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INSECT, PLANT DISEASE, & WEED SCIENCE NEWS [No. 91-14] [June 28, 1991]

Alex Martin
University of Nebraska - Lincoln, amartin2@unl.edu

Bob N. Stougarrd
Extension Weed Specialist, University of Nebraska-Lincoln

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

Insect Science Plant Disease Weed Science NEWS

UNIVERSITY OF NEBRASKA COOPERATIVE EXTENSION • INSTITUTE OF AGRICULTURE AND NATURAL RESOURCES

No. 91-14 June 28, 1991

In this issue

PLANT DISEASE

Corn anthracnose identified in Fillmore County

A leaf spot occurring on the lower leaves of 24-inch corn was identified as anthracnose in southwest Fillmore County last week. This disease normally appears later in the season in Nebraska; however, plants at any growth stage can be infected. Leaf symptoms initially appear as small, oval to elongate, water-soaked spots. These spots may enlarge to 1/2 inch lesions and become brown and spindle-shaped with yellow to reddish-brown borders. Lesions may coalesce (run together) and cause blighting of the entire leaf. This disease can be tentatively identified in the field by using a hand lens to look for tiny black spines (setae) in older lesions. Anthracnose also can cause top dieback and stalk rot later in the season.

This disease is favored by moderate to high temperatures, extended cloudy conditions, and frequent rain. The anthracnose fungus overwinters in residue from the previous crop; thus, conservation tillage practices contribute to the buildup and early appearance of this disease. Control measures include resistant hybrids, crop rotation, and burying of crop residue.

Ben Doupnik, Jr.

Corn lethal necrosis suspected

Several corn plants exhibiting symptoms of corn lethal necrosis were collected in Harlan County last week. Samples will be tested for the maize chlorotic mottle virus and maize dwarf mosaic virus which cause corn lethal necrosis. If confirmed, this would be its earliest appearance ever. This is very disturbing since there is potential for a severe outbreak in south central Nebraska. Growers in this area should scout for plants which exhibit a bright greenish-yellow mottling, leaf-margin necrosis, and top death. Control includes planting tolerant hybrids and crop rotation.

Ben Doupnik, Jr.

UNIVERSITY OF NEBRASKA-LINCOLN, COOPERATING WITH THE COUNTIES AND THE U.S. DEPARTMENT OF AGRICULTURE

Wind and rain damage provide opportunity for bacterial blight infection in soybeans

Bacterial blight is one of the most common diseases of soybeans in the Midwest. Symptoms of the disease, caused by the bacterium *Pseudomonas syringae* pv. *glycinea*, are conspicuous on leaves but also can occur on stems, petioles, and pods. While the disease is most obvious during mid-season, plant tissues may become infected any time after seedling emergence.

The bacterium overseasons in surface crop residue and in seeds. Primary infections of cotyledons may be a major source of inoculum for secondary spread to the trifoliate leaves. The organism is spread during cool, wet weather and during cultivation while the foliage is damp. It rests on leaf surfaces and buds, needing only the proper temperature and windblown rain to enter plant tissues. Disease outbreaks commonly occur after windy rainstorms, with typical water-soaked lesions forming five to seven days after infection. The bacterium enters the plant through stomates and multiplies in the intercellular spaces where it produces a toxin that inhibits chlorophyll synthesis.

Symptoms on leaves begin as small, angular, water-soaked spots. The centers soon dry out, turn reddish brown to black, and are surrounded by a water-soaked margin bordered by a yellowish-green halo. The angular lesions enlarge and merge to produce large, irregular dead areas. The necrotic tissues of older lesions frequently drop out or tear away, giving the leaves a ragged appearance, especially after strong winds or beating rains. Severe cases may be mistaken for hail injury.

Large, black lesions develop on stems and leaf petioles. Pod lesions, at first small and water-soaked, later enlarge and merge to involve much of the pod surface. The lesions turn dark brown to black with age. If bacteria penetrate to the interior portions of the pod, seeds may become infected. Depending on the extent of infection, seeds may be shriveled, develop sunken or raised lesions, be slightly discolored, or may even appear healthy.

To control bacterial blight:

(1) rotate to non-host crops such as corn, sorghum, or small grains where possible
(2) avoid cultivation or other field activities when plants are wet; and
(3) incorporate crop residue to reduce the carryover potential from season to season.

