

# THE VEGETABLE GAZETTE

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## In This Issue: Comments from the Editor

Weed of the Month: Nightshade

Insect of the Month: Seedcorn Maggot

Handy Measurements

The Potato Section

Potato Musing

NE-184 Trial Results

Program for the 48th Annual Potato Growers Institute

Potato Cull Piles

Upcoming Meetings

**Tip for the Month:** “It usually takes a very small oven to produce a half-baked idea”  
Author Unknown.

## Comments from the Editor

Bill Lamont, Department of Horticulture

As I look out my office window at the snowflakes and sleet coming down, it is difficult to place much faith in that “old groundhog’s” prediction of an early spring. I don’t know about you but I still have things to finish up from last year and could use a delayed spring. The Mid-Atlantic Fruit and Vegetable Convention held at the Hershey Lodge and Convention Center was excellent and I want to acknowledge and thank the county extension agents that served as moderators for the sessions and manned the extension display and publication table. There are a number of county meetings coming up, so be sure to check the calendar of meetings at the end of this issue. I want to thank those colleagues in the other departments that have supported the Vegetable Gazette with contributions and encourage others to send in an article next month. I think that we have the beginnings of an “Insect Pest of the Month” and hopefully will have a “Disease of the Month” that covers vegetables and potatoes for each issue to go along with Dr. Orzolek’s alternating “Weed of the Month” and “Herbicide of the Month”. We do not have any articles written by county agents in this issue but will have two in the next issue. I would remind Tim Elkner, Extension Agent, Lancaster County and Scott Guiser, Extension Agent, Bucks County that they are both on deck for articles for March. As always, the Vegetable Gazette Team encourages your feedback so that we can better serve your needs and address your concerns. The month of February also presents growers with time to attend some of the excellent upcoming 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.

**Weed of the Month: Nightshade (*Solanum nigrum* complex)**

M.D. Orzolek, Department of Horticulture

Black nightshade (*Solanum nigrum* complex) is a major economic weed in the field production of several vegetable crops in the Northeast and competes extremely well with tomato, snap bean and pepper. Nightshade, an annual weed, seed germinate in May and continues through September with the highest percentage of nightshade seed germinating in May and June. Germination of nightshade is enhanced under cool, moist conditions which is typical across Pennsylvania in the Spring. To identify seedling nightshade, look for a purplish tint under the leaf and fairly pointed leaves with pencil-size holes resulting from flea-beetle feeding. Seedling nightshade resembles smooth pigweed except that pigweed doesn't bear the telltale flea-beetle holes. Flowers of nightshade bloom during a 60-day period in July and August before producing the familiar dark purple berries in September. Each nightshade plant can produce up to 1,000 berries and each berry can contain up to 50 or more seeds.

*Solanum nigrum* is actually a complex of three species found in North America. They include American black nightshade (*Solanum americanum*), which is common in many southern and coastal areas; black nightshade (*Solanum nigrum*) which is common to the westernmost states and eastern black nightshade (*Solanum ptycanthum*) which is the common black-berried species east of the Rocky mountains. In addition, a fourth species of the complex, hairy nightshade (*Solanum sarrachoides*) is found throughout most of North America. Taxonomically, the *Solanum nigrum* complex is generally considered confusing because of their species similarity, phenotypic plasticity (refers to change in plant form which can be caused by mowing, application of herbicides, grazing and various insect infestations and genetic variability). The competition of nightshade with a vegetable crop is not the only concern for growers because nightshades serve as alternative hosts for 13 species of nematodes, 3 species of bacteria, 15 species of fungi and 31 species of plant viruses. In Pennsylvania, the major nightshade species is *Solanum nigrum*, but there have been reports of isolated pockets of *Solanum sarrachoides*.

Since nightshades are in the same botanical family (Solanaceae) as tomato, pepper, eggplant and potato, control or elimination of nightshades in these crops is difficult since herbicides that will effectively control nightshades generally can't be used with Solanaceous crops. Soil-applied pre-emergence herbicides are not selective between weed and crop species.

