The Vegetable & Small Fruit Gazette

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In This Issue

Comments from the Editor

Elsa Sánchez, Department of Horticulture, Penn State University

I want to thank Tim Elkner for his excellent article, **2005 Pumpkin Variety Evaluations in Pennsylvania.** I also look forward to Eric Oesterling's article for the March issue. I also want to thank everyone who contributed articles to this issue and I want to encourage others to join us in upcoming issues. As always, the Vegetable & Small Fruit Gazette Team encourages your feedback so that we can better serve your needs and address your concerns.

Quote for Thought from Pete Ferretti

> A hunting party was hopelessly lost. An angry hunter barked at the guide, "I thought you called yourself the best guide in Maine!"
> "I am, sir, he replied, "but I think we're in Canada now."
>
> - The Lion (July/August 2005)

Schedule for Articles

March – Eric Oesterling	April – George Perry
May – Lee Young	June – Jeff Mizer
July – Tom Butzler	August – Steve Bogash
September – Cheryl Bjornson	October – Scott Guiser
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2005 Pumpkin Variety Evaluations in Pennsylvania

Timothy E. Elkner, Horticulture Extension Educator, Lancaster County, Tom Butzler, Horticulture Extension Educator, Clinton County and Mike Orzolek, Horticulture Extension Specialist, Department of Horticulture, Penn State University

Pumpkins are a high value crop in the mid-Atlantic region. In Pennsylvania, pumpkin acreage is second only to sweet corn. PA ranked first in fresh market pumpkin production in 2002 with 7,376 acres harvested for 9% of the total US acreage (non-processing). Because of the importance of pumpkins in PA, multiple field trials are often conducted throughout the state. There have been many new varieties of pumpkins introduced in recent years by commercial seed companies and some are reported to have PM tolerance or resistance. The studies reported in this paper were designed to evaluate new pumpkin varieties, including PM tolerant and resistant pumpkin varieties, under PA growing conditions.

Seven varieties of small pumpkins (<5 lbs), 10 varieties of medium pumpkins (7-24 lbs) and 12 varieties of large pumpkins (25+ lbs) were grown in Lancaster County while 4 varieties of small pumpkins, 8 varieties of medium pumpkins and 9 varieties of large pumpkins were grown in Centre County in 2005. The pumpkins were grown using raised beds with black plastic row covers and drip irrigation in Lancaster and on bare soil with overhead irrigation at Centre County. Spacing of the plants was as follows: small – 2 ft in row X 8 ft between rows (Lancaster) and 6 X 3 (Centre County), medium – 4 ft in row X 8 ft between rows and large – 8 ft X 8 ft (Lancaster)and 9 ft X 9 ft (Centre County). Transplants were set June 15 in Lancaster and June 23 in Centre County. Admire was applied through the drip system post-planting in Lancaster at the labeled rate. Recommended fertility, weed control and disease and insect control practices were used. There were three 10 plant replicates per variety at Lancaster and two 10 plant replicates per variety at Centre County. Fruit were harvested and weighed on September 28 in Centre County and September 29 and 30 in Lancaster.

Overall, yields were similar or slightly higher in Lancaster for the small and medium varieties with higher yields in the large varieties (Tables 1, 2). Average fruit sizes were similar at both sites for small and medium varieties while Centre County had higher average fruit size in the large varieties. This was most likely a function of greater space for each plant at that location (81 ft^2 vs. 64 ft^2). Producers of large pumpkins will need to consider their markets when spacing large-fruited plants – higher spacing resulted in larger fruit but overall reduced yields.

'Ironman' was the highest yielding small variety at Lancaster followed by Cannonball. 'Ironman' had similar yields at Lancaster in 2004 (Note: 2004 data not reported in this paper. See the web address at the end for this information). 'Cannonball' was the highest yielding small variety at Centre County followed by 'Prankster' (RPX 089). 'Ironman' did not perform well at Centre County. The small pumpkins tended to have a smooth texture (Table 3) and good handle quality.