David Wysong

Wheat scab threat reduced in south central Nebraska

Warmer and drier weather the past three weeks has greatly reduced the threat of potential damage associated with the widespread head scab infection reported in *IPW News* No. 91-12.

Early harvest reports on wheat quality suggest that test weights are running 58-61 pounds with few, if any, scabby kernels. Although yields are sporadic, ranging from 10-40 bushels per acre, and some fields have lower test weights, several other diseases have contributed more to the low yield and low test weight condition than head scab. These include Septoria leaf blotch, tan spot, leaf rust, powdery mildew, and take-all. All but take-all can be controlled with foliar fungicides. Crop rotation will help control all but leaf rust.

Ben Doupnik, Jr.

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Lisa Brown Jasa, Editor

For more information about a particular subject, write the authors at the addresses below:

UNL Department of Entomology
202 Plant Industry Bldg.
Lincoln, NE 68583-0816

UNL Department of Plant Pathology
406 Plant Science Bldg.
Lincoln, NE 68583-0722

UNL Weed Science
Department of Agronomy
279 Plant Science Bldg.
Lincoln, NE 68583-0915

Nematodes may be hidden, but the threat is real

Nematodes can attack corn at any growth stage. Those which which feed in or on the roots are small, slender, thread-like animals that inhabit the soil. Some spend most of their lives within root tissues, such as the lesion and lance nematodes, while others are external feeders and only partially penetrate root surfaces (needle, dagger, sting and stubby-root nematodes). High populations of certain kinds are necessary to induce above-ground symptoms; others can cause extensive root injury and weak, unthrifty plants even at low levels. Seedling plants or plants stressed by other factors, such as poor fertility or lack of moisture, are less able to withstand nematode feeding than are healthy plants. An otherwise healthy plant will frequently 'outgrow' nematode colonization by producing new roots.

Above-ground symptoms include stunting, off-color leaves, ragged or uneven appearance (height variation), and general lack of vigorous growth of plants in patchy areas within the field. These symptoms may be similar to those caused by several other factors, such as disease caused by other pathogens, insect injury, fertilizer imbalances, or soil moisture deficiencies or excesses.

Root symptoms may include pruning of feeder roots, proliferation of fibrous roots, thickening or swelling of smaller roots, and slight to severe discoloration. The discoloration often becomes more severe due to secondary bacteria and fungi entering a nematode feeding wound and further rotting the root.

In most cases, practices that promote vigorous corn growth will minimize the effects of parasitic nematodes. Fertilize soils according to soil tests and provide supplemental irrigation as needed. Control root-feeding insects and maintain good weed control. Weeds may act as nematode reservoirs for this or next year's crop. Rotate perennial trouble fields to a crop other than corn. Soil insecticide/nematicides are only partially effective in reducing population levels in heavily infested fields.

David Wysong

WEED SCIENCE

Timing is essential for late season 2,4-D use

Corn should not be sprayed with 2,4-D from a week before tassel emergence until after the silks turn brown. Early planted corn in Nebraska is now in this stage and should not be sprayed with 2,4-D. Treatments at this stage often can interfere with pollination and cause yield reductions. After the silks turn brown, pollination is complete and 2,4-D use can safely resume.

Grain sorghum should not be sprayed with 2,4-D from the boot through the dough stage. Spraying sorghum during this sensitive period can cause pollination problems and yield reductions. 2,4-D spraying can be continued after the soft dough stage. Between a 12-inch height and boot stage, a drop extension should be used to direct 2,4-D away from the sorghum whorl. Banvel should never be used on grain sorghum after it reaches 15 inches.

Bob Stougaard and Alex Martin

State grants special labels for three herbicides

The Nebraska Department of Agriculture issued 24(c) registrations for three herbicides June 21, providing for special uses this season.

AAtrex for CRP acres. The use of AAtrex for CRP acres was reinstated on 1) seedling switchgrass and big bluestem, and 2) established stands of perennial warm-season grasses. These uses of AAtrex were recently dropped from the federal label.

Ally + 2,4-D amine as a pre-harvest wheat treatment. Ally + 2,4-D is more effective in desiccating broadleaf weeds than 2,4-D alone. Application rates are 1/10 oz/A Ally + 4 to 8 oz/A 2,4-D amine. Minimum spray volume for aerial application is 1 gallon per acre. Apply treatment after the crop is in the dough stage but not within 20 days of harvest.

