

The Vegetable and Small Fruit Gazette

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Horticulture Department
The Pennsylvania State University

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Tip for the Month: "I believe that friends are quiet angels who lift us to our feet when our wings have trouble remembering how to fly"- Unknown.

Comments from the Editor

Bill Lamont, Department of Horticulture

December is the time to write the final chapter in the year 2001 and a time to reflect back on the year and to prepare for the Holiday Season. It is again a time when we gather around the Christmas dinner table with family and take time to say "thank you" for all the blessings that we have received individually and as a nation. I fondly remember my own childhood Christmases and the excitement and anticipation almost to the breaking point, as I looked forward to the arrival of Santa Claus with his 8 tiny reindeer. Boy it seemed like six months or more from Thanksgiving to Christmas back then. Where did the time go between Christmas 2000 and Christmas 2001, forget the time between Thanksgiving and Christmas. We need to stop and reflect on the real reason for the Christmas season amongst the hustle and bustle of our activities. You

will probably again eat more turkey or ham, mash potatoes and dressing or filling, depending where you grew up, and cranberry sauce or jelly than you promised yourself you would before sitting down to dinner. Join the crowd!! I hope that all my hunter friends harvested their deer or are in the process of chasing after it, as I am still doing, hoping to harvest some tasty venison to enjoy all winter and to go along with those excellent Pennsylvania potatoes. I want to thank Andy Muza for finishing the year off in grand fashion and setting the standard for next year with his excellent article "**2001 High Tunnel Demonstration - Erie County, Pennsylvania**". As I have said in the past, I really appreciate the level of agent participation in supplying articles for this publication. My hat is off to each of you and I have included the 2002 schedule for agent articles. Make sure to check the upcoming winter meeting schedule, we have a lot of excellent opportunities for growers to receive updates and new information. It gives me great pleasure to welcome and introduce Dr. Kathy Kelly, our new Consumer Horticulture Information Specialist to the Horticulture Department. She is will be a real asset to the horticulture team. Kathy has written an article of introduction in this issue, the first of many we expect from her. From all of us here at University Park we wish you and your families a Merry Christmas and a Healthy, Happy, and Prosperous New Year. As always, the Vegetable and Small Fruit Gazette Team encourages your feedback so that we can better serve your needs and address your concerns.

Schedule for Agent Articles

Bill Lamont, Department of Horticulture

Here is the 2002 schedule for agent articles. I took editorial license to assign several months that were not spoken for to agents who I knew were dying to write an article. I look forward to another year of excellent articles from the front line troops.

January	Tim Elkner
February	Emelie Swackhammer
March	George Perry and Steve Bogash
April	Greg Burns
May	Tom Butzler
June	Laura McNutt

July	Steve Bogash
August	Mary Conklin
September	Eric Oesterling
October	Cheryl Bjornson
November	John Esslinger
December	Andy Muza

Introduction to Kathleen Kelley

Kathleen Kelley, Assistant Professor of Consumer Horticulture

Hello. My name is Kathy Kelley and I am the Consumer Horticulture Information Specialists for the Department of Horticulture at The Pennsylvania State University. I am pleased to be a member of Cooperative Extension and look forward to making a contribution that will help meet the horticultural needs of Pennsylvanians.

I have obtained degrees from Michigan State University in disciplines that will assist me with my responsibilities. I completed a B.S. in Botany and Plant Pathology and then received a M.S. in Horticulture where I studied the cold hardiness of container-grown nursery stock. I then completed a dual Ph.D. program in the Departments of Horticulture and Botany & Plant Pathology where I conducted research on the marketing, production, and postharvest shelf-life of edible flowers. Under guidance of Dr. Bridget Behe, Department of Horticulture, Michigan State University, I concentrated most of my efforts on consumer-marketing research. During this time we were productive in determining some of the needs of consumers and professional chefs for edible flowers. I continued to work in this area as a Postdoctoral Research Associate with the responsibility of conducting consumer-marketing research on edible crops (including 'Collosal' chestnuts, carrots, and organic apples) while assisting Dr. Behe with her research on ornamentals.