Cutting or mowing nightshade, where feasible, can be effective in reducing additional nightshade seed being incorporated into the soil. Cultivating nightshade at the 2-leaf stage of growth will also help eliminate future problems with the current crop being grown, but also eliminate future seed production.

Several herbicides are effective in controlling nightshade including: atarzine, Dual, Lasso, Pursuit, Goal, Karmex, Lorox, Sinbar, Roundup and 2,4-D. In many cases, best control of nightshade is achieved by switching to more competitive crops as corn, soybeans, or buckwheat. Be sure to READ THE LABELS for rates and crop restrictions before applying the herbicide to the field.

References:

1. Anonymous. 1982. Nightshade: To control it, you have to know it. Agrichemical Age. Feb.pp6-7.

2. Gorski, S. A. and M. K. Wertz. 1987. Tomato (*Lycopersicon esculentum*) and eastern black nightshade (*Solanum ptycanthum*) tolerance to acifluorfen. *Weed Technology*. Vol 1:278-281.
3. Henne, R. C. 1984. Black nightshade control in tomatoes. *Proc. Northeast Weed Sci. Soc.* pp. 130-131.
4. Rogers, B. S. and A. G. Ogg, Jr. 1981. Biology of weeds of the *Solanum nigrum* complex (*Solanum* Section *Solanum*) in North America. *USDA Publication ARM-W-23*. Pp. 30.

### **Insect of the Month**

Seedcorn Maggot in Vine and Other Vegetable Crops

S. J. Fleischer and S. Gesell, Department of Entomology

The seedcorn maggot, *Delia platura* (Meigen), a pest imported from Europe, is now established throughout the United States and southern Canada. Seedcorn maggots invade melons and other vine crops, beans, and sweet corn. Damage is most significant during establishment and early plant growth, and there are cultural and insecticide practices you should consider several months before planting time.

Description of life stages and life cycle: The adults are brownish-gray flies and closely resemble common houseflies except that they are about half the size. They are grayish-brown flies that you can find at the base of plants. The tiny, white, elongated eggs are deposited in loose groups among debris and around plant stems near the soil surface. Maggots are dirty white with a yellowish tinge. They are legless, cylindrical, and tapered. Full-grown maggots are 1/5- to 1/4-inch in length. They have no visible head, but two tiny black hooks on their front end are a part of their mouth to feed in the seed or on the underground parts of seedlings. The maggots pupate inside a dark brown capsule-like puparium that resembles a grain of wheat in size and shape. These puparia are found in the soil where the maggots developed. Seed corn maggot puparia can be found throughout the year, and they overwinter in these puparia.

The adult flies emerge from dark brown, capsule-like puparia during late April and early May. Eggs are deposited on or near the soil surface at the base of seedlings and young transplants. Eggs of later generations frequently are deposited around plant stems at the soil surface. Eggs hatch in a few days and the maggots work their way into the soil in search of food. They complete their development in a week to 10 days and then pupate in the nearby soil. The pupal stage requires about 10 days, then a new generation of adult flies emerges. The seedcorn maggot survives the winter in the pupal stage. The time required to grow from egg to adult is between 3 to 4 weeks. There are 3 to 5 generations each year. Populations tend to decline during summer or dry months.

Type of damage: Maggots burrow into the seeds and destroy the seed germ, or they graze on young roots. The type of damage differs among crops. Damaged seed may germinate, but there may not be enough food reserves left in the seed for the plant to survive. Larger seeded crops (such as beans and some corn varieties) may be able to grow past this damage if there are sufficient reserves in the seed and good growing conditions. In peas, the damage is in the seed, and you rarely see above-ground feeding. On snap beans, you can find damage or maggots in seeds and in the emerging hypocotyl.

Snap beans and some sweet corn varieties can tolerate maggots feeding on seed tissue. Vine crops are probably the least tolerant to seedcorn maggot damage, especially if it occurs in cooler soils.

Reduced plant stands can result from seedcorn maggot feeding, especially if conditions for plant growth are not optimal. In field corn, a few corn seedlings are infested with maggots in the spring in almost every field in the Commonwealth. Usually no more than 2 percent of the field corn seedlings are infested, but occasionally fields may suffer a plant loss of 30 to 60 percent from this pest. In vegetables, the biggest problems occur when adults congregate in newly planted fields where plant growth conditions are not optimal.

