Crop Solutions that Work

June 3, 2016

WEEDY FIELDS AND BLACK CUTWORMS

Significant or intense captures of black cutworm moths are being reported from some areas. However, there is no way to accurately predict where the cutworm moths will descend out of weather fronts. Even if you are monitoring black cutworm moth flights with your own pheromone trap, you cannot be absolutely certain of where cutworm eggs are being laid. There are, however, certain behavioral characteristics of black cutworm moths that we can use to help estimate the risk to a particular field.

Black cutworm moths do not like to lay eggs (oviposit) on bare soil or even in weed-free corn fields. They prefer soybean residue if there is no green weed growth available, but will almost always go to green weeds to lay eggs when these weeds are present. A master list of preferred weed hosts is not available but we know that chickweed, curled dock, yellow rocket, henbit, and other winter annual or early spring annual weeds are regarded as desirable food hosts and oviposition sites for black cutworm moths.

When corn is planted into weed cover and burndown herbicide applications are then made, the risk to the emerging corn can be great. As the weeds die, they lose attractiveness for cutworm larval feeding. Yet, the dying weeds can serve as food for the cutworm larvae for well over a week, longer under cool conditions, often long enough for emerging corn to be at risk. A similar situation exists when weeds are tilled down just ahead of corn planting. The dying weeds can also serve as food in this situation until the corn emerges.

Cutworms gain size and toughness when they have fed on weeds before moving over to corn. Even when the corn features a Bt (Lepidoptera) trait and/or Cruiser, Poncho, or Gaucho insecticide seed treatment, these larger cutworms are not as susceptible to the trait or seed treatment as are the smaller worms. Although indiscriminate insecticide use should be discouraged, the risk from cutworms getting a healthy start in weeds should not be ignored. In fact, the closer the weed control efforts are to corn planting, the more risk exists for cutworms to move from weed growth over to corn. Under these circumstances, addition of an insecticide to the herbicide burndown mix is probably a reasonable choice.

Cornfields should be closely monitored from the time of emergence, to a few weeks after emergence. Timely detection of early black cutworm damage in corn allows adequate time for rescue insecticide treatments, with little or no loss of yield.

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AGRONOMY™

Contributing Editor:
Eric Meyer

Urea Top-Dressing on Corn -
Photo Provided by Jerry Harbour, Prairieland

- ***Waiting too long to understand Nitrogen status of your field can cost yield and operational efficiencies***
- ***N-Watch is a valuable tool for assessing N status and helping to make management decisions prior to additions of N in season***
- ***The next N watch sampling regimen should be taken when corn is 6-12 inches tall (V3-V5)***
- ***Iowa State PM 1714 is a tool to assist growers interpreting soil test nitrate levels at the 6-12 inch growth stage of corn***

DO I NEED TO ADD NITROGEN TO MY FIELDS TO INSURE N SUFFICIENCY FOR YIELD?

If you wait too long to see deficiency symptoms in corn, you may have already experienced yield loss and the N application window may close down due to crop size or weather related issues, conversely over application of N can lead to reduced profits and negative environmental impact when N is not needed and over-applied. N-Watch can be a very good tool to help estimate soil Nitrate to assess management actions.

As a guide to help interpret N-Watch data output refer to the Iowa State publication regarding (PM-1714). http://www.extension.iastate.edu/Publications/PM1714.pdf

PM 1714 testing procedure is calibrated to assess soil nitrate-N sufficiency in the 0-12 inch depth. Sample time should be synchronized to 6-12 inch corn height (Using the droopy leaf method), which equates to approximately the V3 – V5 growth stage depending on the corn hybrid, consider turnaround time for lab analysis, evaluation of results and logistics related to N application. The critical level of Nitrate – N in the top 12 inches of soil for corn following corn and corn following soybean is 25 ppm, when nitrate – N levels fall below this critical value an N management decision should be considered.

Example from PM 1714. A soil test of 15 ppm and a critical concentration of 25 ppm results in a recommendation of 80 pounds per acre to be applied (25 - 15) x 8 = 80

Example from PM 1714. A soil test of 35 ppm and a critical concentration of 25 ppm indicates that the soil already has approximately 80 pounds of N more than needed (25 – 35) x 8 = (80) No N application needed

Remember that N-Watch and PM 1714 are tools where interpretation of soil test N data should be considered as part of the whole system of tools and not just an easy number that triggers a nitrogen application. The best use of N Watch and the most accurate interpretation of soil test numerical values come when there has been an on-going N testing program that leads to a more robust situational awareness of soil N trends and any given soil test regarding N status in a field. Soil tests may underestimate PAN where 1.) Inhibitors have been used, 2.) More than 150 lb. N/acre of Nh_3 were applied or 3.) More than 150 lb. N/acre of manure was injected. Also first year corn following alfalfa and second year corn after alfalfa tends to mineralize more plant available N after soil sampling. Excess rainfall events prior to soil sampling can also have a confounding effect of soil nitrate levels.

