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Black Cutworms in Corn and Soybean

Black cutworms are a potential destructive pest of seedling corn; however, they do not overwinter in Missouri and are not present in Missouri crop fields every year. Moths migrate from the Gulf Coast or Mexico on wind currents beginning in mid-March and continuing through May.

Preventative insecticide applications are not recommended because black cutworms are not present every year, nor do they reach economic thresholds in every field in years when black cutworms are present. Monitoring for pest presence with pheromone traps is done throughout the state as part of the University of Missouri's Integrated Pest Management program. When the number of black cutworm moths trapped reaches threshold levels, corn growers are alerted to intensify scouting efforts in fields. When damage reaches economic threshold levels, a rescue insecticide treatment is warranted.

Moths lay eggs in thick vegetation, close to the ground in low lying, wet areas of the field during warm nights in March and April. Depending upon temperature, larvae hatch within three to 16 days. A single moth can lay more than 1,000 eggs. The larva goes through six or seven stages called instars, reaching 1 ½ to 2 inches in length. The first generation causes the most damage to seedling corn, but late-planted corn or other crops such as soybean and tomatoes may be damaged by the second generation of black cutworms. Depending upon temperature, it takes 35 to 50 days for the life cycle to be completed from egg to adult.

Small larvae may feed on plants leaving small pinholes in seedling corn leaves or feed on the leaf margins. Once larvae reach the fourth instar, they feed at night cutting seedling corn plants off at the base of the plant either above or below the soil surface. Large larvae may cut several plants in one night. Cut plants may be drug down into the cutworm's underground burrow. Cutting may last 2 ½ to 3 weeks depending upon temperatures. Cool temperatures prolong damage as both the black cutworm larva and corn plant growth is dependent upon temperature. Large larvae may tunnel into stalks of corn plants causing wilting or "dead heart." Once corn plants reach the five-leaf stage, they are no longer susceptible to black cutworm injury.

When black cutworms are present in large numbers, soybeans may also be damaged. Soybean plants are cut off below the cotyledons, which are the seed leaves which first appear when the plant emerges from the ground. In soybeans, scout for at least two weeks after seedling emergence.

Scout by examining 25 consecutive plants in 10 random locations in the field. Rescue insecticide treatments are recommended when 2-4 percent of corn seedlings are cut below ground or 6-8 percent have feeding damage or are cut above ground. The lower the plant population, the less feeding damage the stand can tolerate. Treatment is recommended in soybeans when 20 percent of the plants are cut, gaps between plants are more than 12 inches and live larvae are present. Black cutworm larvae have a rough, grainy skin and range in color from light gray to black.

When black cutworm damage occurs in field crops, eggs were laid before the crop was

planted. Destroying vegetative cover a minimum of 14 days prior to planting can help reduce host sites for moths to lay eggs and reduce larva survival by eliminating a food source.

The University of Missouri tracks black cutworm moth flight by trapping them in pheromone traps. Statewide moth trap counts can be viewed at

https://ipm.missouri.edu/pestMonitoring/ When an intensive moth flight is reported, prediction models are used to forecast the potential for black cutworm damage and an alert to intensify scouting efforts is given.

Source: *Valerie Tate, agronomy specialist*

USDA Surveys

This winter a research report was released by University of Illinois about the declining rates in USDA National Agriculture Statistical Service (NASS) survey responses. The report stated response rates were in the 80 to 85 percent range in the 1980s and have fallen and in some cases below 60 percent. Of greater concern, it appears the decline has accelerated the past five years suggesting the decline reflects a long-term permanent change.

Lower response rates can potentially introduce bias or error in the estimates released by USDA. An example of bias could occur if higher yielding farms drop out. Reduced response rates will likely introduce error in the estimates making them more inaccurate. It will be most noticeable at the county level, due to the number of responses. Nationally, it does not have as big of an impact due to larger numbers. If county responses drop to a certain level, the county data will not be published.

The research is not clear on why the decline is accelerating. Some reasons could include: tired of filling out surveys, time consuming and difficulty in contacting producers due to unpublished cell numbers.

The data from surveys is used in many ways. One of the more recent uses of the data is the 2014 Farm Bill program Agricultural Risk Coverage (ARC). ARC relies on the NASS county yield estimates to determine if the program will provide payments in a given year, on a given commodity and the extent.

Alternative methods of gathering data include: remote sensing, weather data and computer modeling have been considered and even used on a limited basis. Those methods of gathering data may supplement survey data, but are cost prohibitive and have limits.

Several decades ago, USDA began the reports to assure the availability of information on the agriculture sector to all participants and that continues to be very important. USDA reports estimates freely, allowing both buyers and sellers equal information about supply and demand of the crops. In a market without free information, large firms could invest in market intelligence that small firms and farms would not have available.

