Integrated Pest & Crop Management

Early Season Soybean Diseases

By Laura Sweets

This could be another interesting year for early season soybean diseases in Missouri. Because of the erratic weather patterns, soybean planting is behind average in some regions of the state. A significant number of acres were just planted during a short dry period about a week ago, so plants in those fields are just emerging. The fluctuations in both air and soil temperatures have contributed to uneven germination and slow growth of young plants in some fields. The next several weeks will be the test for how severe early season seed decay, damping off and seedling blight are in soybeans this year.

However, the unusual fluctuations in both soil moisture and soil temperatures could increase the potential for Pythium seed decay and seedling blight as well as Phytophthora seedling blight. The early season soybean diseases include those that cause seed decay, seedling blights and root rots of soybean. Most of these early season soybean diseases are caused by fungi in the soil that are found wherever soybeans are grown. *Pythium, Phytophthora, Rhizoctonia* and *Fusarium* are the most common of these early season pathogens, although *Macrophomina* (charcoal rot fungus) may also cause early season seedling problems.

This season weather may have a direct impact on seedling health and vigor. Saturated soils resulting in oxygen deprivation may have caused poor germination and death of germinated seedlings before they emerged through the soil surface. Saturated soils and oxygen deprivation may also adversely affect young seedlings. In some fields soybean plants were just crooking through the soil surface when unusually low temperatures occurred. The crook of the young plant may have been damaged by cold temperatures and as these plants unfold that region of the hypocotyl may be discolored and constricted. Soil pathogens such as Phytophthora or Rhizoctonia may also be contributing to the discoloration and constriction of this area of the hypocotyl. If the constriction isn't too severe, plants may survive. However, if the constriction is severe, these young plants may not survive. This is especially true if the plants are then stressed by hot, windy conditions.

Soybean seedling blights have the potential to cause losses in Missouri soybean fields every year. The specific seedling blights that occur and their severity vary with the environmental conditions each season. With the changes in weather patterns this spring and soybean planting delayed in much of the state because of wet soil conditions, it is difficult to predict which, if any, seedling blights may occur or may cause significant problems this season.

Pythium and *Phytophthora* are favored by wet conditions and are more likely to be serious problems when wet conditions exist at or just after planting. *Rhizoctonia* and *Fusarium* are not as restricted by soil moistures and soil temperatures but still need some

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Numerous Reports of Black Cutworm Damage to Corn and Soybean Seedlings

By Wayne Bailey

During the past 10 days many reports of black cutworm damage to seedling corn plants and soybean have been received. Larvae produced from late moth flights have reached the 4th instar or later stages of growth and are causing problems on seedling corn and soybean plants in fields scattered across the state. Black cutworm larvae occasionally cause damage to seedling soybean when their feeding activities result in high plant mortality. In most years, low populations of black cutworm larval in soybean go unnoticed as surviving plants often compensate for lost plants. However, moderate to heavy feeding by black cutworm larvae on soybeans seedlings may substantially reduce crop yields if high seedling mortality occurs. Although a good economic threshold for black cutworm feeding on soybean seedlings is lacking, 20% or more cutting of soybean seedlings has been used in past years. With the higher commodity prices for soybean, this economic threshold is probably too conservative. As commodity prices go higher, producers can afford to treat pest infestations at lower thresholds. With this in mind, an economic threshold of 10% or more cutting is a more reasonable economic threshold for black cutworm infestations in seedling soybean. Soybean producers are encouraged to monitor soybeans stands at least twice per week during the next month to make sure cutworm larvae are not reducing plant stands to unacceptable levels. Seed applied insecticide treatments on soybean should help reduce black cutworm larval numbers, but may not prevent economic damage in situations where larval feeding is severe. In corn, these seed treatments often control about 50% of black cutworm larvae under heavy infestations. They should work better in soybean where the treated seed is grouped closer together in the row. However, insecticide efficacy data on black cutworm in soybean is very limited for many of the new seed treatments. A list of rescue application insecticides for black cutworm control in soybean is as follows. Be sure to follow label directions concerning whether the insecticide selected for rescue or replant needs to be incorporated or simple broadcast over the soil surface.