RPX 764 and RPX 763 were the most productive medium-sized fruit at Lancaster while RPX 764 and 'Racer' were best at Centre County. However, there were some fruit quality issues with both RPX 763 and RPX 764 so these lines have been dropped by Rupp. 'Racer' and 'Charisma' both performed better at Centre County than Lancaster. These varieties suffered heavily from sunburn at

Lancaster which significantly reduced yields. 'Magician' and 'Gold Gem' performed well at Lancaster but not in Centre County. 'Magic Lantern', the current standard in Lancaster County, performed poorly this season compared to previous seasons. However, 'Scarecrow' and 'Gold Bullion', which performed well at Lancaster in 2004 also performed poorly in 2005. The medium varieties generally had good handle quality at both locations and tended to have more ribbing than the smaller varieties at Lancaster.

'Dependable' had the highest yields at Lancaster in the large pumpkin group. RPX 768 and 'Gold Medallion' (RPX 771) were the highest yielding varieties at Centre County. These varieties also did well at Lancaster. 'Harvest Time' and 'Gold Medal' were two additional varieties that did well at both locations. 'Expert' did well at Centre County but suffered from sunburn at Lancaster. 'Autumn King' and 'Golden Condor' were two varieties that performed well in 2004 but poorly in 2005 at Lancaster. Texture of the large pumpkins varied more within the group than in the medium pumpkins. Growers should match the texture of varieties grown to their anticipated market needs.

Photographs from all varieties grown at Lancaster can be viewed at: http://capitalhort.cas.psu.edu/Default.html . Select "Research/Variety Trails". Additional data and photographs from all varieties grown at Centre County can be viewed at: http://clinton.extension.psu.edu/hort/pumpkin/05Pumpkin_demonstration.htm.

Table 1: Yield and fruit quality ratings for 29 varieties of small, medium, and large pumpkins grown in Lancaster County, PA in 2005.

Variety	# fruit/ Plant	Avg. wt. Fruit	Est. yield (tons/A)	Handle Quality[a]	Source
Small					
Cannonball	2.8	3.7	13.8	4.0	HM*
Ironman	3.7	3.2	16.2	4.2	HM
Gold Dust	9.5	0.6	9.0	3.7	Rupp
Prankster (RPX 089)	3.3	2.6	11.5	3.5	Rupp
Bumpkin	6.7	0.5	4.9	3.2	Meyer
Harvest Princess	5.6	1.5	11.5	3.5	Meyer
Pure Gold	2.1	2.1	6.7	3.2	Meyer
Medium					
Magician	3.3	9.8	22.1	3.2	HM
18 Karat Gold (RPX 761)	2.3	11.1	17.3	3.3	Rupp
Racer	2.4	9.4	15.2	3.8	Johnny's
Gold Bullion	1.9	10.7	13.9	2.8	Rupp
Magic Lantern	1.8	11.0	13.9	2.7	HM
Charisma	2.1	10.4	15.2	3.2	Johnny's
RPX 763[b]	2.7	13.0	23.5	4.0	Rupp
RPX 764[b]	2.7	14.4	26.5	3.2	Rupp
Scarecrow	1.8	8.7	10.6	3.0	Meyer
Gold Gem	1.8	15.5	18.6	3.3	Rupp
Large					
Gladiator	2.0	13.7	9.1	3.2	HM
Harvest Time	3.1	21.4	22.5	2.7	AC*
RPX 768[c]	2.7	19.8	18.2	2.8	Rupp
Expert	1.7	13.5	7.9	2.8	Johnny's
Autumn King	2.2	15.9	12.0	3.5	Rupp
Super Herc	1.7	18.2	10.3	3.5	HM
Dependable	4.5	18.6	28.8	3.5	AC
Gold Medallion (RPX 771)	2.8	19.6	18.7	3.2	Rupp
Gold Medal	3.8	16.4	20.9	3.2	Rupp
Golden Condor	2.2	17.7	13.0	3.5	Meyer
20 Karat Gold (RPX 760)	2.1	12.2	8.6	4.0	Rupp
Pro Gold 510	2.8	15.9	14.9	3.2	AC

*HM = Harris-Moran, AC = Abbott and Cobb

[a]Handle quality was rated using a scale from 1 to 5 with 1 being poor and 5 being excellent

[b]Line dropped by Rupp

[c]Line still in trial at Rupp

Table 2: Yield and fruit quality ratings for 21 varieties of small, medium, and large pumpkins grown in Centre County, PA in 2005.

