

# The Vegetable and Small Fruit Gazette

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Horticulture Department  
The Pennsylvania State University

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**Tip for the Month--** "To the world, you may be one person; but to one person, you may be the world".

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## **Comments from the Editor**

Bill Lamont, Department of Horticulture

As I finish the Vegetable and Small Fruit Gazette, it is a beautiful day with plenty of sunshine and "Penn State" blue skies. Lately, we have been having sunshine in the morning and then some afternoon thunderstorms moving through the area. Thank heavens we haven't had any hail. I have seen what hail can do to vegetables and small fruits and we do not need that type of weather. Kathy is busy harvesting her strawberry crops and many different crops are being harvested from the high tunnels. The early Dark Red Norland's in the high tunnel are almost ready to dig. I want to thank Lee Young for her excellent articles in last months gazette, which fulfilled her commitment for June articles, and I look forward to receiving Eric Oesterling's article for the July issue. I want to thank colleagues from other departments who contributed articles to this issue and I want to encourage others to join us in upcoming issues. 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.

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## Schedule for Agent Articles

Bill Lamont, Department of Horticulture

July	Eric Oesterling
August	Jeff Mizer
September	Emelie Swackhamer
October	Cheryl Bjornson
November	John Esslinger
December	Andy Muza

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## Two More Workshops for Training Extension Professionals and Vocational Agriculture Teachers on High Tunnel Technology to be conducted in 2004

Bill Lamont, Department of Horticulture

We are offering two more workshops funded by a Professional Development Grant from Northeast SARE Program to train extension specialists, county agents and vocational agriculture teachers on the use of high tunnel technology. The objective of the program is to train the trainers. Each workshop will be two days and two nights lodging and mileage up to 500 miles will be covered for participants. The dates and location of the workshops are: June 29 and 30, 2004 at the High Tunnel Research and Education Facility, Horticulture Farm, Rock Springs, PA and August 3-4, 2004 at the University of New Hampshire Horticulture Farm, Durham, NH. The states we are soliciting participants from are Connecticut, Delaware, Maine, Massachusetts, Maryland, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, West Virginia, Virginia, Ohio and Washington, D.C. Class size will be limited to 50 per workshop. Each workshop will be two days with a mixture of classroom presentations on the different components of high tunnel technology, "hands-on" participation, and presentations by growers utilizing this technology.

A high tunnel manual will be given to each participant and will serve as a handy reference on all aspects of this technology. To sign up for the workshop or for more information contact Bill Lamont, Phone: 814-865-7118 or E-mail: [wlamont@psu.edu](mailto:wlamont@psu.edu)

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## Successful Greenhouse IPM Project Expands

Kristie Auman-Bauer, Pennsylvania IPM Program

Greenhouse growers in Southwestern Pennsylvania are aiming to reduce their use of pesticides through a recently expanded IPM training program.

Integrated Pest Management, or IPM, aims to manage pests -- such as insects, diseases, weeds and animals -- by combining physical, biological and chemical tactics that are safe, profitable and environmentally compatible. A greenhouse IPM program follows a biointensive strategy and relies upon sanitation, mechanical barriers, biocontrol, scouting and targeted pesticides when necessary.

The project, headed by Cathy Thomas, Pennsylvania Integrated Pest Management Program biocontrol specialist, is part of the program's greenhouse IPM program and is funded by the Environmental Protection Agency and Sustainable Agriculture Research and Education program. The successful program was started in the Susquehanna River was expanded into Lancaster County and Southwestern Pennsylvania. According to Thomas, IPM is catching on because many growers are looking for viable alternatives to using pesticides.

The project includes a diverse group consisting of bedding plant and greenhouse vegetable growers. "There is a concentration of greenhouse growers in southwestern PA who have not received the attention of the PA greenhouse IPM program in the past due to limited resources," says Thomas. "This project specifically targets these underserved growers. We were able to enlist ten growers to participate and hire Les Garrett, an IPM consultant," she says.

Garret makes weekly visits to the ten growers spanning Allegheny, Armstrong, Indiana and Westmoreland Counties and trains growers on greenhouse IPM methods. "We're still in the educational phase of the project," says Garrett, a former plant inspector of 33 years with the Pennsylvania Department of Agriculture. "I teach growers pest scouting techniques, life cycles of the pests and biocontrol agents. We show the grower how biocontrol alternatives can be used and blended with compatible chemical controls to manage pests," Garrett explains.

