

# The Vegetable and Small Fruit Gazette

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Horticulture Department  
The Pennsylvania State University

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**Tip for the Month:** "Your destiny is not a matter of chance; it's a matter of choice." -Unknown

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## **Comments from the Editor**

Bill Lamont, Department of Horticulture

The leaves on the trees are beginning to change into a array of orange, red, and yellow colors, although I am not sure how spectacular the fall foliage display is going to be this year given the extremely dry weather we experienced. The harvest of fall crops is well under way with pumpkins, ornamental corn, corn stalks and both regular and "mini" straw bales decorating the farm markets and retail stores. This is a time to see "Fall Entertainment" on the farm in full swing with corn maizes and bus loads of school kids coming out to the farms to pick a pumpkin and hopefully learn about farming and farm life. I want to thank Steve Bogash for his excellent article and look forward to John Esslinger's article in the November issue. I am adding meetings, field days and twilight meetings to the Upcoming Meetings List. If you have an event that you would like to

advertise, please send it to me. As always, the Vegetable and Small Fruit Gazette Team encourages your feedback so that we can better serve your needs and address your concerns. **Note: The date of the Western Pa. Vegetable and Berry Growers' Seminar held at the Days Inn in Butler has been moved to November 19, 2002. It has normally been held in December.**

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### **Schedule for Agent Articles**

Bill Lamont, Department of Horticulture

November	John Esslinger
December	Andy Muza

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### **Heads Up on Agent Roundtable**

Bill Lamont, Department of Horticulture

In an effort to minimize travel and maximize efficiency of time spent by county extension staff at the Penn State campus, the ornamental and vegetable teams in the Department of Horticulture have again decided to schedule their in-service training programs back to back.

**In November the Ornamentals team will be having an In-service on November 13 and the Vegetable and Small Fruits Team will be holding their annual Agent Roundtable the next day on November 14th.** There will again be a dinner on November 13th for participants of both groups to foster interaction and the concept of being part of a team.

For information on the ornamental programs contact Dr. Jim Sellmer, 814-863-2250 e-mail: jcs32@psu.edu and for information the Vegetable and Small Fruit Roundtable contact Dr. Bill Lamont, 814-865-7118 or e-mail: wlamont@psu.edu.

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### **Organic Matter Application-Can You Apply Too Much**

M.D. Orzolek, Department of Horticulture

Fall is an excellent time to clean-up fields and plan for future crop nutrient requirements as well as increasing soil organic matter content for your farm field management program. Since most vegetable crops have already been harvested, growers should consider the broadcast application of a non-selective herbicide to 1) eliminate both perennial and difficult annual weeds in the field, 2) increase the efficiency of retrieving plastic mulch and 3) help establish a cover crop. Fall is also an excellent time to add soil amendments to increase soil organic matter. Why increase soil organic matter? High soil organic matter (greater than 3.5%) will increase the water holding capacity of soil, increase soil nutrient reserves, increase soil microbiological activity and increase soil tilth.

Organic matter has long been known to improve soil fertility and tilth, which in turn, have increased crop yields. "Organic matter composts", however, is a poorly defined term used for a wide variety of materials - all of which impact soils differently. Therefore, prior to recommending the use of a specific organic compost for a specific purpose it must be tested to determine the nutritive value of the material and the total maximum amount of material to apply per acre. Organic compost/manures can consist of a variety of materials including: chicken - beef - hog - sheep - horse manures, straw, leaves, sawdust, table scraps, treated sewage sludge, peatmoss, etc. Addition of organic composts to soil should take into account; soil type, affect on soil pH, nutrient content of compost, crops to be planted in rotation after addition of compost to soil, and rainfall or total water application through irrigation.

The recommended soil pH range for optimum plant growth, nutrient availability and best bacterial activity is 6.5 to 7.2. The soil pH affects nutrient availability and at a pH of 5.0 to 5.5, both iron and boron become more available to plants causing potential toxicity symptoms while phosphorus and potassium are less available to plants and may result in nutrient imbalances in the plant.

While liberal applications of organic composts (5 to 10+T/A) has been a rule of thumb for many growers in the last decade, it has lead to some very difficult problems in the fields where the organic compost was applied. The most serious problem has been a large release and availability of nitrogen resulting in almost all cases of very extensive vegetative growth at the expense of reproductive growth (reduced fruit production and quality). There has been an extreme build-up of phosphorus in the soil especially with the use of animal manures at rates greater than 5 T/A; resulting in soil P levels in excess of 1000 lbs./A - potential for opening phosphorus mines in PA. Also the high P levels in soil probably contribute to the high P levels in the Susquehanna River and ultimately, the Chesapeake Bay. There also can develop an imbalance in the ratios of soil K-Mg-Ca availability which will have a profound affect on the quality for fruit produced in the field (poor color, soft tissue, blossom end rot, poor shape).

