The Vegetable and Small Fruit Gazette

Vol. 9, No. 5- May 2005

Horticulture Department
The Pennsylvania State University

In this Issue:

Comments from the Editor
Quote for Thought from Pete Ferretti
Schedule for Educator Articles
Strawberry Plasticulture Review
Triazine-Resistant Lambsquarters Control in Sweet Corn
New Conservation Security Program Payments Can Be Used for IPM
The Organic Way- Plant Families
Review of Recent Herbicide Additions/Changes for Vegetable Crops
Review of Compendium of Potato Diseases, Second Edition
Actara®/Platinum for Strawberries and Bushberries
Nifty Frost Alert
Job Announcements
Upcoming Meetings

Comments from the Editor

Elsa Sánchez, Department of Horticulture

I want to thank George Perry for his excellent article, Strawberry Plasticulture Review, and look forward to Jeff Mizer's article for the June 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.

Back to top

Quote for Thought from Pete Ferretti

Pete Ferretti, Department of Horticulture

Warden Kane to prisoner about to be executed – "Do you have one last wish?"
Prisoner – "Yes, fire my lawyer!"

-Warden Kane
WTLR Radio

Back to top

Schedule for Agent Articles

Elsa Sánchez, Department of Horticulture

May– George Perry	June– Jeff Mizer
July– Scott Guiser	August– Tom Butzler
September– Lee Young	October– Cheryl Bjornson
November– John Esslinger	December– Andy Muza

Back to top

Strawberry Plasticulture Review

George Perry, Extension Agent, Schuylkill County

Let's review what makes a good strawberry plasticulture planting. Strawberry cultivars are vegetatively propagated because their seeds are not true to type. Using plug transplants is the best method to establish a high quality planting. The advantage of a plug is it's not subject to digging damage which results in transplant shock. Research has shown that large crowned transplants produce higher early season yield than small crowned transplants. Plugs can be purchased from commercial suppliers which have had their stock inspected and approved free of disease and insects. Also, growers may want to grow their own plugs. If you are planning on producing your own plugs, purchase tips from a reliable source. By using your own tips you are another generation further from the original cultivar. Sanitation and having the proper equipment may be the deciding factor to purchase and not try and grow your own plugs. If disease is in your planting, it will carry over to the daughter plants. Establishing a plasticulture planting is very expensive so consider all the options and alternatives before planting.

The following planting specifics and background information is from Dr. Joseph Fiola, Specialist in Small Fruit, University of Maryland.

Background

High density, annual, strawberry production systems utilized in California, Florida and North Carolina have increased profitability over conventional matted-row plantings. The late summer planted system includes raised beds, black plastic mulch, trickle irrigation and plants spaced on staggered double rows. Establishment costs are higher, but production is earlier (when crop value is highest) and of greater quality. Labor cost are typically reduced as there is no need for blossom removal, setting daughter plants or hand weeding and fruit is more easily and efficiently harvested from the beds. The short growth period

(plant late August, harvest mid May) allows efficient land use for double cropping possibilities and ease of rotation. By planting late in the summer, the plant directs energy into branch crowns and flower buds instead of runners and avoids the heat, drought and weed and disease pressure of midsummer.

Dedicated growers in certain locations have found high profitability in utilizing this system. However, potential limitation of the system include: high establishment costs, including plastic, plant costs (high density), trickle irrigation and floating row covers as well as winter injury reducing growth and fruiting. Research is being conducted to make this system practical in more limiting Northern climates.

Specifics of the Planting System

There are many critical parameters of the system, all of which are important to optimal production and efficiency. Since this is an integrated system, all of the components are important and any “weak link” or exclusion of a component can lead to failure.

Location: This system has given highest yields at locations with a long growing season. A limitation of the system is the risk of low yield due to a restricted period available for growth in the fall in some locations and/or seasons. Floating row covers become even more critical as sites become more marginal. Select fields protected from Westerly winds and with a Southern exposure.

Prepare soil: Work the soil well to make beds, including plowing, disking and roto-tilling. Fumigation is highly recommended to control weeds and diseases, especially where strawberries or solanaceous crops were previously planted.

Fertilization: Sample and have soil tested by the local County Agricultural Educator to determine specific nutritional needs. Generally, broadcast and work into beds 60 lb actual nitrogen/A, depending on soil type, as a 10-10-10 fertilizer. An additional 30 pounds of N/A is then added through the trickle in the early spring.

Prepare bed with black plastic mulch: Raised beds (24-30” width; wider if less in height) are prepared on 4-5’ row centers. Center crowned, firm beds, with tight black plastic are a necessity. Trickle irrigation is installed while laying the plastic.

Plants: The best current option for plant type is the use of transplant “plugs” ($130.00/1000) which are propagated from actively growing runner tips. Plugs can be purchased directly or to save money, one can purchase tips ($55.00/1000) and produce transplants plugs in a greenhouse. A list of nurseries which supply plugs and runner tips, and/or directions for propagating from tips is available through Cooperative Extension. Dormant and/or fresh-dug plants may be an option in some areas.

Cultivars: The current primary choice for cultivar for this system is ‘Chandler’. Although they are not typically a problem with this system, ‘Chandler’ is susceptible to Red Stele (Phytophthora) and Verticillium wilt. ‘Allstar’ had yield and fruit size comparable to ‘Chandler’ in replicated trials and is definitely worth a trial on heavy soils where Red Stele may be a severe problem. ‘Idea’, ‘Marmolada’ and ‘Jewel’ have performed well in observation trials and may warrant limited testing.

Plant Spacing: The best in-row spacing is 12 inches on a staggered double row. The quantity of plants per acre depends on row center distance (example: 60’ (5’) centers x 12 x 12 within = 17,400/A).

Planting date: Optimal planting date and spacing must be determined to allow for ample time to produce sufficient vegetative growth before flower bud initiation. In Northern areas, mid to late August planting of plugs is necessary. Early applied floating row covers may help compensate for slightly late planting dates.

Row Covers: Floating row covers (FRC) are considered an integral part of the system in the Northeast for improved growth in the fall, winter protection, frost protection and earlier fruiting. Remove the FRC at the first signs of bloom to allow for bee pollination.

