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INSECT, PLANT DISEASE, & WEED SCIENCE NEWS [No. 90-18] [Aug. 3, 1990]

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Insect Plant Disease Weed Science NEWS

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

No. 90-18 **Aug. 3, 1990**

In This Issue

INSECT SCIENCE

Capture 2EC Gets Crisis Exemption

On July 27, Gov. Kay Orr signed a Crisis Exemption allowing the use of the synthetic pyrethroid bifenthrin (Capture 2EC) miticide/insecticide for controlling two-spotted spider mites and Banks grass mites on corn. This use expires Aug. 10.

The approved application rate is 0.08 pound AI per acre or 5.12-fluid-ounces formulation per acre in a minimum of two gallons total spray volume per acre. Capture 2EC may only be applied by aircraft and no more than two applications are permitted this season. **Certified commercial or private applicators must supervise the use of Capture 2EC and the applicator must posses supplemental labeling information when the product is used.**

This product may be used to control these two species of spider mites in corn fields where the leaves of the lower third of the plant have mite populations destroying them and mites are moving into the middle third of the plant. Reports from western, southwestern, and south central Nebraska indicated there were corn fields in this condition when the exemption was signed.

Capture 2EC has been tested in corn in Nebraska and surrounding states for several years. Test results indicate that Capture reduces two-spotted spider mite infestation levels similarly to Comite, which is also registered for this use. Banks grass mite infestation levels also can be reduced by applying these products, however, other registered products such as Cygon or Lorsban are less costly and just as effective.

Steve Danielson

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

European Corn Borers: To Treat or Not to Treat

Worksheet Aids in Determination

Last week I discussed general scouting procedures and treatment guidelines for second generation European corn borers in field corn. Factors influencing treatment decisions for second generation corn borers are numerous, and there are no simple answers that apply to all situations.

A worksheet (see box) has been developed by University of Illinois entomologists to help determine whether treatment of second generation European corn borers in corn is economical. This worksheet is similar in concept to those used for first generation European corn borer treatment decisions (see *IPW News*, pages 80-81, No. 90-13).

For this worksheet you need to know:

- Average number of egg masses/plant in field
- Crop stage
- Expected yield
- Expected value of corn
- Expected percent control with insecticide
- Cost of control (chemical plus application costs)

This worksheet may be useful in closely evaluating the many factors influencing the cost/benefit relationships involved in treating second generation European corn borers. Average values are suggested in the worksheet and may need to be modified in certain situations.

1. Borer survival is suggested to be two borers per egg mass. On average, European corn borer egg masses contain 20 eggs, although this may vary from 10 to 40. Two borers per 20 eggs equals a 10% survival rate. Larval survival will vary with weather conditions and field type (dry land versus irrigated corn). In irrigated corn, larval survival is more likely to be 20% or more, but in dryland corn it's likely to be 10% or less. Exposure to hot, dry weather greatly decreases egg survival.

2. Yield loss per borer is suggested to be 4% per borer for infestations before silks turn brown, and 3% per borer after silks turn brown, but before blister stage. These are reasonable averages based on published research data. However, different hybrids and cultural conditions under which the crop is grown (irrigation, soil fertility) can modify the yield loss values. Also, it should be noted that these values only account for physiological yield loss (reduced yield from corn borer damage to water and nutrient uptake through the stalk) and do not consider the potential for yield loss due to stalk breakage or ear drop. This aspect of yield loss is very difficult to predict because it varies with hybrid, cultural practices, and weather conditions, as well as the length of second generation egg laying by European corn borer moths.

3. Percent control with insecticides is suggested to be equal to 75%. This is a good average value for second generation European corn borer control, although if you have data to suggest higher or lower levels of control under your conditions, change this value.

Continued on Page 111

Management Worksheet for Second Generation European Corn Borers

_____ Number of egg masses/plant x 2 borers/egg mass* = _____ borers/plant

_____ Borers/plant x 4% yield loss/borer** =_____% yield loss

_____ % yield loss x _____expected yield =_____ bu/A loss

_____ Borers/acre loss x $_____ sale price/bu = $_____ loss/A

$_____ Loss/A x 75% control = $_____ preventable loss/A

$ _____ Preventable loss/A

\- $ _____ Cost of control (chemical+application costs)

= $ _____ Profit (+) or loss (-) per acre if treatment is applied

If preventable loss exceeds cost of control, insecticide treatment is likely to result in economic benefit.

