

THE VEGETABLE GAZETTE

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In This Issue: Comments from the Editor
Weed Control in Tomato
PVGA Field Tour to South Jersey
Pest of the Month--Onion Thrips
June Vegetable Disease Reminders
Small Fruit Research Projects
Small Fruit Production Guide and Changes
Flower Thrips and Spider Mites on Strawberries
Can Strawberry Plasticulture Work In Pennsylvania?
The Potato Section
 Potato Musings
 Terry Simpson Retiring
Upcoming Meetings

Tip for the Month: “Wisdom comes with age, but it doesn’t do you any good since humility tends to set in about the same time”.

Comments from the Editor

Bill Lamont, Department of Horticulture

Planting is in high gear all across the Keystone State. It is definitely a hectic time of year, as growers hurry to get their vegetable crops planted and then work to hook-up their irrigation systems so as to water the crops if timely rains do not appear. As I travel around the state it is evident that we have adopted plasticulture as a tool to be utilized to produce a wide range of vegetable, small fruit and ornamental crops. I have observed fields of early sweet corn emerging from under clear plastic, annual hill strawberry plantings that are discussed in George Perry’s excellent article, and tomatoes for the early market planted in high tunnels. The fields at the Horticulture Research Farm at Rock Springs are alive with activity as the early sweet corn planting under ultra-thin gauge, clear plastic film continues to grow and develop. The fields are an array of colors that are the result of Mike Orzolek’s crew who applied a whole myriad of different colored plastic mulches for testing this coming season with a wide variety of vegetables. All our potato plantings both out in the counties and at the Horticulture Farm are finished. We have picked up the portable pumping and filtering unit for our potato drip irrigation/fertigation project in Schuylkill County and will be delivering it to the test site soon. The high tunnels project continues to make head way and hopefully we will receive the plastic coverings to finished the first twelve houses and then plant the tomatoes. The second group the twelve are being constructed and will be planted with fall vegetable crops.

I want to thank those colleagues in the other departments that are supporting the Vegetable Gazette with contributions and would encourage others to send in an article

next month. The “Insect Pest of the Month” continues to be very popular and we have the “Monthly Vegetable Disease Reminders” that covers the vegetable crops. Dr. Orzolek’s timely “Weed of the Month” or “Herbicide of the Month” articles continue to be great addition to the line-up. Kathy Demchak, Extension Small Fruit Specialist, has written several great articles concerning small fruits. This issue also contains an excellent article “Can Strawberry Plasticulture Work In Pennsylvania?” written by George Perry, Extension Agent, Schuylkill County . Since no agent signed up to write an article for July there exists the opportunity for someone to step up to the plate and make a contribution. Emelie Swackhamer, Extension Agent in Lehigh County is on deck for an article on no-till pumpkins for August.

As always, the Vegetable Gazette Team encourages your feedback so that we can better serve your needs and address your concerns. Be sure to check the educational opportunities listed in the upcoming meetings at the end of the gazette.

Weed Control in Tomato

Mike Orzolek, Department of Horticulture

Most growers have transplanted their tomato crop by now and applied a pre-transplant herbicide to help control weeds. Depending on the type of tomato being grown (processing vs fresh market) weed management may be somewhat easier with the fresh market tomato crop grown on raised beds, drip irrigation and black or red plastic mulch. Use of plastic mulch will effectively keep 95% of weeds from growing on the 30” bed. There still may be some weeds growing in the hole in the plastic film made to plant the tomato and/or between the rows of plastic mulch. Use of organic mulches such as straw or annual ryegrass between beds of plastic mulch will reduce/eliminate the need for hand weeding during the growing season. Unless there is extremely heavy weed pressure where the tomato plant was placed through the plastic in the soil, occasional hand weeding or postemergent application of Sencor/Lexone or Poast will help eliminate weeds in the hole.