While it's still early in the program, many of the growers are already seeing the benefits of an IPM program. Garrett will work with the growers through a crop cycle so the growers gain confidence and independence. According to Thomas, by converting these growers to IPM methods they expect to see a reduction of pesticide use by at least 50 percent, thereby slowing resistance in target pests and creating a safer working environment. Thomas has been a part of numerous IPM/biocontrol related projects working with Penn State and Pennsylvania Department of Agriculture personnel. Thomas has compiled her biocontrol advice into a publication, **"Bug vs. Bug." The sixty-six page, full color manual can be found on the PAIPM Web site at <http://paipm.cas.psu.edu/ProblemSolvers/grnhseProbiSolv.htm>.** For more information on biocontrol of plant pests in greenhouses, contact Thomas at (717) 705-5857 or e-mail [c-cthomas@state.pa.us](mailto:c-cthomas@state.pa.us).

The Pennsylvania IPM program is a collaboration between the Pennsylvania State University and the Pennsylvania Department of Agriculture aimed at promoting integrated pest management in both agricultural and nonagricultural situations.

For more information, contact the program at (814) 865-2839, or Web site <http://paipm.cas.psu.edu>.

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## **The Organic Way- Weed Management Strategies**

Elsa Sanchez, Assistant Professor of Horticultural Systems Management

The Organic Farming and Research is a non-profit organization that promotes organic agriculture. Biannually the organization sponsors and conducts a national survey of certified organic operations. Survey results provide perspective on practices that certified organic growers use across the country. Responses from the most recent survey (the 4th one) are in the process of being analyzed. Preliminary findings are available online at [www.ofrf.org](http://www.ofrf.org).

For the Third Biennial National Organic Farmers' Survey, a questionnaire was mailed to 4,638 certified organic growers throughout the US late in 1997 and early in 1998. Twenty-six percent or, 1,192 responses were obtained and used for analysis. In the survey weed management was identified as the number one research priority. Growers were also asked to indicate which weed management strategies they employ and how frequently they are used (see table below). This information may be useful in making decisions regarding weed management in your organic operation.

<b>Weed Management Strategy</b>	<b>Percentage of respondents who use the strategy "frequently or regularly"</b>
Mechanical tillage	75%
Weeding by hand or with hand implements	75%
Crop rotations	75%
Cover crops	58%
Mulches	44%
Planting date adjustment	29%
Smother crops	23%
Row width adjustment	20%

Faming and burning	11%
Grazing	16%
Ridge tillage	8%
Solarization	3%

Table adapted from Waltz, 1999.

Reference:

Waltz, E. 1999. Third Biennial National Organic Farmers' Survey. Santa Cruz, CA. Organic Farming Research Foundation. [www.ofrf.org](http://www.ofrf.org)

Please mail or email ideas for future column topics or thoughts on organic production to Elsa Sánchez, Department of Horticulture, Penn State University, University Park, PA 16802 or [elsasanchez@psu.edu](mailto:elsasanchez@psu.edu).

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## Identify Insect Pests in the Garden with New Publication

Kristie Auman-Bauer, PA IPM Program

Whether you are trying to identify what six-legged creature is damaging your tomato plants or determine if that yellow-striped beetle on your cucumbers is a pest, the Pennsylvania IPM Program's new publication "Identifying Vegetable Insect Pests in Pennsylvania" will help you find the answer.

Targeted to the home gardener, the guide includes pictures and descriptions of vegetable pests commonly found in the garden and flower beds. It is available as a downloadable PDF file from the Pennsylvania IPM Program's Web site at <http://paipm.cas.psu.edu/pdf/vegpests.pdf>.

Of the hundreds of insect species that may be found in and around gardens, only a few species are pests. The guide is designed to allow the gardener to quickly identify common insect pests by matching a suspected pest with a picture. In addition to the pictures the guide includes size indicators alongside color images of each pest. It also includes short descriptions of each pest and the plants it commonly targets.

