



PLANT PEST Newsletter

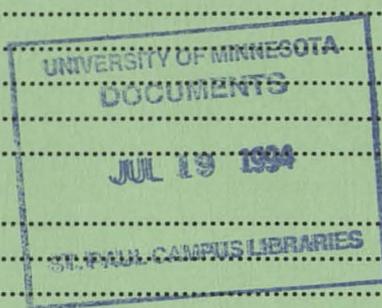
MINNESOTA EXTENSION SERVICE

UNIVERSITY OF MINNESOTA

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CORN

SCOUTING CORN ROOTWORM BEETLES — Adult emergence is underway in southern Minnesota. Last Thursday I observed northern corn rootworms near Walnut Grove in SW Minnesota. Corn rootworm phenology is at two to three weeks ahead of last year. This shift has important implications for both scouting and adult control.

A couple of general principles should set the stage for understanding scouting and adult control strategies. Western corn rootworms emerge earlier than northern corn rootworms. Males tend to emerge earlier than females. Both males and females prefer to feed on pollen, elongating silks and, in the case of western corn rootworms, leaves. Females typically require about a two-week period before they are ready to lay eggs.

Egg laying continues over a two to four week period with the duration dependent on corn phenology and temperature. Last year's cool wet weather and prolonged corn development offered ideal conditions for beetle longevity and egg laying. With this summer's warmer weather, we're probably looking at an earlier, and potentially shorter, period of egg laying. For a given field, crop phenology plays a key role in the timing and

extent of egg laying because beetles prefer feeding on pollen and silks. Once pollen is unavailable, beetles actively forage outside the field on flowering plants (e.g., goldenrod, alfalfa, soybean). Presence of beetles on flowering plants doesn't mean they are laying eggs away from corn; they still return to corn fields to lay their eggs. Once silks have dried, corn rootworms leave the field in preference for nearby fields with pollen/silks still available. Thus, late maturing fields have a tendency to concentrate beetles from a large area, phenomenon called the "trap crop effect".

Scouting corn rootworm beetles has three uses:

1. Prevent silk clipping from causing pollination problems
2. Time insecticide applications for adult control
3. Predict the necessity for larval control next year.

Each of these uses has distinctly different thresholds. The most common scouting technique is the "whole-plant count", where beetles on the plant are visually counted weekly during the period of beetle activity. An alternative technique involves unbaited Pherocon-AM sticky traps to catch the beetles for one or more one-week periods. Scouting should begin as soon as

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contact Extension Plant Pathology at 612-625-6290**

CORN/continued

silks emerge in the field and continue until the silks dry (or a management decision is made).

Silk Clipping

Corn rootworm beetles readily feed on emerging silks. If beetles are abundant enough, they can keep silks pruned to within 1/2" of the ear tip and interfere with pollination. The situation rarely poses a problem in field corn, except when drought conditions already reduce the overlap between pollination and silking. This usually requires 10 or more beetles per plant on fields with less than 50% silk emergence. Silk clipping generates more concern with seed corn fields where poor pollination has a larger economic impact.

Adult Control

Although soil insecticides have become the preferred approach to corn rootworm management, adult control to prevent egg laying is a viable alternative. First initiated in the 1970s with products like SEVIN and PENNCAP-M, interest in adult control has been rekindled by the advent of two new products, SLAM — marketed by BASF, and COMPEL — marketed by Ecogen. These two products take advantage of corn rootworms natural plant product, cucurbitacin, found in members of the cucumber family (squash, pumpkins, cucumber). Cucurbitacin is a powerful feeding stimulant that is used to induce feeding on an insecticide-laced bait, typically containing carbaryl (Sevin). Because of the feeding stimulant, insecticide rates can be drastically reduced from nearly 1.0 lb active ingredient per acre to 0.10 or less. These products also offer less impact on beneficial insects since cucurbitacin acts as a feeding deterrent to most beneficial insects.

Success with adult control hinges on scouting to determine if populations are high enough to warrant control and if egg laying is just beginning. Remember that the goal is to prevent egg laying, not merely killing adult beetles. Poor timing can easily reduce beetle numbers without impacting egg laying substantially. Insecticide application is recommended when beetle populations exceed 1 per plant and 10% of the females have well developed eggs. This can be easily determined by squeezing the abdomens of fat females and seeing if eggs come out.