Pennsylvania has heavier soils and shorter growing season than the major plasticulture growing areas. 'Sweet Charlie', 'Cavendish' and 'Darselect' have been tried on plasticulture in Pennsylvania. 'Chandler' is still the cultivar of choice most growers are using. With ideal weather conditions we can grow a profitable crop in Pennsylvania.

Back to top

Triazine-Resistant Lambsquarters Control in Sweet Corn

David H. Johnson, Associate Professor, Penn State Southeast Research and Extension Center, Lancaster County
Timothy Elkner, Horticulture Extension Agent, Lancaster County

Weed control in sweet corn can be challenging to the grower, especially with the loss of Bladex and the presence in Pennsylvania of triazine-resistant weeds such as common lambsquarters and smooth pigweed. Several new products have been registered for field corn in the past few years, and some are now registered for sweet corn or may be in the near future. These new herbicides include Callisto, Lumax, Option, and Permit. Of these, only Permit is currently labeled for sweet corn in Pennsylvania. Sweet corn has also been added to the Stinger and Aim labels. Based on their use in field corn, several of these products will provide excellent weed control options for sweet corn producers, including control of triazine-resistant weeds. These products will also be useful for those growers who do not have triazine-resistant weeds, but want to rely less on atrazine-based programs.

In a project funded by the Pennsylvania Vegetable Marketing Board, we studied triazine-resistant lambsquarters control in sweet corn at the Penn State research farm in Lancaster County. The site has a natural population of common lambsquarters (some of which is triazine resistant) and several other weeds. Sweet corn (cv 'Argent') was planted on May 15, 2004, and herbicides were applied on May 18 (pre-emergence) and June 13 (post-emergence). Sweet corn had three collars and was 8-10 inches tall and weeds were 1 to 4 inches tall at the time of the post-emergence applications.

Due to the wet weather experienced in the summer of 2004, good activation of the pre-emergence herbicides occurred, resulting in excellent early season weed control. Few weeds were present at the time of post-emergence sprays. 2,4-D amine caused some sweet corn injury, mostly in the form of leaning or twisted plants. Callisto caused bleaching injury as high as 18% at 14 days after treatment (DAT), and Option caused stunting injury at this time. By 27 DAT there was no indication of injury.

Common lambsquarters (mostly triazine resistant) control was good from Bicep II Magnum, which contains Dual II Magnum and atrazine (Table 1). This was surprising, but it is likely that the Dual II Magnum portion gave most of the control. Lumax, which is similar to Bicep II Magnum but also contains Callisto, gave 100% season-long control. Control was also 100% season long when Callisto (mesotrione) was used following Dual II Magnum. Laddok S-12, when used after Dual II Magnum, also gave surprisingly high lambsquarters control. Although not statistically significant, control by 2,4-D and Option were slightly less, mainly due to the escape of a few plants in each plot. Aim gave lower control, but it is known to be weak on lambsquarters.

With the exception of Dual II Magnum followed by 2,4-D amine, all products gave excellent redroot pigweed control. Similar results were found for velvetleaf, giant foxtail, prickly sida, and eastern black nightshade (data not shown). The early season injury noted for 2,4-D, Callisto, and Option resulted in

some yield reduction compared to Laddok S-12. However, all treatments except the 2,4-D amine treatment yielded better than the weedy check.

In a separate study, we evaluated tolerance of 16 sweet corn cultivars to Callisto, Lumax, Option, Permit, Aim, and Stinger. All herbicides were applied at 2X rates to simulate overlap situations. The sweet corn cultivars were white, yellow, or bicolor, and represented se, sh-2, and triplesweet genetics. Most cultivars showed good tolerance to the herbicides. For Option, there was more injury potential on the shorter-season cultivars, such as 'Exstacy II', 'Temptation', 'Frosty', 'Luscious TSW', and 'Silver Princess' (data not shown). Aim caused slight burning injury, with all cultivars similarly affected. However, most were able to outgrow the injury. Permit and Stinger did not cause any injury.

In summary, the new herbicides Lumax, Callisto, and Option provided excellent triazine-resistant common lambsquarters control. These herbicides are NOT yet registered for sweet corn use, but are in review at the EPA. Some injury with Callisto, Option, and Aim was observed, but the sweet corn recovered quickly. Aim was weaker on common lambsquarters but gave excellent redroot pigweed control.

Table 1: Weed Control in sweet cornwith herbicides, Landisville, PA, 2004

		Crop Injury			Common lambsquarters		Redroot pigweed		Yield
Treatment[1]	Rate	6 DAT	14 DAT	27 DAT	14 DAT	50 DAT	14 DAT	50 DAT	
		----	% injury	----	----------% injury----------				
Weedy check		0	0	0	0	0	0	0	4.8
Bicep II Magnum	2.1 qt/a	0	0	0	92	90	100	100	6.6
Dual II Magnum, pre fb Laddok S-12 + COC, post	1.5 pt/a fb 1.67 qt/a + 1%	0	0	0	100	99	100	100	7.2
Dual II Magnum, pre fb 2,4-D amine, post	1.5 pt/a fb 1 pt/a	11	12	0	100	94	89	99	5.1
Lumax, pre	2.5 qt/a	0	0	0	100	100	100	100	6.3
Dual II Magnum, pre fb Callisto + atrazine + COC + UAN, post	1.5 pt/a fb 3 oz/a + 0.5 pt/a + 1% + 2.5%	8	18	0	100	100	100	100	6.0
Dual II Magnum, pre fb	1.5 pt/a fb 1.5	0	16	0	100	92	100	100	5.8

Option + MSO + UAN, post	oz/a + 1% + 1%								
Dual II Magnum, pre fb Aim + NIS, post	1.5 pt/a fb 0.5 oz/a + 0.25%	0	0	0	100	88	100	100	6.4
LSD (0.05)		4	6	--	8	10	4	1	0.9

[1]Abbreviations: fb = followed by, COC = crop oil concentrate, UAN = 28% liquid fertilizer, MSO = methylated seed oil, NIS = nonionic surfactant, DAT = days after treatment, LSD = least significant difference.

Back to top

New Conservation Security Program Payments Can Be Used for IPM

Kristie Auman-Bauer, PA IPM Program

A new conservation program will offer payments to farmers in exchange for enhancing watersheds and protecting the environment.

