

# THE VEGETABLE GAZETTE

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**Saying for the Month:** "When an old man dies, a whole library is gone"- An old African Proverb

## **Comments from the Editor**

Bill Lamont, Department of Horticulture

The impact of continuing dry weather, high temperatures and sometimes windy conditions this summer has had on vegetable crops is being printed in the newspapers and on the T.V. reports. Not only is the lack of moisture a problem but what happens when plants are under stress and we apply an insecticide or fungicide. The situation is addressed in an article by Mike Orzolek. We can definitely say that the environmental conditions this summer are certainly testing both growers and their crops. If you did not have irrigation the effect is certainly quite pronounced. Just remember for those who have irrigation systems especially those using drip irrigation, make sure to check the systems valves, gauges, filters etc. so as to prevent any potential clogging etc. We have the drip irrigation system up and running in the high tunnels and have planted tomatoes in eight of the tunnels. This will be our fall crop. It will be interesting to see how long we can keep this crop producing in the fall. Maybe we will have fresh tomatoes for our Thanksgiving meal. For those who will be at Ag Progress Days, I encourage you to stop by and see the high tunnels. Also, remember we have put 3 high tunnels out in the state-under the able leadership of Eric Osterling and Guy Metzler in the western part of the state, Steve Bogash in the Blair County area and Tim Elkner at the Southeastern Ag Research Center at Landisville in Lancaster County. I am sure that once these tunnels are up and running, that we will see articles about them in future issues of the gazette.

As always, I want to thank those colleagues in the other departments that are supporting the Vegetable Gazette with contributions and would encourage others to

send in an article next month. The “Insect Pest of the Month”, “Monthly Vegetable Disease Reminders” and “Weed of the Month” or “Weed Control Program for a Specific Crop” are excellent. Kathy Demchak, Extension Small Fruit Specialist, continues to supply us with not only with the opportunity to pick delicious blueberries but supplies us with great articles concerning small fruits. Emelie Swackhamer, Extension Agent in Lehigh County has written an excellent article on no-till pumpkins this month and I am not sure who is on deck for next month but if you haven’t written anything for the gazette up to now here is your chance-Sept., Oct., Nov. and Dec. I need four articles..

As always, the Vegetable Gazette Team encourages your feedback so that we can better serve your needs and address your concerns. Be sure to check the educational opportunities listed in the upcoming meetings at the end of the gazette.

Pumpkin Production in a No-till Rye Mulch System  
Emelie Swackhamer, Horticulture Agent, Lehigh and Northampton Counties

There has been much interest in growing pumpkins in no-till systems, using the residue of cover crops like rye as a natural mulch. There are many advantages of using this method, as more and more Pennsylvania growers are finding out.

**The advantages include:**

1. Rye mulch provides some weed control. The rye straw left on the soil surface reduces the number of weed seeds that germinate by blocking the sunlight. There is also some evidence to suggest that the rye straw has allelopathic effects on germinating weed seeds; it has the ability to suppress germination and growth of the young weeds, probably due to a chemical compound contained within the rye plant.
2. Rye mulch will reduce evaporation of soil moisture, which is especially helpful to growers who do not irrigate their fields.
3. Rye grown as a cover crop will add organic matter to the soil, and improve the structure of the soil in two ways. First, growth of the roots of the rye plants will improve water filtration in the soil. Second, in reduced tillage systems there is less soil compaction because less time is spent running equipment over the field.
4. Rye mulch makes a field more pleasant for your customers who pick their own pumpkins. The rye straw that remains at harvest will reduce the mud customers will encounter, and will also make it a lot nicer to drive through the field. The fruit will be cleaner, which is another big bonus for pick-your own operations.

5. Rye mulch may reduce the amount of disease occurring on mature fruit. Many of the diseases of pumpkin fruit are soil-borne and rye straw provides a barrier which may prevent infection by disease-causing fungi.

**The disadvantages include:**

1. Rye mulch does not eliminate perennial weeds. Do not attempt to grow no-till pumpkins in a field that is heavily infested with yellow nutsedge, other perennial weeds, or weeds that are not controlled adequately by the residual herbicides labeled for use in no-till pumpkins.
2. Disturbing the rye straw when planting the pumpkin crop decreases its ability to shade the soil and allows weed seeds to germinate in the disturbed areas
3. Planting into the rye straw may require modifications to your conventional planting system. Stony or very dry soil is especially difficult to plant into. To penetrate the mulch layer, it may be helpful to add weight to your planter. Some growers increase their seeding rate slightly to compensate for skips, and then thin the plants if needed. Others go back in after the seed has germinated and fill in the stand by hand-planting into skipped areas.

If you would like to learn more about how to use no-till systems in rye mulch, consult page 123-124 of the 1999 Pennsylvania Commercial Vegetable Production Recommendation Guide, or contact your local Cooperative Extension office. The guide summarizes cover crop establishment, management, weed management, planting and fertility.

