



# AgVantage Green Notes



Volume 15, Issue 7

## Western Bean Cutworm Season Begins

By Christian Krupke, John Obermeyer, and Larry Bledsoe, Purdue—Pheromone trap cooperators have been catching western bean cutworm moths for the past two weeks. Over the weekend of June 27, several moths were captured, last week's heat probably spurred their emergence from the soil. The most surprising capture was from Mike Shrack in Jay County, it is only a guess on whether that moth overwintered in that area or was transported on winds. You can track future Indiana, and other Midwestern state captures, via the Western Bean Cutworm Monitoring Network at <http://www.ent.iastate.edu/trap/westernbeancutworm/> and click on "Trap Sites" under the Site Navigation on the left hand side.

Scouting and treatment guidelines are likely only a concern for counties, where moth numbers have been highest and damage was observed last year. University of Nebraska entomologists, knowing this

sporadic pest for decades, suggest that egg scouting begin once moths are being captured with regular frequency. In five different areas of a field, inspect 20 consecutive plants for egg masses which are laid on the upper surface of the top leaves of corn and/or larvae that may have hatched and crawled to the whorl and begun to feed. Moths are most attracted to cornfields that are soon, or just beginning, to pollinate. A treatment threshold of 8% of the plants with an egg mass and/or larvae in the whorl is suggested. Timeliness is critical, because as soon as pollination begins, larvae will make their way into the ear via the silks and become impervious to insecticides. This threshold has recently been tweaked by crop consultants, and suggested by Iowa State University, to be about 5% of plants infested.

Last year, damage from this pest was found only in occasional fields in northwestern counties. Hot spots within a field had numerous ears infested, but usually

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## Points to Consider for Fungicide Applications in Corn—Kierston Wise, PU

It is the time of year when we are receiving more and more questions regarding the benefits of a fungicide application in corn. The most frequent question we receive is "Should I spray a fungicide?" Although this seems like a straightforward question, the answer is complex. There are many factors to consider when making the decision on if and when to apply a fungicide to hybrid corn.

One important point to note is that university researchers have not seen consistent yield benefits from foliar fungicide applications in corn. In other words, we see a lot of variation in the yield response from a fungicide application, and a foliar fungicide application has not been profitable in every situation. This said, we know that there are certain factors that influence disease development and understanding these factors can aid in making a decision on whether or not to apply a fungicide:

1. **Hybrid susceptibility.** Hybrids vary in their susceptibility to foliar diseases of corn, and hybrids susceptible to diseases such as gray leaf spot are at a greater risk of disease development than hybrids with moderate or high levels of disease resistance.

2. **Previous crop and cropping system.** Most of the fungal diseases, such as gray leaf spot, survive from year to year on crop residue, and planting corn-on-corn, and planting corn into high levels of corn residue (no-till) will increase the likelihood that disease will develop.

3. **Late planting.** Research from Iowa State University has demon-

strated that late-planted corn (which describes most of the Indiana corn in 2009) is at higher risk of gray leaf spot development.

4. **Favorable weather conditions.** Foliar diseases, like gray leaf spot, require high humidity, moisture and moderate to warm temperatures for disease development.

5. **Level of disease in the field.** This is a crucial factor when deciding to apply a fungicide, however, it is not always considered due to equipment or labor availability, etc. Scouting fields around V10 to V14, or prior to tassel emergence, can help determine the level of disease pressure in a field. This factor could make the difference in whether or not a fungicide application will pay at the end of the season.

Unfortunately, there are no hard and fast rules as to how much disease in a field is necessary to "pull the trigger," but there are guidelines that were established based on work from Gary Munkvold at Iowa State. These guidelines are based on a combination of the number of infected plants observed in a field and hybrid susceptibility:

1. If 50% of the plants in a field have disease lesions present on the third leaf below the ear leaf or higher prior to tasseling, AND the hybrid is rated as susceptible, or moderately susceptible, a fungicide application should be considered.

