

The Vegetable and Small Fruit Gazette

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Horticulture Department
The Pennsylvania State University

In this Issue: Comments from the Editor

Schedule for Agent Articles

Inservice Training for 2001

Genetic Engineering Inservice

Gaicho on sweet corn and Tops-MZ-Gaicho on Potato Seed Pieces A

A New Look-Penn State's Soil Test Report Has Been Updated!

Biological Control of Fungus Gnat Larvae

High Tunnel Production of Primocane-Bearing Raspberries

Potato Musings

Potato Sessions at the Mid-Atlantic Fruit and Vegetable Convention

County Winter Potato Meetings

Upcoming Meetings

Tip for the Month: "The things that come to those who wait may be the things left by those who got there first".

Comments from the Editor

Bill Lamont, Department of Horticulture

I want to thank each of you that pitched in to help make the Mid-Atlantic Fruit and Vegetable Convention held last week in Hershey such a huge success. I felt that it was an excellent educational program and attendance was at an all time high. For growers that didn't avail themselves of the opportunity to participate in this meeting we look forward to seeing you at next years meeting. Emelie Swackhamer has provided an excellent article "A New Look- Penn State's Soil Test Report Has been Updated" and I look forward to a continuous stream of articles from county extension personnel. Cathy Thomas continues her excellent articles on biological control. As always, the Vegetable and Small Fruit Gazette Team encourages your feedback so that we can better serve your needs and address your concerns. The month of February continues to provide growers with some excellent educational opportunities at the county, state and national levels. I would refer you to the extensive listing of upcoming meetings at the end of the gazette. See you at the meetings.

Schedule for Agent Articles

Bill Lamont, Department of Horticulture

Mar.-George Perry, April- Scott Guiser, May-Laura McNutt, June-Tom Butzler, July- Dwane Miller and Jim Welshans, August-Eric Oesterling, Sept.-Ron Hostetler, October-Mary Concklin, November-John Esslinger, December- Andy Muza

Inservice Training for 2001

Bill Lamont, Department of Horticulture

April 17-18, 2001- Department of Entomology-"Insects Pests of Greenhouse Vegetable and Ornamental Crops"- Contact: Paul Heller 814-865-3008

Tentative (Months may change)

July 2001- Departments of Horticulture, Entomology, and Plant Pathology-"Production of Vegetables, Small Fruits and Cut Flowers in High Tunnels"- Contact: Bill Lamont 814-865-7118

August 2001- Departments of Horticulture, Entomology and Plant Pathology-"Potatoes- A-Z. Contact: Bill Lamont 814-865-7118

September 2001- Department of Horticulture- "Proper Post-Harvest Handling and Storage of Vegetables and Small Fruits" Contact: Bill Lamont 814-865-7118 or Mike Orzolek, 814-863-2251

Genetic Engineering Inservice

S. J. Fleischer, Department of Entomology

A multidisciplinary group of faculty have pulled together an inservice on genetic engineering applications in plant food production that will occur on March 15-16. This is a two-day inservice tagged onto the end of March inservice week, 2001. As the first of a series of workshops designed to help agents and faculty understand the current situation, this two-day workshop will cover:

- the scientific basis for genetic engineering
- human health and ecological issues
- genetic engineering technologies in current use
- the regulatory system
- risk communication
- consumer concerns and viewpoints

Agents will have the opportunity to ask questions and provide feedback on a basic approach to food system education, teaching materials will be provided, and Continuing education credits will be obtained. I encourage you to attend the entire session, which we hope to include both Family Living and Ag Production agents. We all need to understand the science and the controversy surrounding this subject.

Gaicho on sweet corn and Tops-MZ-Gaicho on Potato Seed Pieces

S. J. Fleischer, Department of Entomology

Earlier articles talked about imidacloprid as a seed treatment in sweet corn. The sweet corn seed treatment is called Gaicho. Gaicho-treated seed will absorb the insecticide, which is systemic, and help control flea beetles during early growth stages, which helps with both insect and disease (Stewart's wilt) management. It will help most on early-planted, susceptible varieties.