** Assumes survival rate of two borers/egg mass; varies with weather and egg mass size*

*** Use 3% loss per borer/plant if infestation occurs after silks are brown. The potential economic benefits of treatments decline rapidly if infestations occur after corn reaches the blister stage.*

Worksheet Aids *(Continued from Page 110)*

Infestations of European corn borers are most damaging when borers enter the stalk early in the reproductive cycle of corn. Because corn borers must be controlled before they enter the stalk, there is a narrow time period between first egg hatch and significant stalk tunneling activity by borers. Scouting efforts should be concentrated on this early egg-laying period and should be repeated at five-day intervals. Egg counts can be accumulated for up to 10 days to reach economic levels. Accumulations beyond 10 days may risk allowing early hatching larvae to enter the stalk before treatment. Although later hatching larvae do not reduce yield as much, they may cause stalk breakage or ear drop. Reduce this yield loss by harvesting fields damaged by corn borers early and select varieties with good stalk strength.

Bob Wright

Attack White Grubs in Turf in Early August

Based on this year's flight of masked chafer beetles (annual white grub adults), the first two weeks in August will be the optimum time to apply insecticides for annual white grub control in home lawns and other turf areas — if sampling indicates treatment is justified. Masked chafer flight activity reached its peak during the second week of July. By early August, all eggs will have hatched and feeding by young white grubs will have begun. Feeding damage from these grubs, however, may not become obvious until late summer when grubs are larger and lawns are experiencing more stress from hot, dry weather.

In order to minimize damage from white grubs, early detection is essential. Grub-damaged areas appear as irregular brown patches that expand over time. Turf in these areas will have a spongy feel and can be easily lifted from the soil, revealing the C-shaped, creamy-white grubs underneath. Since drought conditions, diseases and other factors can produce identical surface symptoms, examine the turf root zone to confirm the pest is present. This can be accomplished by selecting several locations in the lawn and peeling back one square foot of turf at each site. If five or more grubs are found per square foot on non-irrigated turf, treatment is usually justified. Irrigated areas should be able to withstand more grubs before visual injury occurs. Insecticides recommended for white grub control in Nebraska include diazinon, Dylox or Proxol, Oftanol, Sevin and Turcam. Triumph and Mocap are also available for use by commercial applicators. Continuous use of the same insecticide over several years may result in less effective control. Rotate products within a season and from one year to the next. In order to insure maximum penetration of the insecticide into the grub feeding zone, apply at least 0.75 inch of water immediately after application. Repeat irrigation every four to five days to continue moving the insecticide into the soil and to keep the root zone moist to encourage turf recovery.

Thatch plays an important role in reducing the effectiveness of turf insecticides applied for white grub control. If the thatch layer is more than 0.5 inch, a light aerification and increased post-treatment irrigation will enhance insecticide penetration and improve white grub control. Also, if soil conditions have been very dry, applying 0.5 inch of water 24 to 48 hours prior to application will bring grubs closer to the surface and increase the level of white grub reduction.

Fred Baxendale

Take Steps to Protect Honeybees from Pesticides

The necessity of honeybees in the overall agricultural picture cannot be argued. Honeybees not only produce honey and wax, they pollinate crops. Bees do not observe property lines and many inadvertently enter insecticide-treated fields. Since most insecticides are toxic to honeybees, many bees can be killed by direct spraying or by residues left in fields. Consider taking one or more of the following precautions to eliminate accidentally killing honeybees:

1. Treat fields only when necessary — when pests are numerous enough to justify the use of an insecticide. This is a good rule to follow regardless of the presence of bees. Often only a portion of a field will require treatment.

2. Treat crops only when they are not in bloom. If a crop is in flower and an insect pest must be controlled, check the field for foraging bees. If bees are numerous, use a material with the lowest possible toxicity to bees. Also, insecticides applied in the early morning or late evening, when bees are not actively foraging in fields, are less likely to result in extensive bee kills.