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Watch Out For Ergot

By Craig Roberts and Adam Leonberger

In a wet year like this, conditions are right for ergot infection; ergot is a fungus with the Latin name of Claviceps purpurea. The current humidity coupled with the warm temperatures will convert the state of Missouri into an incubator. And this month, ergot, which is a surface pathogen, will thrive; "ergot bodies" will begin to appear in grass seedheads; the best way to describe the appearance of ergot bodies, they look like mouse droppings.

Worldwide, ergot infection is most common in small grains, such as rye. In our state, infe

ction occurs most often in tall fescue; this is simply because Missouri has so many acres of tall fescue.

Ergot produces toxic compounds called ergot alkaloids. These alkaloids are similar to ergovaline, the ergot alkaloid frequently reported in toxic tall fescue. These alkaloids cause ergot poisoning. Ergot poisoning symptoms in livestock are similar to symptoms of fescue toxicosis—lameness, heat stress, and poor production. Because of the similarity between these two disorders, many producers will phone up their extension offices to report "fescue foot," even though they are probably seeing ergot poisoning.

Management to prevent ergot poisoning is straightforward. Avoid feeding infected seedheads to livestock. This means clipping if the seedheads are infected. If hay is made, producers should be aware that at least half of the alkaloid concentration will remain. This is true even if the hay is field cured and stored for more than a year.

Occasionally, producers will feed screenings from a seed conditioner. If this occurs, producers must check the screenings to ensure no ergot is present. Ergot bodies in seed screenings are highly concentrated, as expected when the seed is cleaned. Therefore, these screenings are highly toxic, enough in some cases to kill the calves being fed.

After seed are removed, the pasture will be free of ergot infection for at least one more year.

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Numerous Reports of Black Cutworm Damage to Corn and Soybean Seedlings

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Table 1. Black Cutworm - Soybean

Comments: Scout emerging plants and treat if cutting reaches or exceeds 10% and cutworms are present.

Common Name	Trade Name	Rate of formulated material per acre	Placement/ Comments	REI Hours	Pre-Harvest Interval Days
esfenvalerate	*Asana XL	5.8 to 9.6 fl oz	foliage	12	21 (grain) Do not graze or feed livestock
cyfluthrin	*Baythroid XL	1.6 to 2.8 fl oz	foliage	12	45 (grain, feeding dry vines) 15 (green forage)
bifenthrin	*Brigade 2EC	2.1 to 6.4 fl oz	foliage	12	18 (grain)
chlorpyrifos + gamma-cyhalothrin	*Cobalt	13 to 26 fl oz	foliage	24	30 (grain) Do not graze or feed livestock
lambda-cyhalothrin + thiamethoxam	*Endigo ZC	2.5 to 3.5 fl oz	foliage	24	30 (grain) Do not graze or feed livestock
zeta-cypermethrin + bifenthrin	*Hero	2.6 to 6.1 fl oz	foliage	12	21 (grain) Do not graze or feed livestock
chlorpyrifos	*Lorsban Advanced	1 to 2 pt	foliage	24	28 (grain) Do not graze or feed livestock
zeta-cypermethrin	*Mustang Max	1.28 to 4.0 fl oz	foliage	12	21 (grain) Do not graze or feed livestock
chlorpyrifos	*Nufos 4E	1 to 2 pt	foliage	24	28 (grain) Do not graze or feed livestock
carbaryl	Sevin 4F	2 to 3 pt	foliage	12	21 (dry grain or hay)
chlorpyrifos + bifenthrin	*Stallion	3.75 to 11.75 fl oz	foliage	24	Do not graze or feed livestock 14 (graze or forage)
cyfluthrin	*Tombstone Helios	0.8 to 1.6 fl oz	foliage	12	45 (grain, feeding dry vines) 15 (green forage)
lambda-cyhalothrin	*Warrior II with Zeon	0.96 to1.60 fl oz	foliage	24	30 (grain) Do not graze or feed livestock

***Designates a restricted-use pesticide. Use restricted to certified applicators only.**
Read the label and follow all insecticide rate information, directions, precautions, and restrictions.

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moisture to initiate infection. *Macrophomina phaseolina* grows best at temperatures between 82-95°F. Infection of seedlings with *Macrophomina* is most likely to occur if conditions of high soil temperatures and low soil moisture exist during the first two to three weeks after planting.