If you want to try pumpkins in no-till rye in 2000, you need to start planning now. Check the fields you wish to put in no-till pumpkins next year to make sure you don't have a lot of perennial or difficult to control weeds. Next, make your plans to get your soil tested and plant the rye. Rye seed needs to be planted in mid-September in the colder regions of the state and before October 5 in the warmer parts of the state. For more information on rye cover establishment, consult pages 158-159 of the Agronomy Guide, or contact your local extension office.

If you'd like to see some pumpkins grown in a no-till rye-mulch system, plan to attend the meeting on September 28, at Grim's Farm in Breiningsville, Lehigh County. Over 30 varieties of pumpkins were planted into rye early in June. Also, an experiment is being conducted there to find out just how much disease suppression can be realized in this no-till system. Penn State specialists Mike Orzolek and Alan MacNab will be there to discuss the results of both the variety demonstration and the disease research experiment. For more information about this meeting, contact Emelie Swackhamer at 610-391-9840.

## **Insect Pest of the Month-Corn Earworm**

Shelby Fleischer, Department of Entomology

The corn earworm, *Helicoverpa zea*, is a very important pest of sweet corn. It can also be a pest in tomatoes, cotton, sorghum, vetch, and other hosts. Thus, it also goes by the name of cotton bollworm and tomato fruitworm. Here, it is primarily a pest in sweet corn, and we'll use the name of corn earworm, and the acronym CEW.

**Seasonal Development.** The corn earworm is a moth, in the insect family Noctuidae. As with all the noctuids (such as fall armyworm), it is a night-flying moth. It is a good flyer, and able to move long distances.

We typically see CEW later in the season because it has not overwintered well in Pennsylvania. It overwinters as a pupae in the soil, at a depth of about 2 to 4 inches. However, it does survive the winter in southern New Jersey, the Delmarva, and southern Illinois. Overwintering is more successful as you travel south, and winter temperatures are warmer. In recent years, we have seen low densities of CEW earlier in the field season, which may reflect some overwintering in southeastern Pennsylvania.

Adults emerge in the spring. They are about  $\frac{1}{2}$  to 1 inch in length, tan to buff-colored, sometimes with some olive shading, with a wavy darker band near the edge of the wings of younger specimens. The eyes have a distinctive serpentine green reflection when held up to sunlight in live specimens. A darker brown spot is located about midway along the outer edge of the front wings. They fly when evening temperatures exceed 55°F, with increasing activity at higher temperatures. They can be caught up in winds and storms, and deposited with the weather patterns.

Females are strongly attracted to fresh silks, where they lay the eggs individually directly on the silk. A female can lay from 500 to 3,000 eggs, and average about 1,000 eggs per female. Eggs will be laid on other plant tissue or hosts when corn silk is not available. Eggs hatch in 2 to 10 days, depending on temperature, and probably hatch within 2 to 4 days during the summer in Pennsylvania.

Hatching larvae crawl away from light, and towards moist, shaded areas. When on silks, hatching larvae feed on the silk and burrow directly down into the ear. They feed on each other as well, which tends to limit the number of larvae to one per ear. They feed on the corn kernels at the tip of the ear, rendering the product unmarketable unless it is possible to cull and cut off the tips of the ear. In field corn, this tip-feeding is often not important. Thus, the corn earworm is a pest to vegetable growers, but not to field corn growers.

As they mature through 6 instars, they will leave large amounts of frass where they are feeding. Larval coloration will vary from greenish to yellow to reddish, with longitudinal stripes which are actually microspines along the body. The microspines give the larvae a rougher feel than the other worms in the ear. The head is tan to yellow, which helps distinguish it from the fall armyworm or European corn borer, which have darker head capsules.

**Monitoring and Management**

Of all our corn pests, the one that is most easily monitored is the corn earworm. Blacklight traps capture males and females, and traps baited with the proper sex pheromone capture only males. Traps are made from heavy wire hardware cloth, or purchased from Gempler's. A cloth net trap sold by Scentry will also work, and are used in some states (including Massachusetts and New York), but they have not performed as well as the wire traps in the mid-Atlantic. Pheromone lures can be purchased from Great Lakes IPM or Gempler's. For corn earworm, the lures made by Hercon have worked well in our area. Traps need to be placed near (or in) a corn field, and the area immediately around the trap kept free of tall weeds or debris. Place traps away from trees or wooded areas. Handle the lures to minimize contamination by using forceps or surgical gloves, or at least preventing the same hand from handling lures for different insect species. Also, keep the lures cool, in the refrigerator or freezer, while in storage. Contact your Extension agent for details on setting up the traps at your farm.

Since much of the CEW population builds as populations move from the south, it makes sense to look at the densities from a regional viewpoint. Penn State Extension, in with support from the Pennsylvania Vegetable Grower's Association (PVGGA) is monitoring CEW with pheromone traps from 15 to 25 sites in Pennsylvania. The data are reported approximately weekly at the 1-800-PENN-IPM telephone line. It is easier to view these data as a map, and we are developing that capability as a web site. We are cooperating with neighboring states. The data are fed to a computer in Entomology, where they are processed into maps for the region, and the maps then turned into web pages. You can look at the most current CEW map, or the most current map for the other pests of sweet corn ears. You can also look at previous maps. When looking at any map, you can also click on a given site, and get the trap capture over time at that site.