**Management:** Seedcorn maggots tend to cause greater losses in fields with an abundance of decaying organic matter, such as manure or a recently plowed cover crop, and during years when the early growing season is cool and damp. Fields that had a cover crop plowed down recently can attract the adult flies. If you are planning on plowing under a cover crop or spreading manure, you should get this done and incorporated well at least a month before planting or transplanting. If you are planting into a dry seedbed, adding water to the transplants also serves to help attract the adult flies.

Any cultural practice that will speed up germination, plant emergence, and early plant growth will help reduce crop losses from maggots - this strategy allows the plant to "outgrow" the feeding damage. In a recent study using muskmelon in Indiana, the major factor that explained the amount of plant injury by seedcorn maggot was soil temperature. Transplanting into colder soils increased injury. Virtually no injury was sustained once soil temperature exceeded about 70 degrees F, but as much as 70% of the plants were lost when soil temperatures were in the mid-to-low 50s. Thus, the potential of seedcorn maggot injury is yet another good reason to not plant vine crops into cold soils.

When direct-seeding, a reliable control method is to plant seeds that are treated with an appropriate insecticide in the seed box at planting. Commercially available seed is often treated with fungicides and/or insecticides to protect the seed from damage during storage. However, this treatment is not sufficient to provide field protection against seedcorn maggots. A planter box seed treatment insecticide at planting is recommended. The Commercial Vegetable Production Guide gives suggestions in the section related to soil pests. Best control with planter box material has been with treatments such as Agrox D-L Plus, Agrox 2-Way, Kernel Guard, SeedMate, or a material with diazinon or Lorsban. Planter box treatments use very small amounts of insecticide, and place it just where it is needed.

Setting transplants does not allow a seedbox treatment. The peat potting mix may be attractive to the adult flies. Good coverage of the transplant ball may help. Avoid planting into cold soils, especially with vine crops.

If significant damage occurs, replanting those areas of the field is required. Look to see if the maggots are still present. If maggots are small (<3/8 inch), then wait 7-10 days for those maggots to begin to pupate before transplanting. If maggots are larger, you can replace transplants in 4-5 days.

## **Handy Measurements**

Pete Ferretti, Department of Horticulture

## Dry Measure

- 8 qts. = 1 Peck
- 2 Pecks = 1 Basket
- 4 Pecks = 1 Bushel
- 1 Gram/ sq. ft = 96 lbs./ A
- 1 Ton/ A = 1 lbs./ 21.78 sq. ft.

1 Pound/ A = 1 gram/ 100 sq. ft. (Actually 0.96 g/ 100 sq. ft.)

- 454 grams= 1 lb.
- 28.35 grams= 1 oz.

This is useful for calibrating pesticides, fertilizers, etc. from field to test plots

- Pounds/ 100 sq. ft. x 435.6 = pounds/ A  
Very important for garden to field type conversions or test plots to field
- 1 sq. Yard = 9 sq. ft. (for construction)

- **Liquid Measure**

- 1 liter/A = 1 liter / 43560 sq. ft. = 1 ml/ 43.5 sq. ft.
- 1 qt/ A = approximately 1000 ml/A = approximately 1ml / 43.5 sq. ft.
- 1qt. /A = 1 ml/ 41.2 sq. ft
- 1 liter = 1000 ml
- 1 qt. = 946.3 ml

## The Potato Section

### Potato Musing

Bill Lamont, Department of Horticulture

The NE-184 is a northeast regional potato project that we are involved in to evaluate potato varieties for their potential use in the eastern United States and Canada. The test is conducted each year at the Horticulture Farm, Rock Springs, PA. The results of last years test is presented below. We are in the final stages of putting together our 1998 Pennsylvania Potato Extension and Research Report that we be mailed out and available at meetings. I want to encourage my colleagues in the Entomology and Plant Pathology Departments to contribute articles each month on insect and disease problems that are negatively impacting potato production in Pennsylvania. I look forward to them reporting on the results of their research or highlighting of an insect or disease problem in each issue of the Vegetable Gazette.