Symptoms of *Pythium damping-off* range from seed rot or preemergence damping-off to early postemergence damping-off. Affected tissue develops a soft, watery brown rot. Pythium damping-off is most likely to occur in cool (50-550F), wet soils.

Phytophthora can cause seed rot, preemergence damping-off and early postemergence damping-off. Initially affected tissue develops a soft, watery brown rot. Within several days the affected plant parts may dry out and shrivel up becoming dark, dry and brittle. This early stage Phytophthora is difficult to distinguish from Pythium damping-off. Phytophthora can also cause a seedling blight in which established seedlings turn yellow, wilt and die. Generally the entire seedling is affected and roots may be poorly developed and rotted. Phytophthora root rot is more likely to occur in heavy, wet soils, low areas or compacted areas, but it may occur in light soils or better drained areas if heavy rains occur after planting.

Rhizoctonia can cause seedling blight and root rot of soybean. Affected stands may have an uneven appearance and seedlings appear pale green in color and stunted in growth. The identifying feature of this disease is a small, reddish lesion on one side of the stem at or just below the soil line. This lesion develops into a sunken, cankered area at the point of infection. Sometimes the lesion will expand to completely girdle the stem. On severely infected seedlings, the entire hypocotyl may be discolored and shriveled into a dry, stringy or wiry stem.

Fusarium can also cause root rot of soybean. Infection is usually confined to roots and lower stems. The lower part of the taproot and the lateral root system may be discolored, deteriorated or completely destroyed. General roots show a nondescript brown discoloration and a dry, shrunken rot. Above ground portions of plants may appear off-color and stunted. Plants with severe Fusarium root rot may die prematurely.

Charcoal rot, caused by *Macrophomina phaseolina*, may be more commonly recognized as a mid to late season disease on maturing soybean plants, but it can also occur early in the season on seedlings. Infected seedlings tend to show a reddish brown discoloration from the soil line up the stem. The discolored area changes from reddish brown to dark brown to black. Foliage may appear off color or begin to dry out and turn brown. If the growing point is killed, a twin stem plant may develop. Under hot, dry conditions, infected seedlings may die. Under cooler, wetter conditions, infected seedlings may survive but carry a latent infection. Then symptoms may reappear later in the season with hot, dry weather.

Once the crop has been planted, there is little that can be done to reduce incidence or severity of soybean seedling diseases. Additional stress from poor growing conditions, herbicide injury or other factors may compound problems with soybean seedling diseases. Prior to planting it is important to consider variety selection (especially in fields with a history of *Phytophthora*), fungicide seed treatment, crop rotation, seedbed preparation and conditions at planting.

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True Armyworm vs. Grass Sawfly

By Wayne Bailey

The grass sawfly (*Pachynematus* spp.) can be confused with small true armyworm larvae in both grass pastures and wheat. Grass sawfly larvae usually occur 1-2 weeks earlier than true armyworm larvae in both crops, but often are present at the same time through May and early June. As previously described, true armyworm larvae are pale green in color when small. They have four sets of abdominal prologs and one anal pair of prologs. Larger larvae are not green and tend to spend more time on the top of the grass or wheat plant. The grass sawfly is pale green through all larval stages and may appear to possess transparent skin over its body. Thus, it looks like you can see all the good stuff inside the larvae. It is commonly observed in wheat just before and after head formation. Although only a rare economic pest of grass pastures in Missouri, it is present in high numbers in many fescue fields this year. This insect is known to cause problems in turf throughout the US and in wheat and barley in many eastern states. In Missouri, larvae of the grass sawfly are generally heavily parasitized and cause only limited damage to wheat. Populations occasionally build in turf, but problems in grass pastures are rare unless heavy populations build and severely defoliate grass vegetation.

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Weed of the Month: Eastern Black Nightshade

By Brett Craigmyle and Kevin Bradley

Eastern black nightshade (*Solanum ptycanthum*) is an erect summer annual with a distribution found primarily east of the Rocky Mountains, but in recent years has been found more commonly in Kentucky, Illinois, Indiana, and Missouri (Ogg and Rogers 1989; Young et al. 2002; Uva et al. 1997). Eastern black nightshade typically germinates from May through July in the Midwest (Myers et al. 2005; Zhou et al. 2005.)