The guide was developed in conjunction with Shelby Fleischer, professor of Entomology at Penn State. "Pest identification is the first step in following an Integrated Pest Management, or IPM, program," explains Fleischer. IPM aims to manage pests -- such as insects, diseases, weeds and animals -- by combining physical, biological and chemical tactics that are safe and environmentally compatible. "IPM allows the home gardener to safely choose the correct tool to eliminate garden pests," says Fleischer.

For more complete information about the insects, their potential as pests, and how to prevent or control them, consult the 'Pest Problem Solver' section of the Pennsylvania IPM Web site at <http://paipm.cas.psu.edu/problemSolv.html> or contact your county Extension office. The phone number may be found in the Blue Pages of the phone book. Other information may be found at the Penn State Department of Entomology's Web site at <http://www.ento.psu.edu/>.

The Pennsylvania IPM program is a collaboration between the Pennsylvania State University and the

Pennsylvania Department of Agriculture aimed at promoting integrated pest management in both agricultural and nonagricultural situations. For more information, contact the program at (814) 865-2839, or Web site <http://paipm.cas.psu.edu>.

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## **Haygrove High Tunnel Tour Date for September 2004**

Jessica Krueger, Haygrove High Tunnels

Due to numerous requests from interested growers, Haygrove Tunnels has rescheduled their second annual North American grower tour of England's high tunnels. The new dates are September 25 – October 2 and will feature Haygrove's home farm with 220 acres of strawberries, raspberries, cherries and lilies produced under tunnels. The latest developments in Haygrove's multi-bay tunnels, season extension, mechanization and spectral filter horticultural films will be showcased.

The grower tour will visit other growers using Haygrove tunnels. At present, these include Hilliers Nursery, Intercrop Farms (leading salad / vegetable producer), Edward Vinson Plants Ltd. (plant breeder / small fruit grower) and Hurst Farm (direct marketer / table top strawberry producer). Additional visits will include the city of Oxford, Windsor Castle (home of Queen Elizabeth II), Canterbury Cathedral, Chartwell House (Winston Churchill's home) and an open day to visit London.

The tour will depart from the headquarters hotel near Heathrow airport at 8:00 A.M. September 26 and return to the same hotel September 30 and October 1. The price of \$799 is based on double occupancy (\$1199 single) and includes 7 nights lodging, coach transportation in England, and two dinners sponsored by Haygrove. Airfare is not included. Sign up deadline is July 15, 2004 and space is limited.

To join this informative, educational tour, call 866-HAYGROVE.

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## **Bug vs. Bug - Bumble Bee Pollination in Greenhouse Vegetable Crops**

Cathy Thomas, Integrated Pest Management Program  
Pennsylvania Department of Agriculture

Proper pollination is needed for optimal fruit set and production. In the past, greenhouse tomato growers have relied on manual pollination, which can be very time consuming. Using bumblebees for pollination is an effective alternative and can completely replace manual pollination. In addition to saving on labor, bumblebee pollination has many advantages. These advantages include: (1) bumble bees are active at low temperatures (41°F), windy and cloudy conditions, (2) effective in greenhouses, high tunnels and in open air, (3) bumble bee pollination results in higher yields and large, high quality fruit in crops such as tomatoes, peppers and blueberries.

According to Richard Gerhart, distributor of bumble bees colonies, (International Technology Services, Biobest), bumblebee pollination started when Dr. Roland de Jog a medical doctor in Belgium had a hobby of raising bumble bees. To enhance his colonies, he placed them in a friends tomato greenhouse, and the rest is history. Roland is the founder and principal owner of Biobest Biologicals, a distributor of biological controls and bumblebees. Kopperts, another producer of natural enemies also began producing

bumblebees. Biobest rears in Belgium and Lamington, Ontario, Spain and has joint ventures in other areas. Kopperts rears in Holland, Detroit, New Zealand and has joint ventures in other areas. Several species are used throughout the world. *Bombus impatiens* is used east of the Rockies, *Bombus occidentalis* in the west, and *Bombus terrestris* is used in most other areas of the world.