For most processing tomato growers growing on bare soil, the use of a preemergent herbicide is extremely important for season long weed management in the crop. Most commonly found weeds in tomato are quackgrass, foxtails, fall panicum, barnyardgrass, common lambsquarters, pigweed species (which may be resistant to triazines), nightshade, galinsoga, Canada thistle, and ragweed. Unfortunately, there is no single herbicide which will control all the above weeds with one application. Use of both pre and post-emergence herbicides coupled with several timely cultivations or mowing of weeds can produce extremely good weed control and the elimination of more weed seed going into the soil for next year. The following herbicides are labeled for use in tomato:

Devrinol (napropamide) applied as a preplant incorporated application at 2 to 4 lbs/A of the 50 DF material and incorporated to a depth of 2 inches the same day of application. Controls most annual grasses and carpetweed, common purslane with fair to good control of lambsquarters and pigweeds.

Tillam (pebulate) applied as a preplant incorporated application at 2 to 2.67 qts/A of the 6E or OLF material and immediately incorporated to a depth of 2 to 3 inches to prevent loss by evaporation. Controls primarily annual grasses as well as yellow nutsedge.

Treflan (trifluralin) applied as a preplant incorporated application at 1 to 2 pts/A of the 4EC or OLF material and immediately incorporated with double-disking to a depth of 2 to 3 inches no later than 8 hours after application. Best application of Treflan achieved when boom is mounted on the front of the disk. Controls primarily annual grasses as well as carpetweed, common purslane with fair to good control of common lambsquarters.

Sencor/Lexone (metribuzin) applied as a postemergence application at 0.33 lbs/A of the 75 DF or OLF material. Do not apply to stressed tomato plants. Do not apply within 3 days after periods of cool, wet, or cloudy weather or crop injury will occur. Do not apply within 24 hours of treatment with other pesticides or injury may occur. Controls primarily broadleaf weeds including; carpetweed, galinsoga, jimsonweed, common lambsquarters (non-triazine resistant only) shepherdspurse, pigweed species (non-triazine resistant only), common purslane and common ragweed. Sencor/Lexone will select for nightshade in infested fields; suggest elimination of this material Sencor application may be repeated again if necessary in 14 days. Do not apply within 7 days of harvest.

Poast (sethoxydim) applied as a postemergence application at 1 to 2 pts/A of the 1.5EC material with 1% oil concentrate for the control of annual and some perennial grasses only. Poast does not control any broadleaf weeds, yellow nutsedge or wild onion. Use of oil concentrate may increase the risk of crop injury when hot or humid conditions prevail. For best results, treat when grasses are actively growing and before tillers are present. Repeated applications may be required to control certain perennial grasses (maximum Poast application allowed – 4.5 pts/A/year).

Dual Magnum (metolachlor) applied as a preplant incorporated, pre-transplant or post-directed application at the rate of 1 to 1.6 pts/A for the control of nightshade, galinsoga, pigweed species and yellow nutsedge. Pennsylvania received a Section 18 last year for the use of this material in tomato and has a Section 18 again in 1999. There is a 90 days to harvest interval with the application of Dual Magnum. For varieties with unknown tolerance to Dual Magnum, treat only a small area to determine Dual Magnum safety. Dual Magnum may damage transplants that have been weakened by environmental stress, to prevent damage, plant only healthy transplants. The application of Dual Magnum for tomato applies from April 20, 1999 to July 30, 1999.

Points To Ponder

- *Herbicides require soil moisture to be activated and effectively control weeds.
- *Post emergent application of herbicides is not effective on stressed weeds – they must be actively growing.
- *Cultivation is most effective when weeds are in the 2 to 4 leaf stage of growth.
- *Post application of herbicides is most effective on small weeds (2 to 4 leaf stage) and actively growing.
- *Scout fields for serious weed infestations prior to planting a crop so that the most competitive crop can be planted in that field.
- *Use multiple weed management techniques to successfully control weeds in the field.

