Tobacco Hornworms on Tobacco

By Lee Townsend

The second brood of tobacco hornworms can be very destructive. Eggs can be laid from early August through early September with the larvae feeding through mid-September. This creates the potential for lots of feeding damage from topping time until plants are taken to the barn. One well-timed insecticide application may reduce feeding significantly but cannot protect tobacco if a lot of egg-laying occurs over a long period of time. It is a good idea to check tobacco about a week before harvest so that a “clean up” spray can be applied if necessary. Be sure to check the harvest interval on the product you use. Cutting before this interval has passed can mean insecticide residues above the legal tolerance level.

One hornworm eats about 0.016 lb (a little over 7 grams) of salable burley or dark tobacco during its development. At a price of about $2.00 per pound, this means that a single hornworm eats about 3 cents worth of tobacco. Assuming a population of 8,200 plants per acre, it is possible to calculate some treatment guidelines.

<table>
<thead>
<tr>
<th>Treatment cost</th>
<th>$10</th>
<th>$15</th>
<th>$20</th>
<th>$25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hornworms / 100 plants</td>
<td>4</td>
<td>6</td>
<td>8</td>
<td>10</td>
</tr>
</tbody>
</table>

The number of hornworms present can be determined by carefully examining groups of 20 plants at randomly selected locations over a field. Use a minimum of 5 locations per acre. Hornworms feed in the upper 1/3 of the plant and can be found hanging from the underside of the leaf. In August and September many of them may have small, white, football-shaped objects on their backs. These are cocoons of a tiny wasp that develops inside the hornworm and kills it. Hornworms with these cocoons should not be included in your counts because they are no longer feeding.

Two species, the tobacco hornworm and the tomato hornworm, occur in Kentucky. The tobacco hornworm, the most common of the two, has 7 oblique white stripes on each side of the body and a curved, red horn. The tomato hornworm has 8 V-shaped stripes on each side and a straight, black horn. The life cycle, damage, and activity period of both is so similar that, for management purposes, they can be lumped together.

Evaluate Corn Now to Prevent Harvest Losses

by Ric Bessin

A sizable portion of the 2002 corn crop was planted late because of the constant spring rains. It’s too bad that we couldn’t have put some of that rain in the bank for this
summer. But that late planted corn will be late harvested corn, some not maturing until late September or October. This late planted corn will remain vulnerable to corn borer attack, both European and southwestern, longer into the fall than early planted corn.

Corn producers need to evaluate their fields during the next few weeks to identify those fields that are heavily infested. Those field with the worst corn borer infestations should be scheduled for the earliest practical harvest rather than waiting for the grain to dry to optimal levels. Those fields with low corn borer infestations should be able to resist lodging and harvest losses further into the fall.

SOYBEANS

IF YOU'RE STILL DRY, WATCH FOR SPIDER MITES IN SOYBEANS
by Doug Johnson

I know that some areas have had rain recently but there are still some very dry spots around. Long spells of dry weather can result in very troublesome pests problems, especially spider mites.

Spider mites are very small. You may be able to see them with the naked eye but you will have to use a hand lens to see any features. They are more closely related to spiders than insects and have eight legs. The two-spotted spider mite, which is what we most often see in KY soybeans, is greenish yellow to dull orange with two large irregular-shaped spots, one on each side of the body. If you suspect spider mites, shake some leaves over a piece of white paper. Look to see if you can see tiny spots moving on the paper. Generally examination with at least a hand lens or preferably a microscope is needed to confirm the diagnosis.

In most cases symptoms of spider mite damage will be noticed before the mites. Spider mites feed with long styletlike mouthparts which they stick into individual cells and suck out the contents. Most other pests with piercing sucking mouthparts feed on the plant sap in the conducting tissue of the plant. These mites feed on the cell contents. As each cell is fed upon and dies, it appears as a small white or yellow spot. This gives the leaves a stippled appearance. The result is a reduction of photosynthetic capacity. As damage increases, plants take on a yellowed then bronzed appearance. If high levels of pressure continue, the plants will defoliate. Remember, this is a double whammy as it usually occurs in the presence of drought stress.

Making a control decision is often very difficult. The general rule of thumb is: if you expect to make a crop then treat the damaged areas as if the plants were defoliated. At this time of year, I think most producers still have reasonable expectation that enough rain will occur to make a crop. If so, use the defoliation tables in ENT-13 (www.uky.edu/Agriculture/ PAT/ recs/crop/ recssoy/ recssoy.htm) or IPM- (www.uky.edu/Agriculture/IPM/manuals.htm) to make a control decision. If the drought is relieved by a sustained rain (increased humidity,) then mite populations will be reduced. If however, a heavy (drought relieving rain) is quickly followed by a clearing sky and low humidity the mite populations may stick around. The importance of rainfall in reducing mite populations is actually a secondary effect. When rain (mainly humidity) increases the activity of a fungal pathogen, which infects and kills the mites, also increases, resulting in reduced mite populations. However, if the rainfall does not result in continued humid conditions the mites may remain around at high levels for some time.