Figure 1. An eastern black nightshade seedling in the early stages of growth.

Eastern black nightshade seedlings have cotyledons that are green on the upper surface, and purple- or maroon-tinted on the lower surface. Stems below these cotyledons are covered with small hairs and are also green to sometimes tinted maroon (Figures 1 and 2). The leaves are simple, arranged alternately along the stem, ovate or ovate to lanceolate in outline, with leaf margins that may either be entire or with blunt teeth (Figure 3). Leaves are often only slightly hairy, but this characteristic can vary from plant to plant. Stems of eastern black nightshade are round and angular, partially hairy, and branching, with a purplish color, and can become woody as the plant matures. White or purple-tinged star-shaped flowers may be present from mid-June throughout summer with glossy black berries maturing 4 to 5 weeks after flowering. The clusters of berries that are produced are capable of producing hundreds of thousands of seed per growing season (Ward and Weaver 1996; Ogg and Rogers 1989).

One of the most common and well known problems associated with eastern black nightshade is its toxicity to livestock. With the exception of the mature berries, the vegetative parts and fruit contain a chemical known as glycoalkaloid solanine which, when ingested, produces a gastrointestinal irritation in all classes of livestock (Uva et al. 1997). In row crop production, eastern black nightshade has become a more notable problem in recent years, especially in soybeans. Although this plant is capable of competing with the crop and reducing soybean yield, it is perhaps even more of a concern for its ability to interfere with soybean harvest and reduce soybean seed quality (Milliman et al. 2000). The berries of this plant are capable of staining corn and soybean seeds and the foliage which often remains green at harvest can plug combines and also act as a source of moisture for fungal growth during storage (Ward and Weaver 1996.).

Eastern black nightshade is not as commonly encountered as a problematic weed of corn as in soybean, as almost all of our current preplant and post-emergence corn herbicides provide good control of this species. However, the growth habit of eastern black nightshade is well adapted to some of the most common weed management practices utilized in current soybean production systems. For example, eastern black nightshade can germinate after post-emergence applications of glyphosate have been made and these plants are also very shade tolerant in nature. Another common practice once used to control eastern black nightshade was the use of ALS herbicides like the imidazolinones (Pursuit, Scepter, etc.) (Milliman et al. 2000). However, over-use of these herbicides has resulted in the selection for ALS-resistant biotypes of eastern black nightshade in several Midwestern states (Milliman et al. 2000).

Figure 2. An eastern black nightshade seedling with the first sets of true leaves.

One of the best options for the control of eastern black nightshade in soybeans is the application of a preplant, residual herbicide. Most of the currently-labeled preplant

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Figure 3. A mature eastern black nightshade plant.

herbicides with residual activity provide good to excellent control of eastern black nightshade in soybeans. Previous research has shown that the chloroacetamide herbicides provide good control of this species (Ashigh and Tardif 2006). For this reason, preplant applications of products that contain metolachlor (Dual II Magnum, Prefix, Boundary, etc.), dimethenamid (Outlook, Verdict, etc.) or alachlor (IntRRo, etc.) should be considered in fields where eastern black nightshade is a concern. Additionally, the flumioxazin- and sulfentrazone-based products like Valor, Valor XLT, Envive, Authority Assist, Authority XL, Authority First, Sonic, etc. also provide good control of this species. Lastly, if there are no concerns with ALS resistance in the population, ALS-inhibiting herbicides like Pursuit, Pursuit Plus, and Scepter can still provide good control of this species. As with almost all weeds encountered in soybean systems, narrower soybean row spacings have also been shown to contribute to the overall level of eastern black nightshade control observed. Stoller and Myers (1989) found that switching from 30-inch to 7.5-inch row spacings decreased the growth and fruit production of eastern black nightshade by 50%.

Literature Cited

Ashigh J. and F.J. Tardif. 2006. ALS-Inhibitor Resistance in Populations of Eastern Black Nightshade (*Solanum ptycanthum*) from Ontario. Weed Tech. 20:308-314.

