2000

Crop Watch No. 2000-17, July 21, 2000

Lisa Brown Jasa
University of Nebraska-Lincoln, ljasa@unlnotes.unl.edu

Follow this and additional works at: http://digitalcommons.unl.edu/cropwatch

Part of the Agriculture Commons

http://digitalcommons.unl.edu/cropwatch/224

This Article is brought to you for free and open access by the Extension at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Crop Watch by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.
Long-term research yields new way to manage bean leaf beetles

Entomologists at Iowa State University have developed a new way to manage bean leaf beetles that may help avoid pre-threshold damage and damage caused by delayed treatment.

ISU Professor of Entomology Larry Pedigo and Wai-Ki F. Lam, entomology postdoctoral associate, used data from 15 years of monitoring bean leaf beetle populations to develop a management plan for second-generation beetles that is based on the first generation’s population size.

Second-generation bean leaf beetles feeding on soybean pods can cause significant economic damage. Management of the beetles during pod setting and filling can be frustrating for farmers because they often watch sub-economic populations of beetles feed on pods for a couple of weeks before the populations reach economic thresholds. Also, farmers are busy during this time and it can be several days after economic threshold is reached before fields can be treated.

Before we describe the new management plan, let’s review the biology of the beetle:

There are two generations of bean leaf beetles in Nebraska. The beetles seen feeding on soybean seedlings in the spring are actually the previous year’s second-generation beetles. These beetles have overwintered as adults and colonized in the seedlings in the spring. They feed, mate, lay eggs, and die in early to mid-June.

The first generation of beetles begins to emerge in late June through July. The offspring from this generation of beetles is the second generation, which generally begins to emerge in August. This is the most damaging generation.

Development from egg to adult can range from 25 to 40 days, so it is common to see adults from the first and second generations in the field at the same time. Because of this generational overlap, the beetles will be present at some level from mid-July until the end of the growing season. As a result, they must be monitored regularly to determine population shifts, which will aid management decisions.

Bean leaf beetles feed on soybean leaves throughout the season, but leaf feeding seldom causes yield loss. Most damage (economic yield loss) occurs when second-generation beetles feed on the developing pods.

Yield loss can occur in several ways. Pods may be clipped from the plants, but that is not the primary cause of yield loss. Many flowers and pods are aborted naturally and blaming pod loss on bean leaf beetle feeding may be a costly mistake. Beetles normally injure soybean pods by feeding on the outside layer of the pod, leaving a thin layer of tissue still covering the seed. They do not usually eat into the developing seed, although this may occur on very small pods.

Fungal pathogens may enter the pod from the feeding sites, causing seeds to appear shrunken, discolored, and moldy, which can result in reduced yield and dockage. Soybeans are most susceptible to yield loss from pod feeding after full pods are formed and seeds have begun developing.

Pedigo and Lam’s new management method is to sample

(Continued on page 147)
Grape, small fruit field day to be Aug. 12

If you are interested in starting a vineyard or just wanting to grow some grapes for juice, jams, and jellies, a University of Nebraska field day will help you learn useful management practices and ideas.

The first Grape and Small Fruit Field Day will be Aug. 12 from 10 a.m.-4 p.m. at the Bob Curttright farm south of Nemaha.

Evaluation of genotypes and cultivars, trellising and end post assembly systems, root stock studies, winter protection, survival/cold hardiness, and other ways to manage grapevines will be presented, said NU viticulturist Paul Read.

“Anyone interested should come. They will learn about growing grapes for personal and commercial reasons,” he said.

The field day will focus on grapes, although growing raspberries, currants, blackberries, plums, cherries, and Asian and European pears also will be discussed.

“The grape and wine industry has been taking off in Nebraska,” Read said. “Farmers and other potential entrepreneurs may want to look at alternative crops and value-added crops.”

Read said nearly 200 people are growing grapes in Nebraska.


“Winery is a stimulus for the economy in that area. They also tend to sell other products, such as homemade breads, cheeses and sausages. They become a tourist destination, provide entertainment and tend to have festivals,” Read said.

Nebraska’s biggest market for its wines after Nebraska is California.

“These wines are high-quality, award-winning products,” Read said. “There definitely is room for a high-quality product if an extremely good job of promoting and marketing of it is done. If we want to have a quality wine industry, we need good grapes and an excellent winemaking technique to have our own market niche.”