Sencor postemergence on corn. The new label provides that Sencor DF can be applied in corn in combination with 2,4-D or Basagran before the corn is 8 inches tall. Also registered is a postemergence-directed treatment of Sencor DF with 2,4-D or Buctril applied when corn is greater than 8 inches tall. These treatments would be effective on many common broadleaf weeds in corn.

Bob Stougaard and Alex Martin

INSECT SCIENCE

Potato leafhoppers damaging soybeans, alfalfa

Potato leafhopper numbers are increasing on several Nebraska crops, including alfalfa and soybeans. Although called *potato* leafhoppers, these small (1/8 inch long), green, wedge-shaped insects with sucking mouthparts also feed on other crops including alfalfa and soybeans. As they feed they inject a toxin which damages plant tissue near the feeding site, causing a yellow or purple triangular shaped area, often referred to as "hopper burn".

On alfalfa, potato leafhoppers usually are a problem on the second and third cuttings. It takes relatively few potato leafhoppers to cause economic injury in alfalfa. Use a sweep net to sample potato leafhoppers, and consider treatment when levels exceed those noted below.

Average height of alfalfa (inches)	*Treat if average number of potato leafhoppers per sweep of 15" net exceeds*
0-3	0.2
3-6	0.5
6-12	1.0
12 or more*	1.5

* If alfalfa exceeds 12 inches or is approaching bloom, consider an early harvest rather than treatment.

Potato leafhoppers are less often a problem on soybeans, but they may migrate into soybeans after nearby alfalfa is cut. Research from Iowa State University has established economic injury levels for soybeans. Ogunlana and Pedigo (J. Economic Entomology, 1974, Vol. 67, pp. 29-32) describe a two-year study in which they caged known numbers of adult and late-stage nymphal potato leafhoppers on field plots of Amsoy soybeans at the following stages: V1 (two trifoliate leaves), R4 (beginning bloom) and R7 (beginning bean development). In these studies, soybean yield in the uninfested controls averaged 72 bushels per acre. Yield loss from potato leafhoppers was most severe on V1 stage soybeans and decreased as soybeans matured. Ogunlana and Pedigo provide the following equations to calculate an economic injury level for potato leafhoppers on soybeans.

Calculate the gain threshold (GT), which is the amount of yield loss where the cost of control equals the money to be gained from avoiding damage:

$$GT = \frac{\text{cost of control (materials + application costs) (\$/acre)}}{\text{market price (\$/bushel)}}$$

For example, if control costs were $10/acre and the soybean market price were $5/bushel, then GT = 10/2 = 2 bushels/acre. This allows you to take into account changing control costs and soybean market values when calculating economic injury.

The number of potato leafhoppers needed to cause economic damage increases rapidly as soybeans mature. Using the appropriate gain threshold for your conditions, an economic injury level (EIL), expressed as number of potato leafhoppers per plant, can be calculated using the following equations for different soybean stages:

Soybean stage V1: EIL = GT/1.55; for example, if GT = 2, EIL = 1.3

R4: EIL = GT/0.17; and if GT = 2, EIL = 11.8

R7: EIL = GT/0.08; and if GT = 2, EIL = 25.0

Treatment would be economically justified if the average number of potato leafhoppers per plant exceeds the EIL.

Registered insecticides, their rates and restrictions on alfalfa and soybeans can be found in the Extension publication, EC 91-1511, *Insect Management Guide for Alfalfa, Soybeans, Wheat, Range, and Pasture.*

Bob Wright

Correction

Please note the story on re-entry intervals on page 71, IPW 91-12: the re-entry interval for Furadan 15G is 14 days without protective clothing, 24 hours with protective clothing.