Emergence of beetles may be spread out over a four week period so you can see the challenge in making a single application effective. Be forewarned: Don't walk away from a field once it is treated — continue scouting. If populations rebound above 1.0 beetle per plant, a second application is required. Slam and Compel have formulation differences that may influence your choice. Slam can be readily sprayed through most air and ground equipment while Compel requires special

application equipment to handle its oatmeal-like consistency. However, this consistency makes Compel more rainfast than Slam. To add to the product choice dilemma, Penncap-M offers some control of second-generation European corn borer while neither Slam or Compel will affect European corn borer.

Predicting Need for Soil Insecticide or Crop Rotation

Scouting is most commonly used to predict the need for crop rotation or soil insecticides following year. If populations exceed 1.0 beetle per plant using the visual count or 4.0 beetles/trap/day using the unbaited Pherocon-AM sticky trap, management action is needed or untreated corn is at risk of lodging or yield loss.

For further information on scouting, three handouts can be requested by calling (612) 624-9272 or contacting your county extension office:

Corn Rootworm Scouting: The Pherocon-AM Sticky Trap Technique

Corn Rootworm Scouting: The Whole-Plant Count Adult Corn Rootworm Control

UNUSUAL HAPPENINGS WITH EUROPEAN CORN BORER

— Last week Dan Palmer, entomologist with DeKalb Genetics at Olivia, observed a slight upsurge in corn borer moth captures in the light trap. That pattern was also observed this week when counts increased to 75 per night at Morris and 100 per night at Lamberton. Moths can still be found in action sites and corn fields. The question is: Are these moths members of the first flight or do they represent the second flight?

While seasonal heat accumulation is running ahead of normal, these moths are too early to be second generation. They probably represent first generation with one qualification. Early in the European corn borer invasion into Minnesota, a distinct one-generation strain with obligatory diapause was present throughout most of the state. Later, a multiple generation form, also called the Iowa strain, invaded the state. Although the multiple generation or Iowa strain seems to predominate, it is probable that the one-generation strain still exists at least in WC and NW Minnesota. The unusual cool weather conditions of 1993 followed by the warmer than normal 1994 conditions may be separating the appearance of moths from these two strains.

For NW and WC Minnesota, we may be caught in the predicament of having an ongoing moth flight with no clear-cut scouting periods or treatment windows. Watch later developing, whorl-stage fields closely.

*Ken Ostlie
Extension Entomologist*

POTATO

LATE BLIGHT STATUS AND MANAGEMENT — Late blight was identified and positively confirmed in the Red River Valley on Wednesday, July 6. This is the first occurrence of the disease in a field for 1994. It was also found in two fields near

Park Rapids, south and east along highway 18. Late blight lesions were found on the leaves, petioles and stems, and were sporulating abundantly.

There were unconfirmed reports of other late blight sightings in the area from Grafton to Park River. Conditions remain extremely favorable for late blight and will continue to be so as long as it continues to be cool and wet.

Conditions for the development of late blight have been nearly ideal for the past 6 days in many areas of the Red River Valley. Growers should scout fields when the rows have closed. If lower leaves are wet at mid to late morning from dew or rain, these fields are likely to have late blight develop in the next 7-14 days. Fields such as this should be on a tight protectant fungicide spray program — a 7-days schedule at a mid to high rate.

If tubers are the size of a nickel or larger, consider a Ridomil combination product. Ridomil is best used before late blight occurs in a potato field. If late blight has been found in your field or in the area nearby, Ridomil should be applied. Fields away from late blight should be scouted heavily and protectant chemicals applied.

