No	Stacks w/ the RR gene are available
Yieldgard RW		MON 863	Cry 3 Bb	No	Yes	
Yieldgard PLUS		MON 810 MON 863	Cry 1Ab Cry 3 Bb	Yes	Yes	
Herculex I	Pioneer / DowAgroSciences	TC1507	Cry 1F	Yes	No	LL
Herculex RW				No	Yes	LL

Producers using transgenic corn must follow an Insect Resistance Management (IRM) plan to delay target insect from becoming resistant to Bt. IRM plans define the amount and placement of a non-Bt corn planting called a 'refuge'. The refuge produces insects which are not exposed to Bt. In theory, these susceptible insects mate with any resistant insects produced in the Bt field, diluting resistance genes and delaying resistance. Details of the refuges differ with the type of corn.

Type of Corn	Refuge Size (% of field acreage or area)	Can the refuge be treated for the target pest?	Location of the refuge compared to the Bt field:	Refuge placement				
				Block in field	Head-lands	Strips in field	Block outside field	Seed mixture
Bt corn for ECB	20%	Yes = But Do NOT use a Bt foliar spray	In field or Within ½ mile	Yes	Yes	Yes, 4-row minimum (6 preferred)	Yes	No
Bt corn for CRW	20%	Yes = soil insecticide or seed treatment	In field or adjacent (for ex, across road or ditch)	Yes	Yes	Yes, 6-row minimum (12 preferred)	Yes - adjacent	No

SEED TREATMENTS for PLANT PATHOGENS

Consult the tables for registered treatments, and diseases that can be controlled. Many commercial formulations contain combinations of ingredients to provide a broader spectrum of protection. Some materials are protectants, which act on the surface of the seed. Others are systemic, and spread throughout the seed. Examples of systemic fungicides include: carboxin, imazalil, imidacloprid, mefenoxam, metalaxyl, propanazazole, tebuconazole, thiabendazole, and triticonazole. *Bacillus subtilis* is a living biocontrol bacterium that grows and colonizes the seed and root surface.

When and why to treat seed

Corn

Seed treatment is recommended for all seed corn to prevent or reduce seed decay and seedling blights, especially in early planted corn. Corn seedling blights are more prevalent in cold, wet soil than in warmer soil (above 55 °F). Seedling blights tend to be more severe in no-till or reduced tillage fields. Corn smut, leaf blights, stalk and ear rots and viruses are not controlled by seed treatments.

Small grains

Seed treatment of small grains is recommended for reducing seed decay and seedling blights, and controlling smuts and bunts. Seed borne head scab is another common problem. If scab-infected seed is being used, the seed should be treated before planting.

Soybeans

Seed treatment for soybeans can be beneficial if seed quality is poor (germination less than 80%). It is useful to control early season damping off. Damping off can be a problem where soils are poorly- drained. *Pythium* and *Fusarium* are active when soil temperatures are less than 60°F, and soils are wet, conditions you might expect to find during early plantings. *Phytophthora* and *Rhizoctonia* are most active when soil temperatures are warmer, around 70-80° F. Seed that is infested with *Sclerotinia* (white mold) should be treated with a fungicide before it is used.

Dry beans

Seed treatments for dry beans are useful for reducing early season damping off, and seed decay and seedling diseases caused by *Rhizoctonia*, *Fusarium*, *Pythium* and *Phytophthora*. Seed that is infested with *Sclerotinia* (white mold) should be treated with a fungicide before it is used.

Seed treatment products- commercial vs. on farm treatment

When using seed treatments, it's important to get even coverage of the material on the seeds. Commercial seed treaters have specialized equipment for this purpose. There is a wider range of products available for commercial use. There are a number of seed treatments available for on-farm use, known as hopper-box or planter-box treatments. Most of these treatments call for filling the planter box half full of seed, adding half the treatment, mixing the product into the seed in the planter box with a stick, then adding the rest of the seed and product, and mixing again. You could also pre-mix the seed and treatment together in a container first, then pour the treated seed into the planter box. Consult the label for specific directions for the product used. Some products can be applied to bulk seed on-farm. Consult your local seed dealer for more information about what is available.