Therefore, important to a good fertility program is calculating the total nitrogen availability in the soil from all potential nitrogen sources. Nitrogen sources include; graded fertilizers (10-10-10 would contain 10% nitrogen per 100 lbs. material), legume cover crops (hairy vetch produces the equivalent of 100 lbs N/A), animal manures (need

to know N-P-K analysis before field application) and organic composts (peanut hulls, straw, etc). Plants generally respond to nitrogen when there is low organic matter in the soil, soil consisting of a large percentage of sand, and/or a cold, wet growing season (much like 1996). How much nitrogen should be applied for the crop to be grown? The crop nitrogen requirement equals the recommended rate of nitrogen application minus the contribution from the previous crop (residual N), minus the contribution from cover crops (especially legumes) planted in rotation, and minus the contribution from manure. Using this method to calculate a crop's nitrogen requirement will reduce/eliminate runoff and leaching of nitrogen and other elements from the soil.

An example of organic matter application is given below in reference to a pumpkin fertility program based on the nitrogen requirement for the crop. A grower plants pumpkins on ground that was in soybeans last year; was planted to hairy vetch after the soybeans were harvested; and 3 tons/A of chicken manure (6-4-3 analysis) was broadcast and incorporated in the spring prior to seeding pumpkins. How much nitrogen should the grower apply to the pumpkin crop? Since the recommended nitrogen application for pumpkins grown on heavy soils is 60 lbs per acre, the grower needs to subtract 25 lbs residual N produced by the soybeans, 60 lbs N produced by the vetch (killed vetch in late March) and 18 lbs N from the manure application.  $[60 - (25+60+18) = \text{surplus } 43 \text{ lbs/A nitrogen}]$ . The grower will not have to add any nitrogen to the pumpkin crop since he has a surplus of 43 lbs/A N over and above the required 60 lbs/A nitrogen recommended for pumpkin production.

In conclusion, a sound, well planned organic matter management program will provide; 1) optimum fertility for maximum crop yields and quality, 2) minimize runoff and leaching of water soluble elements, and 3) reduce total fertilizer costs over time.

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## **Yellow Shoulder on Tomato**

Steve Bogash, Commercial Horticulture Agent, Franklin County Cooperative Extension and Michael Orzolek, Department of Horticulture

This soon to be past growing season was challenging for a great many reasons. Among the problems that growers in my part of Pennsylvania (Adams, Cumberland and Franklin Counties) experienced was the disorder known as yellow shoulder. Yellow shoulder is a physiological disorder of tomatoes that is characterized by discolored regions under the skin that show through and reduce the quality of the fruit. The disorder can range from very mild with some internal spotting to quite severe with large areas that are hardened and yellow to white. This wide variation in symptoms has spawned a number of names for the same primary disorder: yellow shoulder, yellow eye, green shoulder, yellow tag, and internal white tissue. It is very important for growers to understand that yellow shoulder is not a delayed ripening, but an actual disorder of the affected tissue.

The cells in the affected sectors of the fruit are generally smaller in size and have a more random arrangement than that of normal cells. Green chlorophyll in these regions fail to develop red pigment. This happens very early in fruit development, which makes early leaf analysis extremely important in prevention, as uniform color requires more K<sup>+</sup> than the amount required to sustain yield.

**The cause of the yellow shoulder disorder in tomato fruit has baffled scientists for the last 30 years. Many scientists believe there are several causal factors for yellow shoulder including: environment (specifically, high temperature >90°F), nutrition, genotype (cultivar) and virus. The interaction of these factors under field conditions is very difficult to evaluate.**

This disorder can be triggered by insufficient exchangeable K<sup>+</sup>, excess magnesium in relation to calcium, and pH above 6.7. Management options to reduce yellow shoulder include increasing K<sup>+</sup> to above 3% by dry matter before the fruit is larger than 1", adjusting the soil pH to 6.4-6.7 and increasing the Mg/Ca ratio to 1/6 or better. Leaf analysis testing at the first flower initiation is extremely important in preventing yellow shoulder as once fruit is hanging and damaged it will not improve. Also, certain cultivars are less susceptible and others at higher risk, so cultivar selection is integral to a program to manage this color disorder. Certain processing varieties have been identified as less susceptible, but much research remains to be done on fresh market varieties in order to identify those that are more or less susceptible. Some growers have anecdotal reports of cultivars that are more or less susceptible, but no research has been done to conclusively identify those cultivars.