PVGA Field Tour to South Jersey

Bill Lamont, Department of Horticulture

The 1999 Pennsylvania Vegetable Growers Association Field Tour on July 14, 1999 will feature visits to the Vineland Produce Auction, the New Jersey Tomato Council packinghouse, two vegetable farms--Flaim and Sons and Sheppard Farms, and Seabrook Brothers freezing plant. This one-day bus tour will be an inside glimpse of the vegetable industry in southern New Jersey that is sure to be a valuable educational experience for growers and others in the industry. The tour will depart from the Furniture Outlet Mall, Morgantown, PA (just off exit 22 of the Pennsylvania Turnpike) at 7:00 AM. Overnight accommodations are available at the nearby Holiday Inn. The tour should arrive back at the Furniture Outlet Mall around 5:30 PM. The cost of the tour is \$35.00 for PVGA members and \$45.00 for non-members and \$30.00 per person for children 16 and under. Spouses, family members, employees and guests of members may attend at the member rate. Registration includes bus fare, luncheon and refreshments. Reservations are due by July 2nd. For more information, please contact Bill Troxell, Executive Secretary, PVGA at 717-694-3596.

Pest of the Month--Onion Thrips

Shelby Fleischer, Department of Entomology

Onion thrips, *Thrips tabaci*, are cosmopolitan insects. They feed on a wide variety of vegetable plants, small grains, field crops and weeds. They are an important pest of cabbage, cauliflower, and onions.

Seasonal Development. Immature onion thrips are small and milky white at first and after molting turn to green or lemon-yellow with red eyes. The adults can range from a pale yellow to dark brown and are usually smaller than 1/16 of an inch. Young thrips lack wings, but adult thrips have four wings that are very narrow and fringed with hairs. The females deposit eggs in tender plant tissues.

Adults and nymphs pass the winter in small grains, clover and alfalfa fields concealed in grass or other plant remnants. Activity may continue throughout the year in warmer parts of the state. In a few days wingless nymphs emerge, feed, and molt four times before reaching the adult stage. Growth from egg to adult can be completed in two weeks when temperatures are warm. In the midwest, development from egg to adult is estimated to take 20 to 40 days, with 5 to 8 generations per year. Development of an infestation is influenced by seasonal conditions. The pest breeds most rapidly when a mild, dry winter is followed by a hot, dry spring. This may be due to better survivorship during the winter, and then movement off of overwintering hosts that are stressed.

Presence of thrips in cabbage should be noted when scouting for worms, and onions should be checked regularly for thrips. Give special attention given to fields near small grains or alfalfa, at times of harvest of small grains and alfalfa, or during times of hot, dry weather. Yellow or white sticky cards may help detect thrips immigration into fields.

Injury. Thrips feed by piercing surface tissues and sucking up the exuded plant juices. On onions with continuing leaf growth, these feeding points elongate to give the typical onion thrips symptoms: whitish spots and streaks on the leaves. Intensive feeding results in a silvery-white stippled appearance sometimes referred to as white blast or silver top. Seedlings may be killed if large numbers of thrips are present. Feeding occurs on the interior of the onion neck, on developing leaves. The early bulbing stage is the most susceptible. If feeding on cabbage, the cabbage is blistered, scarred, and bronzed by

thrips feeding on leaves; and heads are unmarketable with thrips present and evident. The damage on cabbage has also been described as forming whitish scratches or brownish blisters on foliage, and red-to-brown patches on heads. Where many thrips have fed, the discolored areas coalesce to form large brownish, blister-like areas. Severe infestations can lead to underweight and misshapen heads. Damaged tissue used for sauerkraut turns into dark blotches during processing.

Management: Cultural controls are important. If possible, avoid planting cabbage, cauliflower or onions close to and immediately downwind of small grains or alfalfa. Choice of variety can also help. In cabbage, onion thrips tend to prefer varieties with very tight head, but host plant resistance tests have not always been consistent. Eastman et al. (1995, see reference below) list varieties with at least moderate resistance and varieties with the least tolerance. Although several natural enemies feed on egg and immature thrips, augmentative release of natural enemies has not been shown to be effective.