Preregistration is encouraged by Aug. 5. Registration is $2 per adult and free for children and members of the Nebraska Winery and Grape Growers Association. Light lunch items and beverages will be available for sale that day.

For more information, directions or to register, contact Donna Michel at (402) 472-8747 or Read at (402) 472-2854.

Field update

Paul C Hay, Extension educator in Gage County: The late June rains have carried us through pollination. The dryland corn is starting to suffer again and will need rain in the next week. Late weeds due to the poor canopy are troubling many farmers. The continued hot, humid weather is a concern for operators with grain stored on farm. Insects and molds could quickly reduce profits if left unattended.
Long-term research yields

(Continued from page 145)

first-generation beetles and use that information to determine if the second generation will require treatment. This is their proposed plan:

Sample your soybean fields after most of the first-generation beetles have emerged — one week after peak emergence is ideal. Since first-generation beetles have begun emerging across most of Nebraska, sampling can begin now. Use a sweep net or drop cloth to sample the fields (see below for a description of sampling techniques).

If the number of beetles reaches or exceeds the threshold (Tables 1 or 2), stop sampling. If the sample is below the threshold, sample the following week. If the sample remains below the threshold, sample again in a week. When the first-generation beetle population begins to decline, stop sampling. If the threshold is not reached, then the second-generation beetle population should not reach an economically damaging level.

If the first-generation population exceeds the threshold, you can expect the second-generation to be at economically damaging population levels. Scout your fields again in late August to monitor for the first emerging second-generation beetles. When the second-generation beetles begin to emerge, treat the field. The best treatment is an insecticide with residual activity, but make sure it has an acceptable preharvest interval (45 days or less).

Drop Cloth Sampling Method

Perhaps the most accurate way to sample beetles is to use a drop (or shake) cloth. A drop cloth is a 3- by 3-foot piece of muslin or plastic with dowel rods attached to each side. Walk 100 feet in from the edge of the field. Hold one rod against the base of the plants and lay the cloth between the rows. Shake the plants against the cloth to knock the insects and count the beetles.

Sweep Net Sampling Method

Walk 100 feet in from the edge of the field. Walk steadily while taking 20 broad, 180° sweeps with a sweep net. Sample throughout the field in at least five locations to get a good population estimate. It is best to sample four locations in every 20 acres of field. Consult Table 2 for the number of beetles per 20 sweeps that justifies treatment of second-generation beetles.


Tom Hunt
Entomology Specialist
Haskell Agricultural Laboratory, NEREC

Keith Jarvi
IPM Extension Assistant, NEREC

Table 1. Economic thresholds for first-generation bean leaf beetles (average number of beetles per 3 foot of row) that predict economic damage caused by second-generation beetles. If thresholds are met, consider treating second-generation beetles in August.

<table>
<thead>
<tr>
<th>Crop Value</th>
<th>Management Cost ($/acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$/bu</td>
<td>7</td>
</tr>
<tr>
<td>8</td>
<td>3.6</td>
</tr>
<tr>
<td>7</td>
<td>4.1</td>
</tr>
<tr>
<td>6</td>
<td>4.7</td>
</tr>
<tr>
<td>5</td>
<td>5.6</td>
</tr>
<tr>
<td>4</td>
<td>7.0</td>
</tr>
</tbody>
</table>

Table 2. Economic thresholds for first-generation bean leaf beetles (average number of beetles per 20 sweeps) that predict economic damage caused by second-generation beetles. If thresholds are met, consider treating second-generation beetles in August.

<table>
<thead>
<tr>
<th>Crop Value</th>
<th>Management Cost ($/acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$/bu</td>
<td>7</td>
</tr>
<tr>
<td>8</td>
<td>14.6</td>
</tr>
<tr>
<td>7</td>
<td>16.6</td>
</tr>
<tr>
<td>6</td>
<td>19.3</td>
</tr>
<tr>
<td>5</td>
<td>23.0</td>
</tr>
<tr>
<td>4</td>
<td>28.6</td>
</tr>
</tbody>
</table>
Mobile nurseries detect new dry bean rust races

Rust is a dry bean disease caused by the fungus *Uromyces appendiculatus*. Many growers are aware that it has caused epidemics in dry beans since the 1950s. In some cases, losses have exceeded 50%. The level of disease varies greatly from year to year. During the 1998 and 1999 growing seasons, for instance, dry beans had a lower overall incidence and severity of rust than in many previous years.