Please note, however, that the maps are showing average catch per day. We are showing the maps as catch per day, and not per week, because we need to report data from more than one state. The other states capture data more frequently than we do in Pennsylvania. (The neighboring states have State Department of Agriculture personnel, or people paid from state IPM funds, servicing the traps, whereas in Pennsylvania we rely on volunteer help). So you need to multiply the trap catch per day in the maps by 7 to estimate a trap catch per week.

The address for the web site is:  
\_ HYPERLINK <http://www.ento.psu.edu/vegetable/>  
\_ <http://www.ento.psu.edu/vegetable/>\_  
From there, click on Sweet Corn Trap Report.

This year, 1999, is a test year as we develop this interface for viewing these pheromone trap catch data as maps on the web. Bear with us, and send us comments to improve it for next year.

Since the larvae feed on silks and then burrow into the ear, they are hard to reach with insecticides. Insecticides should be applied in sufficient water to ensure thorough coverage. High water volumes (30 gal/A) is recommended. Timing insecticides to when the eggs are hatching and the larvae are feeding on silks is critical. This is best

done by applying insecticides when the moths are flying, which is within a day or so of when they are laying eggs. A useful guide is to watch the change in trap capture over time, and tighten spray frequency as trap catch is increasing. A starting point for spray timing is:

Frequency	Spray
CEW almost absent (< 14 / week)	4 days to no spray, depending on ECB
CEW very low (14 to 35 / week)	5 to 6 day
CEW low (36 to 70 / week)	4 to 5 day
CEW moderate (71 to 350 / week)	3 to 4 day
CEW high (> 350 / week)	2 to 3 day

It is very important to realize that trap capture can be influenced by all the factors that influence insect flight behavior at night, such as temperature, wind, humidity, etc. Therefore, the capture should be used as a guide.

Insecticide resistance has been a problem with the corn earworm. This is not well documented in the northeast, where we are often dealing with few generations. But in the southeast, this cotton bollworm is well known to show resistance to a range of pesticides. The current vegetable production guide lists carbamates (Lannate, Larvin) and pyrethroids (Asana, Baythroid, permethrin, and Warrior) as useful materials.

Systemics activity would help, and the transgenic sweet corn varieties, which express the proteins from *Bacillus thuringiensis*, have proven very effective in field tests. Our tests when spraying *B. thuringiensis* has met with variable success, and is difficult to make work consistently, probably because it is hard to get the larvae to ingest a toxic dose. Younger larvae will die from a much smaller dose than will older larvae. By making the plant create the protein, the very young larvae end up ingesting a toxic dose very quickly. Processing varieties of the transgenic Bt sweet corn are now being grown commercially, and sh2 varieties are being tested.

References:

Prostak, D. J. Corn earworm. Pp 75-79 In Adams, R. G. and J. C. Clark (eds). Northeast Sweet Corn Production and IPM Manual. University of Connecticut, Resource Center U-35, 1376 Storrs Rd., Storrs, CT 06269- 4035

## **Weed Management in Cantaloupes**

Mike Orzolek, Department of Horticulture

Controlling weeds in cantaloupe requires both cultural and chemical methods to be successful. Since the production of cantaloupe and other melons in Pennsylvania can be very difficult on bare ground, all cantaloupe is grown on flat or preferably raised beds with plastic mulch (IRT green, blue, silver or black) and drip irrigation. The use of plastic mulch will eliminate weeds on the bed except for the occasional weed(s) that pop-up in or near the transplant hole, prior to transplants producing a large, competitive canopy. The area between the rows of melons can be treated with a labeled herbicide or seeded with a living mulch such as annual rye or clover. The other option is to cultivate several times during the growing season prior to vines running off the beds and into the row middles. Placement of clean straw between the row middles is another option providing that

the straw is free of grain and weed seed and placed on the soil before transplanting the crop. There are not many herbicides to choose from, but the following materials are labeled for cantaloupes.

**Naptalam** (Alanap 2SC) applied pretransplant and incorporated to a depth of 2 inches at the rate of 1 gal/A (2.0 lbs ai/A). generally a broadleaf weed material which will give fair to good control of carpetweed, galinsoga, common lambsquarters, jimsonweed, pigweed, purslane and common ragweed. Alanap can also be applied postemergence at the rate of 2 to 4 qts/A when the vines are ready to run to extend residual weed control or suppress smooth pigweed. Do not apply if rainfall is expected within 6 hours and do not mix with liquid fertilizer.

**Bensulide** (Prefar 4EC) applied pretransplant and incorporated to a depth of 2 inches or less at the rate of 5 to 6 qts/A (5 to 6 lbs ai/A). generally a grass weed material with some control of lambsquarters, pigweed and purslane. Because of the specificity of weed species controlled, many growers will tank mix the combination of **Prefar** and **Alanap** and apply prior to raising beds or laying plastic mulch. Best response from the tank mix (prefar and alanap) obtained when 0.5 inches of water irrigated on field immediately after application.