In general, red onions tend to be more susceptible to thrips than white onions, with yellows intermediate. Resistance to thrips infestation occurs in some varieties of sweet Spanish onions. Davis et al. (1995, see reference below) lists tolerant, moderately tolerant, and susceptible varieties. In the midwest, Davis et al. (1995) reports that all varieties can tolerate populations of 25 thrips per plant. In well-managed, irrigated onion crops, plants can tolerate high populations of thrips without yield reduction. Bulb size can be reduced if populations greater than 50 thrips per plant are allowed to develop and persist. In onions, waiting until you see crop damage is not recommended. Sprays need to be applied based on high populations but before feeding damage is readily apparent. Early crops can sometimes be harvested before damaging populations develop.

Insecticide resistance has been a problem with the onion thrips. Also, in onions, it is possible to have a different species of thrips ñ the Western flower thrips ñ and some insecticides that work on onion thrips may not work on Western flower thrips.

Since the insects feed between leaves near the base of the plant, they are hard to reach with insecticides. Insecticides should be applied in sufficient water to ensure thorough coverage. High water volumes (30 gal/A) is recommended in the midwest. Systemics activity helps. When thrips are increasing in a cabbage field, it is important to apply insecticides before cupping or curd formation. The Commercial Vegetable Guide lists current labeled options.

References:

Eastman, C., S. Mahr, J. Wyman, C. Hoy, & H. Oloumi-Sadeghi. 1995. Cabbage, broccoli, and cauliflower. Pp. 99-112 In Foster, R. and B. Flood. Vegetable insect management with emphasis on the midwest. Meister Publ. Co. 1995. Willoughby, Ohio.

Davis, M., E. Grafius, W. Crenshaw and T. Royer. 1995. Onions. Pp. 136-146. In Foster, R. and B. Flood. Vegetable insect management with emphasis on the midwest. Meister Publ. Co. 1995. Willoughby, Ohio.

June Vegetable Disease Reminders

Alan MacNab, Department of Plant Pathology

The following diseases should be considered early in June. Some will appear in June. For others, control measures must be taken now to minimize disease severity later in the season. Growers who have experienced significant losses from diseases should review diagnosis and control information. Diagnosis information is available in the PSU publication titled "Identifying Diseases of Vegetables". Control information is available in "Commercial Vegetable Production Recommendations".

Vegetable	Disease	Controls
Beans	Mosaic viruses	For commercial plantings, do not make successive plantings in adjacent areas; although few plants may be affected in early plantings, number of plants affected usually increases in successive plantings as more virus inoculum from previous plantings becomes available to aphid vectors. Do not plant near clovers; they're a source of viruses that can affect beans. Maximum density plantings may minimize losses.
Celery	Leaf blight	Maintain a regular fungicide program in plant beds. If blights get started in plant beds, control will be more difficult and expensive later in production fields.
Cucumber	Bacterial wilt	Stop the vector (cucumber beetle) from feeding on plants. Beetles have been prevalent in some areas this season. Several insecticides provide good control. Maximum density plantings may minimize losses.
	Mosaic	Grow only CMV-resistant vars. There is also good resistance to other diseases. Scab and powdery mildew usually are next in importance.
Muskmelon	Collapse	This late-season problem can be avoided by promoting early harvest. Polyethylene mulch is important in many areas of Pennsylvania.
	Powdery mildew	When possible, gardeners should use powdery mildew resistant varieties such as Earlygold (early only), Saticoy or Eclipse (roadside and shipping type), and Marygold (casaba type). When necessary, fungicides can be used later in the season.
	Fusarium	If long rotation is not possible, use resistant