Rust variability is caused by factors such as the weather being unfavorable for rust development or development delayed until late in the growing season. Some variability also may be due to varietal differences in rust susceptibility and cultural practices that affect canopy moisture or rust fungus survival. For example, volunteer beans sometimes found in corn fields in the spring may provide an early host for the fungus and an opportunity for sexual recombination leading to new pathogenic races. However, genetic sources of rust resistance are available in many dry edible beans and have led to new resistant varieties and breeding lines.

University of Nebraska plant breeder Dermot Coyne has released two rust-resistant varieties, the pinto Chase and the great northern Weihing. Other bean varieties such as Matterhorn, Vision, and Apache are also resistant to our local rust races. However, some of these may be susceptible to white mold (Apache and Vision, for example) or other diseases. We need to understand pathogenic variability of the rust fungus and compare each year’s isolates with previous years’ known pathotypes and races. This information is essential to Coyne’s rust resistance breeding program. In 1999, we identified a new rust pathotype able to defeat the rust resistance genes in resistant varieties such as Matterhorn, Chase, and Weihing.

University of Nebraska researchers and extension educators are cooperating with Panhandle growers, scouts, crop consultants, and field managers to conduct a bean rust variability study during the current growing season. The study also is being conducted in the southwest bean growing region by Horticulturist Dale Lindgren and research technician Dan Schaaf at the West Central Research and Extension Center near North Platte.

A major component of the bean rust study is the Rust Mobile Monitor Nursery, which has been used for several years. Rust symptoms usually begin to appear in early August. When brown powdery rust symptoms are observed in bean fields, growers, consultants, and field managers in the Panhandle should notify an extension educator of the infected field’s location and the bean variety or class. The educator will contact Jim Schild at the Panhandle Research and Extension Center to plan a site visit. If the field is in the southwest, those identifying rust can contact Lindgren or Schaaf, (308) 532-3611, ext. 146 or 169.

Rust symptoms will be monitored on the primary leaves of the nursery. It will take about six to eight days to germinate and grow the 12 bean varieties to the primary leaf stage in the mobile nursery. The nursery will be placed in the field for two to three hours during midday and returned to the West Central or Panhandle Research and Extension Center to be misted overnight. Rust ratings will be taken 10-14 days after the nurseries are exposed. Bean leaves also will be collected at the field site and sent to Lincoln where disease reaction data will be compared to that obtained by the nursery.

For more information on rust, refer to NebGuide G95-1250, Rust of Dry Bean or Regional Bulletin 562A, Dry Bean Production and Pest Management. You also may contact your local Cooperative Extension office; Lindgren or Schaaf at West Central REC; Bob Harveson at Panhandle REC (308) 632-1239; or Jim Steadman, UNL plant pathology department, at (402) 472-3163.

J.R. Steadman  
UNL Professor  
Plant Pathology  
R.M. Harveson  
Plant Pathologist PREC, Scottsbluff

Plant and Pest Clinic Update

Alfalfa diseases diagnosed July 11-18 in the UNL Plant and Pest Diagnostic Clinic included *Fusarium* crown rot, bacterial stem blight, and summer black stem (Kimball County).

Corn diseases included holcus spot (Holt and York counties), maize chlorotic mottle virus (Phelps County), and wheat streak mosaic virus (Adams County).

Soybean diseases present were bacterial blight (Clay and Hamilton counties), bacterial pustule (Phelps County), blight and pustule together (Kearney and Phelps counties), and Phytophthora rot (Lancaster County).

Jane A. Christensen  
Plant and Pest Diagnostic Clinic
Only two fungicide options for bean rust in 2000

The dry bean breeding program at the University of Nebraska and similar programs in other bean-producing states have produced a few rust-resistant bean varieties. However, many popular pinto and great northern varieties grown in Nebraska and surrounding states are susceptible to the pathogen's local races. If rust is found in fields earlier than three weeks before harvest, growers may need to consider applying fungicide.

The decision to apply one or more fungicide treatments will depend on the risk of a rust epidemic in a particular bean field. Bean rust favors cool, moist weather and is further enhanced by varieties susceptible to the pathogen's many races. To assist growers in determining rust potential, a bean rust forecast model with a worksheet was developed by H.F. Schwartz at Colorado State University (http://www.colostate.edu/orgs/VegNet).