Bumblebees' hives are shipped to growers in completely maintenance-free hives. The housing made of solid, recyclable cardboard with a moisture resistant coating. The hive has two flight openings. The standard flight opening is used under normal conditions. A tapered tube is attached to hole no. 2 which creates a lock in system. When this valve is open, the bumblebees can enter, but are unable to get out. This is a convenient option if the hive needs to be removed from the greenhouse. The hives are supplied with sugar water for the total life expectancy of the hive, since crops such as tomato have blossoms that do not produce nectar.

### **Tomato Pollination**

Tomato blossoms require slight movement for sufficient pollen from the stamens to fall onto the stigma of the flower. Bumble bees cause movement by hanging upside down on the flower, fastening their jaws onto the staminal tube, and then setting the flower into vibration by activating their flight muscles. This is called "buzz pollination". These jaw marks will soon appear as a brown discoloration on the blossom assuring the grower that flower has been visited and "set". Bumblebees are most active in the morning and in the afternoon at temperatures between 50 and 86 °F. They function best at temperatures between 59 and 77°F

Bumble bees can be used to pollinate other crops such as peppers, cherry tomatoes, and eggplants and blueberries.

Consider these factors when using bumblebee pollination:

- Use pesticides selectively since many of the traditional classes of insecticides will have a negative impact on the hive. Contact a bumblebees distributor for specific information about persistence and compatibility of specific compounds.
- Systemic pesticides (pesticides that are absorbed through the roots) may damage the bumblebee population.
- Bumblebees perform best when used with natural enemies to control pests.
- Remove blue sticky cards since they may attract the bumblebees.
- Keep ants away from the hive.
- Do not put ornamental hanging baskets treated with systemic insecticides in houses with bumblebees.

Informative Websites:

<http://www.koppert.nl> – Koppert Biologicals, 734-641-3763, MI  
<http://www.biobest.be> – Biobest Biologicals, 303-661-9546, CO

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## Rooting Strawberry "Tips" to Create Plugs for Raised-Bed Plasticulture Production in PA

Steve Bogash, PSU Cooperative Extension, and Kathy Demchak, Department of Horticulture

- 1) Use tips only from a reputable source. Tissue cultured mother plants are the preferred source. Using tips from your own or other local fields can create future problems, as there is the potential to move diseases and mites from field to field. Also, many varieties are patented and require licensing in order to take cuttings. USDA varieties are not patented, and can be propagated at no charge.
- 2) Ideally, tips should be planted as soon as they arrive. However, if this is not possible, the tips may be stored at 34F and 75-80% humidity for up to 2 weeks from the date they were harvested from the mother plants. If you're in a pinch for time and cooler space, pack the plants in ice. Allow 35 days from planting to grow a field-ready plug. Trim any runner cord to a 3/8-1/2" stub before planting.
- 3) Carefully cull the tips you are going to plant. Anything that looks at all questionable should be discarded.
- 4) Sort tips by size. Do not plant small and large tips in the same trays, as the smaller plants are likely to get shaded. The smaller plants in this now lower canopy in the flat are ripe for botrytis and powdery mildew as air circulation will be poorer in the lower canopy.
- 5) Plant the tips in plug trays with 50 cells/tray. Use a sterile media designed for rooting herbaceous "bare-rooted" plants. This includes most professional grower mixes. If you are recycling trays, be sure to remove all organic matter from them, then chlorine dip (1 part liquid bleach to 9 parts clean water) the trays prior to use. Be careful to avoid contamination of the propagation area.
- 6) The hook on the tip should be just in the potting media. Do not bury the crown.
- 7) Do not fertilize just planted tips. The fertilizer charge in most potting media will be sufficient until the plants are well-rooted. Fertilize for the first time at two weeks after planting using 100 ppm of nitrogen with calcium nitrate as the source, and repeat at weekly intervals. If you are holding the plants for longer than 4-5 weeks (thus creating super plants), switch to 20-20-20 at 100 ppm of nitrogen for later applications.
- 8) Your goal is to keep the leaves moist until the tips start to create their own roots. Hot, sunny days will require extra mist, while cooler, cloudy days less mist. The assumption with the following misting regimen is that you will be placing the new tips in a greenhouse or high tunnel. Enclosed structures will require less misting as wind will not dry the leaves as with plants growing outdoors. Do not allow the surface of the leaves to dry for the first 7 days. Mist using fogger nozzles of an intermediate discharge rate. Start with the following misting regimen, but adjust it as needed to prevent over-watering or desiccation of the leaves:
  - a) Time for the system to fill needs to be factored in as this regimen assumes actual misting time.
  - b) Day 1-7: Use 5 seconds of mist every 15 minutes.
  - c) Day 7-12: Gradually reduce misting. Keep the media moist. Misting should be terminated by the end of this period.
  - d) After week 3, the plants should be well-rooted and ready to begin conditioning for field planting. Keep the media moist, but expose the plants to full sun by setting them on a field wagon or on ground cover fabric. Keeping them in a greenhouse or high tunnel is OK, but do not mist and maintain good airflow.