	wilt	varieties such as Saticoy, Superstar, and Eclipse.
Peppers	Bacterial leaf spots	Start with disease-free plants. Where diseases are expected, follow a regular preventive spray program. Start early and continue with fixed copper for several weeks until you are relatively certain young plants are not carrying the bacterial pathogen. The following new varieties have resistance to races 1, 2, and 3 of the pathogen: Boynton Bell, Commandant, Enterprise, X3R Camelot, and X3R Wizzard.
	Viruses	Plant only varieties resistant to TMV and, when possible, to other viruses. Maximum density plantings may minimize losses. Aphid controls followed to stop transmission of aphid-borne viruses (CMV and Etch) have not been very successful for virus control.
Sweet Corn	Stewart's bacterial wilt	This disease is expected to be important following mild winters.
	MDM Virus	Where this virus was a problem in past years, try varieties claimed to be resistant. A few are listed in the Commercial Vegetable Guide. Maximum density planting may minimize losses. This disease usually is not important in early plantings.
Tomato	Bact. spot and speck	Where inoculum is suspected (old tomato fields, transplants with symptoms), spray with a tank mixture of fixed copper plus either maneb or mancozeb, or with Bravo C/M. Start as soon as plants are established and continue at 7 to 10 day intervals, especially during wet periods.
	Early blight	In new fields where disease-free transplants were used, fungicide sprays should not be needed until the end of June. However, if diseased transplants were planted, or if fields were planted to tomatoes last year, start a preventive spray program now. Quadris is a new fungicide that is excellent for control of

tomato early blight.

Late blight Primary inoculum can be introduced with infected seed tubers, from cull piles, and in/on volunteer potato plants. Inoculum also could be introduced with tomato transplants. If inoculum is present, late blight will have the potential to develop whenever environment favors the disease (wet and cool conditions). The major control after plantings are established is to keep plants covered with protective fungicides whenever environment favors the disease.

Small Fruit Research Projects

Kathy Demchak, Department of Horticulture

There are a number of small fruit research projects in progress at the Horticulture Research Farm at Rock Springs. Some of these will be finished before next year's (Year 2000) field day, so if you're in the neighborhood this year - perhaps for Ag Progress Days - feel free to stop by to see what's going on.

Herbicides for Establishment-Year Strawberries. This project was recently funded by the Pennsylvania Vegetable Growers Association, so my thanks to them. This study looks at some currently labeled herbicides, and some that are in the 'pipeline', on 'Northeaster', 'Allstar', and 'Earliglow'. Plants are established and the first set of herbicide treatments was applied. Data is being collected this year on weeds controlled and phytotoxicity (or lack thereof).

Strawberry Genotype Evaluation. This study evaluates 27 wild genotypes of strawberries as future breeding material. The plants are fruiting this year. So far, there is a huge range of plant characteristics. Some have the typical local 'wild' fruit size (pea-sized), others have fruit that is as large as typical Eastern cultivars. Some have beautiful color, others are white when ripe. There is a wide range of flavor characteristics as well.

IR-4 Magnitude-of-Residue Projects. There are 2 projects underway this year. One is for evaluating Stinger herbicide on blueberry, and another looks as quinoxifen fungicide (trade name not yet certain) on grapes. Data on how well these work and phytotoxicity is being collected, but the main purpose of the studies is to establish how much residue would exist in harvested product, a necessary step in a product getting labeled. This necessitates that the projects are conducted under extremely stringent guidelines.

Table Grapes. Seven cultivars of seedless table grapes are being evaluated in an observation plot - 'Einset', 'Himrod', 'Canadice', 'Mars', 'Reliance', 'Vanessa', and 'Marquis'. This will be their first fruiting year.

Primocane-bearing Raspberries and Wine Grapes. A primocane-bearing raspberry cultivar plot (13 cultivars) and a French-American hybrid wine grape plot (with 'Vignoles', 'Traminette', 'Cayuga', and 'Chambourcin') are still being maintained for those who are interested in seeing how the various cultivars perform.