The Conservation Security Program (CSP) will be available to approximately 235,000 farmers and ranchers in 220 watersheds nationwide. The Natural Resources Conservation Service (NRCS) will administer the program, which reimburses growers on working lands for various conservation practices, including integrated pest management.

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.

According to Agriculture Secretary Mike Johanns, CSP is a voluntary conservation program that supports ongoing stewardship of private, agricultural working lands and rewards those producers who are meeting the highest standards of conservation and environmental management on their operations. "This is a unique program that offers payments for enhancing natural resources, rewards those farmers and ranchers who are model conservationists and provides incentives for other producers to meet those same high standards of environmental performance," says Johanns.

Payments can include four components: 1) an annual stewardship component for the base level of conservation treatment, 2) an annual component for maintenance of existing conservation practices, 3) a one-time new practice component for additional needed practices, and 4) an enhancement component for exceptional conservation effort. Enhancement activities could include limiting pesticide applications through IPM implementation, total farm energy audits, shelterbelts for wildlife and air quality, and riparian forest buffers for restoring critical stream habitat.

According to Kelly Ireland, CSP manager in Pennsylvania, the program began last year with the Raystown watershed being one of eighteen pioneer watersheds nationwide. "The program in Raystown last year was very successful and created a lot of interest, with thirty-six contracts being signed. This is the first year the program will be implemented with watersheds nationwide," says Ireland.

The new watersheds in Pennsylvania for the 2005 CSP program include the Lower Susquehanna-Swatara Watershed (in Franklin, Cumberland, Perry, Dauphin, York, Lancaster, Lebanon, Schuylkill and Berks Counties), the Schuylkill Watershed (in Schuylkill, Lebanon, Berks, Carbon, Lehigh, Bucks, Montgomery, Chester, Philadelphia and Delaware Counties) and the Chester-Sassafras (in Chester County). Producers in the Raystown Watershed have another opportunity to sign up this year. Sign-ups for the program will be held from March 28 through May 27. To apply for CSP, NRCS asks potential participants to complete a self-assessment workbook available on the Web or from their local NRCS offices-to determine if their operation meets the requirements of the program and qualifies for program participation. The self-assessment process is completed using a self-screening questionnaire for each land use to be enrolled.

When this process is completed, the producer submits the workbook to the local NRCS office during the sign-up period and meets with NRCS personnel to go over any additional needed documentation. NRCS will then determine which enrollment category the producer qualifies for and selects the categories to be funded through CSP.

Additional information on CSP in Pennsylvania, including eligible watersheds, self-assessment workbook, and a schedule of community meetings about the program is available on the Web at http://www.pa.nrcs.usda.gov/.

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.

Back to top

The Organic Way- Plant Families

Elsa Sánchez, Department of Horticulture

Knowing which family a plant belongs to can be useful in making decisions about crop rotations for managing pests and soil fertility. Plants that are in a family are genetically related, so they share similar characteristics. As an example, members of the Cucurbitaceae, among other shared characteristics, have deeply lobed or divided leaves, separate male and female flowers on each plant (termed "monoecious" plants) with five fused petals, similar fruit types, and tendrils for climbing. Besides having similarities in appearance, plants in the same family often have similar susceptibilities to various problems such as diseases, insects, or nematodes.

In general, it is not recommended that a field be planted with members of the same family in succession to avoid the build-up of shared pests. Some crops should not follow members of other families either because of susceptibility to common pests. For example, strawberries (or other crops in the Rosaceae) should not be planted after members of the Solanaceae (and vice versa) because they are all susceptible to verticillium wilt. Keep in mind that various weeds also belong to these same families, and can also host the same pests. Knowing plant families can also be useful in determining appropriate pesticides to use, when warranted, as effects within families are often similar. This can apply to both wanted effects, and unwanted effects such as phytotoxicity to crop plants from certain pesticides.

Crops can be rotated to manage soil fertility. This is done by including crops in the rotation to improve the fertility status of the soil and rotating among heavy users of certain nutrients. For example, members of the Fabaceae can be grown to add nitrogen to the soil and many members of the Liliaceae are heavy users of potassium.

The table below lists several vegetables, herbs, fruit, cut flowers, cover crops and weeds by plant family. Plant family names can be easily identified because they end in '-ceae'; however, some families also have 'old' names which end in '-ae'. Old names as well as common names are included in the table. Note than some plants are listed in more than one grouping.

		Members		
Family Name	**Aliases**	**Crops**	**Ornamentals**	**Weeds**
Solanaceae	solanaceous crops; potato, tomato or nightshade family	peppers (bell and chile), tomatoes, potatoes, eggplant, tobacco, tomatillo	petunia, million bells	nightshade, jimsonweed, henbane, groundcherry, buffalobur, horsenettle
Brassicaceae	Cruciferae; brassicas; cole crops; cruciferous crops; mustard family	horseradish, cabbage, cauliflower, broccoli, kohlrabi, kale, Brussels sprouts, turnips, Chinese cabbage, radish, rapeseed, mustard, collards, watercress, pak choi, bok choi, rutabaga	stock, alyssum, candytuft	shepherd's-purse, field pennycress, yellow rocket
Cucurbitaceae	cucurbits; cucumber family; squash family	cucumber, melons, watermelon, summer squash, pumpkin, gourds, winter squash		
Rosaceae	rose family, rosaceous plants	apples, peaches, apricots, nectarines, plums, strawberries, blackberries, raspberries, pears, cherries		multiflora rose
Fabaceae	Leguminosae; leguminous crops; legumes; bean, pea or legume family	beans, peas, lentils, peanut, soybean, edamame, garbanzo bean, fava beans hairy vetch, vetches, alfalfa, clovers, cowpea, birdsfoot trefoil, black medic		various vetches, clovers, black medic