**Ethafluralin** (Curbit 3E) is labeled only for direct-seeded cantaloupes as a postemergence application at the rate of 1.5 to 2.0 pts/A (0.56 to 0.75 lbs ai/A). There are several precautions with the use of this herbicide including: 1) Dry weather following application may reduce weed control, DO NOT preplant incorporate, DO NOT use on transplanted cantaloupes, DO NOT apply under plastic mulch or tunnels and DO NOT use when soils are cold or wet – crop injury may result. Curbit controls certain annual grasses and some broadleaf weeds.

**Sethoxydim** (Poast 1.5EC) applied postemergence at the rate of 1.0 to 1.5 pts/A (0.2 to 0.3 lbs ai/A) for the control of both annual and perennial grasses; it does not control any broadleaf weeds, wild onion or yellow nutsedge. A oil concentrate is recommended in the tank with Poast as a 1 percent solution, but the use of the oil concentrate may increase the risk of crop injury when hot or humid conditions prevail (the precise description of the summer of 1999 in Pennsylvania). For best results, treat grasses that are actively growing (not under stress) and before tillers are present. Do not tank-mix with or apply within 2 to 3 days of any other pesticide unless labeled, as the risk of crop injury may be increased, or reduced control of grasses may result.

**Paraquat** has received a 24© label for application at the rate of 1.6 pts/A (0.5 lb ai/A) as a directed spray with shields to control emerged weeds between the rows after crop establishment. Add nonionic surfactant according to the labeled directions. DO NOT allow the spray or spray drift to contact the crop or injury may result. Do not exceed a spray pressure of 30 psi.

I'm am currently conducting research on the use of Dual Magnum for cucurbits. It is my understanding that Pennsylvania may be able to obtain a Section 18 next year (2000) for Dual Magnum on cucurbits including cantaloupe.

## **Field Problems Summer of 1999**

Mike Orzolek, Department of Horticulture

Several growers have been calling me about production problems with their vegetables – the following is a short synopsis of those calls.

1. Tomato fruit have blotchy ripening or gray wall at harvest, what is the cause? Blotchy ripening is not caused by a virus, it is a combination of environmental factors (fluctuating temperature, especially high temperatures and moisture) and nutrition – specifically low levels of potassium in the plant. If you suspect that your tomatoes have blotchy ripening, I suggest you get a tissue test for the crop and add additional potassium if necessary.
  2. My pumpkin, pepper, snap bean or tomato crop have very few fruits on them, what is the probable cause? 1999 has been characterized by high temperatures and very little rainfall, both conditions can result in pollination problems – pollen not shedding from anthers, lack of pollen tube development in ovary or lack of bee activity in field due to excess heat in hive.
  3. After applying a fungicide or insecticide, the plant leaves looked scorch, have necrotic spots or have fallen off the plant, what is the probable cause? All plants when growing under stressful conditions, such as high temperatures and dry conditions, produce ethylene gas. Normally the amount of ethylene gas produced internally by the plant is not enough to initiate senescence (the aging process in plants). However, when pesticides are applied to plants which already have relatively high internal levels of ethylene in them, the chemical pesticides can interact and start the aging process in plants characterized by yellowing of leaves and in some cases cause leaf drop. The other problem with pesticide applications in many cases is not the active ingredient, but the inert or carrier added to the pesticide or the surfactant or spreader-sticker added to the spray-tank. On very hot, humid days, the inert ingredients or surfactants can cause leaf necrosis of the entire leaf or as spots. If severe enough, plants may not recover – be cautious, DO NOT use surfactants or spreader stickers when spraying under hot, above 90°F, very humid, above 68% humidity, conditions.
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### **Heads-Up-- Two In-Service Educational Training Opportunities**

Bill Lamont, Department of Horticulture

Just another reminder on the two in-service educational training opportunities to mark on your calendars. The first the Horticulture Agents/Specialists Vegetable/Small Fruits Roundtable which will be held November 23, 1999 from 9 AM-3 PM in Room 10 Tyson Building. This is the opportunity for horticulture agents and extension specialists from Horticulture, Entomology and Plant Pathology working with vegetables and small fruits to exchange observations and thoughts on the recently completed growing season. Updates on results of on-farm tests and research projects conducted by county extension staff and extension specialists will be presented. Planning and coordination of next year's activities will be an important part of the roundtable.

The second training session will be on the Operation and Use of High Tunnels which will be offered on April 12, 2000 from 8:30 AM-5 PM at the Horticulture Research Farm at Rock Springs. The training will be conducted at the "High Tunnel Research Facility" and will cover all phases of production in a high tunnel and provide agents with "hands-on" experience in specific phases of the operation of a high tunnel.

Topics to be covered include: what crops, determining planting dates, planting techniques, water management considerations, fertility management, importance of proper ventilation, controlling insects and diseases and opportunities for multiple cropping. Mark both of these training sessions on your calendars now.