The practice of letting the fruit hang longer in order to "color up" does not work and has the potential to increase the danger from fruit rots. Increasing K<sup>+</sup> through the drip lines once there is abundant fruit hanging is also unlikely to lessen symptoms as this disorder shows up very shortly after fruit set.

Quite a bit of work has been done by UC Davis and Ohio State on prevention of this disorder in processing varieties. They have developed the Hartz formula for anticipating the risk of yellow shoulder. This formula can be readily accessed online at [www.oardc.ohio-state.edu/tomato](http://www.oardc.ohio-state.edu/tomato). You will need recent soil and leaf analysis results in order to use the formula.

For most growers the best practices to prevent yellow shoulder will be to intensively leaf test tomatoes from first flower cluster for Ca, K<sup>+</sup> and Mg levels. From this information, a grower could apply Potassium Nitrate, Calcium Nitrate, or Calcium Chelate to reduce the potential for this disorder. Attempting to adjust soil pH downward through the application of sulfur or acidifying fertilizers is probably not a good recommendation as our generally high lime soils can make this a tricky proposition at best.

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## **Worried about Drought? Manage Your Production Risk with Crop Insurance**

Jayson Harper, Professor of Agricultural Economics, Department of Ag Economics and Rural Sociology

With the current poor growing season rapidly winding down, now is the time to start thinking about production risk management strategies for next year. In particular, farmers who wish to get crop insurance for fall-planted small grains must apply by September 30. Although there were major increases in the number of farmers using crop insurance in Pennsylvania this year, still only about 50% of eligible acres are covered (compared to 80% or more in the Midwest). Several things have happened recently to make crop insurance an even better risk management tool for Pennsylvania farmers:

1) Adjusted Gross Revenue (AGR) insurance is now available in 14 counties in Pennsylvania: Berks, Carbon, Crawford, Columbia, Erie, Fayette, Lackawanna, Lancaster, Lehigh, Monroe, Northampton, Schuylkill, Westmoreland, and York. AGR insures the revenue for your entire farm rather than individual crops by guaranteeing a percentage of average gross farm revenue, including a small amount of livestock revenue. The plan uses information from your last five years of Schedule F tax forms to calculate the policy revenue guarantee. No more than 35% of expected allowable income can come from animals or animal products. If more than 50% of your expected farm income is from crops that have multi-peril crop insurance (MPCI) available in your county, you can still get AGR insurance, but you must also get at least minimum (CAT) levels of MPCI for those crops. AGR covers loss of revenue during the current insurance year due to any unavoidable peril that occurs during the current or previous insurance year. The last day to apply for AGR insurance is January 31.

2) A simplified version of AGR (called AGR lite) is being proposed for farmers with adjusted gross revenues of less than \$100,000 and it may be available for Pennsylvania farmers in 2003. Unlike regular AGR insurance, farmers would still be eligible to participate if they have more than 35% livestock income if at least 30% of the animal feed (by weight) is produced on-farm. Also, farmers will not be required to get at least CAT levels of coverage for crops covered by MPCI in their county. Producers will also not be required to provide copies of tax forms unless they file an insurance claim. Compared to the AGR program, AGR lite is much more flexible and would require less paperwork to apply. It is program that would make sense for a lot farmers in Pennsylvania and the decision on the whether to approve the program will be made by the end of the year. The last day to apply for AGR lite insurance would be March 15 (like MPCI for spring-seeded crops).

**3) Crop Revenue Coverage (CRC), an insurance product first introduced in 2000, is now available in all Pennsylvania counties for corn and 49 counties for soybeans. Unlike MPCI that covers only yield losses, CRC provides protection against both yield and price risk. The farmer selects a level of revenue to protect based on price and yield expectations. Losses are paid if revenues fall below the guarantee at the higher of an early-season price or the harvest price.**

4) Farmers using crop insurance have traditionally been able to choose a yield guarantee level of 50, 55, 60, 65, 70, or 75% of their farm's actual production history yield. In a sense, this determines the "deductible" before an insurance claim would be paid. Selecting a lower yield guarantee lowers the premium. Many farmers, however, felt that they would like to have higher levels of coverage available. In response, the 80 and 85% coverage levels have been introduced for corn and soybeans in many counties.