2. If the hybrid is rated as moderately resistant and disease is present on the third leaf below the ear leaf on 50% of plants prior to tasseling, AND additional factors or conditions that favor disease development

# Critical Growth Stages for Maximizing Soybean Yield

This year's soybean crop has been blessed with almost too much rain so far, but unless we are extremely lucky, the rains will stop sometime during the summer. Dry spells in Kentucky don't happen every year (it just seems that way), but when they do they can last for most of the summer, or, more commonly, for just a couple of weeks. The effect of these short dry spells on yield will depend upon how long they are and when they occur during the life cycle of the soybean crop.

The soybean plant goes through three distinct phases of growth between planting and maturity: 1.) vegetative growth, 2.) flowering and pod set, and 3.) seed filling. Vegetative growth in soybean actually continues until the end of flowering and pod set, but for our purposes here, vegetative growth will be the period from planting until the first flower appears (growth stage R1).

Phase One, vegetative growth, is not as sensitive to dry weather as the other phases. During vegetative growth the plant produces the leaves and roots that are going to do the work of producing yield. The leaves use the energy in sunlight to convert carbon dioxide in the air into the simple sugars that serve as the building blocks for all plant and seed tissues, while the roots take up the water and nutrients that the plant needs for growth.

To produce maximum yield, the plants must produce enough leaves to completely cover the ground by initial bloom (growth stage R1). If they don't, some sunlight will reach the ground and be wasted, reducing the number of pods and seeds, and yield. The ample rains so far this season will probably ensure ground cover by R1. Reaching full ground cover by R1 is easier with narrow rows or full season varieties, but late plantings, especially in wide rows, make it more difficult. Soybeans usually produce more than enough leaves to cover the ground so they can lose some leaves to dry weather and still reach complete ground cover by growth stage R1, making vegetative growth less sen-

sitive than phase two or three.

The critical phase when drought must be avoided is Phase Two, flowering and pod set. During flowering and pod set, the soybean plant determines how many pods and seeds to produce. Dry weather during this phase will reduce pod and seed number and yield. Some of the lost yield can be recovered by producing larger seeds, but this adjustment may not be large enough to get it all back.

Flowering and pod set can continue for up to 40 days in Kentucky. We used to think that this allowed the plant plenty of time to recover from a short dry spell. But, in our field experiments, soybean could not recover from 14 days of stress at the beginning of flowering and pod set even though flowering continued for nearly 20 days after the stress. The pods lost to stress were not recovered and yield was reduced. The good news was that stress periods of less than 10 days during peak pod production had no effect on pod survival or yield.

Drought during Phase Three, seed filling, will hurt yield. This is not surprising since this phase is when yield is actually produced; phases one and two are only the preliminaries to the main event. Water stress during seed filling accelerates normal leaf senescence where leaves turn yellow and fall off the plant, causing early maturity, smaller seeds and lower yield. The early maturity of soybean plants on hill tops where the soil is shallow is a vivid example of water stress hastening maturity.

The 2009 soybean season is off to a late, but amply wet start. Vegetative growth is proceeding well and the leaves and roots are developing the machinery to produce high yield. We need timely rains for the next 60 days to realize this potential. If dry spells occur, they will have the greatest effect on yield during flowering and pod set, and seed filling.

## Silk Clipping Insects

Japanese beetle adults have emerged from the soil and corn root-worm beetles are starting to emerge. These two insects can feed on corn silks and with heavy pressure and continued feeding they can reduce the number of pollinated kernels.

The following are various thresholds from silk clipping of corn root-worm adults:

- Indiana— silks are clipped back to within 1/2" or less before 50%

of the plants are pollinated and beetles are present

- Illinois—5 or more beetles per plant, pollination is not complete and silk clipping is observed
- Ohio— 5 or more beetles per silk mass, 75% of the plants have silked and silk clipping to less than 1/4" is observed

## It is Time to Sample for Corn Nematodes—Greg Tytko, Iowa State

There is much discussion about corn nematodes this season, and interest likely will continue or increase in the next few years. Many articles have been published in the agricultural press about changes in corn production practices that may increase the occurrence of these microscopic worms that live in the soil and can damage corn.