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SOYBEANS

PHYTOPHTHORA ROOT ROT (PRR) — At the recent field school plant samples with typical Phytophthora Root Rot were seen. The variety carried the Rps-1a gene and that source of resistance is commonly defeated in MN. The plants had the brown to dark brown stem lesion, poor roots and an overall yellowing to the foliage. This symptom is typical of plants with genes that are defeated by the “new” races of the fungus and typical of plants with little general resistance. The symptoms of PRR today are more often just the off color of the foliage, slight stunting and difficult to clearly diagnose. At the field school people, when given a choice usually picked the two best rows where PRR was a problem, the two rows picked were the two rows treated with Ridomil. The difference was color and uniformity of plant stand and growth. The difficult part is without the side by side comparison few would be able to select the healthy plants. Many soybean varieties today have “tolerance” or “field resistance” and this usually prevents the development of the stem lesion and wilting seen in the fully susceptible varieties. The only symptoms to view are easily confused with stunting, water damage, or nitrogen deficient symptoms.

Disease development is dependent on several factors and the major factor is drainage. Soil without adequate drainage or soils that are water saturated for 2 days shortly after planting are prime sites for the development of PRR. Such sites need internal drainage and should be planted to resistant soybeans. Race specific resistant lines still offer the grower a good choice. Of the genes that confer race specific resistance Rps-1k offers the best range of protection. Some races of PRR in MN can overcome the 1k gene, but it is the best choice for now. The variety can also have “tolerance”. This broad type of resistance

protects against all tested races, but is effective at a lower level and can be overcome. Some of the first “tolerant” varieties exhibited only low levels and failed under severe disease pressure. Today the use of tolerant plant backgrounds and race specific Rps genes such as 1k have provided the grower with a very good option for PRR management. Tillage is important and as less tillage becomes more common the incidence of PRR will increase. No-till fields warm slower and dry slower providing a very good environment for PRR to develop. Fungicides are another option, seed treatment with Metalaxyl (Apron) or soil treatment with (Ridomil) or the use of Anchor will provide some protection against the races of PRR.

The problems with PRR were minor when resistance was effective and the tilled fields were planted following complete tillage. Drainage is the same but with less tillage and more races of PRR that can overcome Rps-1a, 1b and 1c we can expect to see more PRR damage. A consideration for the no-till sites is to delay planting until the soil warms and dries. Plant varieties with adequate race specific resistance and/or select lines with proven high tolerance. Fungicide treatments may be considered when planting susceptible lines with low tolerance in fields with a history of PRR.

The lower leaves of soybeans are now turning yellow. The lower leaf loss of color and leaf drop is normal and at this time is due to Septoria Brown Spot of Bacterial Blight. These two pathogens develop on the leaves and cause the leaves to yellow and fall. Seldom do we see serious plant damage to this early leaf drop.

*Ward C. Stienstra
Extension Plant Pathologist*

WHEAT AND BARLEY

FUNGICIDES REGISTERED FOR POST-ANTHESIS APPLICATION TO WHEAT AND BARLEY THAT MAY REDUCE SCAB

SITUATION: Scab observed in NE ND and NW MN and recent rains will favor more spread. Septoria leaf and glume blotch and Tan spot also a threat.

ACTION: Wheat producers at greatest risk with a crop worth protecting may want to try a POST-flowering fungicide appli-

cation of benomyl (Benlate 50WP @ 0.5 lb/acre) + spreader/sticker or an application of mancozeb (2 lb/acre) + spreader/sticker to reduce glume blotch and POSSIBLY reduce scab. Benomyl is a locally systemic with some activity against Fusaria fungi. It may be applied up to 21 days before harvest. Benomyl is registered for wheat and barley. Mancozeb, a protectant registered for wheat and barley, may be applied up to 26 days before harvest. Both labels support leaf disease control, **NOT SCAB CONTROL**. Benomyl may be tank mixed with mancozeb.

WHEAT AND BARLEY/continued

JUSTIFICATION: Some studies in ND and MN in 1993 indicated that POST-flowering/post-infection applications were somewhat successful. A 1993 study at Langdon with a non-registered fungicide applied AFTER infection showed a 15-20% reduction in scab severity. Heading applications of mancozeb in MN in 1993 gave some degree of control. A 1977 Illinois study applied benomyl (0.5 lb product/acre) + mancozeb (1.0 lb product/acre) at early milk stage and 10 days later, resulting in a 12% reduction in scab, good control of glume

blotch, and a 17% increase in yield. Cost of 0.5 lb of Benlate is about \$7.00; cost of 2 lb of formulated mancozeb is about \$5.50. Data with post-flowering applications of fungicides is very limited. Wheat and barley varieties highly susceptible to scab should be expected to respond more than moderately susceptible ones. More research is needed.