As the Consumer Horticulture Information Specialists for The Pennsylvania State University, I can now take advantage of my experiences and use the tools that I possess to help fulfill the needs for my position. I look forward to producing quality programs and information that can be of benefit.

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2001 High Tunnel Demonstration- Erie County, Pennsylvania

Andy Muza, Erie County Cooperative Extension

The High Tunnel Demonstration Project in Erie County, Pennsylvania is a component of a statewide High Tunnel Research and Education Program. This program is being conducted by Drs. Bill Lamont and Mike Orzolek (Department of Horticulture, Penn State) in cooperation with other faculty, extension agents and farmers throughout the Commonwealth. In addition, this specific demonstration would not have been possible without the cooperation of Roberta Dudas, Harold Bolkey, Maureen Schick and John Dudas. These participants were involved with construction, daily management and/or data collection during the season.

On April 6, construction of a 17' wide by 36' long high tunnel greenhouse began on a vegetable and fruit farm in Fairview, Pennsylvania. This site is approximately 1 mile from Lake Erie in the western part of Erie County. The construction was completed on April 14 when a 6 mil, Dura-Therm plastic covering was applied to the framework. Application of the plastic covering was delayed for a two day period due to windy conditions.

Twenty pounds of a 16-16-16 fertilizer was broadcast inside the high tunnel on April 30. The soil was rototilled and drip irrigation tape and black plastic mulch was laid the same day. A total of 4 rows were able to fit within the tunnel with a spacing of at least 3' between rows.

Crops which were grown in the high tunnel this season included 3 varieties of tomatoes (1 variety/row) and one row of various cut flowers. The cut flower component was spearheaded by Guy Metzler, Armstrong County Extension Agent. This information will be presented separately in a future article.

Tomato varieties tested included 'Bush Early Girl' and 'Seedway 10250' which is described as a hybrid greenhouse tomato. Both varieties are determinate types. In addition, the cluster grape tomato 'Mini Charm' was also planted. 'Mini Charm' is an indeterminate type with 20 or more fruits per cluster.

Tomato transplants with an average height of 3.5 inches were planted in the high tunnel on May 1. (This was over 3 weeks before planting occurred in the field.) One variety was planted per row. Each of the rows consisted of a staggered double row of plants spaced 2' apart. Spacings between rows were 3' apart. Tomatoes were staked using the basketweave system and plants were pruned 3 - 4 times throughout the season. Early in the season plants were drip irrigated for 1/2 hour /day every 2 - 3 days. Irrigation was

increased by mid-summer to 1 hour /day every 1 - 2 days (1/2 hour in A.M. and 1/2 hour in P.M.). During most of the summer the sides of the high tunnel were rolled up between 6:00 - 6:30 A.M. and rolled down around 8:30 - 9:30 P.M. This schedule was adjusted, especially early and late season, according to environmental conditions.

Tomatoes grown in the high tunnel were sold at the roadside market located at the farm site. Yield comparisons cannot be made between 'Bush Early Girl' and 'Seedway 10250' because yield data was not kept separate. However, the total recorded yield for these varieties from initial harvest on July 24 - October 12 amounted to 1,158.5 pounds. This represents the yield harvested during the time the roadside market was open. Tomatoes continued to be produced in the high tunnel through the end of November but were not harvested for sale. 'Bush Early Girl' and 'Seedway 10250' were sold at the roadside market in both pint and quart containers. The average weight per pint was 0.75 pounds and sold for \$1.50/pint (\$2.00/pound). The average weight per quart was 1.5 pounds and sold for \$2.50/quart (\$1.67/pound). Prices were kept the same throughout the season.

In this trial the performance of the grape tomato 'Mini Charm' was a disappointment. This was mainly due to our own inexperience and labor availability. As indicated above, 3.5 inch high transplants were planted on May 1. By June 25 this variety was 5' tall and by July 26 had reached the top of the high tunnel. The plants were both suckered and trimmed down to a height of about 6', three times during the season. A total of only 22.5 pounds of grape tomatoes were harvested from July 25 - October 3. These tomatoes were sold in pint containers at \$1.50/pint. The flavor of these grape tomatoes was excellent and there was less cracking of fruit in the high tunnel compared with those grown in the field. In addition, the skins of the high tunnel grown grape tomatoes did not taste as tough as those grown in the field. However, this variety was extremely vigorous in the high tunnel and required more time in labor for pruning and picking than was available. The inability to harvest frequently and to provide the needed cultural maintenance resulted in unacceptable losses in our situation.