Nematode feeding on corn can stunt plants and cause leaves to turn pale green or yellow and wilt. Damage is rarely field wide, more often occurring in patches that have non-discrete edges that fade into healthy-looking plants.

There are many production problems that stunt corn plants and affect the foliage. To determine if plant-parasitic nematodes are causing observed damage to corn, a corn plant with the soil surrounding the plant must be collected to check for nematode densities in the soil and for two nematode species that feed almost exclusively in roots. These endoparasitic corn nematodes will be detected only in low numbers in the soil during the growing season and damage could be misdiagnosed if only a soil sample was collected.

**Sampling** Sampling mid season, when damage symptoms are apparent and nematode numbers are greatest, is necessary because corn nematode population densities increase through the growing season and the different nematode species vary in the number needed to cause damage.

To check for corn nematodes, collect 2-3 corn plants of affected corn with the root ball and soil intact and place in a moisture proof bag. The tops of the plants can be discarded.

Samples can be sent to the Purdue Nematode Lab, Department of Entomology, Purdue University, 901 W State Street, West Lafayette IN 47907-2089. A submission form can be found on the Purdue

Nematology Website. There is a \$10 cost for analysis..

We have done some nematode sampling within the Ceres Solutions trade area. Results indicate spiral, lance, lesion, and needle nematodes have been found in various samples. So far most of the fields have had non-yield limiting nematode numbers.

# Recovery and Yield Potential from Lodged Corn

Strong winds and heavy rains associated with severe thunderstorms can lodge or knock corn plants over, especially if the nodal root system is not fully developed. Root lodging can be directly related to severe feeding by rootworm larvae. However, Bt rootworm resistance alone will not prevent root lodging. Hybrids differ in their ability to resist root lodging. Moreover, a hybrid may exhibit outstanding stalk lodging resistance but may be very susceptible to root lodging. Hot, dry weather conditions and soil compaction may inhibit nodal root formation and predispose plants to wind injury.

Strong winds can pull corn roots part way out of the soil. The problem is more pronounced when soil are saturated by heavy rains accompanying winds. If root lodging occurs before grain fill, plants usually recover at least partly by "kneeing up." This results in the characteristic gooseneck bend in the lower stalk with brace roots providing above ground support. If this stalk bending takes place before pollination, there may be little effect on yield. When lodging occurs later in the season, some yield decrease due to partial loss of root activity and reduced light interception may occur. If root lodging occurs shortly

before or during pollen shed and pollination, it may interfere with effective fertilization thereby reducing kernel set. Several university studies have been performed to assess the impact of wind lodging on corn growth and grain yield.

Iowa state researchers forced V10 corn to "root lodge" at a 45 degree angle in plots with and without rootworms. Grain yield of root lodged corn without rootworms yielded 11 and 40 percent less than the control in the two years of the study while root lodged corn with rootworms yielded 12 and 28 percent of the control. Years were a major factor affecting the yield response. The ISU researchers concluded that "root lodging was more detrimental to biomass accumulation and grain yield than corn rootworm injury caused by larval feeding." In another ISU study that evaluated natural root lodging, root lodged plants intercepted 28 percent less light than plants that were not root lodged.

In a University of Wisconsin study, root lodging was simulated by saturating soil with water and manually pushing corn plants over at

## Summer Seeded Cover Crops— Alan Sundermeier, Ohio State University

Now is the time to prepare for planting cover crops after wheat or oats harvest this summer. Your local seed dealer may not stock supplies and need to make a special order. Control of summer annual weeds and volunteer wheat may be needed before planting cover crops.