### **Mid-Atlantic Direct Marketing Conference**

John Berry, County Agent, Lehigh County

PaFarm and four additional state direct marketing associations, in conjunction with Cooperative Extension of Pennsylvania, Delaware, Virginia, Maryland and New Jersey, is proud to announce the Mid-Atlantic Direct Marketing Conference (MADMC) 2000. The conference will be held from February 23rd through February 27th, 2000 at the Parsippany Hilton in Parsippany, NJ. MADMC is aimed at identifying emerging trends in direct agricultural marketing, finding innovative ways to increase the sales and profitability of direct marketing, and putting direct marketers in contact with vendors who offer services and products which can make their business grow.

Direct marketing remains a successful method for farmers to sell their products in the Northeast as evidenced by the increasing number of markets in the region. This yearly conference provides an opportunity for practicing direct marketers to exchange ideas and marketing strategies with one another as well as a chance to interact with policy makers regarding regulations. In addition to direct marketers from the Mid-Atlantic region, participants from New York and New England will also be taking part in the conference increasing the expected attendance to over 500. Our annual trade show will again showcase a wide variety of vendors and exciting products that service direct market establishments.

On February 23rd and 24th, participants will have the opportunity to see where direct agricultural marketing got its start. Several direct marketing facilities in New Jersey and New York State will be part of a complete pre conference tour package including meals, lodging and transportation to the featured markets. Hands-on pre-conference workshops are being planned for Thursday, February 24th. In-house presentations, a wide selection of informative sessions to choose from, training and the main conference agenda will take place on February 25th and 26th. There will be additional opportunities to visit local direct marketing facilities during a post conference tour on Sunday, February 27th.

For more information, please contact Dr. Ramu Govindasamy (732) 932-9171, extension 254. Details will also be posted at <http://www.cook.rutgers.edu/~agecon/madmc.htm> as the conference agenda is developed

### **July Disease Reminders**

Alan MacNab, Plant Pathology Department

## DISEASE IDENTIFICATION

Identification information is available in the colored publication, "Identifying Vegetable Diseases" which is available from most extension offices.

## ASPARAGUS

Rust: Continue applying fungicide sprays to young plantings.

## BEANS

Mosaic Viruses: Use resistance to BV-1. Provide good weed control; weeds are a source of bean viruses. Do not plant near clovers; they are a source of bean viruses. Do not make successive plantings in adjacent strips or fields; the few diseased plants that appear in early plantings act as an important virus source for later adjacent plantings.

White Mold and Gray Mold: Apply protective fungicide sprays when warranted. Wet conditions immediately before and during bloom promote disease development. Ronilan is very effective; Benlate and Topsin M also are good when timed well.

## BEANS, LIMAS

Downy Mildew: During wet weather, when conditions favor disease, use fungicides. Conditions that favor late blight of tomatoes and potatoes also favor downy mildew of lima beans.

## BEETS

Leaf Spots: Use fungicides where disease usually occurs.

## CABBAGE:

Fusarium Yellows: This disease is favored by hot weather. When possible, avoid susceptible varieties.

Clubroot: Where present, it is too late to apply controls for this year. Determine the source if possible. Then plan rotation, pH adjustment, or Terraclor use for next season. Wet soil conditions favor development.

Downy Mildew and Leaf Spots: These diseases become most important late in the season. Where anticipated and warranted, fungicides provide some control. For downy mildew, Ridomil/Bravo 81W (1.5 to 2 lb/A) is effective and can be applied at 14-day intervals until 7 days before harvest. Weekly applications of Bravo and maneb also provide control.

## CARROTS and CELERY

Leaf Spots: Continue regular fungicide sprays; they are most important for the remainder of the season. Wet weather will promote their appearance and development.

## CUCURBITS

Bacterial Wilt: Where present, it is too late to attain control this year. Plan cucumber beetle (bacteria carrier) control for next year.

Leaf Spots, Blights, and Powdery Mildew: Use regular fungicide sprays unless varieties are resistant to the diseases of concern. Leaf diseases are of major importance on muskmelons (cantaloups) during late season. Alternaria leaf blight appears this time of year. Quadris (new federal Section 3 label) and NOVA (new Section 18 PA label) are excellent for powdery mildew, a disease which appears yearly starting about mid- to late-season. Alternate these materials to reduce chance of resistance development in the fungus. When NOVA is used, Bravo can be added to help control diseases in addition to powdery mildew. Ridomil/Bravo 81W is especially good for downy mildew, a disease that appears less frequently than powdery mildew in Pennsylvania.

Scab: For susceptible varieties, use fungicides when conditions are cool and wet. For cucumbers, use resistant varieties for next year. Beware of this disease if late plantings of susceptible cucumbers are planted.

Mosaic Viruses: Use resistant varieties. When resistant varieties are not available, control perennial weeds, plant in large fields, and control aphids.