e) Even at the beginning, do not mist after sundown. Some growers believe that this can create larger plugs, but the greater chance of diseases offsets and possible benefits.

Additional recommendations:

-Keep the plants in an enclosed structure (greenhouse / high tunnel) until they are rooted enough to resist being dislodged in a storm. Unrooted tips can be easily dislodged by wind or heavy rain. Some growers do produce their plug plants outside. See the setup at Berry Hill Irrigation if that is how you plan to produce plugs. Be sure to put down a layer of groundcover fabric before any outdoor planting.

-Shade cloth can be used to limit plant desiccation, but is not recommended. This will slow the time from sticking the tips to having field-ready plugs by about a week.

-Soil inoculants such as Plant Shield and Mycostop may be advantageous in preventing soil-borne diseases. However, no definitive research has been done using these products on strawberry tips at this time. In other crops, these products have prevented a wide range of soil-borne diseases.

-Due to the constant misting, control of diseases should be managed primarily with good ventilation. Any fungicides that are applied during the time the tips are being misted will be washed off too quickly to accomplish anything. However, a fungicide application to the plants prior to planting is probably a good idea.

-Scout the plants for spider mites. Their eggs are tiny so use a hand lens. If any eggs or mites are found, treat before planting in the field. Materials for two-spotted spider mite control include: Kelthane 35W, Dicofol 4E, Vendex 50WP, Brigade WSB, Danitol 2.4EC, Acramite, and Zeal. Zeal is only for eggs and immatures. As always, growers should closely follow label restrictions and requirements.

Thanks for Dr. Frank Louws at NC State for disease control pointers, and to David Lankford of Davon Crest Farms for many helpful suggestions.

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## **Strawberry Fruit Anthracnose in 2004**

Kathy Demchak, Small Fruits Specialist, Department of Horticulture

The warm temperatures and high humidity across the state have caused perfect conditions for anthracnose fruit rot development. So far, this disease has been found primarily on plantings of plasticulture Chandler, but has also been found on matted-row plants. Symptoms to watch for are brown sunken lesions, usually first noticed on the fruit. These lesions are usually dark brown on green berries, and start out dark brown on ripe berries, though a salmon-colored hue is often apparent in the center of the lesion as sporulation occurs. Sunken brown lesions are also usually found on the leaf petioles once they are examined more closely. Captan, Quadris, Pristine, Captevate and Cabrio are labeled for anthracnose control and all work quite well. However, Quadris and Cabrio are in the strobilurin class of fungicides, as is one of the active ingredients in Pristine. Consequently, these materials cannot be alternated with each other for resistance management purposes. Captevate, a mixture of captan and the active ingredient in Elevate, probably will not be yet available in PA until after strawberry season. Switch, an excellent gray mold material, is not labeled for anthracnose control, but will have some activity against anthracnose when used for gray mold control.

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## Potato Musings

Bill Lamont, Department of Horticulture

## Potato Chip Variety Trial for the Snack Food Association and US Potato Board

Bill Lamont, Vegetable Specialist, Department of Horticulture

The 2004 Potato Chip Trial is located on Jim Hite's Farm in Cambria County. There are 12 lines that are being evaluated. They are Atlantic, Snowden that are industry standards that new lines are evaluated against. Then there is B1240-1, NY132, ND2470-27, ND5822C-7, W1773-7, W1201, AF2211-9, MSJ-461-1, MSF-099-3, and A91790-13. This test is conducted in collaboration with Mike Harteis, County Extension Director, Cambria County and Daniel Sharretts, Mgr. Agricultural Services – Potatoes, Snyder Of Berlin. Also Dr. Don Halseth, Cornell University has agreed to be the Potato Research Advisor and coordinator for the Potato Chip Variety Trials for the SFA and USPB. Dr. Dick Chase from Michigan State University was the longtime advisor and coordinator and a great resource on all aspects of potato management. I hope to get Don to come down to our meeting at the test site this year.