Poaceae	Gramineae; grass family	corn, wheat, barley, oats, sorghum, rice, millet, rye, ryegrass, sorghum-sudangrass, fescue, timothy	ornamental grasses	brome, wild oats, crabgrass, orchardgrass, barnyardgrass, quackgrass, fall panicum, foxtail, Johnsongrass
Polygonaceae	Knotweed family	buckwheat, rhubarb		knotweed, smartweed
Liliaceae	lily family; alliums (for members of the Allium genera)	asparagus, onions, leeks, chives, garlic, shallot	tulips, daffodils, hosta, hyacinth	wild garlic and onions
Lamiaceaesalvia,	Labiatae; mint family	lavender, basil, marjoram, oregano, rosemary, sage, thyme, mints, catnip	salvia, *Molucella* (bells-of-Ireland)	mints, catnip, henbit
Ericaceae	heather or blueberry family	blueberries, cranberries	rhododendrons, azalea, heather	
Chenopodiaceae	goosefoot family	spinach, beets, chard, sugar beets		kochia, lambsquarters
Apiaceae	Umbelliferae; carrot family	carrots, parsnips, celery, dill, chervil, cilantro, parsley, caraway, fennel	*Trachymeme, Buplerum*	poison-hemlock, wild carrot
Asteraceae	sunflower family; aster family	sunflowers, lettuce, endive, escarole, radicchio, dandelion, Jerusalem artichoke, artichoke, safflower, chicory, tarragon, chamomile, echinacea, sunflowers	marigold, mums, zinnia, aster, *Calendula*, cosmos, *Rudbeckia*, *Tithonia, Centaurea, Helichrysum*, yarrow, *Leucanthemum*, echinacea, sunflowers	dandelion, Jerusalem artichoke, chicory, echinacea, thistles, knapweeds, cocklebur, yarrow, ragweeds, goldenrod, groundsel, galinsoga, sunflowers

Back to top

Review of Recent Herbicide Additions/Changes for Vegetable Crops

M.D. Orzolek, Department of Horticulture

Asparagus

Solicam 80DF (norflurazon) – Apply 2.5 to 5.0 lbs/A at the end of the cutting season. Primarily controls grasses and suppresses yellow nutsedge. Solicam is a long lasting herbicide in the soil.

Sandea 75 DF (halosulfuron-methyl) – Apply 0.5 to 1.0 dry ounce/A plus nonionic surfactant (0.25% spray solution) post-emergence during or after the cutting season for control of yellow nutsedge and certain annual broadleaf weeds. Does not control emerged common lambsquarters.

Beans – Snaps and Limas

Pursuit 2SC (imazethapyr) – FOR LIMAS ONLY – Apply 1.5 to 3.0 fluid ounces/A. Primarily controls broadleaf weeds. Pursuit residues persist in the soil after harvest and may affect rotational crops. DO NOT APPLY more than 3 fluid ounces/A/yr. Weed control may be inconsistent when dry weather follows application.

Sandea 75 DF (halosulfuron-methyl) – **Pre-emergence** - Apply 0.5 to 1.0 dry ounces/A of Sandea 75 DF pre-emergence to control or suppress yellow nutsedge and many annual broadleaf weeds. Results have been the most consistent when the application was followed by rainfall or irrigation. Do NOT apply Sandea to crops treated with a soil applied organophosphate insecticide, or use a foliar applied organophosphate insecticide within 21 days before or 7 days after a Sandea application.

Sandea 75 DF (halosulfuron-methyl) – **Post-emergence** - Apply 0.5 to 0.66 dry ounces of Sandea 75 DF plus nonionic surfactant to be 0.25 percent of the spray solution (1 quart per 100 gallons of spray solution) post-emergence to control yellow nutsedge and certain annual broadleaf weeds. Applications should be sprayed when the crop has 2 to 3 trifoliate leaves and annual weeds are less than 2 inches tall. Treatments applied when beans are younger increase the risk of temporary stunting, and applications after the 3rd trifoliate leaf stage increases the risk of a split set.

Command 3ME (clomazone) - Apply 4 to 8 fluid ounces per acre Command 3ME to control annual grasses and many broadleaf weeds including common lambsquarters, velvetleaf, spurred anoda, and jimsonweed. Combine with Dual Magnum 7.62E to control yellow nutsedge and pigweed. Mustards, morningglory species, and pigweed species will not be controlled with Command alone. Some temporary crop injury (partial whitening of leaf or stem tissue) may be apparent after crop emergence. Complete recovery will occur from minor early injury without affecting yield or earliness.

Reflex (fomesafen) – **Sect 18 for Pennsylvania**. Apply 1.0 to 1.5 pts/A of Reflex to snap beans in the 1st to 4th trifoliate leaf stage for the suppression (stunting the plant and suppressing seed pod development) of horsenettle. Apply when horsenettle is at the 2 – 4 leaf stage of growth. Use of nonionic surfactant recommended. Do not apply within 30 days of harvest. Reflex will also control morningglory species, pigweed species and common ragweed. Reflex will not control annual grasses.

Beets

Stinger 3A (clopyralid) - Apply 2 to 8 fluid ounces of Stinger 3A per acre in a single application to control certain annual and perennial broadleaf weeds. Stinger controls weeds in the Composite (Asteraceae) and Legume (Fabaceae) plant families. Common annuals controlled include galinsoga, ragweed species, common cocklebur, groundsel, pineappleweed, clover, and vetch. Perennials controlled include Canada thistle, goldenrod species, aster species, and mugwort (wild chrysanthemum). Stinger is very effective on small seedling annual and emerging perennial weeds less than 2 to 4 inches tall, but is less effective and

takes longer to work when weeds are larger. Use 2 to 4 fluid ounces to control annual weeds less than 2 inches tall. Increase the rate to 4 to 8 fluid ounces to control larger annual weeds. Apply the maximum rate of 8 fluid ounces to suppress or control perennial weeds. Spray additives are not needed or required by the label, and are not recommended. Stinger is a post-emergence herbicide with residual soil activity. Observe follow crop restrictions or injury may occur from herbicide carry-over.

Broccoli, Brussels Sprouts, Cabbage, Cauliflower, Collards, Kale and Kohlrabi
Stinger 3A (clopyralid) - Apply 2 to 8 fluid ounces of Stinger 3A per acre in one or two application to control certain annual and perennial broadleaf weeds. Do not exceed 8 fluid ounces in one year. Stinger controls weeds in the Composite (Asteraceae) and Legume (Fabaceae) plant families. Common annuals controlled include galinsoga, ragweed species, common cocklebur, groundsel, pineappleweed, clover, and vetch. Perennials controlled include Canada thistle, goldenrod species, aster species, and mugwort (wild chrysanthemum). Stinger is very effective on small seedling annual and emerging perennial weeds less than 2 to 4 inches tall, but is less effective and takes longer to work when weeds are larger. Use 2 to 4 fluid ounces to control annual weeds less than 2 inches tall. Increase the rate to 4 to 8 fluid ounces to control larger annual weeds. Apply the maximum rate of 8 fluid ounces to suppress or control perennial weeds. Spray additives are not needed or required by the label, and are not recommended. Stinger is a post-emergence herbicide with residual soil activity. Observe follow crop restrictions or injury may occur from herbicide carry-over.