Inoculants and seed treatments

Some fungicides may reduce the effectiveness of seed-applied inoculants (*Rhizobium*). The standard practice when using inoculants is to apply them as a stand-alone treatment immediately before planting. Research at Michigan State University has shown a small increase in soybean yield when using inoculants (about 1.5 bu/A). The use of inoculants with soybeans may be helpful when land is newly planted to soybeans, or if it has been a long interval between soybean plantings.

Molybdenum and seed treatments

Several seed treatments in the tables list molybdenum as an ingredient. Molybdenum is important in the nitrogen fixation process. Michigan does not have any widespread problems with soils deficient in molybdenum. However, molybdenum deficiencies can occur below pH 6.0. One alternative for soils with a pH range of between 5.0 and 6.0 is to add molybdenum. Liming, however, is the best long-term solution to this problem if soybeans are to be grown regularly.

Seed treatments registered for CORN diseases

Trade name	Common name	Seed rots, seedling blights	Pythium damping off	Commercial or on farm use = C or F	Rate per 100 lb. Seed or as noted	REI hrs.	Comments
Allegiance Dry	metalaxyl		X	F	1.5-2 oz.	24	
Allegiance FL	metalaxyl		X	C	0.75 fl. oz.	24	
Apron TL	metalaxyl		X	C	0.27 fl. oz.	24	
Apron F	metalaxyl		X	C	0.82-1.64	24	
Apron-XL-LS	mefanoxam		X	C	0.32-0.64 fl. oz.	48	
Cruiser Extreme	fludioxonil +mefanoxam+ azoxystrobin + thiamethoxam (insecticide)	X		C	See label	48	Insecticide for wireworm, seed corn maggot, and white grubs.
Captan 400	captan	X	X	C	1.25-2.375 fl. oz	96	
Captan 30-DD	captan	X	X	C	1.5 fl. oz.	96	
Captan- Diazinon	captan + diazinon (insecticide)	X	X	F	2 oz./ bushel	96	Insecticide for seed corn maggot.
Captan Moly	captan	X	X	F	1.33 oz./bushel	4	
Dynasty	axoxystrobin	X	X	C	0.153 fl. oz.	4	Mfg. recommends using only in combination with other fungicides.
Grain Guard Plus	mancozeb + lindane (insecticide)	X	X	F	3 oz./bushel	12	Insecticide for wireworm.
Kernel Guard	captan + diazinon + lindane (insecticides)	X		F	2 oz. bushel	12	Insecticides for wireworm, seed corn maggot.
Kernel Guard Supreme	carboxin + permethrin (insecticide)	X		F	1.5 oz./42 lb.	12	Insecticide for wireworm, seed corn maggot.
Kickstart	carboxin + diazinon + lindane (insecticides)	X		F	1.5 oz./42 lb	12	Insecticides for wireworm, seed corn maggot.
Kickstart VP	carboxin + permethrin (insecticide)	X		F	1.5 oz./42 lb.	12	Insecticide for wireworm, seed corn maggot.
Kodiak Flowable	<i>Bacillus subtilis</i>			C, F	0.2-1.0 fl. oz.	4	Biological fungicide. <i>Fusarium</i> also listed on label.
Kodiak HB	<i>Bacillus subtilis</i>			F	4-8 oz.	4	Biological fungicide. <i>Fusarium</i> also listed on label.
Latitude	carboxin + metalaxyl + imidacloprid (insecticide)	X	X	F	1.5 oz/42 lb.	24	Insecticide for wireworm, seed corn maggot.
System 3 Seed treatment	Pentachloronitrobenzene + metalaxyl + <i>Bacillus subtilis</i>	X	X	F	2-3 oz./bushel	12	
Trilex FL	trifloxystrobin	X		C	0.32- 0.64 fl. oz.	12	
Vitavax -34	carboxin	X		C	2-4 fl. oz.	12	Labeled for seed borne head smut.