Cover crops offer many benefits to producers that increase farm profitability and environmental sustainability. Each cover crop has a niche or special purpose. Legume cover crops are typically used to produce homegrown nitrogen. Grass cover crops are used to increase soil organic matter, recycle excess nutrients, and reduce soil compaction. Brassica crops are grown to loosen the soil, recycle nutrients, and suppress weeds. Some other cover crops are grown to suppress insects, disease, weeds, or attract beneficial insects. Therefore, cover crops should be considered an integral part of any farming system that wants to efficiently utilize nutrients, improve soil quality, and increase farm profitability. Refer to this factsheet for more about cover crops in cropping rotations: <http://ohioline.osu.edu/sag-fact/pdf/0009.pdf>

Decisions on which cover crop to plant need to consider the following:

**Homegrown Nitrogen** -Summer planted legumes may contribute nitrogen to the following grain crop. The availability and amount of the nitrogen produced can vary widely depending on cover crop growth and nutrient content. Soybeans that are treated and will not carryover can be used as an economical cover crop. Cowpea is better adapted to hot, dry weather and will grow rapidly until a killing frost in the fall. Austrian Winter Pea is a legume that may or may not survive the winter when summer planted. If winter pea is planted in mid-September,

fall growth will be limited but winter survival is improved, and spring growth will contribute nitrogen. Summer planted clovers usually do not establish well in hot, dry weather.

**Brassica** -Oilseed radish has the ability to recycle soil nutrients, suppress weeds and pathogens, break up compaction, reduce soil erosion, and produce large amounts of biomass. Freezing temperatures of 20 to 25 degrees will kill oilseed radish which allows for successful no-till spring planting of subsequent crops. As a fast growing, cool season cover crop, oilseed radish is best utilized when planted after small grain (e.g. wheat) or corn silage harvest. Excess nutrients in manure amended soil are rapidly absorbed by this cover crop, thus preventing leaching or runoff of nutrients into water systems. Without a source of nitrogen, oilseed radish growth will be limited, therefore its use is recommended after a manure application. Refer to this factsheet for more information: [http://ohioline.osu.edu/sag-fact/pdf/Oilseed\\_Radish.pdf](http://ohioline.osu.edu/sag-fact/pdf/Oilseed_Radish.pdf)

**Grass Cover Crops** -Cereal rye or winter rye can be planted from summer to late fall. Cereal rye is hardy and will survive the winter. A fall forage cutting is possible if planted soon after wheat. Cereal rye does an excellent job of capturing manure nutrients into biomass growth. Oats is another economical choice for summer seeded cover crops. It also can grow rapidly, absorb excess soil nutrients, and provide a fall forage harvest. Oats will winterkill and work well with no-till corn planting the following year.

The Midwest Cover Crops Council website contains more information <http://mccc.msu.edu>

## Soybean Rust and Soybean Aphid Update

Soybean rust continues to be found mainly on kudzu in the south. Weather conditions in the south are hot and dry which will slow disease development. The following is a report from Purdue on soybean rust and soybean aphids in Indiana.

**Crop Growth Stage** Last Modified: 07/12/09 05:06 PM As of July 6th, 95% of soybeans in Indiana have emerged, and 3% are blooming. Growth stages range from V3 to R1 in sentinel plots.

**Observation and Outlook - Disease** Last Modified: 07/12/09 05:06 PM - Brown spot is present in many fields on lower leaves, however the dry weather over the last week has not been favorable for disease development.

Soybean rust has not been detected in Indiana as of July 12th.

**Observation and Outlook - Insect** Last Modified: 07/08/09 04:14 PM No soybean aphids reported yet from sentinel sites. Conditions remain excellent for aphid growth and development (moderate temperatures, absence of storm activity).

**Scouting and Management - Disease** Last Modified: 07/12/09 05:06 PM Sentinel plot monitoring began in Indiana in July. We will monitor 12 sentinel plots on a weekly basis, and additional fields and kudzu as needed.

No management of soybean rust is needed in Indiana at this time.