Fusarium Wilt: It is too late to apply controls for this year. For future years, try rotation, resistance when available, and if necessary, soil fumigation. Symptoms appear first on plants in wettest areas of fields, and the disease is more prevalent in cool soil than in warm soil. The variety Athena may have the most resistance.

#### EGGPLANT

Verticillium Wilt: Follow rotations that avoid susceptible crops for as many years as possible. Where present yearly, consider fumigation where crop value warrants the expense.

#### ONIONS

Leaf Spots: Apply fungicides on a regular schedule, especially for those planned for storage. Defoliation diseases are active now. Note that Ridomil/Bravo and Ridomil MZ are labeled for onions, and are materials of choice if one has difficulty controlling downy mildew. Other materials listed in the Commercial Vegetable Production Guide are good for other leaf diseases that affect onions.

#### PEPPER

Mosaics and Virus Spots: It is too late to affect control for this year. For future years, use TMV resistance, plant in large fields, control aphid vectors, and eliminate perennial weeds near fields.

Bacterial Spot: Where present, determine source. Did it come on plants? If present, start basic copper sprays early and tank mix with maneb. Plan to rotate to fields not recently planted to tomatoes or peppers. This can be a serious problem. Inoculum can be seed-borne. If disease is detected in a field, do not work in the field when plants are wet. The bacteria that cause this disease are spread less when plants are dry than when plants are wet.

Phytophthora blight: This disease is promoted by wet soil (poor drainage and/or heavy rainfall). The most severe losses are reported on cherry and cheese types. Follow a 3-year rotation between susceptible crops such as pepper, cucurbits, eggplant, and tomato. Ridomil 2E soil applications (over the row at planting, and directed onto the soil at the base of plants at 30 days and 60 days after planting) are helpful. In addition, provide the best drainage possible; in some areas, it is necessary to grow

susceptible peppers on high ridges. In addition, to prevent the stem and fruit rot stage of this disease, apply Ridomil/Copper or a fixed copper alone at 7- to 10-day intervals.

### PUMPKIN and SQUASH

**Powdery mildew:** Powdery mildew has been important in recent years. Quadris (new federal Section 3 label) and NOVA (new Section 18 PA label) are excellent for powdery mildew, a disease which appears yearly starting about mid- to late-season. Alternate these materials to reduce chance of resistance development in the fungus. When NOVA is used, Bravo can be added to help control diseases in addition to powdery mildew.

**Phytophthora blight:** This disease is promoted by wet soil (poor drainage and/or heavy rainfall). Follow a 3-year rotation between susceptible crops such as pepper, cucurbits, eggplant, and tomato. Ridomil 2E applied at planting as labeled for Pythium and cottony leek control may be helpful. Foliar applications of Ridomil/Bravo 81WP at 3 lb/A may be adequate; it is labeled for application at 14-day intervals.

### SWEET CORN

**Leaf Spots and Rust:** Some varieties have some resistance. Fungicides are effective for leaf spots but less effective for rust. Tilt and mancozeb are labeled for rust; Tilt is somewhat systemic and sometimes is the material of choice when rust is especially difficult to control at the end of the season.

**Maize Dwarf Mosaic (MDM):** Aphid vector control may help in large fields. Where MDM is present, plan to try tolerant varieties in future years.

### TOMATOES

**Bacterial Speck and Spot:** If spots are a yearly problem, and symptoms appear on leaves, continue sprays with basic copper plus maneb/mancozeb. Next year, rotate to new fields, use pathogen-free seed, and spray seedlings regularly with streptomycin before transplanting. If symptoms are not present on leaves now, the fixed copper applications may not be needed for the rest of the season. Where present, try to avoid working and spraying in plantings when they are wet.

**Bacterial Canker:** Bacterial canker is appearing in some fields. I suspect that inoculum source is either infected seed, or infested soil. The causal bacteria can persist in soil for at least 3 years! Control is very difficult at this time. Do not work in affected plantings when plants are wet. Application of fixed copper tank mixed with either maneb or mancozeb, as for bacterial spot and bacterial speck, may help slow spread in fields.

**Fruit Rots and Leaf Spots:** Where possible, rotate and provide adequate fertility. Continue a good fungicide program. In addition to the standard fungicides, Bravo and mancozeb, which provide good control, Quadris is an excellent new fungicide for early blight control.

**Late Blight:** As of July 19, 1999, late blight has not been reported anywhere near Pennsylvania, and conditions have been too dry in most areas of the state for late blight to get started. However, this could change when we get rain. Fungicides are needed to protect tomatoes (and potatoes) whenever environmental conditions favor disease

development. Up-to-date information is available on the toll free "Hotline" --- 1-800-PENN-IPM

New Fungicides for Powdery Mildew Control on Cucurbits  
Alan MacNab, Plant Pathology Department

A. Announcement of NOVA 40W Section 18 Labeling: Nova 40W now has a Section 18 label for use on cucurbits to help control powdery mildew through September, 1999. I received this notification today, July 19, 1999.

The following is important information for growers to have in their possession whenever they use Nova on cucurbits in Pennsylvania.