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PESTICIDE NEWS

Deletion of acephate (Orthene) uses on soybeans—Valent USA Corporation plans to delete soybeans from all US labels of the insecticide acephate. They have followed this course of action due to new reregistration requirements imposed under FIFRA, Section 4 Data Call-In, including residues in processed commodities. The USEPA has not yet accepted this deletion. Valent will consider supporting at plant or seed treatment uses of acephate on soybeans if another party wishes to develop the required data. For additional information, please contact Mr. Richard A. Zimmerman, Valent USA Corporation; Tel: 510-256-2850; Fax: 510-256-2888.

Revocation of ethylan (Perthane) tolerances—The USEPA has proposed revocation of all tolerances for residues of ethylan on or in apples, broccoli, Brussels sprouts, cabbage, cauliflower, cherries, kohlrabi, lettuce, meat, milk, pears, and spinach. The last products containing this insecticide were canceled in 1990, and distribution of products apparently stopped in 1985. Therefore, the USEPA is not recommending action levels for this pesticide. For additional information, please contact Ms. Ann Sibold, EPA Special Review Branch; Tel: 703-308-8033; Fax: 703-308-8041.

Revocation of tetradifon tolerances—The USEPA has proposed revocation of tolerances for tetradifon residues. This miticide was registered on apples, apricots, cherries, citrus, crabapples, cucumbers, figs, grapefruit, grapes, hops, lemons, limes, meat, melons, milk, nectarines, oranges, peaches, pears, peppermint, plums (prunes), pumpkins, quinces, squash (winter), spearmint, strawberries, tangerines, tea, and tomatoes. All registrations were canceled by 1990. Written comments, identified by OPP-300336 should be sent to the Public Response Branch of EPA by August 22, 1994. Respondents are asked to answer these questions: 1) Are there any existing stocks of the chemical?; 2) If so, how much?; 3) When will the stocks be depleted?; and 4) How long would commodities treated with these chemicals be in the channels of trade? For additional information please contact Mr. Owen F. Beeder, EPA Reregistration Division; Tel: 703-308-8351; Fax: 703-308-8369. Send comments to: Public Response Branch (7506C), EPA Office of Pesticide Prog., 401 M Street S. W., Washington, D. C. 20460.

Sulfur dioxide tolerances to be revoked—The USEPA has proposed revocation of exemptions from tolerances for the fumigant, sulfur dioxide. This pesticide was registered on barley, buckwheat, corn, oats, popcorn, rice, rye, grain sorghum, and wheat. All applicable registrations have been canceled. The tolerance and registration on grapes is not affected by this action. Written comments, identified by OPP-300336, should be sent to the Public Response Branch of EPA by August 22, 1994. Respondents are requested to answer the four questions listed above under tetradifon tolerance revocation notice. For additional information please contact Mr. Owen F. Beeder, EPA Reregistration Division; Tel: 703-308-8351; Fax: 703-308-8369. Send comments to: Public Response Branch (7506C), EPA Office of Pesticide Prog., 401 M Street S. W., Washington, D. C. 20460.

Residue data requirements for registration—The USEPA has announced the availability of proposed updated guidelines on the residue requirements for the registration of pesticides. This document describes raw and processed foods and animal feeds for which residue data are collected and tolerances are set, and the maximum residues allowed in feeds. This is an update of the *Guide for estimating toxic residues in animal feeds and diets* authored by Dr. L. Harris in 1975. The USEPA is reevaluating the policy of allowing as a substitute for data a label restriction prohibiting the use or sale of a commodity for livestock feed purposes. Comments will be accepted until August 22, 1994. For copies of this document and to send comments, please contact Pesticide Docket, EPA Public Response Branch, Room 1132, Crystal Mall # 2, 1921 Jefferson Drive Highway, Arlington, VA 22202; Tel: 703-305-5805; fax: 703-305-5884. For additional information, please contact Mr. Jerry Stokes (7509C), EPA Health Effects Division, 401 M Street S.W., Washington, D. C. 20460; Tel: 703-305-7561; Fax: 703-305-5147.