Two related items have now occurred which may cause some confusion: (1) the availability of imidacloprid seed treatment in field corn; and (2) a combined fungicide and imidacloprid treatment for seed potatoes.

Some confusion has arisen because field corn also now has two formulations for imidacloprid-treated seed: Gaicho or Prescribe. The Gaicho formulation for field corn uses a rate of 0.16 mg of active ingredient (ai) / kernel. This is much lower than the rate for sweet corn, which is applied at 8 fl. oz./cwt. seed, resulting in about 0.5 to 0.75 mg ai / kernel, depending on seed size. The Prescribe formulation for field corn 1.34 mg ai / kernel. These different rates are designed to target different pests while avoiding phytotoxicity to the different cultivars. All imidacloprid seed treatments are not available for farmers to treat their own seed - the seed treatment must be commercially applied. Sweet corn growers have only one option: Gaicho for sweet corn.

The second new development is that Pennsylvania recently secured a 24-C Special Local Needs Registration for a fungicide+insecticide treatment to potato seed pieces, which also uses imidacloprid as the insecticide. The fungicides are thiophanate-methyl (aimed at Fusarium dry rot, Rhizoctonia, and silver scurf) and mancozeb (to reduce late blight infections that occur during potato seed handling). Imidacloprid has now been added, and field data provided by Gustafson from Maine, Michigan, New York and New Jersey suggest control rates that are very similar to using Admire in-furrow at planting. Growers may want to consider testing the Tops-MZ-Gaicho formulation applied to the seed piece as an alternative to applying Admire in-furrow on a portion of their acreage.

A New Look-Penn State's Soil Test Report Has Been Updated!

Emelie Swackhamer, Horticulture Extension Agent
Lehigh and Northampton Counties

To find out exactly how much lime and fertilizer you need to grow the best vegetable crop this

year, test your soil. You can get soil test kits from your county's Cooperative Extension office for \$6.00 each.

You may notice the report from your Penn State soil test looks different this year. Ann M. Wolf, Director of the Ag Analytical Services Lab at University Park has made these changes with the intentions of making your report even more useful.

The typestyle of your newest reports will be easier to read, and the entire form has been redesigned to help you read it correctly.

You will notice, soil nutrient levels no longer appear as Low, Medium, High and Excessive. The new format shows levels at Below optimum, Optimum, or Above Optimum.

The old "Excessive" category was removed because researchers generally do not have a well-defined point where high levels of nutrients cause damage to the crop or the environment. This old category of "Excessive" did not necessarily mean the nutrient was found at dangerous levels, but it was often alarming to people.

For example, growers often found recommendations confusing when a nutrient like phosphorous showed up in the excessive range, yet the report called for phosphorous to be added in a starter fertilizer. This practice is recommended (especially on early crops grown in cold soils) because phosphorous supplied to young plants in a starter fertilizer near the root zone would be more readily available to the young plants than the same nutrient present in other areas of the soil.

According to Dr. Orzolek, following the recommendations on the report is the most important first step. The recommendations will tell you what to add, and have taken characteristics of your soil like pH, Cation Exchange Capacity (CEC) and the percent saturation of K, Mg, and Ca into account.

Also, the coded comments made with each crop that ***are found on the back of every soil test report*** are very critical, but often overlooked or ignored. Below are some key HIGHLIGHTS found in the comment section of the soil test report:

- Reduce nitrogen and potash application when manure is applied.
- Adjust nitrogen levels according to soil type, previous management, amount of rainfall and/or irrigation, and plant growth.
- Use an all-soluble, high phosphate plant starter fertilizer in transplant water in cold soils and for early plantings.
- Most vegetable crops and especially peas and beans will NOT tolerate high soluble salt levels. Exceptions are beets and asparagus which are salt-loving and spinach which is fairly salt tolerant.
- Limestone quality is important.
- Limestone requires time to react with soil. Fall is an excellent time to lime.
- Lime supplies needed calcium and magnesium in addition to raising soil pH levels.
- Common scab may cause problems on beets, carrots, daikon, radish, rutabaga, turnip roots, and parsnip in addition to Irish potato. Excessive use of farm manure can aggravate

a scab problem. If manures are used, apply only moderate amounts in the fall to a growing cover crop.