5) Under the Federal 2000 Agricultural Risk Protection Act crop insurance premiums for farmers were reduced by 27-41% depending on the level of coverage selected. In addition, the Commonwealth of Pennsylvania is paying the \$30/crop application fee and reducing producer paid premiums by an additional 16-30% in 2003. This means that crop insurance premiums will be 40-58% lower in 2003 than they were in 1999.

6) Catastrophic crop insurance (CAT) was introduced several years ago to replace ad hoc disaster assistance programs enacted by Congress and provide a safety net based on a farmer's actual production history and insurance principles. The per acre insurance premium for CAT is paid totally by the Federal government. To encourage all farmers to have at least this level of protection, the Commonwealth of Pennsylvania is again paying the \$100 administrative fee this next year. CAT insurance provides farmers with a crop insurance yield guarantee of 50% of their farm's actual production history yield, with any losses reimbursed at 55% of the established indemnity price. Compared to higher levels of coverage, CAT provides only minimal protection against yield losses. For some diversified farmers this level of coverage is sufficient to protect them against severe cash flow shortfalls. Corn farmers who have used the CAT level of MPCY yield insurance in the past may wish to consider using the CAT level of Indexed Income Protection (IIP) that provides a revenue guarantee similar to CRC.

If you are interested in crop insurance as a way to help you manage your production risk, contract a crop insurance agent to discuss the options that are available to you in your county. Crop insurance is guaranteed and subsidized by the Federal government, but is sold through private insurance agents. A list of insurance agents licensed to sell crop insurance in Pennsylvania is available on the USDA, Risk Management Agency web site: <http://www.rma.usda.gov>. First click on "Agent Locator" in the left toolbar. Then click on "Agent" under the "Agent Locator/Providers List". Finally, you can pull down on "Pennsylvania" to get a list of agents.

More information on crop insurance products and crop coverage can be found on the Pennsylvania Crop Insurance Education web site at <http://cropins.aers.psu.edu>.

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## Edamame Cultivar Trial-In Field Production

Elsa Sanchez and Kathleen Kelley, Department of Horticulture

*This is the third article in the series on production and marketing of ethnic crops.*

Edamame plants were harvested beginning on August 14, 2002 and continued for 2 weeks. Plants were harvested when the pods were 80-90% filled. The harvest of each cultivar followed the order of flowering with Envy being harvested first followed by Kenko, Butterbeans, Butterbaby, Early Hakucho, Green Legend, Shironomai and Lucky Lion. Late Giant Black Seeded has not been harvested to date, as pods have not yet developed. Data taken at harvest included marketable yield, unmarketable yield, the number and weight of soybeans in 50 pods and the number of pods in 500 g. Data were analyzed by GLM ANOVA and Fisher's Multiple Comparison Test was used to compare means. Marketable yield, the mean weight of soybeans per pod and the mean number of beans per pod will be reported. Shironomai had the highest marketable yield of all cultivars (see Table. 1 below). The other cultivars had statistically similar marketable yields with the exception of Envy, which had lower yield than Butterbaby.

Table. 1. Marketable Yield. Marketable yield was taken by culling unmarketable pods and weighing the remaining pods. Marketable yield was highest for Shironomai.

Cultivar	Mean Pod Weight Per Plant (g)
Envy	69.5a
Early Hakucho	85.1ab
Kenko	87.3ab
Lucky Lion	90.6ab
Butterbeans	95.7ab
Green Legend	101.0ab
Butterbaby	113.2b
Shironomai	170.5c

Envy had the lowest soybean weight at 0.88g per pod. The remaining pods had statistically similar soybean weights per pod ranging from 1.15g per pod for Lucky Lion to 1.41g per pod for Green Legend. The mean number of soybeans per pod ranged from 2.17 for Shironomai to 2.37 for Early Hakucho. Shironomai had high marketable yields in this and other cultivar trials and had the highest soybean weight per pod along with other cultivars. However, the germination percentage of Shironomai was unacceptably low (14%), as reported in the last issue of the Vegetable and Small Fruit Gazette. It cannot be recommended to PA growers until the problems with germination are studied further. Until then, better choices for PA growers are Butterbeans, Envy and Early Hakucho based on germination percentages and marketable yield.