Milliman, L.D., D.E. Riechers, F.W. Simmons, and L.M. Wax. 2000. Two Biotypes of Eastern Black Nightshade that are resistant to ALS-inhibiting Herbicides. Proc. North Bent. Weed Sci. Soc. 55:86.

Myers. M.W., W.S. Curran, M.J. Vangessel, B.A. Majek, D.A. Mortensen, D.D Calvin, H.D. Karsten, and G.W. Roth. 2005. Effect of Soil Disturbance on Annual Weed Emergence in the Northeastern United States. Weed Tech. 19:274-282.

Ogg, A.G., Jr., and J.H. Dawson. 1984. Time of Emergence of Eight weed species. Weed Sci. 32:327-335.

Ogg, A.G., Jr., and B.S. Rogers. 1989. Taxonomy, distribution, biology, and control of black nightshade and related species in the United States and Canada. Rev. Weed Sci. 4:25-58.

Stoller, E.W. and R.A. Myers. 1989. Effects of Shading and Soybean Interference on Eastern Black Nightshade Growth and Development. Weed Res. 29:307-316.

Uva, R.H., J.C. Neal, and J.M. Ditomaso. 1997. *Weeds of the Northeast.* South Korea. Cornell University Press.

Ward, I.K., and S.E. Weaver. 1996. Response of Eastern Black Nightshade (Solanum ptycanthum) to Low Rates of Imazethapyr and Metolachlor. Weed Sci. 44:897-902.

Young, B.C., S.A. Nolte, and J.R. Martin. 2002. Occurrence and management of eastern black nightshade with perennial characteristics. Proc. North Cent. Weed Sci. Soc. 57:32.

Zhou, J., E.L. Deckard, and C.G. Messersmith. 2005. Factors Affecting Eastern Black Nightshade (*Solanum ptycanthum*) Seed Germination. Weed Sci. 53:651-656.

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Double Crop Soybean Yields Better with TLC

By Allen Wrather

Farmers in south Missouri will begin harvesting wheat in about one to two weeks and then begin to plant soybean into these fields. They can help the double crop soybean grow and yield as well as possible with the following four procedures.

1. For south Missouri, plant a maturity group (MG) 4 or very early 5 variety. In our tests, yields of mid-June planted MG 3 varieties were always lower than yields for MG 4 and very early 5 varieties. The yields for the MG 4 and 5 varieties were about the same. The harvest date for a mid-June planted MG 4 variety will be about mid-October.
2. Plant seed that has been commercially treated with a fungicide in fields where irrigation will be used to help the soybean seed germinate. This treatment will help protect the seeds and seedlings from rot that may develop due to wet soil from irrigation. Fungicide seed treatments available now are more effective than those available a few years ago.
3. Scout the crop frequently during the summer and fall to determine if insecticides are needed, especially for stink bugs and pod feeders; to determine if foliar fertilizer is needed, especially potassium; and to determine if a foliar fungicide is needed at beginning pod fill.
4. Irrigate if possible but do it properly.

Following these suggested procedures will give farmers a better chance of realizing a profit with double-crop soybean in 2011.

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True Armyworm in Grass Pastures, Wheat and Corn

By Wayne Bailey

True Armyworm in Grass Pastures, Wheat and Corn. Wheat, tall fescue, grass pastures, and occasionally field corn are all hosts of true armyworm (*Mythimna unipuncta* formerly *Pseudaletia unipuncta*). Problems with true armyworm larvae are occurring in some grass pastures in south central and southwestern regions of the state and in wheat and corn in scattered fields throughout Missouri. This pest is most active in grass pastures where larvae were first reported about three weeks ago and continue to cause problems in some areas. The major damage in tall fescue and other grass pastures is defoliation with some cutting of seed heads. Heavy true armyworm infestations may defoliate and consume 100% of the grass foliage and move to feed in adjoining grass pastures before reaching maturity.

This insect rapidly grows through approximately 7 or more worm stages (instars) as they develop from egg to adult moth. The early instars avoid light and spend much time close to the soil surface and on lower plant foliage. Feeding by early instars is usually minimal, but the amount of damage they cause rapidly increases as the larvae increase in size and move upward on host plants. A total of 2-3 generations may be produced each season, but only the first generation generally causes problems in grass crops and pastures. Later generation larvae tend to move to turf to feed and develop. Larvae may also cause problems on highways when they move in mass (like their armyworm name implies) and are killed by vehicle traffic. Large slick spots on the road surfaces may form and result in vehicle accidents. True armyworm larvae do not feed on legumes, only grasses.

