

THE VEGETABLE GAZETTE

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Saying for the Month: "There is no limit to the good a man can do if he doesn't care you gets the credit"

Comments from the Editor

Bill Lamont, Department of Horticulture

The editor takes the complete blame for not having the vegetable gazette out on time. I will have the next issue back on schedule. It is hard to believe that it is already September but I can look out my window (when I am in the office which is very limited) and see the millions of students with backpacks criss-crossing the street in front of Tyson. What a summer--irrigation is certainly the buzz word. We can definitely say that the environmental conditions this summer certainly tested both growers and their crops. If you did not have irrigation the effect is certainly quite pronounced. The tomatoes in the high tunnels at the Horticulture Farm are flowering (a late fall crop) and should have tomatoes in about 40 days. We are fertigating them. 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 annual roundtable in November. We received a nice write-up on the high tunnels in the Lancaster Farming.

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. If you are an agent and have not written anything for the gazette up to now here is your chance- Oct., Nov. and Dec. I need three 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.

Weed Management Considerations For 2000

Michael Orzolek, Department of Horticulture

As summer comes to an end and fall begins, most crops have been harvested from the field, although it would not be hard to find plentiful weeds growing in those abandoned fields. In order to insure a more effective weed management program for those vegetable fields in 2000, there are several strategies that you can use now in 1999 to help you have better control of weeds in 2000. Since weeds are still in your field, make a map of the weed species present and the extent of the infestation. It may be advisable still this year to come in with a broadcast application of either Roundup or Banvel to help eradicate those pesky annuals or especially perennials that are still growing in your field. Spraying the weeds with a non-selective herbicide before the end of September will insure weed uptake and death. As the year advances and temperature drops, effectiveness of the postemergence, non-selective herbicide applications becomes minimal to non-existent. If spraying the harvested field is not possible because of location, crop sensitivity in adjoining field, stage of weed growth, etc., at least MOWING the standing weeds to minimize weed seed contamination in your field will pay dividends next year. Another effective weed control strategy is to plant a winter cover crop – to help minimize soil erosion – but also keep weeds from becoming established and competitive in your field. Use of rye, hairy vetch, Austrian winter pea, white or crimson clover have been very effective in reducing weeds problems in the field while contributing to some substantial amounts of nitrogen to the succeeding crop to be planted in that field. Best times for planting/establishment of these cover crops is mid-August through October 1 in most of Pennsylvania with the more northern tier counties falling into end of August/mid-September time frame in most years. Also, keep in mind when you plan to establish and harvest next year's crops. If you can harvest the crop before June 1, that's only a few weeks after most weed seed will start to germinate and grow in most of the Commonwealth. One caution, be aware of Roundup Ready corn and bean locations in relation to most vegetables. In 1999, several drift incidences were brought to my attention involving Roundup Ready corn and beans and vegetable crops. Depending on the stage of growth of the vegetable crop, concentration of the Roundup and extent of drifting, Roundup drift can complete kill a plant to affecting vegetative growth and/or sex of the flower in vine crops.

Pumpkin Production 1999

Michael Orzolek, Department of Horticulture

Because of the long hot, dry summer, many pumpkin producers are finding that their pumpkins have matured (turned orange) and are just sitting in the field exposed to the elements and pests. Since many growers have less than half a crop to harvest in the Commonwealth, pumpkins have become a rather valuable commodity in 1999. The only way to make money on pumpkins is to have high quality pumpkins available for sale. To insure high quality pumpkins, especially if they have turned orange already, is to harvest them out of the field and into structures that will keep them cool and dry until sales at the end of this month or early October. If you have been on a rigid fungicide and insecticide

program, then you are half way there to quality fruit. If harvesting pumpkins from the field is producing abrasions or cuts on the surface of the fruit, placing the pumpkins in a structure which has a temperature of 85°F to 90°F for 3 days will help heal or suberize the surface cuts/abrasions on the pumpkin so that fungi or bacteria will not infect the fruit and/or insects will not feed or bore into the fruit. After the 3 days at high temperatures, pumpkins should be kept at a standard temperature of 50°F to 55°F and relative humidity of 60 to 70% until they are sold. Green mature pumpkins once harvested will turn orange in storage, but immature green pumpkins will not turn orange in storage regardless of temperature or length of storage. The quality of the pumpkin taken out of storage will be no better than the quality of the pumpkin going into storage. If you decide to leave your pumpkins in the field, it is imperative that you maintain your insect and disease spray program.