Just a reminder that there are several meetings coming up of interest to potato growers: February 10, 1999: Cambria and Somerset Potato Meeting; February 11, 1999 (evening): Potato Growers Meeting, York County; February 16, 1999: Western Pennsylvania Potato Meeting; February 24-25, 1999: PA Potato Growers Cooperative Annual Meeting; March 3, 1999: Lehigh/ Schuylkill County Potato Growers Meeting; March 15, 1999: Potter County Vegetable and Potato Growers Meeting; March 16, 1999: Erie County Potato and Vegetable Growers Meeting.

In 1999 we will continue to be innovative in our approach to solving problems and will always strive to better serve the potato growers and potato industry in Pennsylvania. We welcome your visits, comments, feedback and suggestions as we go about our work.

### **NE-184 Trial Results**

Bill Lamont and Terry Simpson, Department of Horticulture

The trial was conducted at the Horticulture Research Farm, located at the Russell E. Larson Agricultural Research Center, Rock Springs, PA. Thirty-five varieties and clones were evaluated in 1998 including both tablestock and chipping types.

All plots were single row, 25 feet long and 3 feet wide, with four replications in a Randomized Complete Block design. Seedpiece spacing was 8 inches for all varieties. Eight hundred pounds of 10-10-10 was banded at planting and no other nutrients were applied during the growing season. All pests were controlled throughout the growing season and were not a limiting factor in 1998. Irrigation was not used during the growing season. Rainfall received during the summer- May (3.5 in), June (4.7 in), July (3.3 in), and August (2.6 in). Average temperatures during the summer (May-September) were in the mid- 60's for lows and in the mid- 80's for highs, a more normal temperature regime than 1997. The trial was planted on May 21, vines killed on September 17 and 24, and potatoes were harvested on October 16. After harvest, the potatoes were held in the potato storage unit located at the Horticulture Farm, at 50° F to 60° F before grading on November 10, 1998 at which time they were stored in coolers located in the potato cellar on campus at 55° F and 45° F until the chip, bake, and boil tests were conducted. Specific gravity was determined by the weight-in-air/weight-in-water method on December 3, 1998. Evaluation of internal tuber quality was made by cutting five tubers in each replication for a total of twenty tubers.

#### **Results**

Only one variety AF1615-1 produced marketable yields higher than the standard, Kennebec (300 cwt/A). The overall average marketable yield for all varieties tested in 1998 was somewhat lower than the previous year.

In evaluation for chipping, three varieties chipped the same as the standards (Atlantic and Snowden) out of 45° F. The varieties were: A81386-1, A84118-3 and NY 102. Out of 55° F there were 11 varieties that chipped very good: the two standards (Atlantic and Snowden), Itasca, Mainechip, Monona, Niska, A81386-1, AF1424-7, BO766-3, NY102 and NY103.

In evaluation for boiling there were 10 varieties that boiled very good, 13 varieties that boiled good and one variety that did not boil very well (AF1480-5).

In evaluation for baking the scores ranged from fair to very good.

Hollow heart was not a problem this year.

### **Program for the 48th Annual Potato Growers Institute**

Bill Lamont, Department of Horticulture

Dates February 24-25, 1999 Place Nittany Lion Inn, Penn State Campus

Wednesday

“Physiology and Field Results on Fertility Uptakes of Potatoes”-Dr. Keith Kelling, Univ. of Wisconsin

“Internal Browning and Quality Problems Associated in Tuber Production”-Dr. Rikki Sterrett, VPI

“Verticilum and Early Dying of Potatoes”-Dr. Barb Christ, Penn State

Potato Cultivar Trials and Selection Results of Promising New Varieties- Dr. David Douches, Michigan State University

“Penn State Variety and Evaluation Trial Results”-Dr. Bill Lamont, Penn State

“Agricultural Benefits and Services”-Mr. Peter Switalski, Agri-Services Agencies, Inc.