In general, pests were not a major problem. There were few weeds due to black plastic mulch in the rows and lack of water for seed germination between rows. A few aphids were observed on tomato plants early in the season. Late in the season two spotted spider mites were present. Botrytis sporulation was also observed on some dead tomato flowers which were killed due to high temperatures.

The first season of the High Tunnel Demonstration Project provided a valuable learning experience. Lessons learned this year will be used to change and improve the project for the 2002 growing season.

Nitrogen Requirement for Vegetable Crops Grown in Pennsylvania

Mike Orzolek, Department of Horticulture

The method of nitrogen application can include broadcasting, banding, sidedressing, fertigation, and foliar fertilization. Common or standard sources of nitrogen for vegetable crop production includes: Ammonium nitrate (33% N), calcium nitrate (20-22% N and 21% Ca), potassium nitrate (13% N and 44-46 K₂O), ammonium sulfate (21% N and 24% S), urea (45-46% N), monammonium phosphate MAP (11% N and 48% P₂O₅), and Diammonium phosphate DAP (16-18% N and 46-48% P₂O₅). Excess nitrogen in plants can result in luxurious vegetative growth and reduced reproductive growth or yield. In addition, excess nitrogen can delay crop maturity and quality of the harvested crop.

Total recommended nitrogen requirement for vegetable crops = Total recommended rate residual N cover crop N manure N equals lbs/A Nitrogen required or **surplus N**. If in doubt regarding nitrogen level in plant tissue, suggest tissue analysis within 2 to 3 weeks after establishing the crop.

Crop	Total N ₂ Requirement Crop (lbs/A)		Total N ₂ Requirement (lbs/A)
Asparagus			
Crowns	40	Okra	80-100
Cutting beds	40-60		
Beans		Onions	60-80
Lima	45-70		
Snap	25-40		
Beets	60-80	Parsley	100-125
Broccoli	80-120	Pasnips	40-60
Brussel Sprouts		Peas	30-45
Cabbage			
Cauliflower	100-120		
Carrots	40-60	Peppers	100-120
Celery	100-120	Potatoes	
		Sweet	40-60
		White	120-140
Cucumbers	80-100	Pumpkins and Winter	40-60

		Squash	
Eggplants	100-120	Radishes	40
Endive, Escarole Leaf Lettuce	60-80	Rutabaga and Turnips	40-60
Horseradish	100-120	Spinach	80-100
Iceberg Lettuce	45-65	Summer Squash	60-80
		Sweet Corn Fresh Market	100-120

When growing crops on plasticulture, remember to subtract from total N2 requirement, the amount you broadcast and incorporate prior to making the beds.

Bug vs. Bug - Greenhouse Sanitation Procedures are Necessary for a Successful IPM Program

Cathy Thomas, Integrated Pest Management Program
 Pennsylvania Department of Agriculture

To prepare for next year's spring greenhouse vegetable crop (or any other crop) the end of season cleanup is critical to prevent carry over of pests and diseases to the next crop cycle. Pest exclusion and greenhouse sanitation are cornerstones in establishing a successful integrated pest management program.

1. Remove all plant debris including weeds. Remove weeds outside the greenhouse, especially those near doors and vents. If plants are infested, place them in a bag and destroy. Do not place infested plant material in dump piles near greenhouses.
2. Pressure wash the interior of the greenhouse with a disinfectant solution.
3. Increase greenhouse temperature (when crop has been removed) to over 77 degrees F for several days. This increases the metabolism of pests left in the greenhouse causing them to starve in the absence of a food source. High sunlight and temperature can pasteurize the greenhouse. Heat treatment is preferred over cold treatment since cold temperatures induce insects into hibernation rather than starvation.
4. Eliminate areas of standing water. Insects will perpetuate with a water source.
5. Remove areas of algae since it is a food source and breeding area for fungus gnats and shore flies.