Publication received by the MN Pesticide Impact Assessment Program—*Agricultural Chemical usage: 1993 fruits summary.*

*Bh. Subramanyam, Coordinator
MN Pesticide Impact Assessment Program*

CLINIC REPORTS

DIAL U

County Agents: Please Alert Master Gardeners of the Following Items

Root rot has been common on many plants including strawberries and raspberries. Both of these plants require well drained soils for good plant growth and fruit production. Wet weather last year and again this year (in some parts of Minnesota) has prevented good root growth and roots have deteriorated. Above ground symptoms appear as stunting, yellowing and sudden wilting of the foliage, followed by dieback and poor fruit set. For best results establish new berry patches on well drained soils and follow recommended management practices.

Dutch elm disease is common in many natural areas where elm has re-established itself. Individual branches wilt, turn yellow or brown and the leaves remain attached. As the disease progresses inward additional branches are invaded with symptoms eventually spreading to the entire tree. To tentatively diagnose Dutch elm disease, peel back the bark on wilting branches, checking the sapwood for brown to gray streaking—normal sapwood is cream colored. Cultures from recently wilted branches with streaking are necessary for positive identification. Infected trees should be destroyed. **Do not** save elm wood with the bark attached as this will provide breeding sites for elm bark beetles which spread the disease.

Weed control: dodder—We got our first “dodder” call of the season this week. Dodder is a leafless parasitic plant that sprouts from seeds in the soil. Once it begins to grow and attach itself to host plants such as impatiens, dodder breaks its connections with the soil and lives totally off its host plant, weakening or killing it.

If you see plants infested with dodder, pull them out. When you allow them to remain in the garden dodder continues to develop and it eventually flowers with structures that look like little hollow balls. After flowers come seeds which fall to the ground to plague next years' garden plants.

Fertilizing—It's time to sidedress flowers and vegetables in the garden, if you haven't already done so, but it's late to fertilize shade trees. If you still want to fertilize your trees this year, wait until fall when they shed their leaves. That way, nutrients will be in place when the trees resume growth next spring.

One place you should be fertilizing regularly every two or three weeks is in any container or hanging basket. Because these containers must be watered frequently, nutrients are often leached through the soil rapidly as well. Watch foliage color for signs of nitrogen deficiency.

Many people assume lawns should be fertilized right through the summer. But if you don't have a sprinkler system with a ready supply of water, it's best to wait to feed the lawn in mid to late August or early September. Fertilizer will neither harm nor help lawns that have gone tan and dormant; you'd just be wasting your money and effort. They will be harmful, however, to green lawns that are under moisture-stress.

Dividing flowering perennials—Wait till later in summer or even early autumn to divide flowering perennials. That way their foliage will have gathered plenty of energy for next year's growth. (Never remove foliage while it's still green and healthy looking; once it has yellowed it's served its purpose and can be safely cut down.

Disappointing zucchini—Most people end up with more zucchini than they can possibly use, but sometimes gardeners have trouble with zukes that don't want to produce at all. Little fruits develop, but turn yellow and shrivel before they grow much at all. (Pumpkins or winter squash can have the same problem.) The problem is poor pollination. Shady conditions (sometimes caused by over-fertilization and heavy leaf canopy), wet weather, or excessive use of pesticides that may have resulted in fewer pollinating insects flying in the area could all be responsible. Try hand pollinating using a child's paint brush or a cotton swab to dab pollen from the anthers in the center of the male flower to the stigma in the center of the female flower. The female flower is easy to detect by the zucchini-shaped bulge (the ovary) behind the blossom. The male blossom has no such bulge.

Zebra caterpillars have been very common lately. These attractive caterpillars have a reddish brown head and a yellow-green body with four yellow stripes and black (zebra-like) markings. They are about 1 1/2 inches long when full grown. They have been reported on a variety of garden plants including swiss chard and broccoli. The literature reports them feeding on many vegetables, including cabbage, sweet peas, flowers, including lilies, gladiolus, and weeds, such as smartweed. The easiest control is to handpick the caterpillars, especially if they are large. If caterpillars are very abundant, especially if they are small, try spraying with insecticidal soap, malathion, or carbaryl (Sevin). Zebra caterpillars grow up to be nondescript, unspectacular, brown moths.