Cucumbers
Command 3ME (clomazone) - Apply 4 to 8 fluid ounces per acre Command 3ME pre-emergence to direct seeded cucumbers to control annual grasses and many broadleaf weeds including common lambsquarters, velvetleaf, spurred anoda, and jimsonweed. Combine with Curbit 3EC to control pigweed species where Curbit is registered for use. Mustards, morningglory species, and pigweed species will not be controlled with Command alone. Some temporary crop injury (partial whitening of leaf or stem tissue) may be apparent after crop emergence. Complete recovery will occur from minor early injury without affecting yield or earliness. Banding the herbicide reduces the risk of crop injury and offsite movement due to vapor drift.

Sandea 75 DF (halosulfuron-methyl) – **Pre-emergence** - Apply 0.5 to 1.0 dry ounces/A of Sandea 75 DF pre-emergence to control or suppress yellow nutsedge and many annual broadleaf weeds including common cocklebur, pigweed species, ragweed species and galinsoga. Results have been most consistent when the application was followed by rainfall or irrigation. Occasionally, slight stunting may be observed following Sandea application early in the season before the vines begin to run. Do NOT apply Sandea to crops treated with a soil applied organophosphate insecticide, or use a foliar applied organophosphate insecticide within 21 days before or 7 days after a Sandea application. Do not exceed a total of 1.0 dry ounce of Sandea pre-emergence/A/yr.

Sandea 75 DF (halosulfuron-methyl) – **Post-emergence** - Apply 0.5 to 1.0 dry ounces of Sandea 75 DF post-emergence to control yellow nutsedge and certain annual broadleaf weeds including common cocklebur, pigweed species, ragweed species and galinsoga when the cucumber crop has 2 to 5 true leaves but has not yet began to bloom or run. Sandea applied post-emergence will not control common lambsquarters or eastern black nightshade. Add nonionic surfactant to produce a 0.25% spray solution. DO NOT USE oil concentrate. Susceptible broadleaf weeds usually exhibit injury symptoms within 1 to 2 weeks of treatment. Typical symptoms begin as yellowing in the growing point that spreads to the entire plant and is followed by death of the weed. Occasionally, slight yellowing of the crop may be observed within a week of Sandea application. Do Not exceed a total of 0.66 dry ounce of Sandea post-emergence/A/yr and Do Not exceed a total of 1.66 dry ounces/A/yr of Sandea applied both pre-emergence and post-emergence per crop cycle.

Cantaloupes, Honeydew and Crenshaw Melons
Sandea 75 DF (halosulfuron-methyl) – Pre-emergence - Apply 0.5 to 1.0 dry ounces/A of Sandea 75 DF pre-emergence to control or suppress yellow nutsedge and many annual broadleaf weeds including common cocklebur, pigweed species, ragweed species and galinsoga. Results have been most

consistent when the application was followed by rainfall or irrigation. Occasionally, slight stunting may be observed following Sandea application early in the season before the vines begin to run. Do NOT apply Sandea to crops treated with a soil applied organophosphate insecticide, or use a foliar applied organophosphate insecticide within 21 days before or 7 days after a Sandea application. Do not exceed a total of 1.0 dry ounce of Sandea pre-emergence/A/yr.

Sandea 75 DF (halosulfuron-methyl) – **Post-emergence** - Apply 0.5 to 0.66 dry ounces of Sandea 75 DF post-emergence to control yellow nutsedge and certain annual broadleaf weeds including common cocklebur, pigweed species, ragweed species and galinsoga when the cucumber crop has 2 to 5 true leaves but has not yet began to bloom or run. Sandea applied post-emergence will not control common lambsquarters or eastern black nightshade. Add nonionic surfactant to produce a 0.25% spray solution. DO NOT USE oil concentrate. Susceptible broadleaf weeds usually exhibit injury symptoms within 1 to 2 weeks of treatment. Typical symptoms begin as yellowing in the growing point that spreads to the entire plant and is followed by death of the weed. Occasionally, slight yellowing of the crop may be observed within a week of Sandea application. Do Not exceed a total of 0.66 dry ounce of Sandea post-emergence/A/yr and Do Not exceed a total of 1.66 dry ounces/A/yr of Sandea applied both pre-emergence and post-emergence per crop cycle.

Onions

Goal 2XL (oxyfluorfen) - Apply 1.6 to 3.2 fluid ounces per acre Goal 2XL post-emergence when onions have a minimum of 3 true leaves to control seedling broadleaf weeds with 4 true leaves or less. Repeat the application but do not exceed a total of 0.5 pound per acre (32 fluid ounces per acre) and do not apply within 60 days of harvest. Goal may cause injury to onion foliage. The injury will appear as necrotic spots on leaves and/or twisted leaves. Heed the following precautions to avoid or minimize injury: Use flat fan nozzles, 20 to 40 psi and 20 to 40 gallons of water per acre. DO NOT tank-mix with any other pesticide. DO NOT use surfactant, oil concentrates, or any other additive. DO NOT apply during extended periods of cool, wet, cloudy weather. DO NOT exceed 0.05 pound per acre (3.2 fluid ounces) per application. DO NOT apply to onions with less than three true leaves (do not count the flag leaf).