Right now we are dry but the air is very humid. This may explain why we have not seen more mite activity. However, things can change very quickly with these pests. Also, just because you feel the humidity, doesn't mean that the microclimate in which the mite lives has the same level of humidity. You simply must keep a watch on doughty crops.

Because this is such a rare pest, it is not listed in ENT-13 Insecticide Recommendations for Soybean (It is on the website version listed above). However, there are currently two insecticides labeled for use against spider mites in soybean, Lorsban® and various formulations of dimethoate. Lorsban 4E may be used at ½ to 1 pt. / Acre, and dimethoate 4 at 1pt. / Acre. Other formulations of dimethoate will have other rates of application. There may be a few products labeled for "Suppression" of spider mites, but suppression is not normally a viable option for this pest.

If control is required, be prepared to make more than one application. This is not the typical soybean pest. Most of the insect pests of soybean are easily controlled with a single insecticide application. This is often not the case with spider mites. A single application may be enough especially if the drought conditions lift. However, be ready to make at least two applications and possible a third.

If damaged appears to be restricted to a portion of the field you may elect to treat only that region. However, if this is the case be sure to look for the mites in the “Non-symptomatic” beans that surround those that are showing symptoms. As the beans are damaged they will become less desirable to the mites as a host, so the mites will move outward to the unaffected beans. You should
always check to see how widely the mites are distributed, then treat another round or two to insure you have covered the entire infestation.

FRUITS

BLACKBERRY ROSETTE (DOUBLE BLOSSOM) DISEASE DIFFICULT TO MANAGE
by John Hartman and Terry Jones*

Rosette disease, caused by the fungus *Cercospora rubi*, is appearing on blackberries in the field this summer and is the subject of recent diagnoses in the plant disease diagnostic laboratory.

**Symptoms.** Blackberry growers will notice flowers with distorted petals, giving the appearance of a double flower (hence double blossom). The mycelium of the fungus grows over the flower pistils and stamens producing a whitish spore mass. Unopened flowers are usually elongated and larger, coarser, and redder than normal. Sepals on infected flowers enlarge and occasionally become leaf-like. On some varieties, shoots may appear abnormal with leafy proliferation (rosette) or witches broom. Berries do not develop from infected branches and other parts of the cane may produce only small, poor quality fruit. Thus, this loss of yield should concern growers.

**How the disease is spread.** The disease begins when the buds of new canes become infected from fungal spores produced on infected distorted flowers of old canes. Symptoms from these infections do not appear until the next year. Blackberries can become infected from spores produced on wild blackberries nearby. Blackberry nursery stock can harbor the causal fungus in rooted plants, but not in root pieces, which are commonly sold for blackberry propagation. We have observed that one can obtain successful growth of disease-free blackberries from root pieces taken from infected plants while rooted plants from the same source become diseased.

**Control.** Select a site isolated from wild blackberries or other brambles. In many parts of Kentucky, this may be difficult. Use disease-free nursery stock, roots only. If the disease is not already severe, infected rosettes and blossom clusters should be picked off and destroyed before they produce spores. Old canes should be removed and destroyed immediately after harvest. Remove and destroy wild blackberries and other brambles near the planting.

If the disease is serious, more drastic action may be needed. The fungicide Benlate can be used up to 5 times in a season beginning at first bloom and extending through harvest. However, this fungicide is no longer being manufactured and when stocks of Benlate run out at the end of next year, there will be no effective chemicals cleared for use in rosette disease control. Labels for substitute fungicides are being developed, but they are not ready yet. Some growers control this disease by harvesting blackberries in alternate years and destroying the above ground parts of both the new and old canes in spring every other year. Splitting the planting into two fields allows harvest every year with biennial cropping on each half.

There are no blackberries resistant to rosette (double blossom) disease. Rosette rarely occurs on red and black raspberries.

*Dr. Terry Jones is U.K. Extension Horticulturist

VEGETABLES

WATCH FOR BEET ARMYWORM IN TOMATO AND PEPPERS
by Ric Bessin

Two weeks ago in the KPN, an economic infestation of beet armyworm was reported in Henderson county pepper field. The larvae were common throughout the field and less than 1/4 inch in length. This week we found beet armyworm in Fayette county. Pepper and tomato growers are advised to monitor their fields carefully for this pest. Beet armyworm can also be a pest of cabbage, broccoli, and cauliflower. In particular, examine the uppermost leaves near the growing tips. This is where the small larvae will be found. There is often a small amount of webbing and small holes or window paning of the youngest leaves.