Small Fruit Production Guide and Changes

Kathy Demchak, Department of Horticulture

One of the questions that has been asked frequently is “What is the current status and future of the Small Fruit Production and Pest Management Guide?”. Several options are being considered for future publication efforts. Since the area in which the Guide becomes outdated most quickly is the area of pesticide recommendations, and the Guide was not updated this past year, here are changes that have occurred since the last edition was published.

One addition is Scythe herbicide (Mycogen Corp.). Scythe (pelargonic acid) is labelled for all small fruit crops, including grapes. It is a non-selective contact herbicide, and generally would be used in the same cases in which you would use Gramoxone (paraquat) such as for vegetative burndown using shielded sprays. One word of caution, according to some (i.e., those with a sense of smell), is that you may need to hold your nose while applying...

JMS Stylet Oil (paraffinic oil, JMS Flower Farms, Inc.) can be used for control of mites, powdery mildew and/or rust on bushberries (blueberries, gooseberries, currants) and caneberries (raspberries and blackberries). In order to avoid potential phytotoxicity problems, follow usage and compatibility information and use high pressure as specified on the label. One point to keep in mind with blueberries is that the fruit may temporarily turn shiny (lose the ‘bloom’) if sprayed late in the season.

You probably have found by now that you can no longer obtain Dacthal (DCPA) and Funginex (triforine), though existing supplies can be used.

There will be label deletions for Rovral (iprodione) and Ronilan (vinclozolin) on strawberries, though existing supplies with the old labels can be used throughout the 1999 growing season. Brambles are not affected. With both of these materials, check the label carefully on the package you are using for changes. There are new materials which hopefully will be labeled by the year 2000. If they are not labeled by then, Section 18’s may be pursued for their use on strawberries.

Although every attempt is made to produce information that is complete, timely, and accurate, the pesticide user bears the responsibility of consulting the pesticide label and adhering to those directions.

Flower Thrips and Spider Mites on Strawberries

Kathy Demchak, Department of Horticulture

(with Carl Felland, Department of Entomology)

Flower thrips and spider mites are showing up in a number of growers’ fields across the state. Samples of flower thrips on traps next to alfalfa in Maryland showed an average density so far this season, which is about 10-fold below that observed in 1994, when thrips caused significant losses in strawberry in the northeastern U.S.

Nevertheless, scouting is recommended. Last year's dry summer, followed by a mild winter, seemed to give spider mite populations a good start this year.

Thrips are tiny cigar-shaped insects that cause a bronzing of the fruit surface. With extremely high populations, the fruit will be small, bronzed and hard. When checking for thrips, breathe on the flower or fruit first, as if you were about to clean a pair of glasses, to make the thrips crawl out. (According to Marvin Pritts from Cornell, we don't know whether... "they are attracted by carbon dioxide, or repelled by bad breath"). For flowers, if there are fewer than 10 thrips per blossom, chemical control probably is not needed. For immature fruit, the threshold is 25 thrips per 50 fruit for marketable fruit, or, for more stringent control, 5 thrips per 50 fruit (thanks to K. Lynch and R. Tremblay, New Brunswick Dept. of Agriculture for this threshold info). Thiodan and malathion, when applied to control other pests, will control thrips. Malathion (3-day PHI) is toxic to bees, so don't use it if blooming plants are present. Thiodan (4-day PHI) is safer, but don't spray it on bees or colonies, and apply at night or early morning when bees are not present. Good coverage, using high pressure and high volume, is necessary. If you were spraying earlier in the season to control strawberry clipper or tarnished plant bug, it's unlikely you will have a problem with thrips.