3. Take precautions to insure that honeybee colonies are not directly sprayed.

4. Check crops to be sprayed for heavy concentrations of blossoming weeds. If bees are present in significant numbers, withhold treatment until the beekeeper has been notified and has had time to move or protect his bees.

Fred Baxendale

Use Degree Days to Predict Pest, Plant Growth

The term degree days is used to describe the relationship between air temperature and progress toward maturity. Most plants and insects mature according to how much heat they have accumulated. This is in contrast to human life stages which are related more to the passage of time. Generally, when it is cooler, the growth or development of plants and insects is slowed. In winter, growth may stop altogether. In spring when the temperature increases, there is a flush of activity.

Scientists have studied how the rate of development of plants and insects is related to temperature and have discovered the lower and upper temperature limits for development. Below the base temperature level, plants or insects don't develop. As the temperature increases above this level, activity increases. When temperatures exceed the upper limit, the rate of development will remain constant or decline. The daily maximum and minimum air temperatures must be known to calculate degree days.When degree days are accumulated over time, the sum is linearly related to plant or insect development during that time.

Degree days are an important tool scientists use to interpret the impact of air temperature on plants and insects and to predict when those plants and the pests that live in and around them will reach specific growth stages.

To understand how degree days work, remember that different limiting factors apply to different crops and insects. It's important to know the correct factors for the specific crop to attain the most accurate prediction of the growth stage of the insect or crop. For cool season crops like winter wheat, the base and upper limits are generally considered to be 40°F and 77°F. For warm season crops like corn, the base and upper limits are generally 50°F and 86°F. Many insects, e.g. European corn borers, black cutworms, also have base temperatures of 50°F, but some insects have different base temperatures. For example, base temperature for the alfalfa weevil is 48°F.

The variability of climate of the High Plains contributes in subtle ways to the success of both crops and the pests (insects or weeds) that compete with or damage the crop. For instance, a pest with a lower base temperature than the crop it lives in is favored by slightly cooler weather. Likewise, a pest with a base temperature higher than the host crop can be favored by slightly warmer weather. This interaction between air temperature and the plant/insect world explains why certain insects are a bigger problem some years than other years.

In the insect world, some insects are the natural enemy of other insects, which results in a predator-prey relationship. Depending on the weather in a particular season and the base temperatures that typify the two insects, the predators may be more or less successful in controlling the prey.

Ken Hubbard
Extension Climate Resources Specialist

Formula for Calculating Degree Days

T_{base} = the temperature limit below which development stops

T_{upper} = the temperature limit above which development stays constant

T_x = the maximum daily air temperature. If T_x falls outside the range of the limiting temperatures, it is set equal to the closest one (T_{base} or T_{upper})

T_n = the minimum daily air temperature. If T_n falls outside the range of the limiting temperatures, it is set equal to the closest one (T_{base} or T_{upper})

Degree Days = $(T_x + T_n) / 2 - T_{base}$

Corn Rootworm Beetle Numbers High

Scouting reports indicate that western corn rootworm beetle adults are very abundant in some corn fields in west- and south-central Nebraska. Now is the time for corn growers across the state to begin scouting. There are several ways of using this information in a management plan.

If the corn is in the green silk stage and beetles are chewing the silks back to within 0.5 inch of the husk, pollination may be interfered with and poor seed set can result. Beetle counts also can help the grower decide whether it's more beneficial to manage adults now or larvae next spring. This is the only way to make informed decisions about rootworm management in continuous corn.

For more information, refer to *IPW News,* pages 97-98, No. 90-16.

