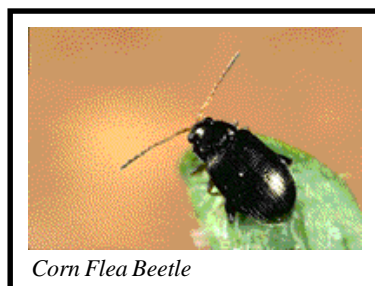




Farm Views

Corn Flea Beetle Survival Expected to be Above Average; Increased Stewart's Wilt May Follow

Due to the mild winter weather, corn flea beetle survival is expected to be above average this year. If the sum of the monthly average temperatures for December, January, and February is greater than 90, winter survival of flea beetles is expected to be high. Except for parts of northeastern Nebraska, most of the state greatly exceeded 90 this winter.



Corn Flea Beetle

Corn flea beetles overwinter as adults in protected areas near corn fields, become active in April, and feed on a variety of grasses before corn emerges. Corn flea beetles can directly injure corn by feeding on seedling plants; but probably more importantly, they vector the bacterium which causes Stewart's wilt. This bacterium overwinters in the gut of the flea beetle. In 1999, Stewart's wilt was found in more areas of Nebraska than had been previously reported, leading to increased concern for an outbreak this year. Early season feeding by the corn flea beetle

and vectoring of the bacterium can lead to the wilt stage of the disease, often killing the plant.

To minimize damage caused by flea beetle feeding:

- Avoid hybrids or inbreds known to be more susceptible to Stewart's wilt. (See seed catalog or local seed company representative.)

- Avoid early planting dates if susceptible inbreds or hybrids are planted.

- Scout for corn flea beetles on seedling corn. Treatment may be warranted on dent corn if 50 percent of plants show severe flea beetle injury (plants look silvery or whitish, or leaves begin to die), and five or more flea beetles per plant are found.

If susceptible inbreds or hybrids were planted, an insecticide may be appropriate when two to three flea beetles per plant are present and 10 percent of the plants show severe flea beetle injury. A variety of foliar insecticides are effective in controlling flea beetles, including Lorsban 4E, 2-3 pints per acre; Sevin XLR Plus, 1-2 quarts per acre; Asana XL, 5.8-9.6 fluid ounces per 1000 row-feet; Lannate LV 0.75-1.5 pints per acre; Pounce 3.2 EC 4-8 fluid ounces per acre; and Warrior T 2.56-3.84 fluid ounces per acre. Source: Bob Wright, Extension Entomologist, South Central REC. (TD)

Weather and Climate Information on the Web

Have you found Lancaster County Extension's weather page? Weather is an integral part of the Nebraska Production Agriculture web pages, found within the Ag/Acreage section. This page provides links to color-coded maps showing: current drought information, one and seven day average soil temperatures, one and seven day potential evapo-transpiration, and links to current radar images of precipitation, maps showing rainfall amounts for the past day, and many more items of interest.

If you would like to view charts of the weather conditions for each day of any month since January 1999 at Lincoln, the information is just a click away. Detailed daily information includes: maximum, minimum, and average temperature, normal maximum, minimum, and average temperatures, record highs and lows, rainfall amounts, and heating degree

cooling degree day values. Less detailed daily weather information can be found for previous years. This historical information includes: high and low temperatures and precipitation for every day back to 1920.

Perhaps you are looking for extension publications covering weather and climate. Links are provided to NebGuides on cropping practices and decisions based on probability of freezes and other weather factors, reducing or mitigating heat stress in animals, and why Nebraskans should be concerned about global warming.

The weather page can be accessed by pointing your web browser to the Lancaster County Extension front page at www.lanco.unl.edu. Select Ag/Acreage, click on the Nebraska Production Agriculture icon, and choose the Weather button. Or point your browser to: www.ianr.unl.edu/ianr/lanco/ag/weather/weather.htm. (TD)

Designing a Bt Refuge for Your Field

One of the issues concerning the use of Bt transgenic corn hybrids is resistance management.

European corn borer larvae (ECB) that feed on Bt corn are exposed to higher levels of the Bt toxin over a longer time than with the use of foliar Bt insecticides, such as Dipel or M-Peril. Under this high level of selection pressure, the potential for resistance developing is high. Resistance management strategies have been designed to prevent or at least delay this.

An important principle of resistance management for European corn borers and Bt corn is the use of refuge planting. A refuge is any ECB host plant not producing Bt proteins or not being treated with conventional Bt formulations. The purpose of the refuge is to supply a source of Bt-susceptible ECB that could mate with resistant ECB potentially emerging from nearby Bt corn. Specific resistance management information will be a part of each corn seed bag label. Be sure and discuss resistance management with your seed dealer.

The EPA has established the following resistance management requirements for 2000.

- On each farm, growers may plant up to 80 percent of their corn acres with Bt corn. At least 20 percent of their corn acres must be planted with non-Bt corn and treated only as needed with insecticides. Decisions to treat the refuge should be based on economic thresholds. Conventional Bt products (liquids or granules) must not be used on the non-Bt refuge.

- Plant non-Bt corn refuge within, adjacent to, or near to the Bt cornfields. If the grower intends to treat the refuge, it should be placed within 1/4 mile

of the Bt field, if at all possible. In any case, the refuge must be placed within 1/2 mile of the Bt field.

- If refuge is established as strips within a field, the strips shouldn't be narrower than six rows.

- If possible, locate refuge plantings to protect potentially vulnerable non-host insects (e.g. Monarch butterfly). Refuge plantings can serve as buffer

same time as possible Bt-resistant ECB from the Bt corn. To achieve this, the corn hybrid in the refuge should be agronomically similar (e.g. similar days to maturity) to the Bt hybrid, planted at the same time as the Bt field, and managed in the same manner as the Bt field. In this way, the ECB moths will be equally attracted to the refuge and Bt cornfield. Larvae also will develop at the same rates and emerge as adults at the same time.

Using a neighbor's cornfield as a refuge is not allowed because the hybrid selection, planting time, pest control, and other production activities are not under the control of the grower planting the Bt corn.

Planting only non-irrigated pivot corners as refuge is not recommended because the corn plants in these areas are significantly different and less attractive to ECB moths than the corn under irrigation. Remember, the idea is to produce some Bt-susceptible ECB moths.

The closer the refuge is to the Bt field, the better. This brings Bt-susceptible ECB in close proximity to any Bt-resistant ECB that may survive in the Bt cornfield. Female ECB generally mate close to where they emerge as adults, so having nearby refuge increases the chances susceptible ECB will mate with a resistant ECB.

Additional information on ECB management, resistance management, and Bt corn hybrids is available through your local county extension office. This information also is available through the UNL Entomology Department web site located at <http://www.ianr.unl.edu/ianr/entomol/entdept.htm>. Source: Tom Hunt, Extension Entomology Specialist, Northeast REC. (TD)



Western Corn Rootworm Adult

zones between the Bt cornfield and the habitat of non-target insects.

Refuge Considerations

Do not plant strips narrower than six rows or mix seed. This increases the risk of resistance occurring because ECB larvae often move from plant to plant. Corn borer larvae that can survive eating small amounts of Bt (low level resistance or tolerance) can end up on a non-Bt plant and survive.

The design for planting strips will depend on your planter. For example, dedicating three end row units of a 12-row planter will effectively give you a 25% refuge and maintain the six-row strip size. If you have a six-row planter you can achieve the 25%, six-row refuge by splitting the planter into three units of Bt and three units of non-Bt. Only strip half of the cornfield. Four-row or single-hopper planters are not suitable for this refuge option.

The European corn borer that is susceptible to Bt from the refuge, must be present at the