Seed treatment for DRY BEAN diseases

Trade name	Common name	Rhizoc.	Pyth.	Phytop.	Seed/seed-ling decay, damping off	Commercial or on farm use= C or F	Rate per 100 lb. Seed or as noted	REI hrs.	Comments
Allegiance Dry	metalazyl		X	X		F	2.0 oz.	24	
Allegiance FL	metalaxyl		X	X		C	0.75 fl. oz.	24	
Allegiance LS	metalaxyl		X	X		C, F	1.2 fl. oz.	24	
Apron TL	metalaxyl		X	X		C	2-4 fl. oz.	24	Use high rate for <i>Phytophthora</i>
Apron-XL-LS	mefanoxam		X	X		C	0.16-0.64	48	Use high rate for <i>Phytophthora</i>
Apron F	metalaxyl		X	X		C	0.82-1.64	24	
Captan 30-DD					X	C	2.25 fl. oz.	96	
Captan 400	captan				X	C	2-3 fl. oz.	96	
Dynasty	azoxystrobin	X			X	C	0.153-0.765 fl. oz.	4	
Kodiak HB	<i>Bacillus subtilis</i>	X					3 – 6 oz.	4	<i>Fusarium</i> also listed on label
Maxim 4FS	fludioxonil	X			X	C	0.08-0.16 fl. oz.	12	
Protector-D	thiram	X			X	F	4.5 oz.	24	
Rival	captan +PCNB +thiabendazole	X			X	C	4.0 fl. oz.	96	
System 3 Seed treatment	Pentachloronitrobenzene + metalaxyl + <i>Bacillus subtilis</i>	X	X	X	X	F	2-3 oz./bushel	12	
Vitavax -34	carboxin				X	C	3-4 fl. oz.	12	
Vitavax CT	carboxin + thiram	X				C, F	12 oz.	24	
Vitavax M	carboxin + thiram	X				C,F	12 oz.	24	Contains molybdenum
RTU- Vitavax Thiram	carboxin + thiram	X	X		X	C, F	6.8 fl. oz.	24	Labeled for suppression of seed borne <i>Sclerotinia</i>

Seed treatment for SMALL GRAINS - wheat, oats, barley

Trade name	Common name	Oat smuts	Wheat loose		Barley loose covered		Seed/seedling decay	Commercial or on farm use = C or F	Rate per 100 lb. Seed or as noted	REI hrs.	Comments
			smut	bunt	smut	smut					
Allegiance Dry	metalaxyl							F	1.5-2 oz.	24	For <i>Pythium</i> -damping off. Also labeled for rye.
Allegiance FL	metalaxyl						X	C	0.75 fl. oz.	24	For <i>Pythium</i> -damping off. Also labeled for rye.
Apron F	metalaxyl							C	0.82-1.64 fl. oz.	24	For <i>Pythium</i> -damping off. Also labeled for rye.
Apron TL	metalaxyl							C	2-4 fl. oz.	24	For <i>Pythium</i> -damping off. Also labeled for rye.
Apron-XL-LS	mefanoxam							C	0.32-0.64 fl. oz.	48	For <i>Pythium</i> -damping off. Also labeled for rye.
Captan 400	captan						X	C	1.5-4 fl. oz.	96	wheat
									2-4 fl. oz.		barley, oats, rye
Captan 30-DD	captan						X	C	1.5 fl. oz.	96	wheat
									2 fl. oz.		barley, rye
									2.33 fl. oz.		oats
Charter	triticonazole		X	X	X	X	X	C, F	3.1 fl. oz.	12	Not labeled for oats
Dynasty	azoxystrobin			X			X	C	0.153-0.382 fl. oz.		Not labeled for oats.
Enhance	captan + carboxin	X	X	X	X	X	X	F	4 oz.	48	
Grain Guard	mancozeb	X		X		X	X	F	2 oz./bushel	12	Also seed/seedling decay on rye.
Grain Guard Plus	mancozeb + lindane (insecticide)	X		X		X	X	F	2 oz./bushel	12	Also seed/seedling decay on rye.
Kodiak Flowable	<i>Bacillus subtilis</i>							C, F	0.1-0.2 fl.oz. wheat, barley	4	Biological fungicide. <i>Fusarium</i> , and <i>Rhizoctonia</i> .
									0.2-1 fl oz. other grains		
Kodiak HB	<i>Bacillus subtilis</i>							F	4-8 oz.	4	Biological fungicide. <i>Fusarium</i> , and <i>Rhizoctonia</i> .