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## **Bug vs. Bug - Two-Spotted Spider Mite**

Cathy Thomas, Integrated Pest Management Program  
Pennsylvania Department of Agriculture

Before implementing a pest control program using natural enemies (biocontrols), give these issues some thought and careful planning.

The first issue to consider before starting a pest control program using natural enemies (biocontrol) is to know what pesticides have been used on the crop itself and in the greenhouse where you will be using biocontrols. Conventional classes of insecticides such as carbamates, chlorinated hydrocarbons, organophosphates, and synthetic pyrethroids can persist for many months on plants and on the greenhouse structure itself. Insecticides from these classes usually have a negative impact on natural enemies and on the bumble bees used for pollination. If you plan to use biocontrols, transplants should not be treated with long residue pesticides. Check with the plant propagator if you do not start your own transplants.

The second issue is to determine what pesticides you can use along with the introduction of natural enemies. If a pest outbreak requires a spray treatment, use selective pesticides and spot spray when possible. A selective pesticide has these qualities:

- Non-toxic or slightly toxic to natural enemies (soft chemistry)
- Short persistence
- Does not inhibit development or reproduction of the natural enemies

Some compounds may be harmful to biocontrols at the moment they are applied, but may have a short persistence (ie, natural pyrethrins). After the recommended time period has elapsed, beneficial insects can be introduced again.

Always consult your biocontrol supplier before applying any pesticide. Even though a particular

pesticide label may state that the compound is safe to use in an IPM program, it may not be safe to use with natural enemies. On line information on the side effects of pesticides on beneficial insects can be obtained through this web site: <http://www.koppert.nl/e0110.shtml> A list of materials for approved for organic production can be found at this web site: Organic Materials Review Institute <http://www.omri.org>

Here are a few additional points to consider when using pesticides with natural enemies.

- Designate a sprayer for soft pesticides and use only in biocontrol houses
- Pesticide vapors from a non-biocontrol area may have a negative impact in other areas where biocontrols are being used.
- Keep accurate records of pesticides and biocontrols that are used and note the effectiveness of those treatments.

### **Pesticide Use Compatibility with Biological Controls (Prepared by Cliff Sadof, Purdue University and Michael Raupp, University of Maryland)**

#### **Botanicals**

Pyrethrins - somewhat compatible, short residue but very broad spectrum. Can be used to cleanup a pest population, one to two weeks (check with biocontrol supplier) before biocontrols are introduced.

Azadirachtin - compatible, insect growth regulator derived from seeds of the neem tree, controls larval stages of insect pests.

#### **Microbial insecticides (pathogen biological control agents)**

*Bacillus thuringiensis var. kurstaki* - highly compatible, targets caterpillars. Larval stages must feed on plants parts containing the bacteria.

*Bacillus thuringiensis var. israelensis* - highly compatible, targets fungus gnat larvae.

*Beauveria bassiana* (fungus) - compatible, kills some soft bodied predators, short residue, broad spectrum.

*Steinernema feltiae* (Nematode) - compatible, targets fungus gnat larvae, low toxicity to humans.

#### **Others**

Horticultural Oil - compatible, active when wet, kills soft-bodied insects; pupal stage parasitoids not killed.

Insecticidal Soap - compatible, active when wet, kills soft-bodied insects, pupal stage parasitoids not killed.

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

Kathy Demchak, Department of Horticulture

Q. Both the Commercial Berry Guide and the instructions for Tissue Analysis Kits describe when to sample leave for a nutrient analysis for my summer-bearing raspberries, but neither mention about how to sample my everbearers. How should these be sampled? (Anon.)

A. I ran this past Dick Funt from Ohio State, since information for fall-bearers (aka everbearers or primocane-bearers) is sparse, so my thanks to him for his input. Sample from the primocanes when they are approaching full height, but before they bloom, using the most recently fully expanded leaves for your sample.

Got a question? Send it to Kathy Demchak, at 102 Tyson Bldg., University Park, PA 16802. You will be credited with the question, or can remain anonymous, as you wish.

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## **Reminder-Fall Applications of Spartan 4F For Strawberries**

Kathy Demchak, Department of Horticulture

A Section 18 emergency exemption had been approved in June 2002 for the use of Spartan 4F (sulfentrazone, from FMC) on strawberries in PA. This exemption is for the control of common groundsel, a problem in a number of growers' fields. This material is similar to Goal in that, while it inhibits establishment of new weeds, it will also burn foliage that it contacts. The second window for its use during this year is when the plants are dormant in the fall, from October 15 through December 15, 2002. Copies of the notification were sent to each county office, along with a record keeping form that should be filled out and sent in to PDA as listed on the form. Here are additional details on the use.