USDA needs your help to continue making county and national data accurate and viable. The data will be important for the work that will soon begin with the next farm bill as well.

For more information see the University of Illinois full report "Falling Response Rates to USDA Crop Surveys: Why It Matters". http://farmdocdaily.illinois.edu/2017/01/falling-response-rates-to-usda-crop-surveys.html

Source: *Mary Sobba, ag business specialist*

Preparing the Garden for Spring

Garden preparation is an important step to gardening with success. Before planting, clean garden containers with soapy water. If garden tools were not cleaned last fall, clean them before using. Rather than discarding old soil in containers, add fresh soil or compost and mix it into the existing soil. Never plant tomato plants in the same containers if the plants were diseased the previous year. If tomato plants grown in the containers were diseased, plant vegetables of a different family this year. Check local nurseries and garden centers for transplants and fresh seeds. Seeds more than two years old may not have good germination rates. Some seeds are viable for many years, but typically, garden vegetable seed should be replaced after two garden seasons.

Garden soil often needs loosened up and organic matter added before spring planting. A complete fertilizer such as 12-12-12 can be added to the soil. Follow soil test results if a test was performed. If not, follow the rule of thumb on the back of the fertilizer bag.

Cool-season vegetables which include lettuce, spinach, kale, peas, radishes, carrots, potatoes, onion, broccoli, cauliflower, cabbage, Brussels sprouts, kohlrabi, should be planted now to ensure a productive harvest before hot weather arrives. Waiting to plant these crops past mid-April may result in a less productive harvest. Instead, these plants will bolt, or go to seed, during the warm days of late spring.

Make new asparagus plantings in early spring. Asparagus is a low maintenance vegetable plant which thrives in full sun. It prefers organically rich soil that is evenly moist. Asparagus roots can take up to 2-3 years to produce a crop. 'Jersey Knight' is a common, all male cultivar, which produces spears that are 3/8" diameter or larger. Asparagus beetles can be a problem, but usually do not require insecticides unless there are larger populations. Weeds are often a problem in asparagus beds. It is important to keep the bed free of weeds. Apply the granular herbicide PREEN® to control grassy weeds like foxtail.

Plant strawberry plants, rhubarb, small fruit plants and fruit trees in early spring. Pineberries are gaining in popularity. They are a relative of the red, domesticated garden strawberry, but taste similar to pineapple. They are relatively new, easy to grow and readily available to home gardeners. Pineberry plants yield white to pinkish hued fruits.

Prepare the soil before planting any of these fruit plants. Add required nutrients. Mulch the plants for added moisture control. In the wild, they thrive near creek banks where their roots can easily absorb water. Sawdust or bark chips work well around small fruit plants, but often nitrogen will need to be added to the soil as the mulch breaks down. Pale or yellowing of the leaves is an indication the plants need fertilizer.

Pull back mulch from roses and other perennial plants. Prune roses, cut ornamental grasses, and trim back perennials like peonies, coneflowers, rudbeckia, and others left in the garden over the winter. Apply a layer of fresh mulch over the beds for weed and moisture control. PREEN® can be used to control annual weeds in flower beds. If crabgrass was a problem last year, apply crabgrass preventer before April 15. Weed n' Feed can also be applied now to control broadleaf weeds in lawns.

Source: *Jennifer Schutter, horticulture specialist*

Scout Early for Alfalfa Pests

Above normal temperatures in late winter and early spring may speed up the development of alfalfa weevil and potato leafhopper in alfalfa fields. Each of these insect pests can significantly reduce alfalfa yield and in some cases weaken plants enough that the pace of stand loss is increased.

Alfalfa weevil grow through four worm (larval or instars) stages on their journey from egg to adult weevil. Adult weevils generally lay eggs inside alfalfa stems during warm days during fall, winter, and spring. Eggs hatch from early to late spring with first stage larvae crawling to the top of alfalfa plant stems to feed inside plant terminals. Larvae continue to feed inside plant terminals through development of the second instar. Third and fourth instars feed on foliage outside of plant terminals often causing substantial decreases in forage yield and quality. Heavy defoliation also reduces alfalfa competition with weeds and may result in increased weed populations.

Producers in Northern Missouri are encouraged to scout alfalfa fields starting the last week of April to determine weevil numbers. Proper scouting is the key to obtaining good estimates of weevil numbers. Scouting for alfalfa weevil is best accomplished using a 3-5 gallon bucket and a sharp knife. Producers are encouraged to sample 10 alfalfa stems at five random locations in a field for a total of 50 stems per field. At each of the five locations, the scout should carefully cup the terminal end of each alfalfa stem, to prevent larvae from falling off, and then cut the stem off near the soil surface. Next place the stem carefully inside the bucket and vigorously tap to dislodge any larvae present. Most weevils found by this scouting method will be in their third or fourth larval stages of growth. Note: eggs laid on south facing slopes often hatch first in the spring due to receiving more heat units due to their location. If the alfalfa weevil population reaches the economic level of one or more larvae present per stem of alfalfa (50 or more larvae per 50 stems) and 30% or more of the alfalfa stems show feeding damage, then control is justified.