Buctril 4EC (bromoxynil) - Apply 4 to 6 fluid ounces Buctril 4EC to dry bulb onions with a minimum of 3 true leaves (do not count the flag leaf) to suppress or control many seedling broadleaf weeds with 4 true leaves or less in 50 to 70 gallons of water per acre. Water volume is important. Concentrated spray solutions kill onions. Repeat applications can be made, but do not apply more than 12 fluid ounces in a single growing season. Buctril may cause injury to onions. The injury will appear as necrotic spots on the leaves. To minimize the risk of injury, heed the following warnings. DO NOT tank-mix with any other pesticides or apply within 3 days of any other pesticide. DO NOT add surfactants, oil concentrates, or other additives. DO NOT treat onions injured by sand, insects, or disease. DO NOT treat onions growing during periods of cloudy weather with high humidity or other low light intensity conditions that could result in “soft” foliage with a thinner-than-normal waxy layer on the leaf surface. DO NOT treat onions with less than 3 true leaves. DO NOT count the flag leaf.

Turnips – Roots and Tops

Stinger 3A (clopyralid) - Apply 2 to 8 fluid ounces of Stinger 3A per acre in a single application to control certain annual and perennial broadleaf weeds. Stinger controls weeds in the Composite (Asteraceae) and Legume (Fabaceae) plant families. Common annuals controlled include galinsoga, ragweed species, common cocklebur, groundsel, pineappleweed, clover, and vetch. Perennials controlled include Canada thistle, goldenrod species, aster species, and mugwort (wild chrysanthemum). Stinger is very effective on small seedling annual and emerging perennial weeds less than 2 to 4 inches tall, but is less effective and takes longer to work when weeds are larger. Use 2 to 4 fluid ounces to control annual weeds less than 2 inches tall. Increase the rate to 4 to 8 fluid ounces to control larger annual weeds. Apply the maximum rate of 8 fluid ounces to suppress or control perennial weeds. Spray additives are not needed or required by the label, and are not recommended. Stinger is a post-emergence herbicide with residual soil activity. Observe follow crop restrictions or injury may occur from herbicide carry-over.

Spinach

Stinger 3A (clopyralid) - Apply 2 to 8 fluid ounces of Stinger 3A per acre in a single application to control certain annual and perennial broadleaf weeds. Stinger controls weeds in the Composite (Asteraceae) and Legume (Fabaceae) plant families. Common annuals controlled include galinsoga, ragweed species, common cocklebur, groundsel, pineappleweed, clover, and vetch. Perennials controlled include Canada thistle, goldenrod species, aster species, and mugwort (wild chrysanthemum). Stinger is very effective on small seedling annual and emerging perennial weeds less than 2 to 4 inches tall, but is less effective and takes longer to work when weeds are larger. Use 2 to 4 fluid ounces to control annual weeds less than 2 inches tall. Increase the rate to 4 to 8 fluid ounces to control larger annual weeds. Apply the maximum rate of 8 fluid ounces to suppress or control perennial weeds. Spray additives are not needed or required by the label, and are not recommended. Application of higher recommended rates of Stinger (4 to 8 fluid ounces), may cause a crop response that appears as a more upright leaf development. Stinger is a post-emergence herbicide with residual soil activity. Observe follow crop restrictions or injury may occur from herbicide carry-over.

Sweet Corn

Sandea 75 DF (halosulfuron-methyl) – **Early-emergence** - Apply 0.5 to 0.66 dry ounces of Sandea 75 DF post-emergence to control yellow nutsedge and certain annual broadleaf weeds including common cocklebur, pigweed species, ragweed species and velvetleaf. Spray before corn reaches 8 inches in height, or use drop nozzles when corn is over 8 inches in height to avoid spraying the foliage and into the whorl. Sandea applied post-emergence will not control common lambsquarters or eastern black nightshade. Add nonionic surfactant to produce a 0.25% spray solution. DO NOT USE oil concentrate. Susceptible broadleaf weeds usually exhibit injury symptoms within 1 to 2 weeks of treatment. Typical symptoms begin as yellowing in the growing point that spreads to the entire plant and is followed by death of the weed. Sweet corn cultivars may vary in sensitivity to Sandea. Do Not use if organophosphate (OP) insecticides have been applied to the crop or the risk of crop injury may increase.

Aim 40 WG (carfentrazone) - Apply 0.33 dry ounces per acre Aim 40WG before corn reaches 8 inches in height to control seedling broadleaf weeds including pigweed species, common lambsquarters, morningglory species, eastern black nightshade, and velvetleaf. Aim will not control ragweed species. Tank-mix with atrazine at reduced rates or another broadleaf weed herbicide to increase the spectrum of weeds controlled. Always add nonionic surfactant to be 0.25 percent of the spray solution (1 quart per 100 gallons of spray solution). Expect to see speckling on the crop foliage after application. Initially the injury may appear to be substantial, but it is not systemic and corn outgrows the injury rapidly. Cultivar sensitivity to Aim may vary. Use caution when treating new cultivars. Weather conditions may affect the degree of injury observed. Injury may be more severe during periods of warm, cloudy weather with high humidity and plentiful soil moisture when corn growth is rapid and "soft." To reduce the risk of crop injury use drop nozzles when corn is over 8 inches tall to avoid spraying the foliage and into the whorl.

Stinger 3A (clopyralid) - Apply 2 to 10.5 fluid ounces of Stinger 3A per acre in one or two application to control certain annual and perennial broadleaf weeds when sweet corn is less than 18 inches tall. Do not exceed 10.5 fluid ounces in one year. Stinger controls weeds in the Composite (Asteraceae) and Legume (Fabaceae) plant families. Common annuals controlled include galinsoga, ragweed species, common cocklebur, groundsel, pineappleweed, clover, and vetch. Perennials controlled include Canada thistle, goldenrod species, aster species, and mugwort (wild chrysanthemum). Stinger is very effective on small seedling annual and emerging perennial weeds less than 2 to 4 inches tall, but is less effective and takes longer to work when weeds are larger. Use 2 to 4 fluid ounces to control annual weeds less than 2 inches tall. Increase the rate to 4 to 8 fluid ounces to control larger annual weeds. Apply the maximum rate of 10.5 fluid ounces, in one or split into two applications to suppress or control perennial weeds. Spray additives are not needed or required by the label, and are not recommended. Stinger is a post-emergence herbicide with residual soil activity. Observe follow crop restrictions or injury may occur from herbicide carry-over.