- Boron is a unique micronutrient. It is toxic to some vegetables at levels slightly above that required for good growth of others. Boron is most critical for beet, cauliflower, celery, and turnip production adequate amounts are essential, but small excesses can be toxic to those crops as well.
- Banded fertilizer is extremely efficient. Side-dressed N is an extremely efficient method of application.
- The fertilizer recommendations are based on the efficient use of plant nutrients. Be sure row applied fertilizer is not in contact with the potato seedpiece.

Call your local Cooperative Extension office if you have any questions about testing your soil.

Bug vs. Bug

Biological Control of Fungus Gnat Larvae

Cathy Thomas, Integrated Pest Management Program, Pennsylvania Department of Agriculture

Fungus gnats, a common greenhouse pest, are known for infesting cuttings and other young plant materials, potted and long term crops such as greenhouse vegetables. Monitor and treat for this pest when transplants for the spring crop are started. There are effective biological controls for treating the larval stage of this pest which include the insect-parasitic nematode, *Steinernema feltiae* (discussed in the January edition) and the predatory soil mite, *Hypoaspis miles*. *Hypoaspis miles* has already shown good potential as a control for fungus gnat larvae, however it has also been found to feed on other soil insects such as spring tans, thrips pupae and shore fly larvae. *Hypoaspis miles* can be introduced without any problem in combination with insect parasitic nematodes. Remember, the key for controlling fungus gnats is to eliminate wet spots and algae growth since they promote fungus gnat development.

Life Cycle

This predatory mite inhabits the top layer (1 - 1.5 inches) of the soil. *Hypoaspis miles* is a brown colored predatory mite, growing to 1 mm in length. Females lay their eggs in the soil. At 75°F *Hypoaspis miles* takes 10-13 days from egg to adult, passing through 3 immature stages. *Hypoaspis miles* prefers moist potting compost and can live for up to 7 weeks in the absence of food. Soil must be moist, but not wet. This predatory mite will not go into hibernation in cold temperatures. The minimum temperature for good activity is 60°F. *H. miles* can be observed in and on the soil and at the base of plant stems.

Application

Hypoaspis miles is delivered to the grower in sprinkler tubes with all stages of the predatory mites in a vermiculite/peat carrier. Always follow instructions that are supplied with the product. If instructions are not packed with the product, contact your supplier and request this information.

- Apply, routine preventive treatments to prevent crop damage.
- Treat as soon as possible after sowing seed or inserting cuttings.

- Contact your biocontrol supplier for rates of introduction.
- Press the openings of the sprinkler tube and sprinkle the material on compost or on the rockwool cube.
- The predatory mites start searching for their prey immediately after introduction.

Nematode products

For optimum performance consider these factors:

- Several pesticides have a negative effect on *Hypoaspis miles*. When controlling diseases and other pests consult your supplier for a list of side-effects of pesticides on beneficial organisms.
- The predatory mites should be introduced as soon as possible after delivery.