Thursday

“Evaluations of Maxim on Potatoes”-Dr. Kiaran Shetty, Novartis

“Silver Scurf Updates and Preventions”-Dr. Neil Gudmestad, North Dakota University

“Concerns of Resistance to Admire/Provado”-Dr. Franklin Chow, Bayer Corp

“Insect Management Strategies”- Dr. Zane Smilowitz

“Potato Scouting Services with Potential Cost Savings to Growers”- Mr. Mark Otto, Agri Business Consulting Inc.

“Update for Management Decisions on Late Blight”- Dr. Barb Christ, Penn State

“PA Germplasm Trial Results”-Dr. Barb Christ, Penn State

“Seed Piece Qualities and Emerging Problems in Seed Production”- Dr. Terry Bourgoin, Director, Div. Plant Industry, Augusta, ME

### **Source for Specialty Potato Seed**

Bill Lamont, Department of Horticulture

Here is a short list of producers of specialty potato seed.

Verlin Rockey

47477 County Road C

Center, CO 81125

719-754-3744 (Warehouse)

FAX 719-754-3702

Potato Patch

RR#1, Box 263

Halstad, MN 56548

800-934-7002

<http://potatopatch.com>.

Ronniger's Seed & Potato Company

P.O Box 307

Ellensburg, WA 98926

509-925-6025

Johnny's Selected Seed  
207-437-4301

**Potato Cull Piles-Just Another Reminder**

Dr. Bill Lamont, Department of Horticulture

It is never to late to make a New Years resolution that you will take care of those potato cull and rock piles before the new growing season. It is just part of an entire sanitation program and it may save you alot of headaches down the road. We know that we had some problems last year so just a heads-up as we move into 1999..

**Upcoming Meetings**

Bill Lamont, Department of Horticulture

Local

February 10, 1999: Cambria and Somerset Potato Meeting. Contact: Ron Hostetler (814) 472-7986

February 11, 1999: Franklin, Cumberland, Adams Counties Vegetable Growers Day, Huntsdale, PA. Contact: Eric Vorodi (717) 263-9226

February 11, 1999 (evening): Potato Growers Meeting, York County. Contact: John Rowehl (717) 840-7408

February 16, 1999: Western Pennsylvania Potato Meeting. Contact: Tom Zundel (724) 662-2323

February 18, 1999: Elk and Cameron County Vegetable Meeting. Contact: Greg Burns (814) 776-5331

February 23, 1999: Schuylkill County Vegetable Growers Meeting. Contact: George Perry (717) 622-4225

February 24-25, 1999: PA Potato Growers Cooperative Annual Meeting, Nittany Lion Inn, Penn State, University Park, PA. Contact: Roger Springer, Manager, PA Potato Cooperative (800) 222-2138 or Dr. Bill Lamont, Department of Horticulture, Penn State (814) 865-7118.

February 24, 1999: Bucks, Montgomery County Vegetable Growers Meeting. Contact: Scott Guiser (215) 345-3283

February 25, 1999: Berks County Vegetable Growers Meeting. Contact: Judy Schwank (610-378-1327

March 3, 1999: Lehigh/ Schuylkill County Potato Growers Meeting. Contact: Bob Leiby (610) 391-9840

March 4, 1999: Potter County Vegetable and Potato Growers Meeting, Coudersport, PA. Contact: Sam Crossley (814) 274-8540

March 16, 1999: Erie County Potato and Vegetable Growers Meeting. Contact Andy Muza (814) 825-0900

April 7, 1999 Greenhouse Vegetable Growers Meeting, Cashtown, PA. Contact: Eric Vorodi (717)-263-9226

#### Regional

February 17-20, 1999: Mid-Atlantic Direct Marketing Conference and Trade Show, Princess Royale Hotel, Ocean City, MD. Contact: Jarvis Caine (301) 405-1265.

#### National

February 21-23, 1999: Fresh Fruit and Vegetable Annual Conference, Marriot Madison West, Madison, WI. Contact: Teryl Roper (608) 262-9751.

May 16-20, 1999: 6th National Symposium on Stand Establishment, Roanoke, VA. Contact: Greg Welbaum (540) 231-5801.

May 19-20, 1999: 28th National Agricultural Plastics Congress, Tallahassee, FL. Contact: Pat Heuser, Executive Secretary, American Society for Plasticulture (814) 238-7045.

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.