Spider mites can be easily missed, since they are very tiny, so you may need a hand lens for detection. Populations that have been missed can explode during hot dry weather. Check the lowest leaves on the plants weekly. Leaves that are infested usually show a bronzing or stippling on the upper leaf surface. The spray threshold is mite presence on 25% or more leaves of a 60-leaf sample. Good coverage, especially to the undersides of the leaves, is important so use a lot of water (200-300 gal/acre) at a high pressure (100 PSI) if possible. There are predator mites that exist naturally and may keep the spider mite population in check, so spray only if necessary. Many pesticides can kill off these predators, with resultant larger spider mite problems in the future. In addition, resistance with repeated use of miticides is likely. Kelthane (3-day PHI) and Vendex (1-day PHI) are labelled. Kelthane is more toxic to mite predators than Vendex.

Can Strawberry Plasticulture Work In Pennsylvania?

George Perry, Extension Agent, Schuylkill County

The last four years a plasticulture strawberry system research program has been conducted in Pennsylvania. At the present time plantings range from a tenth of an acre to four acres in at least six counties. Will plasticulture strawberries work for everyone? The answer is no, if you have a stone mulch like some farms in the Ringtown Valley of Schuylkill County this system is not feasible.

The high density, annual, strawberry production system was first implemented in California. Florida and North Carolina were the next states to introduce this system to their growers. New Jersey has done extensive research on strawberry plasticulture which can be adapted to many Pennsylvania locations. The system can increase profitability over conventional matted row plantings. Establishment costs are higher, but production is earlier and higher quality fruit. Fruit from plants grown on culture are redder and greater in pigment intensity on the surface than fruit grown in matted row system. There are no significant differences in brightness of fruit surface and flesh of fruit grown in the two cultural systems. In a cool growing season, the plasticulture system yields a higher fruit soluble solid and ascorbic acid content, lower titratable acid content and greater leaf area and chlorophyll content. In addition, the total sugar, fructose, glucose and myo-inositol contents are higher, but the sucrose content is lower compared to those grown in matted row. The matted row cultural system results in fruit with greater malic acid, citric acid and ellagic acid contents compared to those in plasticulture. In a warm season the matted row system produces higher solid and sugar and lower acid contents than the plasticulture system.

The specifics of the planting system is information from Dr. Joseph A. Fiola, Specialist in Small Fruit and Viticulture, Rutgers Cooperative Extension. 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 rototilling. Fumigation is highly recommended to control weeds and diseases, especially where strawberries or solanaceous crops (tomatoes, peppers, etc.) were previously planted.

Fertilization. Sample and have soil tested by the university to determine specific nutritional needs. Generally, broadcast and work into beds 60 lb actual nitrogen/Acre, 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 necessary. 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. 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 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, Marmolade, 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 12x12 within = 17,400 plants per acre. **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 are considered a **necessity** as an integral part of the system in the Northeast for improved growth in the fall, winter protection, frost protection, and earlier fruiting. Remove the floating row cover at the first signs of bloom to allow for bee pollination.

The Potato Section

Bill Lamont, Department of Horticulture

Potato Musings

The Potato Association of America Annual Meeting will be held at the Doubletree Inn, Somerset, NJ, August 1-5, 1999. This is an excellent meeting that brings together the breadth of individuals working with potatoes, from the breeding, culture and management, disease and insect management and utilization of the potato. For more information on the meeting contact Dr. Mel Henninger, 732-932-9711 Ext. 120 or e-mail Henninger@aesop.rutgers.edu. Having the meeting so close by is really a plus. Last year it was in North Dakota.

All our potato trials are planted and emerging. We will keep you posted on them as the season progresses. We have trials in the following counties: York, Cambria, Lehigh, Washington, a demonstration planting in Potter and the drip irrigation/fertigation project in Schuylkill County. We also have plantings at the Horticulture Farm at Rock Springs.

Terry Simpson, Horticulture Technician, to Retire on June 29th

After a total of 31 years of dedicated and loyal service to Penn State University and with a majority of those years (23 years) working in the potato programs both in the Agronomy and Horticulture Departments, Terry has decided to take advantage of an employment opportunity that arose in his own home township. He is going to be working with the Worth Township Road Department and the nice thing is he can now ride his bicycle to work each morning. So when you come through Port Matilda you can expect the roads to be in excellent shape and the snow removed quickly in the winter.

