Upcoming Events

Soybean Management Field Days

http://cropwatch.unl.edu/

Begin Scouting for Western Bean Cutworm Eggs

Western bean cutworm moths have been emerging since June 12 at Clay Center. As moth numbers increase, mating will begin and females will begin laying eggs on corn. The appearance of the first moths provides a signal that farmers and crop consultants should begin to scout fields for the white, dome-shaped eggs.

Life Cycle - Western bean cutworm moths lay eggs in clusters of 5 to 200 on the top surface of the upper most leaf of a corn plant and on any leaf surface of dry beans. The eggs require five to seven days to develop, during which time the egg color changes to tan and then to purple immediately before they hatch.

Scouting - Scouting for western bean cutworm should begin in field corn when the first moths are caught. Control decisions should be made shortly after the moth flight peaks. The moth flight usually peaks in early to mid-July, but will probably peak somewhat sooner this year.

When scouting for western bean cutworms in corn, check 20 plants in at least five areas of each field. Look for eggs on the top surface of the upper most leaf or look for larvae in the tassel. If 8% of field corn plants, 5% of seed corn plants, or 5% of popcorn plants have egg masses or larvae, consider applying an insecticide.

Western bean cutworm moths prefer to lay eggs in corn plants that are in the late whorl stage compared to those that have completely tasseled. Pay particular attention to later planted fields or those with uneven development. Western bean cutworm eggs that hatch when corn plants are in the late whorl stage of growth have a high rate of survival. The larvae are well protected in the whorl or tassel.

Treatment Recommendations - Bt corn hybrids with proteins active against western bean cutworms (for example, Cry 1F and VIP3A) appear to control the larvae very well, although not entirely, and should not need treating. For the Handy Bt Trait Table that is a list of commercially available Bt corn hybrids and the proteins they express contact your Extension Office.

If an insecticide treatment is warranted in corn, it should be made when 95% of the plants in a field have tasseled. This timing of the application increases the chance that the worms will be exposed to the insecticide resulting in better control.

Chemigation has provided very good control of this insect, even at lowest labeled rates. Asana, Ambush, Baythroid, Pounce, Lorsban, Capture, Mustang, Penncap-M, Prevathon, Proaxis, Warrior, and Sevin are all labeled for control of western bean cutworm. Many generics also will give good control. A list of registered insecticides, rates, preharvest intervals, and grazing restrictions is on the UNL Department of Entomology website at http://entomology.unl.edu/instabls/wbeancut.shtml for western bean cutworms.

Source: Bob Wright, Extension Entomologist, Lincoln

How Extended High Heat Disrupts Corn Pollination

Corn was originally a tropical grass from the high elevation areas of central Mexico about 7,400 feet above sea level, 2,000 feet higher than Denver. Today, corn still prefers conditions typical of that area — warm daytime temperatures and cool nights. Areas that consistently produce high corn yields share some significant characteristics. These areas — central Chile, the west slope of Colorado, etc. — are usually very bright, clear, high light intensity areas with cool nights.

Corn maximizes its growth rate at 86˚F. Days with temperatures hotter than that cause stress. In the high yield areas, cool night temperatures — at or below 50˚F — reduce respiration rates and preserve plant sugars, which can be used for growth or reproduction, or stored for yield. These are optimum conditions for corn, and interestingly, are fairly typical for areas around central Mexico where corn is native.

This year, in the prairie states and in the Cornbelt, conditions have been dramatically less than optimal.

In years when we get high day and nighttime temperatures coinciding with the peak pollination period, we can expect problems. Continual heat exposure before and during pollination worsens the response. Daytime temperatures have consistently stayed in the upper 90s to low 100s.

The high humidity, which helps reduce crop water demand, also increases the thermal mass of the air—and provides extra stored heat and insulation at night.

Corn is a "C4 Photosynthesis" plant, making it extremely efficient at capturing light and fixing CO2 into sugars. One drawback of this system is that with high daytime temperatures, the efficiency of photosynthesis decreases, so the plant makes less sugar to use or store. High nighttime temperatures increase the respiration rate of the plant, causing it to use up or waste sugars for growth and development. This results in the plant making less sugar but using up more than it would during cooler temperatures.