# Grain Update

## USDA Summary—June 10,2009

Estimates in Million Bushels

Corn	July USDA—09/10	Jun USDA-09/10
Carry-in	1770	1600
Production	12,290	11,935
Total Supply	14,075	13,550
Feed and Residual	5200	5,150
Ethanol	4100	4100
Exports	1,950	1,900
Total Use	12,525	12,460
Carry-out	1,550	1,090
<b>Soybeans</b>		
Carry-in	110	110
Production	3380	3,195
Total Supply	3179	3,317
Crush	1,680	1,675
Exports	1,275	1,260
Seed	94	92
Residual	81	79
Total Use	3130	3107
Carry-out	250	210
<b>Wheat</b>		
Carry-in	667	669
Production	2,112	2,016
Total Supply	2,894	2,800
Food	955	955
Seed	78	78
Feed & Resid	230	220
Exports	925	900
Total Use	1,263	2,153
Carry-out	706	647

are present (see above factors), a fungicide application should be considered.

3. Resistant hybrids should be scouted for disease problems, but fungicide applications to these hybrids are generally not recommended, and will not consistently result in a yield increase.

These points have been outlined in past *Pest&Crop* newsletters, and also by many other university researchers around the Midwest.

The factors that we described above influenced the response we observed from fungicide applications in research that was conducted in Jennings, Randolph, and Tippecanoe counties in Indiana last year. When we compare the results across previous crop and hybrid susceptibility, we see that the corn-on-corn trial planted to a more susceptible hybrid had the highest level of foliar disease, and the greatest average yield response to a fungicide application.

A final point is that some level of disease can be found in a field, but the decision to spray should be based on the disease present, as well as the factors discussed above. For instance, we have seen a lot of Anthracnose leaf blight this spring, and it has been confused with gray leaf spot in some cases. We are just now starting to see early lesions of gray leaf spot on some susceptible hybrids and we recommend scouting fields to determine the level of disease present. Common rust is also a disease that may be present on ear leaves or above at this point in the season, but it rarely causes serious yield loss, and a few lesions of common rust on a leaf will not justify a fungicide application

***Jeff Nagel and I have been in several fields from north to south. We have found abundant grey leaf spot in some fields and not much in other fields. This is definitely a year we need to check each field for disease presence and level of infection.***

## Western Bean Cutworm cont...

only one worm was found and damage was primarily in the ear tips. Last year, a field in northern Newton County near the Illinois border was noticeably damaged by this pest, click the link below to view movie of this field and severe damage. From our limited experience with this pest, areas of sandy soils and continuous corn seem to promote higher populations. Too, Cry1F (Bt protein found in Herculex 1) has shown to be very effective in suppressing this pest.

In the weeks to follow, we will keep you abreast of observations shared from others concerning this ear-attacking insect. Too, we'll post photos to help in worm identification. Till then...happy scouting!

## Lodged Corn Cont...

the base, perpendicular to row direction. Wind damage was simulated at various vegetative stages through silking (V10 to R1). Compared to hand harvested grain yields of control plants, grain yield decreased by 2 to 6%, 5 to 15% and 13 to 31% when the lodging occurred at early (V10-V12), medium (V13-V15) and late (V17-R1) stages, respectively.

## Ceres Solutions Answer Plot Days

Come get the latest and greatest information on new and upcoming corn and soybean genetics and technologies from Croplan Genetics, Dekalb/ Asgrow, and Syngenta at our Answer Plot/ Seed Kick Off Days at Ceres Solutions.

Not only we will have discussions on our seed genetics, but we also plan to have some timely agronomic discussions on planning for 2009 cropping season—nutrient and crop protection wise and our Ceres Solutions AgVantage Program. Hold the following dates open on your calendar:

**August 17**—Roselawn Dairy and Forage Day

**August 19**— Roselawn Answer Plot near the Roselawn Ceres Solutions facility.

**August 20**—Crops 63 Answer Plot just east of US 63 and south of the intersection of US 74 and US 63 (1 mile south of the Beef House).

**August 21th**—Answer Plot at FFR Research Facility just north of Lafayette IN and just off of SR 25.

**August 28**—Farmersburg Answer Plot just west of US 41 and just north of Farmersburg.

Stay tuned for more details on times, locations and agenda.

Choosing the right seed for your farm to ensure profitability is not just choosing the right genetics. It is understanding your fertility, how to protect crops and how to protect yields. Come join us to learn about a total crops solutions.