Suppliers of Nematodes

- Many biological control suppliers sell *Hypoaspis miles*
- IPM Labs, Locke, NY 315-497-2063, ipmlabs@baldcom.net
- International Technology, Bio Best Products, CO 303-661-9546
- Syngenta Bioline, Oxnard, CA 805-986-8265, Fax: 805-986-8267, info@syngentabioline.com

Useful websites

www.biobest.be

www.bugsandbees.com

www.koppert.com

www.nysaes.cornell.edu/ent/biocontrol/websites.html

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High Tunnel Production of Primocane-Bearing Raspberries

Kathy Demchak, Department of Horticulture

High tunnel production of primocane-bearing raspberries offers potential increases in yield and fruit quality as compared to field production, based on research conducted during the past year at Penn State. Until more research is conducted, this growing system should be tried on a limited

basis. This growing system may be of particular value is where a premium market exists for high quality fruit produced with little or no pesticide use. High tunnel production is also advantageous where a longer growing season is needed to allow more complete harvest of the fall-bearing raspberry crop. This lengthening the growing season appears to be the main advantage, more so than advancement of the harvest season. Yield obtained per linear foot of row during the planting year was nearly equal to that from a mature 3-year-old field planting.

Plants are planted in spring. If tissue-cultured plants are used, they should be planted when it expected that temperatures will no longer drop below freezing in the high tunnel. Plants may be grown either in the ground with trickle irrigation, or in containers using media as for greenhouse production. If plants are grown in the ground, the high tunnel will need to be dedicated to raspberry production, unless the tunnel is moveable. Containers offer the advantage that a different crop can be grown within the high tunnel early in the year, after which the raspberry plants can be moved in. The raspberry plants should be in the tunnel for protection from rainfall during the time from bloom through harvest to obtain the advantage of increased grey mold control without fungicides.

While extensive evaluation of cultivar suitability has not been done, characteristics desired may be somewhat different than for field production. For example, if a market that commands a choice price is to be targeted, size and flavor may be of more importance than resistance to foliar diseases because plant foliage is kept dry. Both Autumn Britten and Heritage performed well, with Autumn Britten fruiting about a month earlier than Heritage.

Generally, pesticides that are labelled for greenhouse raspberry production can be used in high tunnels. However, no pesticides were found to be necessary on research plantings, and again, a higher price may be obtained for pesticide-free fruit. Differences in pest complexes should be expected from those encountered in field production, specifically:

Lower incidence of diseases that are worse when the foliage is wet, such as grey mold and leaf spots. By keeping the foliage, flowers, and fruit of the crop protected from rain, disease was minimized. In the research plantings, 97-100% of fruit harvested was marketable and shelf-life was more than doubled with no fungicides used when compared to that from field plantings under a standard fungicide spray program.

Higher incidence of powdery mildew. Powdery mildew is a disease which requires dry foliage and high humidity for the highest incidence. Both of these conditions exist in high tunnels. This was not found to be a problem on raspberries during this first year, though this warrants watching.

Two-spotted spider mites. These mites have routinely showed up on greenhouse plantings of raspberries, and were present in the high-tunnels as well. They can be controlled through the release of predatory mites. Scouting for two-spotted mites should be done at least weekly, and more often if the weather is hot. Mite populations can explode quickly, so ordering and release of predatory mites should be accomplished quickly following observation of two-spotted mites. The mite supplier should be able to assist with recommendations on species and numbers of predatory mites that should be released.

Nuisance insects. A low incidence of other various insects were found, such as grasshoppers and jumping spiders which webbed the tops of some shoots closed. Their incidence was not high enough to be a cause for concern.

Other problems that were encountered were sunscald of the fruit when the temperatures become too high, and magnesium deficiency in soilless media. This was mitigated by an application of Epsom salts.

Potato Musings

Potato Sessions at the Mid-Atlantic Fruit and Vegetable Convention

Bill Lamont, Department of Horticulture

The three potato sessions at the Mid-Atlantic Fruit and Vegetable Meeting certainly offered something for every potato grower. In previous year we only had one session on potatoes at the Hershey meeting but the decision by the PA Potato Cooperative to discontinue the "Potato Institute" provided an opportunity to expand the number of sessions on potatoes at the Mid-Atlantic Fruit and Vegetable Meeting. I think that the educational program was excellent and attendance for the first year of this new venture was ok. I personally am going to promote the potato program at the remaining local county meetings and also do more out-of-state advertising next year. There was plenty of "meat and potatoes" no pun intended- presented at the sessions and if you weren't there you definitely missed out. You can mark down the dates on your long range planner for next years Mid-Atlantic Fruit and Vegetable Convention as January 29, 30 and 31, 2002. The potato sessions will be organized similar to this year starting at 1:30 PM on January 29th and then running all day on January 30th. See you next year in Hershey. If you have suggestions for topics for next year, contact Dr. Bill Lamont, Program Chair for the Potato Program.