Four to eight fluid ounces of Spartan 4F can be used per acre per application (an application could have been applied at renovation), with a yearly maximum of 12 ounces used. Applications can be made to the entire field as a broadcast spray or as a treatment to only those areas where targeted weeds are present or expected. For the material to be effective as a preemergent herbicide, rainfall or irrigation is required for activation. If 0.5 to 1 inch of rainfall or irrigation is not received within 7 to 10 days after application, a shallow cultivation should be used to lightly incorporate the herbicide. The material should not be used if the soil is saturated or if heavy rainfall is predicted to occur within the next 24 hours. A 105-day preharvest interval must be observed. Because this material can leach to groundwater under certain conditions, this material cannot be applied on soils classified as sand which have less than 1 percent organic matter.

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## **Potato Musings**

Bill Lamont, Department of Horticulture

## **Potato Storage Management-Cooling Period**

Bill Lamont, Department of Horticulture

Immediately after the curing period, begin cooling the tubers down to the holding temperature. Potatoes should be cooled slowly. Reducing the storage temperatures too quickly, followed by a mid-fall warm spell, causes fluctuation of tuber temperatures. Fluctuating temperatures may reduce the storage life and quality of the potato. Cool a maximum 4-5 degrees F per week. Use a pulp thermometer to check the tuber temperature. Potatoes should be cooled with humid air no lower than 3-5 degrees F below tuber temperature. Only humid, cool air should be used unless a humidifier is available. Through pile ventilation achieves rapid cooling; however, dehydration is likely if a humidifier is not used. (Long Island Fruit and Veg Update, Sept. 13, 2002)

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## **Potato Session at Western Pennsylvania Vegetable and Berry Grower's Seminar**

Bill Lamont, Department of Horticulture

A session on potatoes will be offered at the Annual Western Pennsylvania Vegetable and Berry Grower's Seminar, on November 19, 2002 held at the Days Inn, Rt. 8 South, Butler, PA.

## Program

- 9:00AM "Potato Variety Update"- Dr. William Lamont Jr., Department of Horticulture, Pennsylvania State University
- 9:30AM "Update on Potato Disease Control"- Dr. Steve Johnston, Rutgers University.
- 10:00AM "Update on Potato Insect Control"- Dr. Gerry Ghidui, Rutgers University.
- 10:30AM "Update on Potato Seed Piece Treatments"- Dr. Steve Johnston, Rutgers University
- 11:00AM "Weed Control and Vine Killing in Potatoes" - Dr. Mike Orzolek, Department of Horticulture, Pennsylvania State University
- 11:30AM "Potato Quality Management"- Dr. Matt Kleinhenz, Ohio State University
- 12 Noon

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## Upcoming Meetings

Bill Lamont, Department of Horticulture

### Local

**November 19, 2002. Western Vegetable Meeting, Days Inn, Butler, Pa. Contact: Eric Oesterling (724)-837-1402**

### Regional

January 14-16, 2003. Vegetable Growers Association Annual Meeting and Trade Show. Trump Taj Mahal Casino and Resort in Atlantic City, NJ.

January 15-17, 2003. Ohio Fruit and Vegetable Growers Congress/Ohio Roadside Marketing Conference/Ohio Christmas tree Winter Meeting. Toledo Sea Gate Centre, Toledo, OH. Contact: Tom Sach (614) 249-2424.

February 4-6, 2003. Mid-Atlantic Fruit and Vegetable Conference, Hershey, PA. Contact: Bill Troxell (717)-694-3596 or e-mail: wt.pvga@tricity.net

## **National**

November 14, 2002. South Dakota Potato Growers Annual Meeting. Clark, SD. Contact: (605) 532-3311

November 15-16, 2002. Red River Valley Potato Growers Annual Meeting. Fargo, ND. Contact: (218) 773-3633.

December 5-7, 2002. National Potato Council Seed Seminar. Hoiday Inn by the Bay, Portland, ME. Contact: (207) 769-5061.

January 7-11, 2003. National Potato Council 54th Annual Meeting. Loews Ventana Canyon Resort, Tucson, AZ. Contact: (202) 682-9456.

## **International**

World Potato Conference. Kunming, China. See [www.potatocongress.org](http://www.potatocongress.org)