Variety	# fruit/ Plant	Avg. wt. Fruit	Est. yield (tons/A)	Handle Quality[a]	Source
Small					
Cannonball	2.2	3.5	9.4	3.5	HM*
Gold Dust	7.5	0.6	5.6	5.0	Rupp
Prankster (RPX 089)	2.0	3.4	8.2	2.0	Rupp
Ironman	1.5	3.2	5.6	3.5	Meyer
Medium					
Charisma	2.0	12.3	16.4	3.5	Johnny's
Racer	2.9	10.3	20.4	4.5	Johnny's
Cotton Candy	1.3	4.2	3.6	1.0	Rupp
RPX 763[b]	2.0	15.9	21.0	4.5	Rupp
Magician	1.7	8.6	9.7	1.5	HM
18 Karat Gold** (RPX 761)	2.3	11.1	17.3	3.3	Rupp
RPX 764[b]**	1.7	14.5	6.4	4.0	Rupp
Gold Gem**	1.7	15.2	7.1	3.0	Rupp
Large					
Harvest Time	1.5	23.7	9.6	3.5	AC*
Pro Gold 510	1.7	18.8	8.3	3.0	AC
Expert	1.8	19.2	9.3	3.5	Johnny's
Gold Medallion (RPX 771)	1.9	23.1	11.5	3.0	Rupp
RPX 768[c]	2.5	22.3	15.0	3.0	Rupp
20 Karat Gold (RPX 760)	1.4	14.5	5.4	3.5	Rupp
Gold Medal	1.7	20.6	9.6	4.0	Rupp
Super Herc	0.9	26.6	7.8	4.0	HM
Gladiator	1.7	13.6	6.1	2.5	HM

*HM = Harris-Moran, AC = Abbott and Cobb

**Medium pumpkins grown at Large spacing

[a]Handle quality was rated using a scale from 1 to 5 with 1 being poor and 5 being excellent

[b]Line dropped by Rupp

[c]Line still in trial at Rupp

Table 3: Evaluation of color, shape, texture, and handle quality for 29 pumpkin varieties grown in Lancaster County, PA in 2005. Texture is rated on a scale of 1-5 with 1 being very smooth and 5 being heavily ribbed.

Variety	Color	Shape	Texture
Small			
Cannonball	Dark Orange	Round	2.0
Iron Man	Dark Orange	Round	2.0
Gold Dust	Yellow Orange	Flattened Oval	3.3
Prankster (RPX 089)	Orange	Round	2.5
Bumpkin	Yellow Orange	Flattened Oval	2.2
Harvest Princess	Orange	Variable	3.2
Pure Gold	Orange	Round	2.5
Medium			
Magician	Dark Orange	Upright Round	3.3
18 Karat Gold (RPX 761)	Dark Orange	Upright Round	2.3
Racer	Dark Orange	Round	3.5
Gold Bullion	Orange	Upright Round	3.0
Magic Lantern	Dark Orange	Upright Round	3.3
Charisma	Orange	Round	3.7
RPX 763[a]	Orange	Upright Round	3.0
RPX 764[a]	Yellow Orange	Round	2.3
Scarecrow	Dark Orange	Upright Round	2.8
Gold Gem	Orange	Upright Round	4.0
Large			
Gladiator	Dark Orange	Upright Oval	3.2
Harvest Time	Orange	Upright	2.7
RPX 768[b]	Orange	Upright Oval	3.0
Expert	Dark Orange	Upright Oval	4.0
Autumn King	Orange	Upright	2.5
Super Herc	Dark Orange	Upright	4.0
Dependable	Yellow Orange	Upright	3.0
Gold Medallion (RPX 771)	Orange	Upright Oval	2.8
Gold Medal	Dark Orange	Upright Oval	3.0
Golden Condor	Dark Orange	Upright	2.5
20 Karat Gold (RPX 760)	Dark Orange	Round	2.8
Pro Gold 510	Dark Orange	Upright Oval	3.3

[a]Line dropped by Rupp
[b]Line still in trial at Rupp

Potato Chips are a Big Business

Bill Lamont, Department of Horticulture, Penn State University

Super Bowl Sunday has become as much of a food event as it has a sports event. The Super Bowl now ranks as the number two food consumption event of the year, second only to Thanksgiving.

According to Frito-Lay, the nation's largest chip manufacturer, they must increase production in the weeks leading up to the event by more than 10 million pounds of chips just to meet the demand for this coming Sunday's viewing event. Add that to a normal week's consumption and, according to ACNielsen Scantrack, that makes the chip business in supermarkets in the United States worth over $2.7 billion each year. Total sales, in all outlets everywhere in the U.S., including places like convenience stores, delis and ballparks, top $6 billion! The U.S. potato chip industry alone employs more than 65,000 people.