Whitemarked tussock moths are just beginning their second generation in the Twin Cities. We had a number of reports during spring of damage by first generation caterpillars. This caterpillar is very distinctive having a reddish head and a hairy yellowish body with two long black tufts of hair that stick out near the head, a yellowish tuft at the tail, and four squarish tufts on the top of the body. Mature caterpillars are about 1 1/4 inch long. Whitemarked tussock moths feed on the leaves of a wide variety of trees and shrubs (over 60), including linden, birch, elm, apple, and maple. Young caterpillars skeletonize leaves while older caterpillars eat the entire leaf except for large veins and petiole.

Infestations do not normally injure plants. However, heavy infestations on trees and shrubs that are stressed, recently transplanted or that have been consistently defoliated over the last several years can be damaged, especially if first generation feeding was severe. Treat while caterpillars are still small, using an insecticide such as *Bacillus thuringiensis* (e.g. Thuricide, B. T.), acephate (e.g. Orthene), malathion, insecticidal soap, or carbaryl (Sevin)

Carpenter ant satellite nests—We have had several reports of large numbers of black ants 'marching' across yards. What they most likely witnessed was a carpenter ant satellite colony in the process of moving. Satellite colonies consist of workers, pupae, and mature larvae; there are no queens or eggs. They move out from the parent colony looking for a site to establish themselves. While parent colonies need moisture-damaged wood to nest in, satellite colonies can nest in sound wood; this is because moisture is only needed for the survival of eggs which satellite colonies don't have.

Satellite nests can become established in homes in a very short time. Once the satellite nest is established, the workers go back and forth between it and the parent colony. If you see any suspicious ant activity, be aware of satellite colonies. Because workers return to the parent colony on a regular basis, a residual spray across their route will help control them. As with parent

DIAL U/Continued

colonies, a direct insecticide treatment into a satellite nest, if its location is known, will also eradicate it. See FO-1015, *Carpenter Ants*.

Deer flies have been particularly annoying this summer for people trying to enjoy the outdoors. The larvae are aquatic, living primarily in ponds, marshes and wetland areas. Adults are found most commonly near these areas, although they are strong fliers and can be found a distance away. Deer flies, like mosquitoes, feed on the blood of mammals. They like to fly around the heads of people, often getting into their hair. They have a tendency to be more common during cloudy days and in the shade. Unfortunately there is little people can do to keep deer flies away. People can wear hats and long sleeved shirts and pants to help protect themselves against bites. Repellents containing DEET or permethrin (follow all label directions) can be used but usually are not very effective against deer flies. The only other option is to avoid places and times when you know deer flies are not tolerable.

Ground beetles—We have received several reports of ground beetles entering buildings, sometimes in large numbers. Ground beetles are very common insects. They are generally dark-colored, fast moving insects found at ground level. They are beneficial because they feed on a wide variety of insects, including harmful garden pests. Once they enter buildings they do not

live long and do not reproduce. Ground beetles are harmless to people and do not destroy property. Physical removal is the only necessary control. If large numbers are present, check for and repair cracks and spaces that may allow insects indoors. You can supplement that with an insecticide treatment of chlorpyrifos or diazinon around the foundation's exterior. Extension educators also read the Dial-U brief *Ground Beetles*.

Woodchucks can be found almost anywhere you don't want to see them. They do extensive damage to vegetable and flower gardens, are able to climb trees and eat the leaves, and often prefer to establish their burrow systems in close proximity to human structures. The most common means of control is the use of a commercial gas cartridge. Ignite the cartridge, place it in the burrow system and seal all entrances. The cartridges are available at hardware stores, farm supply stores and nurseries. Always read the directions carefully. Another option of control is live trapping. Bait traps with fresh lettuce, apples, carrots, fresh beans, etc. Place traps at the main entrance of the burrow and be sure to check the trap twice daily.

Other common questions include carpenter ants and insect/mite galls.

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Entomology

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Wildlife

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