Terry started working at Penn State back in 1966 but his employment was interrupted in 1968 when he received his draft notice and decided to join the Marine Corps for a two year stint. The Marines are always looking for a few good men and Terry Simpson certainly fit the mold. He returned to work at Penn State in 1970 and where he was employed at the university library in the shipping and receiving department. He worked in that position until 1973 when he took a position in the Agronomy Department and began working with potatoes with Dr. Joe Harrington. He moved over to the Horticulture

Department in 1976 with Dr. Dick Cole, Potato Specialist and continued to work in the potato program up until the present.

Words cannot begin to express how much Terry's dedication to the potato program, the potato growers and potato industry in Pennsylvania have meant over the years. His knowledge of potatoes, his professionalism in his approach to his job, his tremendous work ethic, his wonderful sense of humor, out-going personality, and personal character and integrity are traits that I have appreciated during our brief tenure together. I liken my time with Terry in the potato program to my Navy days, when as a newly commissioned Ensign I reported to my first command and was introduced to my Chief Petty Officer. The Chief was salty to say the least and had been around the world quite a few times and knew all the ropes. My father who had been in the Navy during W.W.II gave me some good advice that served me well during my military days and still serves me well--he said that if I had a good Chief Petty Officer, that I was to stick close to him and listen to his advice and I would be in good shape. Terry was certainly that type of Chief Petty Officer and my only regret is that we couldn't have served together longer. I have the greatest admiration and respect for Terry and appreciated his knowledgeable, thoughtful and insightful comments concerning potatoes, the program or life in general. He certainly will be missed but promises to return for his annual allotment of potatoes, even his favorite All Blue. To borrow the farewell given to shipmates in the Navy--Terry from all who have known and worked with you over the years-- "We wish you fair winds and following seas".

We will be having a "Celebration of Service" for Terry on Wednesday, June 30th from 11:30 AM-1:30 PM in the headhouse of the greenhouses behind the Horticulture Building that will feature a "Potluck Lunch" or bring a dish for others to enjoy, and other surprises. If you would like to contribute toward a gift for Terry, please send it to Tiffany Shultz, Department of Horticulture, Room 102, Penn State University, University Park, PA. 16802. Please make checks to Tiffany Shultz. Also if you would like to send a letter expressing your own appreciation to Terry, please send that also to Tiffany.

Upcoming Meetings

Bill Lamont, Department of Horticulture

Local

Regional

July 14, 1999. Pennsylvania Vegetable Growers Association Field Tour to South Jersey. Contact: Bill Troxell (717) 694-3596.

January 18-20, 2000: New Jersey Vegetable Growers Association Meeting and Trade Show, Taj Mahal, Atlantic City, NJ. Contact: Phil Traino at 609-985-4382.

January 25-27, 2000: Mid-Atlantic Fruit and Vegetable Growers Convention, Hershey, PA. Contact: Bill Troxell (717) 694-3596.

National

July 28-31, 1999: American Society for Horticultural Science (ASHS), Minneapolis Convention Center, Minneapolis, MN. Contact: 703-836-4606 or e-mail ashs@ashs.org

August 1-5, 1999. Potato Association of America, Doubletree Inn, Somerset, NJ. Contact Dr. Mel Henninger, 732-932-9711 Ext. 120 or e-mail Henninger@aesop.rutgers.edu.

August 4-8, 1999. North American Farmers' Direct Marketing Association's Summer Tour, Nova Scotia, Canada. Contact: Charlie Touchette at 888-884-9270.

September 23-26, 2000: 15th International Agricultural Plastics Congress and the 29th National Agricultural Plastics Congress, Hershey, PA. Contact: Pat Heuser, Executive Secretary, American Society for Plasticulture (814) 238-7045.