Seed treatment for SMALL GRAINS - wheat, oats, barley, continued

Trade name	Common name	Oat smuts	Wheat loose		Barley loose covered		Seed/seedling decay	Commercial or on farm use = C or F	Rate per 100 lb. Seed or as noted	REI hrs	Comments
			smut	bunt	smut	smut					
Raxil-MD	tebuconazole + metalaxyl		X		X		X	C	5-6.5 fl. oz.	24	Labeled for seed borne scab, flag smut.
Raxil MD-W	tebuconazole + metalaxyl + imidacloprid (insecticide)		X		X		X	C	5 fl. oz.	24	For wheat, barley. Labeled for seed borne scab., flag smut. Insecticide for wireworm
Raxil MD Extra	tebuconazole + metalaxyl + imazalil		X		X		X	C	5 fl. oz.	48	For wheat, barley. Labeled for seed borne scab., flag smut.
Raxil-Thiram	tebuconazole + thiram	X	X	X	X	X	X	C	3.5-4.6 fl. oz.	24	Labeled for seed borne scab., flag smut.
Stiletto	carboxin + thiram + metalaxyl	X	X	X	X	X	X	F	5- 6.8 fl. oz.	24	
System 3 Seed treatment	Pentachloronitrobenzene + metalaxyl + <i>Bacillus subtilis</i>		X	X		X	X	F	2-3 oz. - wheat	12	Not labeled for oats.
									2-4 oz. -barley		
Vitavax -34	carboxin	X	X	X	X	X		C	2-3 fl. oz.	12	Also labeled for flag smut of wheat.
Vitavax 200	carboxin + thiram	X	X	X	X	X	X	C	3-4 fl. oz.	24	
Vitavax CT	carboxin + thiram	X	X	X	X	X	X	C, F	9-12 fl. oz.	24	
Vitavax M	carboxin + thiram	X	X	X	X	X	X	C, F	9-12 fl. oz.	24	Contains molybdenum
Vitavax -PCNB	carboxin + penta-chloronitrobenzene	X	X	X	X	X	X	C	3-4 fl. oz.	12	
Vitavax-Thiram-Lindane	carboxin + thiram + lindane (insecticide)	X						C	5 fl. oz	24	Insecticide for wireworm, seed corn maggot.
									6 fl. oz.-barley		
Vitavax TL	carboxin + thiram	X	X	X	X	X	X	F	5-6.8 fl. oz.	24	
RTU- Vitavax Extra	carboxin + imazalil + thiabendazole		X	X			X	C	See label	48	For wheat only; seed borne scab, glume blotch, also listed.
RTU- Vitavax Thiram	carboxin + thiram	X	X	X	X	X	X	C, F	5-6.8 fl. oz.	24	