6. Consider the installation of insect screens over vents to prevent entry of whiteflies, thrips and winged aphids.
7. The ground or growth media should be treated for pests and diseases through crop rotation and/or steaming. This will reduce carryover of pests such as thrips and spider mites which hide where they are sheltered until favorable environmental conditions resume. Steaming is effective in eliminating insects, diseases, weeds, and nematodes.

After crop removal and other greenhouse treatments, place yellow sticky cards in the empty greenhouse to monitor for any lingering winged pests. Check the cards weekly to determine if further action is required. Some growers find it helpful to monitor for pests by placing sticky cards in the greenhouse, 1-2 weeks before planting the next crop.

If you plan to use pesticides as a corrective measure to destroy pests from a previous crop follow these guidelines if you are using natural enemies or bumble bees for pollination in the next crop cycle. Always use the cleanup procedures listed above when using a chemical treatment. This will reduce the need for chemicals at the beginning of the next crop cycle when the plants are young and tender.

1. Use selective pesticides. These are compounds that are non-toxic or slightly toxic to natural enemies.
2. Use pesticides with short residues. There are compounds that persist for a few days and those that persist for many months. Avoid using pesticides with long residuals especially if you plan to use natural enemies and bumble bees for pollination.
3. Avoid using traditional classes of insecticides such as synthetic pyrethroids, carbamates, chlorinated hydrocarbons, and organophosphates. For example, Endosulfan (Thiodan™) requires a three month waiting period before using bumblebees.
4. Compounds that can be used with short residue periods include pyrethrins (Pyganic™, listed on Organic Materials Review Institute), insecticidal soap, horticultural oil, azadirachtin (insect growth regulator).

Always consult a biocontrol supplier for specific information on chemicals and their effects on natural enemies. These websites will also provide specific information on many compounds.

<http://www.koppert.nl/e0110.shtml>

<http://www.biobest.be>

Please phone or email me if there are specific issues you would like me address in this column.

Cathy Thomas
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That's a Berry Good Question

Kathy Demchak, Department of Horticulture

Q. Why are my strawberry plants still sending out runners this fall? It's late October! They were also runnering by early May. Usually they don't runner that much unless its summer. (Anon.)

Well, as you may guess, it's all related to the warm weather we had this fall and last spring. Runner development is what's called a long-day response, but this doesn't mean that the days have to be long. It just means that the days have to be longer than a certain critical daylength. (And, if we get technical, even this isn't phrased correctly - what is needed is a nightlength shorter than a critical length.) Runner formation occurs in the spring or summer when days are at least 10 hours long (this happens in late January for PA) and temperatures are at least 70 degrees F. Because the daylength requirement is met so early - before plant growth begins - anytime we have warm temperatures in the spring, plants can begin runnering. This is why growers sometimes note runners forming as early as April or May. However, the longer the day and the hotter the temperatures, the greater will be the number of runners formed. Runner formation stops when days get less than 10 hours long (for PA, mid-November) or temperatures reach freezing. All of this varies with cultivar, too, but on average, this is the way things work.

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.

Guthion and Imidan Changes for Small Fruit

Kathy Demchak, Department of Horticulture

The EPA announced new restrictions on the uses of Guthion (azinphos-methyl) and Imidan (phosmet) on small fruit and many other crops. Guthion use on strawberries and grapes is immediately cancelled, though existing stocks may be used during at least 2002. Use on blueberries and caneberries will be allowed for on a 4-year time-limited basis; however, the uses on caneberries (raspberries, blackberries, etc.) would be limited to sprays directed to the lower canes and soil for control of crown borers. Foliar uses on caneberries would be prohibited. The re-entry interval and pre-harvest interval is 7 days for both blueberries and caneberries (previously 48 hours to 4 days depending on the activity for both crops).

Imidan may continue to be used on blueberries and grapes for the next 5 years during a time-limited registration, though the re-entry interval is increased to 3 days for blueberries and 14 days for grapes (previously 24 hours for both). These changes may be modified following a public comment period of 60 days.