Several management options are available, although application of a foliar rescue insecticide is the most common management strategy. In addition to insecticides, early harvest, grazing, and biological control are other viable options depending on larval numbers, plant growth stage, and field conditions. One alternative to insecticide is early mechanical harvest if the alfalfa is within 7-10 days of the normal harvest stage of 1/10 bloom. Early cutting will cause the death of most alfalfa weevil larvae through mechanical crushing by hay conditioners, or dehydration from the sun, following the removal of the alfalfa canopy. After forage removal, the field should be monitored to detect a possible resurgence in larval numbers.

Grazing is being used by some Missouri producers to reduce the numbers of alfalfa weevil eggs and larvae. Grazing is initiated when weevil numbers reach or are approaching the economic threshold and the alfalfa plants are more than 6-8 inches in height. Grazing is generally accomplished using a management intensive grazing method in which a large number of cattle are placed on a small number of acres and quickly remove the alfalfa growth. As the alfalfa is grazed to normal harvest level, eggs and larvae present are destroyed. Data from Missouri indicate alfalfa weevil larval numbers are reduced by about 98% with mechanical harvest and about 90% by cattle in an intensive grazing system. These reductions in larval numbers can effectively eliminate the risk from alfalfa weevil as long as most spring laid eggs have hatched. This method of alfalfa weevil control has risks. These risks include damage to wet fields and bloat. Producers should continue to scout alfalfa after grazing to determine whether larval or adult alfalfa weevil numbers again reach economic levels and require further control.

Alfalfa stands are most vulnerable to potato leafhopper immediately after the first cutting, and when re-growth is slowed by excess rainfall. Early May is when potato leafhopper adults generally migrate into Missouri, though it may occur earlier depending on weather. In most years, these adults and their offspring will build in number and may severely damage alfalfa plants.

Potato leafhopper adults are very small, about 1/8-inch in length, wedge shaped, and greenish-yellow in color. They

are very mobile and quickly move sideways, jump, or fly when disturbed. Even if a field has severe infestation of potato leafhopper, do not expect to see the insects while just walking through the field, since they are very small and move fast. A fine mesh insect net is the only practical way to check for the presence of potato leafhopper.

This is a native insect which migrates into Missouri each spring from southern states and Mexico. The potato leafhopper is often transported into the state by late winter and early spring storms which move in a northeast direction. The leafhoppers are thought to actively fly into the storms and be carried great distances by low level winds (jets) which approach 100 mph in speed. Arrival of leafhoppers is usually associated with strong thunderstorms containing hail. After a storm passes, high numbers of leafhoppers can often be found in the trail of the storms. The arriving adults may feed initially on several tree species before moving to alfalfa to feed and reproduce. Immature leafhoppers, called nymphs, look very similar to the adult stage except they possess wing pads instead of functional wings. Two to three generations of potato leafhopper are often produced each year with economic damage generally occurring on alfalfa following removal of first harvest.

Damage is caused when both adult and nymphal (immature) leafhoppers use their piercing-sucking mouthparts to penetrate alfalfa leaflets and stems. They remove plant juices and often cause yellowing of established plants, stunting of plant growth, and possible mortality of seedling alfalfa. Both forage quality and quantity are reduced by this alfalfa pest. Alfalfa plants damaged by potato leafhopper feeding will often turn yellow as sugars from photosynthesis are trapped in the plant foliage and cause the change in color to yellow, commonly referred to as “hopper burn”. Scouting for this pest is best accomplished using a 15-inch diameter sweep net. Take 10 pendulum sweeps at five random locations in the field. If the average number of potato leafhoppers per sweep (adult + nymphs) reaches or exceeds the economic threshold numbers listed below, treatment is justified.

Economic Threshold for Potato Leafhopper in Alfalfa

Alfalfa Stem Length - inches	Ave # PLH/Sweep (traditional variety)	Ave # PLH/Sweep (PLH Resistant Variety)
< 3	0.2 (2 in 10 sweeps)	0.6 (6 in 10 sweeps)
6	0.5 (5 in 10 sweeps)	1.5 (15 in 10 sweeps)
8-10	1.0 (1 per sweep)	3.0 (30 in 10 sweeps)
12-14	2.0 (2 per sweep)	6.0 (60 in 10 sweeps)

Source: *Max Glover, agronomy specialist*