Seed treatments registered for SOYBEAN diseases

Trade name	Common name	Rhizoc.	Pyth	Phytop.	Phomop.	commercial or on-farm use = C or F	Rate per 100 lb. Seed or as noted	REI hrs.	Comments
Allegiance Dry	metalaxyl		X	X		F	1.5 – 2.0 oz.	24	Labeled for suppression of early season downy mildew at 2.0 oz. rate
Allegiance FL	metalaxyl		X	X		C	0.75-1.5 fl oz.	24	Also labeled for systemic downy mildew
Allegiance LS	metalaxyl		X	X		C, F	1.2-2.4 fl. oz	24	
Apron TL	metalaxyl		X	X		C	2.0-4.0 fl. oz.	24	Use higher rate for <i>Phytophthora</i> .
Apron-XL-LS	mefanoxam		X	X		C	0.16-0.64 fl. oz.	48	Labeled for suppression of downy mildew at higher rate
Apron F	metalaxyl		X	X		C	0.82-1.64 fl. oz.	24	Labeled for suppression of seed borne downy mildew
ApronMaxx RFC	fludioxonil + mefanoxam	X	X	X	X	C, F	1.5 oz.	48	Also labeled for <i>Fusarium</i> , and suppression of seed borne <i>Sclerotinia</i> .
ApronMaxx RTA	fludioxonil + mefanoxam	X	X	X	X	F	5.0 fl. oz.	48	Also labeled for <i>Fusarium</i> , and suppression of seed borne <i>Sclerotinia</i> .
Captan 400	captan	X	X		X	C	1.5-2.5 fl. oz.	96	
Captan 30-DD	captan	X	X		X	C	2.0 fl. oz.	96	
Bean Guard	captan + carboxin	X	X		X	F	2 oz./ 60 lb seed	12	Contains molybdenum.
Bean Guard Allegiance	captan + carboxin + metalaxyl	X	X			F	2 oz./ 60 lb seed	24	Contains molybdenum. Also labeled for <i>Fusarium</i> .
Captan Moly	captan	X	X		X	F	3.5 oz.	4	Contains molybdenum.
Captan 400	captan	X	X		X	C	1.5-2.5 fl. oz.	96	
Cruiser MAXX Pak	fludioxonil + mefanoxam + thiamethoxam (insecticide)	X	X	X	X		see product labels	48	Also labeled for <i>Fusarium</i> , and suppression of seed borne <i>Sclerotinia</i> ; insecticide for seedcorn maggot.
Enhance	captan + carboxin	X	X		X	F	3 oz./ bushel	48	Controls seed borne <i>Phomopsis</i>
Hi Moly Captan-D	captan	X	X		X	F	2 oz./bushel	12	Contains molybdenum.
Maxim 4FS	fludioxonil	X			X	C	0.08-0.16 fl. oz.	12	
Protector-D	thiram	X	X		X	F	2 oz./bushel	24	
Protector-L	thiram	X	X		X	F	6.7 fl. oz.	24	Contains molybdenum.
Protector-L-Allegiance	thiram + metalaxyl	X	X		X	F	6.7 fl. oz.	24	Contains molybdenum.
Kernel Guard Supreme	carboxin + permethrin (insecticide)	X	X		X	F	3 oz.	12	insecticide for seed corn maggot
Kickstart VP	carboxin + permethrin (insecticide)	X	X		X	F	1.5 oz/50 lb.	12	insecticide for seed corn maggot
Kodiak Flowable	<i>Bacillus subtilis</i>	X				C, F	0.25 fl. oz.	4	Biological fungicide. <i>Fusarium</i> also listed on label.

Seed treatments registered for SOYBEAN diseases, continued

Trade name	Common name	Rhizoc.	Pyth	Phytop.	Phomop.	commercial or on-farm use = C or F	Rate per 100 lb. Seed or as noted	REI hrs.	Comments
Kodiak HB	<i>Bacillus subtilis</i>	X				F	3-6 oz.	4	Biological fungicide. <i>Fusarium</i> also listed on label.
Rival	captan +PCNB +thiabendazole	X	X		X	C	4.0 fl. oz.	96	
SoyGard	azoxystrobin + metalaxyl	X	X		X	C	0.32-0.43 oz.	24	
Stiletto	carboxin + thiram + metalaxyl	X	X			F	6.7 fl. oz.	24	Also labeled for <i>Fusarium</i>
Stiletto Pak	metalaxyl					C	6.8 fl. oz.		Multipack for larger quantities
System 3 Seed treatment	Pentachloronitrobenzene + metalaxyl + <i>Bacillus subtilis</i>	X	X	X	X	F	4-6 oz./bushel	12	
Triple-Noctin L	thiram	X	X		X	F	4 oz./bushel	24	Contains molybdenum and inoculant
Vitavax -34	carboxin	X			X	C	3-4 fl. oz.	12	Labeled for seedling diseases
Vitavax 200	carboxin + thiram	X	X		X	C	4 fl. oz.	24	
Vitavax CT	carboxin + thiram	X			X	C, F	12 oz.	24	
Vitavax M	carboxin + thiram	X			X	C, F	12 oz.	24	Contains molybdenum.
Vitavax M DC	carboxin +captan	X	X		X	F	12 oz.	48	Contains molybdenum.
Vitavax -PCNB	carboxin + penta-chloronitrobenzene	X			X	C	4 oz.	12	Labeled for seedling diseases
Vitavax TL	carboxin + thiram	X	X		X	F	6.8 fl. oz.	24	
RTU- Vitavax Thiram	carboxin + thiram	X	X		X	C, F	6.8 fl. oz.	24	Labeled for suppression of seed borne <i>Sclerotinia</i>
Warden RTA	fludioxonil + mefanoxam	X	X	X	X	C	5 fl. oz.	48	Labeled for seed borne <i>Sclerotinia</i> , <i>Fusarium</i>