B. Supplemental Labeling for NOVA

NOVA 40W has not received a full EPA Section 3 registration for cucurbit crops in the United States. However, a Section 18 Emergency Exemption for Nova 40W fungicide has been issued for use on cucurbit crops in Pennsylvania. [This was signed by the EPA representative on July 16, 1999.]

NOVA 40W Fungicide (EPA Reg. No. 707-221)  
For Control of Powdery Mildew in Cucurbit Crops  
(Cucumbers, Melons, Pumpkins, Squash)

**EMERGENCY EXEMPTION FOR USE AND DISTRIBUTION  
ONLY IN THE STATE OF PENNSYLVANIA**

Use Recommendation:

Apply 2.5 ounces NOVA 40W fungicide per acre. Begin applications at first sign of disease and make subsequent applications at 7 to 10 day intervals.

Restrictions:

Applications through any type of irrigation system (i.e. chemigation) are prohibited.

Do not make applications within 48 hours of harvest.

Do not apply more than 24 ounces (0.6 lb active ingredient) per acre per year.

Environmental hazards:

Do not apply directly to water, to areas where surface water is present, or to inter-tidal areas below the mean high-water mark. Do not contaminate water when disposing of equipment washwater or rinsate. Do not apply when weather conditions favor drift or runoff from areas treated.

These statements, as well as all other applicable directions for use on the federal NOVA 40W federal label, are applicable to this emergency exemption use.

The information contained herein is believed to be reliable, but ROHM AND HAAS COMPANY MAKES NO WARRANTIES, EITHER EXPRESSED OR IMPLIED, AS TO ITS ACCURACY AND ASSUMES NO LIABILITIES ARISING OUT OF ITS USE BY OTHERS.

Rohm and Haas Company  
100 Independence Mall West  
Philadelphia, PA 19106  
215-592-3000

NOVA is a registered trade mark of Rohm and Haas Company.

C. Growers Must Report NOVA Use to PDA by Season's End: Here is a table format to use for this report to be sent to PDA, Attn. John Lake, Sect.18, 2301 N. Cameron St., Harrisburg, PA 17110-9408.

<u>Date of appl'n</u>	<u>Acres Location</u>	<u>Rate of appl'n treated (Units prod./A)</u>	<u>Effectiveness of pesticide</u>
_____	_____	_____	_____

Any adverse effects? \_\_\_\_\_

D. Two Excellent Fungicides Now Available: With the EPA granting a Section 18 for use of NOVA on cucurbits, Pennsylvania cucurbit growers now have the tools they need to control powdery mildew within a responsible fungicide resistance management program. The two key fungicides within this program are Quadris (recently granted a full federal Section 3 label), and NOVA (just granted a Section 18 label for use in Pennsylvania).

E. Resistance Management Program Suggested to Control Powdery Mildew on Cucurbits in Pennsylvania:

One simple program is to alternate the following two treatments at 7-day intervals:

1. A treatment to alternate with NOVA:

Quadris, 11-15.4 fl. oz./A. This treatment is very good for powdery mildew, black rot, anthracnose, and Alternaria leaf spot; Quadris also is labeled for downy mildew, Cercospora leaf spot, and Rhizoctonia belly rot.

2. A treatment to alternate with Quadris:

NOVA 40W, 2.5 oz./A + chlorothalonil (Bravo, Terranil), 2-3 pint 6F/A, or equivalent rates of other formulations. The NOVA treatment is very good for powdery mildew. If needed, addition of Bravo to the NOVA will help control black rot, anthracnose, downy mildew, scab, Alternaria leaf spot, and some other diseases. Bravo also provides a third mode of action for control of powdery mildew on leaf surfaces whenever effective coverage can be attained.

Important: Relative to powdery mildew, likely the most important disease on cucurbits, it is important to alternate Quadris with NOVA. By alternating these materials, you will minimize chance for the powdery mildew fungus to develop resistance to these excellent powdery mildew fungicides. For powdery mildew control, the labeled intervals are 5-7 days for Quadris, and 7-10 days for NOVA.

F. Some NOVA Use Directions and Restrictions:

1. Make the first application when powdery mildew first appears in the area.
2. NOVA can be used at the rate of 2.5 oz/A.
3. A maximum of 6 applications can be made to a planting in one season. Do not apply more than 15 oz. of product per acre per season.
4. Do not apply within 48 hours of harvest.
5. Protect groundwater: "Users are advised to be careful in mixing and handling this chemical to avoid spills. This product must not be mixed/loaded, or used within 50 ft of sink holes or wells, including abandoned wells and drainage wells. Avoid direct application to bare soil. Do not over irrigate. Avoid use during periods of heavy rain."
6. Crop rotations: "Myclobutanil [NOVA] treated fields can be rotated at any time to crops which are included on a myclobutanil label. Leafy vegetable and small grain crops may be rotated after 120 days following application of myclobutanil. All other crops may be planted after 210 days following applications of myclobutanil."