SOYBEAN GROWTH FACTS

Soybeans Emerging

- When the expanding soybean hypocotyl lifts the cotyledons above the soil surface, sunlight causes the cotyledons to turn green and triggers growth of the unifoliate leaves, also stopping hypocotyl expansion.

- Cotyledons normally feed the developing plant for only about a week after emergence, but may do so longer under stress conditions. The cotyledons provide both stored nutrients and limited photosynthetic nutrients.

- Loss of terminal buds or leaves while cotyledons are still attached will trigger development of new axillary buds at the junctions (axils) of the cotyledons and stem.

- Soybean leaf tissue is much more cold tolerant than corn leaf tissue. Since the soybean growing point is always above ground after emergence, however, soybeans may suffer more from a late cold snap.

- The nitrogen-fixing root nodules on soybean roots normally begin to form within a week after plant emergence. The nitrogen-fixing bacteria will supply most of the young plant's nitrogen requirements 10 to 14 days after formation. This process is inhibited in soils that are either too cool or too hot. The presence of soil nitrogen will also inhibit nodule formation.

- Nitrogen fixing root nodules last about 6 to 7 weeks each, but new ones continue to be formed through pod fill. Active nodules are a salmon color in the middle. These nodules tend to become inactive or die during hot, stressful periods of the summer and become olive colored in the middle.

- If weather or pests causes destruction of the terminal bud of the soybean plant, buds in the lower leaf axils may reconfigure to become new stem branches. Leaf axils over the entire height of the plant are also the sites from which flowers will arise.

- Soybeans have three growth habits: Determinate (vegetative growth stops when flowering is initiated), Indeterminate (vegetative growth continues long after flowering begins), and Semi-Determinate (vegetative growth continues after flowering begins, but stops earlier than with indeterminate varieties). Determinate varieties are more popular in the south because they remain shorter and resist lodging. Indeterminate and semi-determinate varieties are more popular in central and northern areas but some indeterminate varieties are now adapted and becoming more popular in the south, as well.

Healthy Soybean Nodule Sliced Open

- Indeterminate soybean varieties may bloom over a period of several weeks, while determinate varieties may have all flowers open in just a few days.

- Flowering in soybeans is triggered by daily hours of darkness. Since nights (at the time of the summer solstice) actually are longer as you go south, moving a variety south from its adapted zone may cause it to bloom earlier. This is why we recommend staying close to adapted maturities, even with late planting or double-crop soybean production. In many cases, with late planting recommendations, a slightly fuller season variety is suggested.

- Narrow row spacing is preferable for late-planted or replanted soybeans. The closer proximity of these shorter plants in narrow rows allows for better utilization of sunlight.

- A period of stress may cause flowering of indeterminate and semi-determinate soybean varieties to slow or stop. On occasion, we have seen these soybeans renew both vegetative and reproductive growth with the return of favorable conditions. Although this demonstrates the adaptability of some of our modern varieties, the presence of both dry beans and "butter beans" on the same plant makes for difficult harvest and lower grain quality.

- Some soybean varieties are known to produce enough flowers to theoretically produce 250 bushel yields. While this unrealized yield potential is often a concern of soybean breeders, most recognize that this is simply a useful trait that helps the soybean tolerate periods of stress while maintaining a base reproductive potential.

Christian County Farmers Supply Company
1210 N. Cheney Street
P.O. Box 377
Taylorville, IL 62568-0377

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SOYBEAN POPULATIONS AND EMERGENCE CONSIDERATIONS

In this edition...

Growers often plant soybeans at populations much higher than necessary for optimum yields. Reasons cited for this often include such things as that the extra plants will aid the emergence of their neighbors, or that the extra seed is not really that expensive and it doesn't seem to hurt. Research has shown that there is usually little reason for planting soybean seed at populations above 150K per acre in 30 inch rows. In fact, there is much research that shows that near optimum yields can be obtained with soybean populations of 100K or less.

When planting soybeans in row widths of 15 inches or less, particularly in heavy-textured soils, it is sometimes beneficial to plant soybean seed at rates between 165K and 220K. This can contribute to more uniform emergence and sometimes to faster canopy closure, though not necessarily to higher yields. In fact, Purdue University recommends planting about 210K seeds per acre in 7 inch rows, 163K seeds per acre in rows spaced between 11 and 20 inches, and 131K seeds per acre in row spacing above 21 inches.

Be sure to check soybean seed bag tags for warm and cold germination percentages, and adjust seeding rates accordingly. When planting soybeans early for your area, a quality seed treatment may provide a slight positive edge for stand establishment.