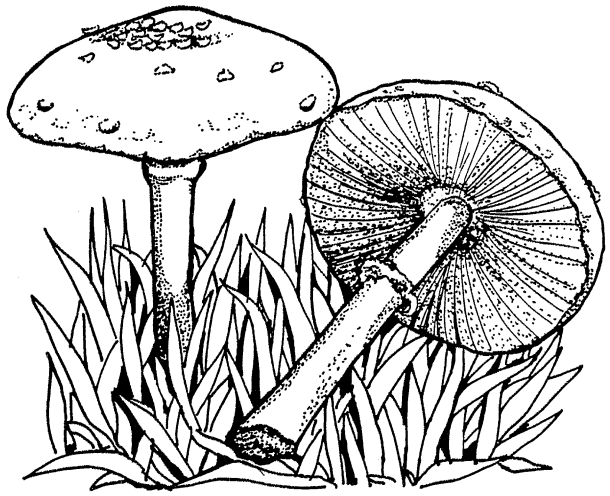
Steve Danielson and Jack Campbell

PLANT DISEASE

Don't Eat the Mushrooms

Abundant rains this summer have encouraged the growth of mushrooms in lawns and grassy areas. I have received numerous requests for mushroom identification and information on whether samples were edible. I will try to identify the mushroom, but I always advise clients **not** to eat the mushroom.

Several mushrooms are deadly when eaten. Others cause discomfort in some people depending on the amount eaten, other foods or drink consumed, and any possible allergic response. Still others are listed as unknown (death or reaction has not been documented). Of course, a few are choice edibles. It is important to accurately identify the mushroom since some deadly mushrooms are very similar to harmless ones. In my opinion, this is risky. I suggest that mushroom hunters search for the beauty and wonder of mushrooms and not their edibility. When mushroom eating is desired, buy them at the grocery store.



To avoid the possibility of accidental ingestion of mushrooms by children or pets, remove the growths as they appear and destroy them. If a mushroom is eaten and the person becomes ill, consult a doctor and take a fresh, whole mushroom sample for identification purposes.

Luanne V. Coziahr

Pack Samples Carefully for Accurate Diagnosis

As the Extension Plant Pathology secretary, I am responsible for logging in all plant materials received in the Plant Disease Clinic. When unwrapping packages and mailers, I have noticed that some specimens are received in very poor condition. For instance, strawberry fruits mashed against the sides of a soft pack mailer and on the unprotected Specimen ID Form makes a proper diagnosis difficult.

I would like to direct this article especially to other secretaries since you are probably the one assigned the task of preparing plant materials for mailing. Even though time may be in short supply and you have a million other things to finish before you close the office, please take the time to prepare the sample and ID Form properly. The NebGuide *G76-322, How to Handle Insect and Plant Specimens for Identification*, is very helpful in explaining the proper way to do this. In addition to the items discussed in the NebGuide, it is very important that the Specimen ID Form not be enclosed in the bag with the sample. Put the ID Form in a plastic bag or paper clip or staple it to the outside of the sample bag. This will keep the form clean rather than wet or stained by plant parts.

This is a very busy time of year, but I know everyone wants to do the best job possible when responding to client questions. If you prepare your plant samples carefully, you will be more likely to receive a prompt and accurate response, rather than the statement "... poor quality sample, unable to make a diagnosis."

Ellen Mayer, Secretary

Check Them Out

The following slide-tape sets can be checked out from the Extension Plant Pathology Office.

1. Diseases of Turfgrass
2. Diseases of Landscape Ornamentals (Flowers, Shrubs, & Trees)
3. Diseases of Wheat
4. Diseases of Alfalfa

John Watkins

Rust-Colored Turf Signals Disease

Rust diseases occur on all commonly grown turfgrasses; however, each rust is highly specialized as to host preference. Occasionally, rusts can cause severe injury to Kentucky bluegrass and perennial ryegrass in Nebraska; but most often, turf is attacked too late in the season to suffer permanent injury.

Trace amounts of stem rust were detected last week on Merian Kentucky bluegrass in research plots north of Lincoln. The first signs of rust attacks on grasses are the development of small chlorotic flecks on leaves. A few days later the flecks are replaced by bright orange to brick-red rust pustules. During the warm days and cool nights of late summer, new pustules are produced about every 10 days. From a distance, heavily rusted turfs appear yellow or orange. When walking through the turf, clouds of orange dust (rust spores) will quickly discolor shoes, mowers, grass catchers, and pant legs.

Turfs maintained in a vigorous, but not lush condition, are less subject to injury by rusts. A regular mowing schedule will reduce the risk of severe rusting in August and September. Fungicides may be needed to control rust on sod fields and on other turfs. The initial application should be in July with one or two treatments following at three-week intervals. Under most situations, good management is sufficient to prevent severe rusting in late summer.

John Watkins

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