After the larvae have gained some size, they move to other parts of the plant and often attack the fruit. Unlike corn borers, they bore into the side of the fruit rather than just under the calyx. Producers that have been relying on pyrethroid or organophosphate insecticides for control of European corn borer may still have significant numbers of beet armyworms in their fields. Beet armyworm is very resistant to many of the commonly used pepper and tomato insecticides.

If beet armyworm is found, they are easiest to control when the larvae are small. Select an insecticide that is labeled for the particular crop and recommended for beet armyworm. Several of the newly registered vegetable insecticides provide excellent control of beet armyworm.

LAWN & TURF
Rationale for Selected Chlorothalonil Restrictions on Turfgrasses.

by Paul Vincelli

With this summer being a high disease pressure year for cool-season turfgrasses in Kentucky, fungicides have been an important tool for turf managers. Turf managers are aware that the label for the important contact fungicide chlorothalonil includes restrictions added relatively recently. Chlorothalonil is found in such products as Daconil, Echo, Manicure, Chlorostar, and Concorde SST. This material is a low-cost fungicide with a broad spectrum of activity, providing partial to complete control of diseases such as dollar spot, brown patch, leaf spot/melting out, gray leaf spot, and others.

Two restrictions that have particular importance relative to use patterns for turf disease control are highlighted in this article, with an explanation of the rationale for these restrictions. This information is based on the Reregistration Eligibility Decision for chlorothalonil published in 1999 by the US Environmental Protection Agency. This document is an impressive 337-page, two-inch thick tome that describes the scientific basis of EPA’s decision to allow reregistration of chlorothalonil, as well as the conditions under which reregistration was permitted. Under the 1988 amendment to the Federal Insecticide, Fungicide, and Rodenticide Act, all pesticides registered before November 1, 1984, must be reregistered to ensure that they meet current stringent standards.

1. Chlorothalonil is no longer labeled for use on home lawns. While this restriction has been in place for several years, it is such an important one that it is worth revisiting. Prior to the institution of this restriction, chlorothalonil was probably the #1 fungicide used on residential lawns. This restriction was agreed to by manufacturers of chlorothalonil in order to reduce overall exposure of two populations to the active ingredient and to HCB: toddlers exposed after the application on home lawns, and residential handlers and applicators of chlorothalonil on home lawns. Hexachlorobenzene (HCB) is a carcinogenic contaminant found in chlorothalonil formulations. Keep in mind that chlorothalonil is registered for disease control on a wide variety of crops including food crops. In order to reduce overall exposure to chlorothalonil and to HCB in these populations and be in compliance with the Food Quality Protection Act, manufacturers agreed to voluntarily remove home lawn uses from the label.

2. Chlorothalonil may be applied only according to the maximum allowable application rates given in Table 1. The restrictions outlined in Table 1 are based on ecological concerns to aquatic ecosystems. When applied, chlorothalonil can contaminate surface water as a result of drift or application to standing water. After application, chlorothalonil can move to surface waters in two ways: (1) via runoff as a dissolved chemical; and (2) via soil erosion, as active ingredient adsorbed to soil particles. Chlorothalonil is highly toxic to various aquatic organisms: fish, aquatic invertebrates, molluscs, and shrimp. I was surprised to learn that a limited number of fish kills have been documented following application of chlorothalonil, including applications to turfgrass. Although chlorothalonil is used on many crops, turfgrass uses are considered to pose a high risk to aquatic ecosystems because of the high application rates used frequently and repeatedly. Although in Kentucky we have no marine or estuarine sites, movement of chlorothalonil to these sites as a result of application to turf is a concern in a number of regions, and the risk to molluscs and shrimp is considered significant. EPA concluded that institution of the restrictions outlined in Table 1 would bring ecological risks from chlorothalonil applications down to an acceptable level. An example of how these restrictions apply to a formulated product is provided in Table 2.

<table>
<thead>
<tr>
<th>Site</th>
<th>Maximum individual application rate per acre (minimum retreatment interval)*</th>
<th>Maximum seasonal total</th>
</tr>
</thead>
</table>

Table 1. Maximum Allowable Application Rates for Chlorothalonil.
Golf course greens | 11.3 lb ai | 7.3 lb ai | (14 days) | (7 days) | 73 lb ai/A
---|---|---|---|---|---
Golf course tees | 11.3 lb ai | 7.3 lb | (14 days) | (7 days) | 52 lb ai/A
Golf course fairways | 11.3 lb ai | 7.3 lb ai | (one application) | (7 days) | 26 lb ai/A
Sod farms | 11.3 lb ai | 7.3 lb ai | (one application) | (7 days) | 26 lb ai/A
Turf (general) | 11.3 lb ai | 7.3 lb ai | (one application) | (7 days) | 26 lb ai/A

*Higher application rates require longer intervals between sprays. Lb ai = pounds of active ingredient.