In 2004, Americans consumed over 1.85 billion pounds of chips as the potato chip officially celebrated its 150th birthday, and while today there are hundreds of brands and varieties lining the supermarket shelves; it is still the "plain" potato chip that remains the sales leader capturing over 80% of sales.

The potato chip hasn't changed all that much since it was first invented back in 1853 by a cook by the name of George Crum in Saratoga Springs, New York. Crum, a part Indian, part African-American worked at the Moon Lake Lodge, and according to folklore, didn't much care for customers who complained and sent their food back to the kitchen. One such customer, reportedly Commodore Cornelius Vanderbilt, sent back his dinner complaining that the standard, thick-cut French style that was popularized in France in the 1700s and brought to the United States by Thomas Jefferson (when he returned from his stint as ambassador to that country) were too thick for his liking and sent back the order. Crum then cut and fried a thinner batch, but Vanderbilt once again complained, and sent these fries back to the kitchen. As was his manner, Crum decided to get even with the unknown guest, and prepared French fries that were too thin and crisp to skewer with a fork.

Supposedly, Vanderbilt loved the browned, paper-thin potatoes, and as fate would have it, other diners requested Crum's potato chips which he called potato crunches, and they soon appeared on the menu as Saratoga Chips, the house specialty; which led to Crum opening his own restaurant, on the lake in Saratoga Springs, called Crum's House, which was financed by four men including Vanderbilt. Crumb called his signature dish "potato crunches" and placed them in baskets on all the tables. He also marketed them for takeout in boxes as "Saratoga Chips" but, not realizing the importance of his creation, neither patented nor otherwise protected his invention.

Potato chip mass production is credited first to William Tappendon of Cleveland, OH, in 1895. He began making chips in his kitchen and delivered them to neighborhood grocery stores; he later created one of the first potato chip factories in a converted a barn in his backyard.

The early 1900s gave birth to a number of companies that helped define the potato chip industry. Leominster Potato Chip Co. founded in 1908. In 1910, Daniel Mikesell and his wife started Mike-sell's in Dayton, Ohio. Dan Dee Pretzel and Potato Chip Company (1913), Num Num (1918), and

Blue Bell (1919) followed. In Pennsylvania, Wise Potato Chips was founded in 1921 when Earl Wise, Sr. decided to make potato chips out of the excess potatoes at his Berwick, Pa. delicatessen. That same year Bill and Salie Utz founded Utz Quality Foods in Hanover, Pa. and Magic City Food Company (which later became Golden Flake Snack Foods) opened in Birmingham, Ala. In 1932, Herman Lay founded Lay's in Nashville, Tenn., which distributed potato chips from a factory in Atlanta, Ga. In 1938, Lay purchased the chip factory and Lay's Brand Potato Chips was born. An industry was launched. Potato chips have become America's favorite snack. But it was the invention of the mechanical potato peeler and continuous fryer, both in 1929 that that moved potato chips from a local small specialty item to the nation's top-selling snack that it is today. In 1926, Laura Scudder started her potato chip company in California, and developed the wax paper bag to pack her chips to preserve their freshness and crispiness, making possible a wider distribution area. At about the same time, Herman Lay, a traveling salesman in the South, helped bring potato chips from Atlanta to Tennessee. Lay sold his chips to Southern grocers out of the trunk of his car, building the first successfully marketed national brand of chips. He is also credited with the invention of the mechanical potato chip peeler.

Today, the trends driving chips include more flavors, less fat and calories, reduced carbs, organic, and much like the trends in wine, beer and coffee – a return to the basics with a number of hand made, kettle-type chips, that are challenging the mainstream products both in taste and price.

Unlike "table potatoes" which come primarily from Maine and Idaho, the number one source of chipping potatoes is Pennsylvania. Although the state ranks only 13th in total potato output, 70% (maybe slightly less today) of the acres in potatoes are in chipping potatoes and these potatoes account for about 25% of all chipping potatoes, the highest in the U.S. Second in production is North Dakota, followed by Florida and then New York State. Many of the boutique brands of chips actually use different varieties of potatoes for different flavors and list them on their packages.