County Winter Potato Meetings

Bill Lamont, Department of Horticulture

February 22, 2001: Cambria and Somerset Regional Vegetable and Potato Meeting, Ebensburg, PA. Contact: Ron Hostetler (814) 472-7986

March 1, 2001: Lehigh/ Schuylkill County Potato Growers Meeting. Contact: Bob Leiby (610) 391-9840

March 14, 2001: Erie County Potato and Vegetable Growers Meeting. Contact Andy Muza (814) 825-0900

March 15, 2001: Western Pennsylvania Potato and Vegetable Meeting. Contact Tom Zundel (724) 662-2323

Upcoming Meetings

Bill Lamont, Department of Horticulture

Local

February 6, 2001: Northeast Vegetable Growers Meeting, Thompson's Dairy Bar, Clarks Summit, PA. Contact: John Esslinger (717) 963-4761

February 8, 2001: Tri-County Vegetable and Small Fruit Meeting, Penn Township Community Bldg., Shippensburg, PA. Contact: Steve Bogash (717) 263-9226

February 13, 2001: Schuylkill County Regional Vegetable Growers Meeting, Extension Office, Pottsville, PA. Contact: George Perry (570) 622-4225

February 14, 2001: Southeastern Vegetable Growers Meeting, Heritage Restaurant, Franconia, PA. Contact: Mary Conklin (610) 489-4315

February 15, 2001: Kutztown Vegetable Auction Growers Meeting, Fleetwood Grange Hall, Kutztown, PA. Contact: John Berry, Lehigh County Extension Office (610) 391-9840 or Laura McNutt, Berks County Extension Office (610) 378-1327

February 21, 2001: Lebanon County Winter Vegetable Meeting, Shaefferstown Fire Hall, Shaefferstown, PA. Contact: Ginger Pryor (717) 270-4391

February 22, 2001: Cambria and Somerset Regional Vegetable and Potato Meeting, Ebensburg, PA. Contact: Ron Hostetler (814) 472-7986

February 27, 2001: Strawberry and Raspberry School, Adams County Extension Office, Gettysburg, PA. (717) 334-6271

March 1, 2001: Lehigh/ Schuylkill County Potato Growers Meeting. Contact: Bob Leiby (610) 391-9840

March 5, 2001: North Central Vegetable Meeting, Lockhaven, PA. Contact: Tom Butzler, (570) 726-0022

March 13, 2001: North Central Vegetable Producers Conference, Coudersport, PA. Contact: Greg Burns (814) 776-5331

March 14, 2001: Erie County Potato and Vegetable Growers Meeting. Contact Andy Muza (814) 825-0900

March 15, 2001: Western Pennsylvania Potato and Vegetable Meeting. Contact Tom Zundel (724) 662-2323

Regional

February 6, 2001: New York State Berry Growers' Association, Owego, NY

February 7-9, 2001: Ohio Fruit and Vegetable Growers Congress and Ohio Roadside Marketing Conf., Toledo, OH. Contact: John Wargowsky (614) 249-2424.

February 9-10, 2001: PASA (Pennsylvania Association for Sustainable Agriculture) 10th Annual Farming For The Future Conference, The Penn Stater Conference Center Hotel, State College, PA Contact: Shirley Gryczuk (814) 863-7235.

February 13-15, 2001: New York Vegetable Conference, Holiday Inn and Convention Center, Syracuse, NY. Contact: Jean Warholic (607) 539-7648.