G. Some Quadris Use Directions and Restrictions:

1. Make the first application before disease appears.
2. Quadris can be used at the rate of 11-15.4 fl. oz./A.
3. A maximum of 6 applications can be made to a planting in one season. Do not apply more than 2.88 quarts of product per acre per season.
4. Do not apply within 1 day of harvest.
5. Phytotoxicity to apples: "Quadris is extremely phytotoxic to certain apple varieties. Avoid spray drift. Extreme care must be used to prevent injury to apple trees. Do not spray when conditions favor drift beyond area intended for application. . . . Do not use spray equipment which has been previously used to apply Quadris Flowable to apple trees."
6. Crop rotations: "Crops on this [Quadris] label may be planted immediately after last treatment. Do not plant other crops within 45 days after last application."
7. Protect groundwater: "For terrestrial [land-based] uses, do not apply directly to water, or to areas where surface water is present or to inter-tidal areas below the mean high-water mark. Drift and runoff may be hazardous to aquatic organisms in neighboring areas. Do not contaminate water when disposing of equipment washwater or rinsate."

**That's a Berry Good Question!!!**

Kathy Demchak, Department of Horticulture

This question was asked by Scott Guiser, Bucks Co. Coop. Ext.

Q. The ground is just too dry to till. How long can strawberry renovation be delayed without injury to the plant or next year's crop? Are there alternatives to tillage such as using Gramoxone (paraquat) to narrow rows?

A. The answer is based on information from people who've worked on renovation research and other small fruit experts in several Northeastern states and Canada. First, the consensus was that, if growers had not yet mowed the plants, they would be better off just skipping that step this year. Since foliage is needed for flower bud development, it may be better to keep what leaves you have, especially if you don't have irrigation (or, can't use it) as is the reason this question was asked in the first place. Mowing too late (past mid-July) in any year hurts more than helps.

A number of growers have been using Gramoxone to narrow the rows, rather than tillage, with good results. In addition, tillage could be used in the fall if we get rain. One individual had been using Scythe herbicide, rather than Gramoxone, also with good results.

Thanks to Marvin Pritts, Dick Funt, Deborah Breth, Kevin Schooley, and Stan Hokanson for their input on the answer.

### **The Potato Section**

Bill Lamont, Department of Horticulture

#### Potato Musings

I will be attending the American Society for Horticultural Science Annual Meeting being held in Minneapolis, Minn., leaving July 27 and returning on Aug. 1st. at which time I will grab some clean clothes and hopped right into my truck and head to the Potato Association of America meetings being held in Somerset, NJ. These meetings are being hosted by my friend and colleague Mel Henninger. I will keep my eyes open for some new information on potatoes that I can share with you in the next issue of the gazette. We have vine killed some of our early potatoes in the plastic mulch/drip irrigation test at the Horticulture Farm, Rock Springs. We were able to produce Red LaSoda's in the 2.5-3 inch size in 60 days from the time we planted the seed piece. If one was growing for the smaller size, new potato market, they could have been harvested even earlier. We also vine killed the Dark Red Norlands and next week will kill the AF1437-1's, a line from Al Reeves breeding program in Maine. There will be field days coming up at the Cambria County and Lehigh County next month. We applied our last fertigation treatment on July 16th at the drip irrigation test plot at Huntsinger Farms, Inc. Will keep you posted on the trials as we begin to harvest.

### **Upcoming Meetings**

Bill Lamont, Department of Horticulture

#### Local

September 28, 1999: Pumpkin Variety Demonstration and Discussion of Disease Research Done in a No-till Rye Field. Grim's Farm

Market, Breinigsville, in western Lehigh County, PA. Time: 3:00-6:00 pm.  
Contact: Emelie Swackhamer, 610-391-9840.

## Regional

January 18-20, 2000: New Jersey Vegetable Growers Association Meeting and Trade Show, Taj Mahal, Atlantic City, NJ. Contact: Phil Traino at 609-985-4382.

January 25-27, 2000: Mid-Atlantic Fruit and Vegetable Growers Convention, Hershey, PA. Contact: Bill Troxell (717) 694-3596.

## National

July 28-31, 1999: American Society for Horticultural Science (ASHS), Minneapolis Convention Center, Minneapolis, MN. Contact: 703-836-4606 or e-mail [ashs@ashs.org](mailto:ashs@ashs.org)

August 1-5, 1999. Potato Association of America, Doubletree Inn, Somerset, NJ.  
Contact Dr. Mel Henninger, 732-932-9711 Ext. 120 or e-mail  
[Henninger@aesop.rutgers.edu](mailto:Henninger@aesop.rutgers.edu).

August 4-8, 1999. North American Farmers' Direct Marketing Association's Summer Tour, Nova Scotia, Canada. Contact: Charlie Touchette at 888-884-9270.

September 23-26, 2000: 15th International Agricultural Plastics Congress and the 29th National Agricultural Plastics Congress, Hershey, PA. Contact: Pat Heuser, Executive Secretary, American Society for Plastics (814) 238-7045.

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