But there are favorites: in the Midwest shoppers prefer a light blander chip, Easterners would rather eat a strong-flavored, darker chip and our northern friends, and the Northeast states and Canada favor salt and vinegar flavored chips. Often, you may find chips of all kinds that are 'browned', and while most of us avoid them thinking they are burned or overcooked, the truth is that some potatoes naturally have higher sugar content and the browning is nothing more than carmelization.

This brings me to our own potato chip initiative here in the Department of Horticulture-the "Blue and White" potato chips to be marketed this coming fall during the football season and hopefully beyond into another bowl game. This is part of the innovative and new variety of chips that are being marketed on the store shelves. We will market the chips at the Cellar Market, the Creamery and hopefully the Penn State dinning facilities. If this program is successful then the cooperating chip company can take a run with it and market the chips at other sporting venues or to the faithful Penn State Alumni through a variety of marketing outlets from supermarket shelves to other innovative marketing strategies. This could be the first in what I like to call the "Sporting Packs of Chips". We have most of the school colors in the potato gene bank we just need to pull them out and market them. Then we can have Navy-"Blue and Gold chips or Nebraska-"Red and White chips". Plus these colored chips are healthier for you, similar to consuming a glass of red wine, blueberries or cranberry juice.

Rotational Crop Planting Restrictions for New Sweet Corn Herbicides

David H. Johnson, Penn State Southeast Research and Extension Center

Weed control is a critical component of sweet corn production, and most growers rely on herbicides as their primary control strategy. Some herbicides have residual activity, in that they continue to be active in the soil for a time after application and control weeds that germinate later in the season. Ideally, this residual control last only long enough to provide the needed duration of weed control and not long enough to injure a sensitive crop that may be planted after sweet corn, either in the same or following year.

Two herbicide products were recently labeled for use in sweet corn. These are Callisto, which contains the active ingredient mesotrione, and Impact, containing the active ingredient topramezone. Both are also labeled for field corn. Both products act to inhibit the plant enzyme hydroxyphenylpyruvate deoxygenase, an important enzyme in the biosynthesis of carotenoid pigments. This results in destruction of plant chlorophylls and "bleaching" (whitening) of foliage of susceptible plants, eventually resulting in plant death. The herbicide Balance Pro (isoxaflutole), which is labeled for field corn (but **not** sweet corn), acts in the same way. Mesotrione is also included in the products Lumax and Lexar, which also contain s-metolachlor and atrazine. These products are labeled for preemergence and early postemergence use in field corn, but neither of these products is currently labeled for sweet corn. It is possible that Lumax will be approved for sweet corn for the 2006 season.

Callisto and Impact are applied postemergence and control annual broadleaf weeds such as common lambsquarters (including triazine resistant), pigweeds, velvetleaf, nightshade, and ragweeds, among others, and also have some activity on small annual grass weeds. They provide residual control of several annual broadleaves. Because of this residual control, there is a risk of injury to crops planted after sweet corn, including several vegetables. This article summarizes the rotational restrictions for these herbicides. This information is taken directly from the product labels.

The label restrictions for Callisto and Impact in Pennsylvania are very similar (Table 1). Both allow planting of all types of corn immediately after use, small grains at 3 months after use, and soybean, sorghum, and alfalfa at 9 months after use. The Callisto label allows planting of potato and tobacco at 9 months after use. For all other crops, including vegetables, growers must wait at least 18 months from the time of product application until planting. This precludes planting most vegetable crops until two years after application. Besides being illegal (against the label), planting these crops sooner will increase the risk of injury and may introduce illegal chemical residues to harvested crops.

Lumax and Lexar both contain atrazine, and hence rotational crop planting restrictions are a bit more restrictive. However, for vegetable crops, growers must wait at least 18 months from the time of application before planting. Other products containing atrazine, such as Bicep II Magnum, Bullet, Cinch ATZ, and Guardsman Max (including the "Lite" versions of these products) also have 18-month restrictions on planting rotational crops.

When planning your weed control program for sweet corn, growers must consider the crops they want to plant into their fields the following year when choosing herbicides. For those planning to grow vegetable crops in those fields the following year, choose herbicides with less residual activity to avoid the potential for injury and illegal residues in their harvested crop. **Always refer to your product labels to ensure you can legally plant your planned rotational crop after use.**

Table 1. Rotational restrictions for new and potential sweet corn herbicides. Information is directly from product labels.