Bob Wright

Scout for rootworm beetles; evaluate damage

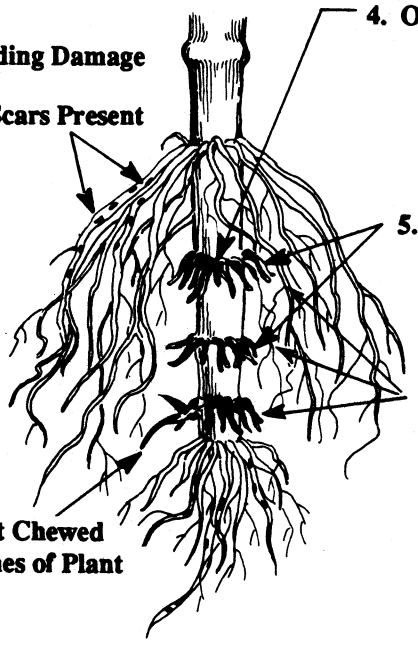
Corn rootworm beetles should begin emerging now and should be easily found in many areas by July 4. If silking has not begun as beetles emerge, they will feed on corn leaves by scraping leaf tissue from the surface, leaving a white skeletonized area on the leaf. However, beetles prefer to feed on corn silks and pollen and will fly from surrounding fields to find their preferred foods. Early silking fields occasionally may be damaged by rootworm beetles flying in from surrounding areas, and should be checked first. If beetle feeding clips the silks to within 1/2 inch of the husk during the 25-50% pollen shed period, control may be necessary so grain production is not reduced due to poor pollination. There are no numerical guidelines, but a minimum of five beetles found per ear in several random samples across the field can indicate the potential for economic damage.

The emergence of rootworm beetles signals that root feeding by immature rootworms is ending. July is a good time to dig roots to evaluate the efficacy of your insecticide control program. If you want reliable data on insecticide efficacy, leave an untreated check strip in the field to provide a basis for comparison with the insecticide treatment. Without this check strip you won't know whether the absence of injury is due to insecticide efficacy or the absence of rootworms. The mere presence of rootworm beetles in a field is not an indication of insecticide failure. Insecticides are applied to a narrow band in the field, and corn roots extend beyond the treated zone where rootworms can easily survive.

Root injury can be rated using the 1-6 injury rating system described below and in NebGuide G82-597, *Evalu-*

Continued on Page 82

Rootworm damage scale



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

To qualify as a pruned root, the root must have been pruned to within 1.5 inches of the plant. It is not necessary for all pruned roots to originate from the same node to qualify as a root system with a full node of roots pruned. It is only necessary that the number of roots pruned is equivalent to that in a full node.

Rootworm damage *(Continued from Page 81)*

ating Corn Rootworm Soil Insecticide Performance). Dig at least 10 randomly selected plants from several areas in the treated portion of a field, with equal numbers of plants taken from the untreated strip, if present. 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 root injury ratings of at least 3 are needed to cause economic damage. 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 regrowth. If several weeks have passed between the end of rootworm injury and the root rating, new root growth may hide root injury. Examine roots carefully to accurately rate them.

Rootworm beetle scouting uses the number of beetles to estimate the potential for rootworm eggs to be laid in a field. This is used to predict the likelihood of economic damage next year. Even though beetles may emerge in early July, scouting doesn't need to start until mid or late July. This is because the male beetles emerge before females, and females require two to three weeks of feeding before eggs mature. Thus, these early emerging beetles are either males or females without eggs and are not contributing to the egg population.

Procedures for rootworm beetle scouting will be described in the next issue of the *IPW News*.

Bob Wright

More records required of private applicators

Certified private pesticide applicators will now be required to maintain records of their use of restricted use pesticides, according to the 1990 farm bill. Previously, only certified commercial pesticide applicators were required to keep these records. The legislation also requires that commercial applicators must keep more specific information about pesticide use.

The following recordkeeping provisions were approved under the 1990 Farm Bill:

1. Application records for restricted use pesticides must be maintained for two years.
2. All certified applicators of restricted use pesticides, both agricultural and non-agricultural, shall keep such records.
3. Commercial applicators shall be required to provide application records to the person for whom the application was made.
4. Records by private certified applicators shall contain information comparable to that maintained by commercial applicators in the state in which the certified applicator lives.

Environmental Programs

5. Records must be available to any federal or state agency that deals with pesticide use or any health or environmental issues related to the use of pesticides.
6. The government cannot release data, including the exact source of data, that could reveal the identity of individual producers.
7. Persons who fail to comply shall be subject to a fine up to $500 for the first offense, and not less than $1000 for each subsequent offense, except in the case of a good-faith effort to comply.
8. A data base and annual reports of the information collected should be prepared annually.

A committee formed by the USDA is developing guidelines for implementing the new requirements, but is not expected to have them set before January 1992.

Larry Schulze
Extension Pesticide Coordinator