NEWS RELEASE - For Immediate Release

Contact: Eric Oesterling, Penn State Cooperative Extension, Westmoreland County
(724) 837-1402

Western Pennsylvania Vegetable Growers Seminar

Eric Oesterling, Extension Agent, Westmoreland County

The annual Western Pennsylvania Vegetable Growers Seminar will be held in Butler, Pennsylvania at the Days Inn - on Wednesday, December 5, 2001 from 8:30AM to 3:30PM. This meeting draws commercial vegetable growers from western Pennsylvania, Ohio and West Virginia to learn the latest information and products available to help them profitably grow top quality produce. Excellent speakers from Penn State, Rutgers University and private industry will discuss pest management practices, business management, and other topics. Commercial exhibitors include seed companies, chemical companies, machinery dealers, greenhouse suppliers, irrigation equipment and distributors of a wide range of products for the commercial grower. Penn State Cooperative Extension and commercial suppliers co-sponsor the seminar.

The vegetable production sessions will feature practical pest management information. Dr Brad Majek, Weed Scientist with Rutgers University will discuss weed control in sweet corn and other crops. Dr. Majek is known for his practical experience, knowledge and real world advice on weed management in vegetable crops. Dr. Shelby Fleischer, Vegetable Crops Entomologist from Penn State will explain the sweet corn pest monitoring system and insect pest management in sweet corn, as well as control of root feeding insect pests. Lee Young, County Extension Director for the Washington County office of Penn State Cooperative Extension will discuss corn flea beetle and Stewarts wilt control. Five category (03) credits and two core credits toward updating pesticide applicator licenses will be given for those who attend the sessions on disease management and pesticide safety.

Separate sessions on business management will be held concurrently with the vegetable production seminars. Business sessions will feature estate planning, financial management, use of crop insurance to reduce risk and use of the internet as a marketing tool.

So if you are involved in, or seriously considering commercial vegetable growing, plan to attend the Western Pennsylvania Vegetable Growers Seminar. It will be held at the Days Inn, Rt. 8 south, Butler, Pennsylvania on December 5, 2001. Registration fee is \$20(includes lunch) if registration is received by Friday, November 30. To register or for more information contact Penn State Extension, Westmoreland County, R. R. #12, Box 202E, Greensburg, Pa. 15601 (724) 837-1402 or any Penn State Extension office in western Pennsylvania.

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Potato Musings

Bill Lamont, Department of Horticulture

Potato Program at the Mid-Atlantic Fruit and Vegetable Meeting in January

Bill Lamont, Department of Horticulture

Tuesday, January 29, 2002 PM

Session E

Potatoes

Tuesday, January 29, 2002, PM

Topics and Speakers

Presiding: Bob Leiby, Lehigh County Cooperative Extension

1:30 PM	Reinventing the Potato-Not The Same Old Spud- Tim Conner, President and CEO, National Potato Promotion Board
2:15	Marketing Pennsylvania Potatoes-Opportunities and Problems- The Broker's View Roger Springer- PA Potato Grower Cooperative Ron Hoover-EK Bear John Hurst-Hurst Potato Sales Ray Hendricks-A.C.E.
3:00 - 3:15	Industry Show and Tell
3:15	USDA Potato Breeding Program- An Update - Dr. Kathleen Haynes, USDA/ARS.
4:00	Developing Products for Specialty Potatoes in Pennsylvania- Dr. Luke Laborde, Department of Food Science, The Pennsylvania State University
4:30	Adjourn

Wednesday, January 30, 2002, AM

Session E

Potatoes

Topics and Speakers

Presiding: Ron Hostetler, Cambria County Cooperative Extension

9:00 AM	Varieties for the Chipping and Tablestock Industry- Dr. Don Halseth, Department of Horticulture, Cornell University, Ithaca, NY
9:30	Producing Potatoes Using Plasticulture-Dr. Bill Lamont, Department of Horticulture, The Pennsylvania State University
10:00 - 10:15	Industry Show and Tell
10:15	Fertilizing for High Quality Potatoes-Dr. Gregory Porter, Department of Applied Ecology and Environmental Science, University of Maine, Orono, ME
11:00	Potato Harvesting to Reduce Bruising- Dr. Don Halseth, Department of Horticulture, Cornell University, Ithaca, NY
11:30	Handling Potato Seed for Optimum Performance-Dr. Steven B. Johnson, Crops Specialist, University of Maine Cooperative Extension, Presque Isle, Maine
12:00 - 1:30 PM	Lunch and Visit with Exhibitors