Scouting: True armyworm moths have grayish-brown to tan colored forewings, with a white spot located in the center of each forewing, and grayish-white to pale hindwings. Larvae are almost hairless with smooth bodies. Although very small larvae are often pale green in color, they quickly change to yellowish-brown or tan bodies with tan to brown heads mottled with darker brown patterns. Three distinct broad, longitudinal dark stripes run the length of the body with one occurring on the back and one each running down each side. An additional one or more orange lines can be found running the length of each side from head to tail. Larval identifying characteristics include the presence of four pairs of abdominal prologs located in the center of the larva and a single pair of anal prologs present at the tail end of the larva. Each abdominal proleg will have a dark brown to black triangle located on the foot of the proleg. These dark triangles are good identification characters as few other larvae possess this characteristic.

Larvae of true armyworm are often active at night or on cloudy days as they avoid light. To determine the presence of small larvae scout plant debris on the ground and for feeding damage on lower plant foliage. As larvae increase in size, they will feed during both night and day periods and move upward on host plants as they consume foliage.

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True Armyworm in Grass Pastures, Wheat and Corn

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Larger larvae tend to remain on the upper regions of host plants.

Economic Thresholds: Tall Fescue and Grass Pastures - Occasional severe pest of grass seed and forage fields. Treat when an average of 4 or more half-grown or larger worms (½ inch to 1 ½ inch larvae) per square foot are present during late spring and before more than 2% to 3% of seed heads are cut from stems in tall fescue seed fields.

True armyworm populations have been light in wheat this spring. Few fields have required an insecticide application and no head cutting has been reported. **Economic Threshold: Wheat** -Treat when an average of 4 or more half-grown or larger worms per square foot are present during late spring and before more than 2% to 3% of seed heads are cut from stems. Wheat should be monitored several times per week after heading as true armyworm larvae can cut most heads from plants in a 2-3 day period once they begin cutting heads.

Several corn fields have reached the economic threshold for true armyworm this past week. Larvae of this pest can severely damage corn when high populations defoliate plants to the point of killing them. Producers are encouraged to scout corn plants weekly for the presence of true armyworm larvae. Although seedling plants are most at risk during this time of the year, corn plants can be defoliated throughout the growing season. **Economic Threshold: Field Corn** – Treat seedling corn when 25% or more of plants are being damaged. Control is justified after pollen shed if leaves above ear zone are being consumed by larvae. True armyworm can be a severe pest on field corn and cause excessive defoliation and plant mortality.

Table 1. Insecticides Control of True Armyworm in Tall Fescue and Grass Pastures

Chemical Name	Trade Name	Rate of formulated material per acre	Placement/Comments
malathion	**Malathion several Products**	see specific labels	foliar broadcast
zeta-cypermethrin	***Mustang Max**	**2.8 to 4.0 fl oz/acre	foliar broadcast
carbaryl	**Sevin XLR Plus**	1 to 1 1/2 quarts/acre	foliar broadcast
spinosad	**Success**	3 to 6 fl oz./acre	foliar broadcast
spinosad	**Tracer 4SC Voliam xpress**	1.o to 3.0 fl oz/acre	foliar broadcast

**Note, FMC recommends a minimum rate of 3 oz/acre for true armyworm control.

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True Armyworm in Grass Pastures, Wheat and Corn

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Table 2. Insecticides Control of True Armyworm in Wheat