	Minimum time from product application until rotational crop planting			
Product	Anytime	3 months	9 months or next year	18 months
Callisto	All types of corn	Small grains	Soybean, sorghum, potato, tobacco, alfalfa	All other crops
Impact	All types of corn	Small grains	Soybean, sorghum, alfalfa	All other crops
Lumax*, Lexar**	Field corn	None	Corn (all types), small grains, soybeans, sorghum	All other crops

*Lumax is NOT currently labeled for sweet corn. Label is pending for 2006 season.
**Lexar is NOT currently labeled for sweet corn. Timeline is probably after 2006.

The Organic Way – Resource Guide for Organic Insect and Disease Management

Elsa Sánchez, Department of Horticulture, Penn State University

A new publication is available for organic growers and growers in transition to organic production, extension personnel, and farm advisors. **Resource Guide for Organic Insect and Disease Management** contains information on cultural strategies and materials in compliance with the National Organic Standards based on published research for insect and disease management of vegetable crops. Crops included in the guide are brassicas, cucurbits, lettuce, solanaceous crops and sweet corn. The guide also contains color photographs of many insects and symptoms of diseases for these crops. Material fact sheets containing references and appendices are also included. The guide is available in its entirety online at http://www.nysaes.cornell.edu/pp/resourceguide/index.php. Additionally, a limited number of copies are also available for purchase $5 plus $4 shipping and handling by contacting Gemma Osborne, NYSAES by mail at 630 W North Street, Geneva, NY 14456 or by email gro2@cornell.edu or by telephone at (315)787-2248.

Berry Crop Insecticide/Miticide Groups

Kathy Demchak, Department of Horticulture

As promised last month in the article on fungicide activity groups, here's a listing of insecticides by activity groups. This information is primarily from the IRAC (Insecticide Resistance Action Committee) Mode of Action Classification, Version 5.1, as updated in Sept. 2005, found at http://www.irac-online.org. These are the same group numbers that are included on labels from certain companies. Caneberries is the crop group that covers raspberries, blackberries, and their hybrids, and bushberries covers crops such as blueberries, gooseberries, currants, and elderberries. Groups not listed below currently do not contain any insecticides labeled for berry crops. As always, follow the instructions on the label in your possession.

Group 1: Acetylcholine esterase inhibitors. This include subgroups 1A (carbamates) and 1B (organophosphates). Active ingredients in subgroup 1A include carbaryl (Sevin), labeled for use on strawberries, caneberries, and blueberries, and methomyl (Lannate), which can be used on strawberries. Carbofuran (Furadan), no longer labeled for use on berries is also in this group. Subgroup 1B includes azinphos-methyl (Guthion or Sniper) which can be used on caneberries until the end of Sept., 2006; chlorpyrifos (Lorsban), which can be used on strawberries prebloom; diazinon, labeled for use on strawberries and blueberries; fenamiphos (Nemacur), which can be used preplant on strawberries and after harvest on raspberries; malathion, which is labeled for use on strawberries, caneberries, blueberries, and Ribes; naled (Dibrom), labeled for use on strawberries; and finally, phosmet (Imidan) for use on blueberries.

Group 2A: GABA-gated chloride channel antagonists. Endosulfan (Thionex), labeled for use on strawberries and blueberries, is in this group.

Group 3: Sodium channel modulators. This group includes the pyrethroids bifenthrin (Brigade or Capture), fenpropathrin (Danitol), and esfenvalerate (Asana), and pyrethrins (an active ingredient in Pyrellin and Pyganic). Brigade is labeled for use on strawberries and caneberries, Capture is labeled for use on caneberries, Danitol can be used on strawberries, blueberries, gooseberries and currants, and Asana is labeled for caneberries and blueberries. Pyrellin and Pyganic can be used on any of the berry crops.

Group 4: Nicotinic acetylcholine receptor agonists/antagonists. There are three subgroups in this group, but only subgroup 4A, the neonicotinoids, includes any insecticides labeled for use on berry crops in PA. This group includes imidacloprid (Admire and Provado), and thiamethoxam (Actara and Platinum), all labeled for use on strawberries and bushberries.

Group 5: This is a different category of nicotinic acetylcholine receptor agonists. Spinosad is in this category (Spintor, Success, and Entrust). All three materials are labeled for use on strawberries, caneberries, and bushberries.