Insect Pest of the Month-The Potato Leafhopper

S. J. Fleischer and D. Emmen, Department of Entomology

The potato leafhopper, *Empoasca fabae*, is a pest that is easy to overlook until the damage called hopperburn-burns you. Due to its feeding habits, it can cause damage that is out of proportion to its density. Most problems in vegetables show up in snap beans for potatoes, but it is capable of successful reproduction on over 200 plants species in 25 different families, including alfalfa, potatoes, beans, peanuts, and woody ornamentals. Potato leafhopper is a transient pest of apples, grapes, celery, rhubarb, and clover to name a few. Densities are typically highest in alfalfa.

The potato leafhopper overwinters to the south of us. Migrant source populations develop in the Gulf States in early spring, where they overwinter on legume host plants, but may also be found on a variety of native, evergreen plants. It has been tentatively demonstrated that the potato leafhopper feeds on loblolly pine, and the leafhopper's overwintering area spans the entire southern pine region and may extend into coastal areas where evergreen hosts are available.

Most overwintering females are mated and in reproductive diapause (their reproduction is delayed). These migrants arrive in Pennsylvania during the spring and early summer and they move northward, recolonizing its entire range from its overwintering source. The summer range spans most of the temperate latitudes east of 100 longitude. Some authors have suggested a "pied-piper" hypothesis for the broad patterns of northward expansion of many pest species, where agricultural activities have provided temporarily suitable habitats for many highly mobile species that are geographically far from suitable overwintering locations. The possibility of some return flow to the south, along with some adult diapause, is currently an open research question.

The sex ratios of our populations shift during the season. The long-distance migrants are predominantly female. A sex ratio of 25 females to 1 male was recorded entering an alfalfa field in May in Pennsylvania. All females were gravid and able to initiate a new generation. The sex ratio changed to approximately 3:1 on second harvest and 1:1 on third harvest. The sex ratio of eggs is 1:1 and adult populations maintain stable 1:1 sex ratios by midseason and thereafter.

Potato leafhopper develops 3 to 4 generations during its residence in its summer range. One important factor that regulates populations is alfalfa harvest. Harvest

destroys eggs and nymphs, and sends adults flying. Recolonization of alfalfa regrowth and vegetable crops occurs by invasion of adults from those populations adjacent to alfalfa fields or neighboring alfalfa fields on adjacent farms.

Eggs are deposited within the plant. Most are in the upper more succulent tissue. On alfalfa, eggs are laid in the top 17 cm or upper one fourth of the plant. In potatoes, eggs are laid more frequently in the terminal leaflets and on leaves between apical and basal leaves. Egg-laying activity is maximum during the dark hours. Very little egg-laying occurs below 18.3 degrees C. Females lay about 2 to 4 eggs per day, and somewhere between 30 and 200 eggs per female over a female's lifetime. In the lab, a female lives about 100 to 120 days.

Egg-hatch occurs in 9 1/2 to 11 days at 75 (F). After hatching, nymphs undergo five instars. The newly emerged nymph is nearly colorless with red spots that quickly fade. A yellow color soon appears, changing to pale green in the third instar. The time of development varies greatly with temperature, but average duration of each of the 1st through 5th instars respectively are: 2.6, 2.3, 2.3, 2.5, and 4.7 days. Mating occurs within 48 h of adult emergence with females beginning to lay eggs in three days. The average reproductive life was 30-35 days for females and 33 days for males.

Leafhopper feeding results in symptoms called "hopperburn". The adults use the lacerate-and-flush style of probing in and around vascular tissue. Potato leafhoppers move its stylets steadily through cells, secreting full salivary sheaths only rarely. This lacerate-and-flush feeding style results in disorganization of vascular bundles, enlargement and proliferation of cells, collapse of phloem fibers, and eventual collapse of phloem sieve elements. It seems likely that both introduction of saliva from the leafhopper and mechanical wounding caused by stylet movement is necessary to cause the injury, which is a saliva-enhanced wound response associated with vascular blockage. The net result blockage of phloem transport. Gross symptoms of hopperburn probably result from this phloem blockage and subsequent accumulation of photoassimilates in leaves. This interacts with other stresses, such as drought.