### Table 2. Maximum Allowable Application Rates for Daconil Ultrex 82.5WDG.

<table>
<thead>
<tr>
<th>Site</th>
<th>Maximum individual application rate (minimum retreatment interval)</th>
<th>Amount of product per year</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>per acre</td>
<td>per 1000 sq ft</td>
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<tr>
<td>Golf course greens</td>
<td>13.6 lb</td>
<td>8.8 lb</td>
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<tr>
<td></td>
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<td>Golf course tees</td>
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<td>Sod farms</td>
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</tr>
<tr>
<td>Turf (general)</td>
<td>13.6 lb</td>
<td>8.8 lb</td>
</tr>
</tbody>
</table>

*Apply no more than two of the high rate sprays per growing season.

### Commentary

In the real world of day-to-day turf disease management, complying with the restrictions outlined in Table 1 probably poses a difficulty in some instances. I know that some turf managers conscientiously follow these restrictions. However, when the health of a putting green or fairway is on the line, a turf manager is under a lot of pressure to take all available steps to maintain turf health, and may even fear for his/ her job. Faced with that, the incentive to overlook these label restrictions certainly can be powerful. It is important to understand that these restrictions are a foundation of the decision to allow reregistration of chlorothalonil on turfgrasses. Violations of these restrictions not only pose the risks described above; repeated violations also could place at risk the registration of chlorothalonil on turfgrasses.

Perhaps understanding the rationale for these label restrictions will provide valuable encouragement to the turf manager to use alternative products as needed. Ask yourself why you got into turf management in the first place. Many times, it is because of a love for nature and being outdoors. Perhaps one can draw on that motivation in those times when there is a great deal of pressure to overlook these restrictions. I’ll never forget the glee with which golf course superintendent Mark Wilson showed me the fish nests in the creek running along Vahalla Country Club, the site of the 1996 and 2000 PGA Tournament. I cannot imagine a better role model than that.

For high-maintenance tall-fescue lawns under the care of a professional, where excellent control of brown patch is expected, Heritage 50WG at may be used at 0.2 oz/1000 sq ft preventively; Prostar 70WP may be used at 3 oz/1000 sq ft curatively. Both treatments provide up to five weeks of residual protection against the disease. For
other turf situations, where chlorothalonil may be used against a range of diseases, see the UK Extension publication PPA-1, Chemical Control of Turfgrass Diseases, for alternatives to chlorothalonil. PPA-1 is available from county Extension offices or on the web at www.ca.uky.edu/agc/pubs/ppa/ppa1/ppa1.pdf.

Thanks to Dr. A. J. Powell, UK Turfgrass Agronomist, for reviewing a draft of the article.

SHADE TREES AND ORNAMENTALS

LACEBUGS CAN WHITEN SHADE TREES AND LANDSCAPE PLANTS
By Lee Townsend

Lacebugs use their sucking mouthparts to feed on plant sap. Damage ranges from scattered small white spots to complete bleaching of the leaves. Some species feed on many different types of plants while others feed only on a narrow range or single species. Injury builds slowly but can become very intense late in the summer. The adult and nymphal stages of the same species can look very different, which can confuse identification.

Azalea lacebugs, about 1/8" long with light brown bodies, are one of the common offenders. They prefer evergreen varieties but attack deciduous varieties and mountain laurel. Sap removal by adults and nymphs, which feed on the underside of the leaves, causes a spotting visible on the upper surface. In heavy infestations, leaves may turn white and drop prematurely. Spots of their tarry excrement build up on the under sides of the leaves. The lacy wings of the adults have dark brown to black markings, nymphs are black and spiny. Populations are greatest in mid- to late summer as the second generation bugs appear.

Insecticidal soap (Safer) can be used to reduce lacebug numbers. The spray must be directed to the underside of the leaves to contact the insects directly. The treatment may need to be repeated to bring populations under control.

INSECT TRAP COUNTS
UKREC, Princeton, KY --July 26-August 2

<table>
<thead>
<tr>
<th>Insect</th>
<th>Count</th>
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</tr>
<tr>
<td>Fall Armyworm</td>
<td>3</td>
</tr>
</tbody>
</table>

NOTE: Trade names are used to simplify the information presented in this newsletter. No endorsement by the Cooperative Extension Service is intended, nor is criticism implied of similar products that are not named.