Heat, especially combined with lack of water, has devastating effects on silking. If plants are slow to silk, the bulk of the pollen may already be shed and gone. Modern hybrids have vastly improved "ASI" or anthesis-silk interval (the time between mid-pollen shed and mid silk). Regardless, in some dryland fields we see seed set problems because of "nick" problems between pollen and silking.

Even in some stressed areas within irrigated fields (extreme sandy spots, hard pans or compaction areas where water isn't absorbed and held, and some "wet spots") we can see stress-induced slow silking and resulting seed set issues. Historically, this has been the most important problem leading to yield reduction, particularly in stressful years. Once silks begin to desiccate, they lose their capacity for pollen tube growth and fertilization.

Even with adequate moisture and timely silking, heat alone can desiccate silks so that they become non-receptive to pollen. While this is a bigger problem when humidity is low, it is apparent that it is happening this year, especially on hybrids that silk quite early relative to pollen shed. Even with dew points in the 70s, when temperatures reach the high 90s to the100s, the heat can still desiccate silks and reduce silk fertility.
Heat also affects pollen production and viability. First, heat over 95˚F depresses

pollen production. Continuous heat, over several days before and during pollen-shed, results in only a fraction of normal pollen being formed, probably because of the reduced sugar available. In addition, heat reduces the period of pollen viability to a couple hours (or even less). While there is normally a surplus of pollen, heat can reduce the fertility and amount available for fertilization of silks. It's been shown that prolonged exposure to temperatures reduced the volume of pollen shed and dramatically reduced its viability.

For each kernel of grain to be produced, one silk needs to be fertilized by one pollen grain.

Addendum to "How Extended High Heat Disrupts Corn Pollination"- A friend of mine, Dr. Jim Dodd of Professional Seed Research, sent me an e-mail after reading the Crop Watch article on "How Extended High Heat Disrupts Corn Pollination". Jim, who is a much better botanist than I, reminded me of the effects of humidity alone on the pollination process.

Corn pollen is produced within anther sacs in the anther. The plant releases new, fresh anthers each morning, starting from near the top of the tassel, on the first day of shed, and proceeding downward over several days. The process of releasing the pollen from the anthers is called "dehiscence." Dehiscence is triggered by the drop in humidity, as the temperature rises. However, when it is extremely humid and the humidity falls very little, dehiscence may not occur at all, or it may be delayed until late in the day. If one has breezes, while the humidity is still very high, the anthers may fall to the ground before pollen is released. If the temperature rises too high before pollen dehiscence occurs, the pollen may have reduced viability when it is shed.

A person experienced at hand pollination in corn will often see this happen. There will be anthers in a "tassel bag," but little pollen. The usual solution to this is to wait a couple hours until the temperature rise reduces the humidity. However, this year we had some conditions where pollen was never released from the anthers. This can impact silk fertilization, particularly in open-pollinated situations.

Source: CropWatch, Tom Hoegemeyer, Professor of Practice, Department of Agronomy and Horticulture

Nebraska Farm Custom Rate Guides Updated

These publications are the result of surveys that have been repeated on even numbered years for some time. The surveys are not based on a random sample of custom operators, but rather the information from operators who chose to share. Those who are familiar with the past publications will find that the current ones are very similar. The following description is for those who may not be aware of these publications.

Nebraska Farm Custom Rates Part 1 covers spring and summer operations, including tillage, planting, haying, fertilizer application, and spraying operations as well as small grain harvest. To view the updated copy go to http://www.ianrpubs.unl.edu/epublic/live/ec823/build/ec823.pdf or contact your local Extension Office for a copy.	**Nebraska Farm Custom Rates Part 2** generally covers fall operations related to harvest, grain harvesting, making and hauling silage, hauling hay, cattle and other commodities and harvesting other crops. To view the updated copy go to http://www.ianrpubs.unl.edu/epublic/live/ec826/build/ec826.pdf or contact your local Extension Office for a copy.

For more UNL information on production economics, including crop budgets, and other resources ask for a copy of **CropWatch: Marketing & Economics** or visit http://cropwatch.unl.edu/web/economics/home