Callisto (mesotrione) - Syngenta Crop Protection – 4.0 lbs Active/gal. Callisto is a **Group 27 herbicide**. Performance of Callisto is not affected by the presence of biotypes resistant to triazines or ALS inhibiting

herbicides. Callisto should be applied at full label rates to help prevent selection for, or population shifts toward, marginally tolerant weed species and/or species biotypes. For best results, apply Callisto to actively growing weeds. Susceptible weeds which emerge soon after application of Callisto may be controlled after they absorb the herbicide from the soil. Callisto will not control most grass weeds.
Apply Callisto **Pre-emergence** alone at 6.0-7.7 fl. oz/A (0.188-0.24 lb a.i./A) by ground sprayers for broadleaf weed control. Callisto may be tank mixed with pre-emergence grass herbicides for grass control.
Apply Callisto **Post-emergence** at 3.0 fl. oz/A per application. Always add an appropriate adjuvant to the spray tank. For best results, apply Callisto to actively growing weeds. Susceptible weeds which emerge soon after application of Callisto may be controlled after they absorb the herbicide from the soil. Callisto will not control most grass weeds.
Two post-emergence applications of Callisto may be made with the following restrictions.

• Only one post-emergence application may be made if Callisto has been applied pre-emergence. Do not exceed a total of two applications per season. Do not exceed a total of 7.7 fl. oz/A (0.24 lb. a.i./A) of Callisto per season.
• Do not make the second application within 14 days of the first application.
• Application of Callisto at rates less than 3.0 fl. oz/A (0.094 lb. a.i./A) post-emergence may result in incomplete weed control and loss of residual control.
• Do not exceed a total of 6.0 fl. oz/A (0.19 lb. a.i./A) for the two post-emergence applications (no pre-emergence application).
• Do not apply Callisto to ground that has already been treated with Lexar, Lumax or Camix in the same season.
• Corn may be treated up to 30 inches tall or up to the 8-leaf stage of corn growth. Do not harvest forage, grain, or stover within 45 days after application.

Annual weeds control includes:

Palmer amaranth	spiny amaranth	buffalobur	carpetweed
Common chickweed	common cocklebur	galinsoga	galinsoga
Jimsonweed	kochia	c. lambsquarters	morningglories
Nightshades	pigweed spp	c. ragweed	giant ragweed
Smartweed spp	common sunflower	horse nettle	
wild buckwheat	dandelion	hemp	
marestail	prostrate knotweed	Venice mallow	

Tomato
Sandea 75 DF (halosulfuron-methyl) – **Pre-transplant** - Apply 0.5 to 1.0 dry ounces/A of Sandea 75 DF to control or suppress yellow nutsedge and many annual broadleaf weeds including common cocklebur, pigweed species, ragweed species and galinsoga. Results have been most consistent when the application was followed by rainfall or irrigation. Occasionally, slight stunting may be observed following Sandea application used early in the season. When observed, recovery of the tomato crop is rapid with no effect on yield or maturity. Do NOT apply Sandea to crops treated with a soil applied organophosphate insecticide, or use a foliar applied organophosphate insecticide within 21 days before or 7 days after a Sandea application. Do not exceed a total of 1.0 dry ounce of Sandea pre-transplant/A/yr. When using

under plastic mulch, apply as a band, the Sandea will be activated by the condensation that forms on the underside of the mulch. Delay transplanting for 7 days after application.

Sandea 75 DF (halosulfuron-methyl) – **Post-emergence** - Apply 0.5 to 1.0 dry ounces of Sandea 75 DF post-emergence to control yellow nutsedge and certain annual broadleaf weeds including common cocklebur, pigweed species and ragweed species and after the crop has been planted 14 days. Sandea applied post-emergence will not control common lambsquarters or eastern black nightshade. Add nonionic surfactant to produce a 0.25% spray solution. DO NOT USE oil concentrate. Susceptible broadleaf weeds usually exhibit injury symptoms within 1 to 2 weeks of treatment. Typical symptoms begin as yellowing in the growing point that spreads to the entire plant and is followed by death of the weed. Occasionally, slight yellowing of the crop may be observed within a week of Sandea application. When observed, recovery of the tomato crop is rapid with no effect on yield or maturity. Do Not exceed a total of 1.0 dry ounce of Sandea post-emergence/A/yr and Do Not exceed a total of 2.0 dry ounces/A/yr of Sandea applied both pre-emergence and post-emergence per crop cycle.

Herbicides with specific crop labels (Section 3):

Celery
Caparol (prometryn) Syngenta – selective control of annual broadleaf weeds and grasses. Transplants only.
Select 2EC (clethodim) Valent – annual and perennial grass control only. Does not control yellow nutsedge.

Garlic
Buctril (bromoxynil) Bayer - suppress or control many seedling broadleaf weeds only.
Goal (oxyfluorfen) Dow - controls broadleaf weeds only.
Prowl (pendimethalin) BASF – controls a wide spectrum annual grasses and broadleaf weeds including waterhemp and lambsquarters.

Pea
Thistrol (MCPA) Nufarm – controls mainly broadleaf weeds post-emergence.

Radicchio
Kerb 50-W (pronamide) Dow – Primarily control annual grasses and certain broadleaf weeds.

Shallot
Poast (sethoxydim) Micro-Flo – Controls annual and perennial grasses only. Does not control nutsedge.
Prism (clethodim) Valent – Controls annual and perennial grasses only. Does not control nutsedge.
Prowl (pendimethalin) BASF – controls a wide spectrum annual grasses and broadleaf weeds including waterhemp and lambsquarters.

Back to top

Review of Compendium of Potato Diseases, Second Edition

Bill Lamont, Department of Horticulture

Compendium of Potato Diseases, Second Edition, edited by: Walter R. Stevenson, Rosemary Loria, Gary D. Franc, and D.P. Weingartner. 2001. American Phytopathological Society Press, 3340 Pilot Knob Road, St. Paul, MN 55121-2097. 144 p., 193 color photographs, 83 black and white illustrations. $49.00, 8 1/2" x 11" soft-cover. ISBN 0-89054-275-9.

The first edition of the **Compendium of Potato Diseases** was published in 1981 by the American Phytopathological Society, with Bill Hooker serving as editor. Since then the knowledge base concerning key pathogens of potatoes and management tools to deal with them has greatly expanded. Because of this explosion of new information it was necessary to revise and completely update the original compendium with practical and up-to-date information on diseases affecting potato. The information contained in the new 2nd Edition will be useful to those working with the potato crop nationally and internationally.