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## Upcoming Meetings

Bill Lamont, Department of Horticulture

### Local

July 14, 2004. Vegetable and Small Fruit Field Day. Horticulture Research Farm, Gate H, Rock Springs, PA. Contact: William Troxell, Executive Secretary, Pennsylvania Vegetable Growers Association, (717)-694-3596.

September 24-25, 2004. Passive Solar Greenhouse Workshop: Design, Construction and Year Round Production. Sonnewald Natural Foods, Spring Grove, PA. Contact: Steve Moore ((717)-225-2489 or [sandcmoore@juno.com](mailto:sandcmoore@juno.com))

Nov 3 and 4, 2004. 2004 Mid-Atlantic Vegetable Workers, Howard Johnson's in Newark, DE. Contact Joanne Whalen at [jwhalen@UDel.Edu](mailto:jwhalen@UDel.Edu).

### Regional

**June 29-30, 2004** High Tunnel Workshop to be held at the High Tunnel Research and Education Facility, Horticulture Farm, Rock Springs, PA. Workshop is funded by Northeast SARE Professional Development Program to train extension specialists, county agents and vocational agriculture teachers on the use of high tunnel technology. **The workshop will be two days and two nights lodging and mileage up to 500 miles will be reimbursed for participants.** The states we are soliciting participants from are Connecticut, Delaware, Maine, Massachusetts, Maryland, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, West Virginia, Virginia, Ohio and Washington, D.C. The workshop will be a mixture of classroom presentations on the different components of high tunnel technology, "hands-on" participation, and presentations by growers utilizing this technology.

A high tunnel manual will be given to each participant and will serve as a handy reference on all aspects of this technology. To sign up for the workshop or for more information contact Bill Lamont, Phone: 814-865-7118 or E-mail: [wlamont@psu.edu](mailto:wlamont@psu.edu).

**August 3-4, 2004.** High Tunnel Workshop to be held at the Horticulture Farm, University of New Hampshire,, Durham, NH. The workshop is funded by Northeast SARE Professional Development Program to train extension specialists, county agents and vocational agriculture teachers on the use of high tunnel technology. **The workshop will be two days and two nights lodging and mileage up to 500 miles will be reimbursed for participants.** The states we are soliciting participants from are Connecticut, Delaware, Maine, Massachusetts, Maryland, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, West Virginia, Virginia, Ohio and Washington, D.C. The workshop will be a mixture of classroom presentations on the different components of high tunnel technology, “hands-on” participation, and presentations by growers utilizing this technology.

A high tunnel manual will be given to each participant and will serve as a handy reference on all aspects of this technology. To sign up for the workshop or for more information contact Bill Lamont, Phone: 814-865-7118 or E-mail: [wlamont@psu.edu](mailto:wlamont@psu.edu). or George Hamilton County Extension Educator, 603-641-6060 or E-mail: [george.hamilton@unh.edu](mailto:george.hamilton@unh.edu)

September 13, 2004. Grower Workshop on High Tunnel Production. High Tunnel Research and Education Facility, Horticulture Farm, Rock Springs, PA. Contact Person: Lisa White, Phone: 814-692-4635 or e-mail: [ldw112@psu.edu](mailto:ldw112@psu.edu).

### **National**

July 17-20, 2004. Annual Meeting of the American Society for Horticultural Science, Austin, TX. Contact: (703)-836-4606 or visit the ASHS website: [ashs.org](http://ashs.org).

### **International**

August 28-31, 2004. 17th International Lettuce and Lettuce and Leafy Vegetable Conference, Quebec, Canada. Contact: Dr. Sylvie Jenni (450)-346-4494 ext. 213 or [jennis@agr.gc.c](mailto:jennis@agr.gc.c)