Group 6: Chloride channel activators. Abamectin (Agri-Mek), a miticide labeled for use on strawberries, is in this group.

Group 7: Juvenile hormone mimics. This group includes pyriproxyfen (Esteem), labeled for bushberries.

Group 10: Compounds with unknown or non-specific modes of action. This group includes the miticide hexythiazox (Savey) in subgroup 10A, and etoxazole (Zeal), in subgroup 10B. Savey is labeled for use on strawberries and caneberries, while Zeal is labeled for only strawberries.

Group 11: Bt insecticides are in this group.

Group 12: Inhibitors of oxidative phosphorylation, and disruptors of ATP formation. Hexakis (Vendex), a miticide labeled for use on strawberries, is in subgroup 12B.

Group 18: Ecdysone agonist/molting disruptors. Tebufenozide (Confirm) is in subgroup 18A, and azadirachtin (Aza-Direct) is in subgroup 18B. Confirm is labeled for use on caneberries and bushberries, while Aza-Direct can be used on any of the berry crops.

Group 20: Mitochondrial complex III electron transport inhibitors. Acequinocyl (Kanemite) is in subgroup 20B, and is a miticide for use on strawberries.

Group 25: Neuronal inhibitors. Only bifenazate (Acramite), a miticide labeled for use on strawberries and nonbearing caneberries and bushberries is in this group.

Group un: Compounds with an unknown mode of action (may be recategorized as more information becomes available). Dicofol (Kelthane), a miticide, is in this category, and is labeled for use on strawberries.

Upcoming Meetings

If you have a meeting you would like to announce, please send the meeting title, date, location and contact information to esanchez@psu.edu.

Local

- ✓ February 11, 2006. **Central PA Crop Growers Meeting**, Penns Valley, PA. For more information contact Tom Butzler at (570) 726-0022 or tmb124@psu.edu.
- ✓ February 18, 2006. **Central PA Crop Growers Meeting**, Tyrone, PA. For more information contact Tom Butzler at (570) 726-0022 or tmb124@psu.edu.
- ✓ February 20, 2006. **Tri County Vegetable Growers' Meeting**, Shippensburg, PA. For more information contact Steve Bogash at (717) 263-9226 or smb13@psu.edu.
- ✓ February 22, 2006. **Farm Family Day**, Lebanon, PA. For more information contact Ginger Pryor at (717) 270-4391 or LebanonExt@psu.edu.
- ✓ March 7, 2006. **Regional Vegetable Growers' Meeting**, Pottsville, PA. For more information contact George Perry at (570) 622-4225 or gpp1@psu.edu.
- ✓ March 15, 2006. **Erie County Vegetable Growers' Meeting**. For more information contact Andy Muza at (814) 725-4601 or ajm4@psu.edu.

Regional

- ✓ February 2 – 4, 2006. **PASA's 15th annual Farming for the Future Conference**, State College, PA. For more information contact PASA (Pennsylvania Association for Sustainable Agriculture) at (814) 349-9856 or info@pasafarming.org. Registration materials can also be found online at www.pasafarming.org.
- ✓ February 22 – 25, 2006. **Mid-Atlantic Direct Marketing Conference and Trade Show**, Reading PA. For additional information, registration materials, or to sign up as an exhibitor, contact John Berry at 610-391-9840, via FAX at 610-391-0683 or via e-mail at jwb15@psu.edu. Provide your name, address, phone and fax numbers, and e-mail address.
- ✓ February 28 – March 1, 2006. **Greenhouse Tomato Short Course**, Jackson, Mississippi. For additional information, including a tentative agenda, registration materials and exhibitor information visit http://www.greenhousetomatosc.com.

National

International

- ✓ February 27 – March 3, 2006. **Advanced Permaculture Garden Design**, Nuevo Arenal, Costa Rica.
  Course Instructors: Daninne Egizio-Hughes and Darrell Frey. This course will focus on applying permaculture design to create gardens and functional landscaping for the Inn. Intensive tropical and forest gardens will be designed to supply fruits, herbs and vegetables for the Inn's visitors. Course Fee: $1500. Registration includes course fee and lodging at the Red Sunset Inn Nearby activities include recreation at Lake Arenal, eco-tours and the spectacular Arenal Volcano. For more information contact Darrell Frey at (724) 376-2797 or defray@bioshelter.com.

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