The organization of the compendium is excellent and it is divided into two major parts. Part I contains descriptions of diseases caused by infectious pathogens, including fungi, bacteria, nematodes, viruses, and phytoplasmas. Part II contains descriptions of diseases observed in the absence of infectious pathogens, including stresses caused by moisture and temperature extremes, air pollution, herbicide drift and carryover, and nutrient imbalances. At the very beginning of the compendium is a brief but comprehensive introduction covering the origin, history and importance of the potato, its development and anatomy, discussion of tuber periderm and disease resistance, tuber respiration and storage environment and potato disease management strategies.

The individual sections describing individual diseases are organized to include: a review of the importance and distribution of the disease, symptoms useful for diagnosis, the causal organism, the disease cycle and epidemiology, and management practices, with selected references for additional details if the reader is interested in finding more information about a particular disease or disorder. The information on disease management includes a discussion of control principles, so that management tools can be adapted to a wide range of cropping circumstances. There are no specific recommendations for chemical treatment provided in the compendium, since these change frequently and thus would necessitate constant updating and reprinting of this publication. Specific control recommendations are generally available from a wide range of other sources for example; The Commercial Vegetable Production Recommendations published annually in Pennsylvania.

A real plus for this compendium, is the fact that the descriptions of most diseases are illustrated with excellent color photographs of plants and potato tubers showing symptoms that are extremely useful in diagnosing a field or storage problem. There are also black and white diagrams and photographs with the text to provide additional illustrations of symptoms and causal agents of disease.

The forty-five authors that participated in writing the individual sections of the compendium literally come from around the world and are recognized experts in their field. The result is an authoritative publication on the diseases of potatoes.

The next to last section in the back of the compendium is a glossary of terms, which I found to be extremely helpful. The final section at the end of the compendium is an index listing the subjects covered in compendium allowing one to quickly find any disease or disorder.

The 2nd Compendium of Potato Diseases belongs on the bookshelf of any person involved at all with potatoes. It is an excellent reference and resource that will prove to be invaluable in helping to diagnose potato diseases and disorders.

Back to top

Actara®/Platinum for Strawberries and Bushberries

K. Demchak,, Department of Horticulture

Another insecticide from Syngenta Crop Protection, Inc. is now registered for use in strawberries and

bushberries (blueberries, Ribes, elderberries, etc.), among other crops. The active ingredient is thiamethoxam, with the trade names of Actara® for foliar applications, or Platinum® for soil applications. Both products are labeled for control of aphids and whiteflies on strawberries, and aphids and leafhoppers on bushberries. Thiamethoxam is in the same chemical class (neonicotinoids) as Admire and Provado (imidacloprid), and behaves similarly in that it is also systemic in the plant. The REI for both Actara® and Platinum® is 12 hours. The PHI for Actara® is 3 days on both strawberries and bushberries. The PHI for Platinum® is 75 days on bushberries, and 50 days on strawberries. You'll find the small fruit uses on a supplemental label. The full and supplemental labels can be viewed from the Crop Data Management Systems Web site at http://www.cdms.net.

Back to top

Nifty Frost Alert

K. Demchak, Department of Horticulture

Those of you who don't relish spending the night driving around fields checking the temperature might find this gadget of interest. There is now a frost alert on the market that flashes a color-coded light to signal what the temperature is in the field. The unit can be hung in a tree or bush, or fastened to a post. The sensor is on a cable that's about 3 feet long, so you can place the unit high enough to see it, while leaving the sensor in the plant canopy. The colors are logical - no light (but with an intermittent green flash so you know it's working) for temperatures above 37 degrees, a green constant light for temperatures of 34-37 degrees, a constant white light for 32-34 degrees, constant red for 30-32 degrees, and a red flash for temperatures below 30 degrees. The unit (6V lantern battery not included) sells for about $150 + shipping, and is available from Spectrum Technologies (http://www.specmeters.com). I got one to test - its temperature indication has been accurate.

Back to top

Job Announcements

Pennsylvania Certified Organic Job Announcement for Organic Transition Specialist

The Organic Transition Specialist will coordinate PCO’s new-applicant program and “Focus on Organic Dairy” project.

Qualifications

• Agricultural experience, preferably in dairy, (organic preferred, but not required);
• Bachelor’s degree or equivalent;
• Knowledge of organic standards;
• Strong communication skills, both written and oral;
• Computer expertise: word processing, Power Point; spreadsheets, internet research, databases.

Position is full-time with benefits. The specialist will work at our Centre Hall, PA, office. Some travel required.

For complete job description or to apply for the position, contact:

Penny Sandoval
PCO Administrative Director
406. S. Pennsylvania Ave.
Centre Hall, PA 16828
penny@paorganic.org
penny@paorganic.org

Back to top

Upcoming Meetings

Elsa Sánchez, Department of Horticulture

Local

October 14-15, 2005. Passive Solar Greenhouse Workshop, 1522 Lefever Lane, Spring Grove, PA 17362. Contact: Steve and Carol Moore (717) 225-2489 or sandcmoore@juno.com.

Regional

May 25, 2005; 6:00 - 8:00 p.m., University of Maryland, Wye Research Center 2005 Strawberry Twilight Meeting, Queenstown MD 21658

What will I see?
• 2004-05 research plots
• Effect of Strawberry tip plugging date on spring yields with and without fall applied row covers in the field and in a high tunnel for fall production.
• Cultivar trial with 'Bish', 'Treasure', 'Festival' and 'Gem'.
• USDA cooperative research on "conditioned" strawberry plugs for fall and spring harvest.
• Greenhouse-gutter production system.
• USDA Fruit Pathologist Dr. Bill Turechek will discuss strawberry diseases and current control measures.
• USDA and University small fruit specialist will also be on hand.
• No pre-registration required

Contact Mike Newell @ Ph. 410-827-7388 or email mnewell@umd.edu
for directions and more information.

January 31 – February 2, 2006. Mid-Atlantic Fruit and Vegetable Convention. For more information contact the Pennsylvania Vegetable Growers Association at pvga@pvga.org or visit http://www.pvga.org/.yracuse, N.Y.

National

International

September 5-9, 2005. Potato 2005. Emmeloord, the Netherlands. Contact: www.potato2005.com.