Session B

Potatoes

Wednesday, January 30, 2002, PM

Topics and Speakers

Presiding: Tom Butzler, Clinton County Cooperative Extension

1:30 PM	Managing the European Corn Borer in Potatoes- Dr. Brian A. Nault, Department of Entomology, NYSAES, Cornell University, Geneva, NY
2:00	Update on Management Strategies for Late Blight and other Potato Diseases- Dr. Barbara Christ, Professor, Department of Plant Pathology, Penn State University,

2:30	Management Issues in Storing Potatoes-Dr. Roger Brook, Extension Engineer, Michigan State University, East Lansing, MI
3:00 - 3:15	Industry Show and Tell
3:15	Proper Ventilation of Potato Storages- Todd Forbush, Engineer, Techmark Inc., Lansing, MI
4:00	Managing Potato Storages Under Disease Pressure Situations - Dr. Steven B. Johnson, Crops Specialist, University of Maine Cooperative Extension, Presque Isle, Maine 04769
4:30	Adjourn

Upcoming Meetings

Bill Lamont, Department of Horticulture

Local

December 5, 2001: Western PA Vegetable Growers Meetings, Butler, PA. Contact: Eric Oesterling (724) 837-1402.

January 5-10, 2002: Pennsylvania Farm Show, Harrisburg PA. Contact: Dr. Pete Ferretti (814) 863-2313.

January 17, 2002: Morrison's Cove Produce Auction Meeting, Martinsburg, PA. Contact: Tom Ford (814) 940-5989

January 21, 2002: New Holland Vegetable Growers Day, New Holland PA. Contact: Tim Elkner (717) 394-6851

January 24, 2002: Susquehanna Regional Vegetable Meeting, Mifflinburg PA. Contact: Jeff Mizer (570) 837-4252

February 6, 2002: Northeast Vegetable Growers Meeting, Thompson's Dairy Bar, Clarks Summit, PA. Contact: John Esslinger (717) 963-4761

February 7, 2002: Tri-County Vegetable and Small Fruit Meeting, Penn Township Community Bldg., Shippensburg, PA. Contact: Steve Bogash (717) 263-9226

February 19, 2002: Lebanon County Auction Vegetable Meeting, Shaefferstown Fire

Community Building, Shaefferstown PA. Contact: Ginger Pryor (717) 240-4391

February 20, 2002: Cambria and Somerset Regional Vegetable and Potato Meeting, Ebensburg, PA. Contact: Ron Hostetler (814) 472-7986

February 28, 2002: Lehigh/Schuylkill County Potato Growers Meeting, Schnecksville Grange in Neffs PA.. Contact: Bob Leiby (610) 391-9840

March 5, 2002: Schuylkill County Regional Vegetable Growers Meeting, Extension Office, Pottsville, PA. Contact: George Perry (570) 622-4225

March 6, 2002: Southeastern Vegetable Growers Meeting, Heritage Restaurant, Franconia, PA. Contact: Mary Conklin (610) 489-4315

March 7, 2002: 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

March 12, 2002: North Central Vegetable Meeting, Pleasant Gap, PA. Contact: Tom Butzler, (570) 726-0022

March 13, 2002: North Central Vegetable Producers Conference, Coudersport, PA. Contact: Greg Burns (814) 776-5331

March 14, 2002: Erie County Potato and Vegetable Growers Meeting. Contact: Andy Muza (814) 825-0900

March 30, 2002: Pond Management for Irrigation, Livestock and Recreational Uses. Biglerville Fruit Lab, Biglerville PA. Contact: Steve Bogash (717) 263-9226

Regional

January 15-17.2002: Vegetable Growers Association Annual Meeting and Trade Show, Atlantic City, NJ. Contact: Phil Traino (856) 985-4382.

January 29-31, 2002: Mid-Atlantic Fruit and Vegetable Growers Convention, Hershey, PA. Contact: Bill Troxell (717) 694-3596.

National

February 23-26, 2002: 30th American Society for Plastics Congress, San Diego, CA. Contact: Pat Heuser Phone: (717) 238-9762 Fax: (717) 238-9985 or website