Management recommendations for areas in the high or moderate risk categories include scouting fields twice weekly, monitoring weather patterns, and beginning a spray program. A word of caution — do not stop irrigating rusted bean fields. Infected bean plants use more water than healthy plants, and stressed plants will result in a greater loss in seed size.

Maneb and Bravo are the two registered fungicides for treating dry bean rust. Tilt is not available for use in Nebraska or Colorado in 2000. Use all products according to label directions.

Haskell Ag Lab Field Day to be Aug. 17

Biotechnology’s effects on Midwestern agriculture will be discussed at the Northeast REC’s Haskell Agricultural Field Day Aug. 17.

Titled “Biotechnology: Global Issues, Local Decisions,” the event is sponsored by the University of Nebraska and area businesses. The morning session, which will include talks by UNL and industry experts, will be at the Dixon County Fairgrounds in Concord. A tour of biotechnology-related research projects at Haskell Agricultural Laboratory Research Farm will be given in the afternoon. The field day, which is open to everyone, will include a free lunch.

Field Day Schedule

Morning
9:15  Welcome and Introduction at the Dixon County Fairgrounds in Concord
      John F. Witkowski, District Director, NEREC

9:30  Impact of GMOs on Food Production in the United States
      Dr. Susan Harlander, Pillsbury, Inc.

10:10 GMOs and U.S. Public Policy
      Dr. Roy Frederick, UNL Agricultural Economics

10:50 GMOs in Nebraska Agriculture
      Panel Discussion, Industry & University Specialists

11:30 Lunch at the fairgrounds

Afternoon
12:45-3:30 Tour of Haskell Research Farm projects

For more information, contact: Tom Hunt, Extension Entomology Specialist, Haskell Ag Lab, NEREC, (402) 584-2863; e-mail: thunt2@unl.edu
Check corn roots for rootworm injury

Western corn rootworm beetles have been emerging for a few weeks in many parts of eastern Nebraska, indicating that rootworm larval feeding is ending. Mid- to late July is a good time to dig roots to evaluate the efficacy of your rootworm management program.

The presence of adult beetles or rootworms in a field is not necessarily an indication of insecticide failure. Soil insecticides are applied in a narrow band to the soil and corn roots grow beyond the treated zone where rootworm larvae may survive. Also, plant lodging may occur without significant rootworm feeding. Dig and wash some roots to check for rootworm injury before assuming that rootworm damage is responsible for lodging.

Rootworm insecticide efficacy can be reliably evaluated only if replicated, untreated check strips are left in the same field as the treatment. Without check strips, you won’t know whether the absence of injury is due to insecticide efficacy or the absence of rootworms.

Root damage from rootworm feeding can be rated using the Iowa 1-6 injury rating system. (See diagram accompanying this article and NebGuide G92-1108, Evaluating Corn Rootworm Soil Insecticide Performance.) Before corn plants can be rated for injury, they need to be at a growth stage where at least three nodes of roots are clearly visible. Dig at least 10 randomly selected plants from several areas of the field. Leave a 9-inch cube of soil surrounding the root system, wash the roots to remove soil, and rate each plant for injury using the rating scale.

The relationship between root injury rating and yield loss is complex, but usually a root injury rating of 3 or more is needed to cause economic yield loss. The corn plant has the capacity to regrow roots and compensate for some early season injury, especially if soil moisture and fertility are adequate during the regrowth period. If several weeks have passed between the end of rootworm injury and the time of root rating, new root growth may hide the injury. Examine roots carefully to accurately rate them.

Bob Wright
Extension Entomologist
Clay Center

Figure 1. Description of the Iowa State University 1 to 6 root damage scale.

1. No feeding damage
2. Visible feeding scars present
3. At least one root chewed to within 1 1/2 inches of plant
4. One entire node of roots destroyed
5. Two nodes destroyed
6. Three or more nodes destroyed

To qualify as a pruned root, the root must have been pruned to within 1 1/2 inches of the plant. It is not necessary for all of the pruned roots to originate from the same node to qualify as a root system with a full node pruned. It is only necessary that the number of roots pruned is equivalent to that in a full node.

Rating Description of root system
1 No noticeable feeding damage.
2 Feeding scars present but no root pruning.
3 At least one root pruned, but less than an entire node of roots pruned.
4 At least one full node of roots pruned but less than two full nodes.
5 At least two full nodes pruned, but less than three full nodes.
6 Three or more full nodes of roots pruned.