Hopperburn shows up as a browning and necrosis along the margins of potato leaves. Damage varies with cultivar. In beans, it can cause a curling of the leaves, stunting, reduced root systems, and reduced yields and quality. Greatest damage comes from feeding on young plants. In alfalfa, it causes a distinctive V-shaped yellow wedge, typically first in the terminal leaflets. However, hopperburn symptoms result from the plant's response to the feeding. Therefore, responding to the damage by spraying is not the best option. It does help, because new leaves will be free of injury. But the best management is to scout for leafhoppers. It is easy to do with a sweep net, or by closely examining the undersides of leaves. Both adults and nymphs will include a characteristic "sideways" walking pattern as part of their movement. Adults also have a characteristic deep lime-green color. Scouting and spraying when thresholds are exceeded is the best management. In some states, the early season influx is monitored simply by regional reporting of the scouting data from alfalfa.

Thresholds in snap beans suggested in the midwest are:

Snap beans, seedling (smaller than 2 true leaves)

1 adult per 2 sweeps; or 2 per foot of row

Snap beans, 3rd trifoliolate to bud stage:

1 adult per sweep, or 1 nymph per 10 leaves, or 5 per foot of row

Spray materials for the respective crops are suggested in the Commercial Vegetable Production Guide.

Reference: Emmen, D. A. 1999. Colonization patterns of the potato leafhopper, *Empoasca fabae* (Harris) (Homoptera: Cicadellidae) in alfalfa. Ph.D. Thesis. Pennsylvania State University. (and references therein).

Change in Section 24(c) Label for Captan on Raspberries and Blackberries

Kathy Demchak, Department of Horticulture

EPA has informed Pennsylvania that the Special Local Needs registrations for raspberries and blackberries of Captan 80W (EPA SLN No. PA-950006) and Captan 80WP (EPA SLN No. PA-970001) have been cancelled. The manufacturer has confirmed this information. These SLN's will not be in effect after the end of this year. Growers instead are advised to obtain Captan 50WP (EPA SLN No. PA-990004) and the current 24(c) labelling. The new label must be in the possession of the user at the time of the pesticide application, and can be obtained from the 24(c) registrant (Micro Flo Company, P.O. Box 772099, Memphis, TN 38117-2099), chemical distributors, John Lake at the Pennsylvania Department of Agriculture (phone 717-772-5211) or through county agents.

For control of fruit rots, Captan 50WP at 4 lb/a can be applied at 5-10% bloom, at full bloom, and at 10-14 day intervals, with a 3-day PHI. Remember to alternate with another material, such as Rovral or Ronilan, for resistance management. For anthracnose, botrytis, and spur blight, apply Captan 50WP when young canes are 8-10" long, with another application 2 weeks later and in the fall after old canes are removed. Do not apply more than 20 lbs. of Captan 50WP per acre per season.

That's a Berry Good Question!!!

Kathy Demchak, Department of Horticulture

This question was asked by a number of people, after I had mentioned working on IR-4 projects. Info is condensed from IR-4's Web site (<http://www.cook.rutgers.edu/~ir4>).

Q. What is IR-4, anyway?

A. IR-4 stands for Interregional Project No. 4, and is a federal program funded through USDA. It was established to help minor crop producers obtain new pest control materials. Minor crops are those for which "the volume of pesticide involved for a particular use is not sufficient to justify the monetary expenditure by the pesticide manufacturer". Most, if not all, vegetable, small fruit, tree fruit, and ornamental crops fall into this category. Ag researchers, state extension personnel, and/or commodity grower groups carry out field trials funded and overseen by IR-4 to obtain crop safety data, and residue samples. These samples are then analyzed in IR-4 regional labs. IR-4 compiles the data collected, then prepares and submits petitions to the EPA requesting tolerances or exemptions for these pest control products. Anyone (growers, extension personnel, etc.) can request that a particular material be evaluated on a particular crop.

This request will be discussed at a national workshop, and if certain criteria are met (sufficient need and/or benefit, cost involved, and chance of the work actually resulting in a labelled use), the request results in an IR-4 study, and hopefully, a new option for control of a pest.

The Potato Section

Bill Lamont, Department of Horticulture

Potato Musings

Put this year in the record books. It was a good year to have irrigation and to use it. I know alot of growers who were very tired of moving irrigation equipment by the time we finally received some rainfall. For those that had irrigation they are probably harvesting some nice looking potatoes-if not the potato yields and quality are likely to be way off. We are just starting to harvest our trials and the potatoes from the drip irrigation trial looked very good. I think that we need to irrigate two rows of potatoes with one drip line. We are working on several ideas to make this happen. Will keep you posted on the trials.

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

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.

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 Plasticulture (814) 238-7045.