Common Name	Trade Name	Rate of formulated material per acre	Placement/ Comments	REI Hours	Pre-Harvest Intervals Days
cyfluthrin	***Baythroid XL**	1.8 to 2.4 fl oz	foliage 1st & 2nd instars only	12	30 (grain) 3 (grazing or forage)
methomyl	***Lannate SP**	1/4 to 1/2 lb	foliage	48	7 (grain) 10 (grazing or feeding)
zeta-cypermethrin	***Mustang Max**	1.76 to 4.0 fl oz	foliage	12	14 (grain. forage, hay)
chlorpyrifos	***Nufos 4E**	1 pt	foliage	24	28 (grain or straw) 14 (forage or hay)
microencapsulated methyl parathion	***Penncap-M**	2 to 3 pt	foliage	48	15 (harvest or graze)
carbaryl	**Sevin 80S**	1 1/4 to 1 7/8 lb	foliage	12	21 (grain or straw) 7 (hay or forage)
spinosad	**Tracer naturalyte**	1.5 to 3.0 fl oz	foliage, timing important	4	21 (grain or straw) 14 (forage or hay)
chlorpyrifos + bifenthrin	***Stallion**	9.25 to 11.75 fl oz	forage	24	14 (grazing) 28 (straw)
cyfluthrin	***Tombstone Helios**	1.8 to 2.4 fl oz	foliage	12	30 (grain) 7 (grazing)
lambda-cyhalothrin	***Warrior II with Zeon**	1.28 to 1.92 fl oz	foliage	24	30 (grain or straw) 7 (hay or forage)

*** Designates a restricted-use pesticide. Use is restricted to certified applicators only.**
Read the label to determine appropriated insecticide rates. Be sure to follow all directions, precautions and restrictions.

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True Armyworm in Grass Pastures, Wheat and Corn

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Table 3. Insecticides Control of True Armyworm in Corn

Common Name	Trade Name	Rate of formulated material per acre	Placement/ Comments	REI Hours	Pre-Harvest Intervals Days
permethrin	***Ambush 25WP**	6.4 to 12.8 fl oz	foliage	12	30 (grain or stover), 0 (forage)
permethrin	***Ambush Insecticide**	6.4 to 12.8 fl oz	foliage	12	30 (grain or stover), 0 (forage)
permethrin	***multiple products**	see specific label	foliage	12	see specific label
esfenvalerate	***Asana XL**	5.8 to 9.6 fl oz	foliage	12	21 (grain)
cyfluthrin	***Baythroid XL (for 1st & 2nd instars)**	1.6 to 2.8 fl oz	foliage	12	21 (grain or fodder) 0 (green forage)
flubendiamide	***Belt SC**	2.0 to 3.0 fl oz	foliage	12	1 (green forage and silage) 28 (grain or stover)
bifenthrin	***Brigade 2EC**	2.1 to 6.4 fl oz	foliage	12	30 (grain, fodder, graze)
chlorpyrifos + gamma-cyhalothrin	***Cobalt**	13 to 26 fl oz	foliage	24	21 (grain or ears) 14 (graze or silage haravest)
deltamethrin	***Delta Gold 1.5EC**	1.5 to 1.9 fl oz	foliage	12	21 (grain, fodder) 12 (cut forage or graze)
zeta-cypermethrin + bifenthrin	***Hero**	4.0 to 10.3 fl oz	foliage	12	30 (grain, stover, graze) 60 (forage)
methoxyfenozide	**Intrepid 2F**	4.0 to 8.0 fl oz	foliage	4	21 (grain)
methomyl	***Lannate SP**	1/4 to 1/2 lb	foliage	48	0 (ears), 3 (forage), 21 (fodder)
methomyl	***Lannate LV**	3/4 to 1 1/2 pt	foliage	48	0 (ears), 3 (forage), 21 (fodder)
chlorpyrifos	***Lorsban Advanced**	1 to 2 pt	foliage	24	21 (grain, ears ,forage, fodder)
chlorpyrifos	***Lorsban 4E**	1 to 2 pt	foliage	24	21 (grain, ears, forage, fodder)
zeta-cypermethrin	***Mustang Max**	3.2 to 4.0 fl oz	foliage	12	30 (grain, stover) 60 (forage)
chlorpyrifos	***Nufos 4E**	1 to 2 pt	foliage	24	21 (grain or ears)
microencapsulated methyl parathion	***Penncap-M**	2 to 3 pt	foliage	48	12 (grain, forage, graze)
carbaryl	**Sevin 4F**	2 to 4 pt	foliage	12	48 (grain or fodder) 14 (harvest or graze forage)
chlorpyrifos + bifenthrin	***Stallion**	9.25 to 11.75 fl oz	foliage	24	30 (grain, stover) 60 (forage)
cyfluthrin	***Tombstone Helios**	1.6 to 2.8 fl oz	foliage	12	21 (grain or fodder), 0 (forage)
spinosad	**Tracer 4SC**	1.0 to 3.0 fl oz	foliage	1	28 (grain), 3 (fodder or forage)
lambda-cyhalothrin	***Warrior II**	1.28 to 1.92 fl oz	foliage	24	21 (grain), 1 (graze, forage) 21 (treated feed or fodder)

*** Designates a restricted-use pesticide. Use is restricted to certified applicators only.**

Read the label to determine appropriated insecticide rates. Be sure to follow all directions, precautions and restrictions.

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Weather Data for the Week Ending June 5, 2011

By Pat Guinan

Station	County	Weekly Temperature (ºF)						Monthly Precipitation (in.)		Growing Degree Days‡	
		Avg. Max.	Avg. Min.	Extreme High	Extreme Low	Mean	Departure from long term avg.	May 1 - May 31	Departure from long term avg.	Accumulated Since Apr. 1	Departure from long term avg.
Corning	Atchison	89	68	96	55	79	+11	3.61	-0.89	762	+167
St. Joseph	Buchanan	86	68	91	56	78	+11	3.60	-1.29	717	+108
Brunswick	Carroll	89	69	95	57	79	+11	4.43	-0.93	743	+104
Albany	Gentry	87	66	93	52	77	+10	4.70	-0.08	692	+117
Auxvasse	Audrain	89	69	94	59	79	+11	5.00	-0.15	762	+118
Vandalia	Audrain	88	66	93	57	78	+10	4.78	-0.36	728	+122
Columbia-Bradford Research and Extension Center	Boone	89	67	94	56	78	+9	5.36	+0.32	745	+65
Columbia-Jefferson Farm and Gardens	Boone	89	68	93	57	79	+10	5.62	+0.61	773	+91
Columbia-Sanborn Field	Boone	90	70	95	58	80	+11	6.49	+1.43	835	+120
Columbia-South Farms	Boone	88	68	92	57	78	+10	6.15	+1.11	771	+90
Williamsburg	Callaway	88	68	92	56	78	+10	5.44	+0.47	774	+152
Novelty	Knox	85	66	90	53	76	+8	5.26	+0.18	648	+46
Linneus	Linn	*	*	*	*	*	*	*	*	*	*
Monroe City	Monroe	87	67	92	57	77	+9	3.66	-1.23	703	+71
Versailles	Morgan	90	68	93	60	80	+11	7.89	+2.48	857	+123
Green Ridge	Pettis	88	68	92	57	79	+10	4.67	-0.30	774	+111
Lamar	Barton	89	69	92	66	79	+9	4.69	-1.31	858	+98
Cook Station	Crawford	90	66	93	62	78	+9	6.33	+1.35	854	+104
Round Spring	Shannon	92	64	97	63	77	+8	6.80	+1.56	809	+106
Mountain Grove	Wright	87	67	93	62	78	+10	7.06	+2.04	782	+122
Delta	Cape Girardeau	93	70	98	67	82	+10	7.48	+2.31	962	+73
Cardwell	Dunklin	96	72	99	69	85	+10	10.04	+5.08	1118	+93
Clarkton	Dunklin	97	72	101	68	84	+9	8.02	+3.62	1071	+78
Glennonville	Dunklin	95	71	100	67	83	+9	8.90	+4.51	1064	+73
Charleston	Mississippi	93	72	99	69	83	+10	6.60	+1.76	1018	+125
Portageville-Delta Center	Pemiscot	96	74	102	71	85	+11	8.94	+4.19	1132	+125
Portageville-Lee Farm	Pemiscot	95	74	102	70	85	+11	9.11	+4.30	1128	+131
Steele	Pemiscot	98	74	102	71	86	+11	8.64	+3.35	1164	+144

* Complete data not available for report

‡Growing degree days are calculated by subtracting a 50 degree (Fahrenheit) base temperature from the average daily temperature. Thus, if the average temperature for the day is 75 degrees, then 25 growing degree days will have been accumulated.

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