

# The Vegetable and Small Fruit Gazette

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Horticulture Department  
The Pennsylvania State University

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**Tip for the Month:** "Spring is just around the corner".

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## **Comments from the Editor**

Bill Lamont, Department of Horticulture

As Editor of the Vegetable and Small Fruit Gazette I feel compelled to take this opportunity to editorialize. I want to challenge each of you that read this to think about the picture that I am going to paint. It is a picture that needs to be hung in every household in the United States. It is a picture of deep sorrow experienced by a country that forgets that its true national security comes from its ability to sustain its own strong and vital agricultural food production system. It is a picture that illustrates tremendous indifference shown by the average consumer who does not or in many cases cares not how food is produced or where it comes from as long as they eat three squares a day and the shelves at the local food store are full to overflowing. It is a picture that shows the myriad of forces acting on the agricultural food system: aging population of producers, pressures for land development, environmental pressures, host of regulations, labor issues, and other issues swirling around agriculture. It is a picture of frustration and confusion on the face of a young grower reviewing his/her grandmother's

receipt ledger for produce that she sold, as they realize that they are getting the same price today for their produce. It is a picture charting the prices that producers pay for what they buy whether it is equipment, supplies, chemicals, seeds and labor for the farming operation or just purchases of items for their family. The last picture is a small hungry child holding his parents hand and in a small, weak voice asking, when are we going to eat again. It makes you think. I want to thank George Perry for his excellent article on "Strawberry Plasticulture vs. Matted Row". As always, the Vegetable and Small Fruit Gazette Team encourages your feedback so that we can better serve your needs and address your concerns. The month of March continues to provide growers with some excellent educational opportunities at the county, state and national levels. I would refer you to the listing of upcoming meetings at the end of the gazette. See you at the meetings.

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### **Schedule for Agent Articles**

Bill Lamont, Department of Horticulture

April	Scott Guiser
May	Laura McNutt
June	Tom Butzler
July	Dwane Miller and Jim Welshans
August	Eric Oesterling
September	Ron Hostetler
October	Mary Concklin
November	John Esslinger
December	Andy Muza

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### **Strawberry Plasticulture vs Matted Row Production**

George Perry, Extension Agent, Schuylkill County

Which strawberry system is best for your strawberry operation? A third system is being researched by USDA at Beltsville called Advanced Matted Row System that is in its infant stage at the present time. Pennsylvania is eighth in production of strawberries with California being first. Pennsylvania harvested \*1560 acres with a state average of

\*4,000 lbs. per acre. A total market value of all most \*6 million dollars. (\* From agricultural statistics averaged from the years 1990-1994)

Let's compare the advantages and disadvantages of plasticulture and matted row.

#### Advantages of Matted Row

1. Cost of establishing a planting is less
2. Broad selection of approved cultivars
3. Less labor at planting time
4. Take advantage of strawberry runnering
5. Mulching cost is less
6. Easy to renovate

#### Disadvantages of Matted Row

1. Fruit ripens same time as other growers
2. More difficult to control insects and disease
3. Marketable fruit yield maybe less
4. Fruit not as clean
5. Picking conditions maybe less desirable
6. Problem keeping runners under control

#### Advantages of Plasticulture

1. Earliness of fruit ripening
2. Cleaner fruit
3. Higher price
4. Better insect and disease control
5. Harvesting conditions better for pickers
6. Possible higher yield

#### Disadvantages of Plasticulture

1. High cost of establishing a planting
2. Limited selection of cultivars
3. Row cover cost higher
4. Need a longer growing season in the fall
5. Runners can become uncontrollable
6. Must have good management practices

Is the matted row system a dinosaur in Pennsylvania? The matted row has its place where soil conditions are such that plasticulture will not work. Some fields in Pennsylvania appear to have been mulched with stones making it difficult for growing crops. It takes less sophisticated equipment and management to operate a successful and profitable matted row system.

Plasticulture on the other hand will give earlier fruit by 10 days to 2 weeks. This advantage will entice customers to come to your place first. It takes more sophisticated equipment and good management practices to operate a successful and profitable

operation. The chance of producing higher yields and cleaner fruit makes plasticulture a system that needs your attention. Which strawberry system is best for you? As the owner, grower and manager you must weigh all the factors and decide which system or combination of systems will work best for you.

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## **Genetic Engineering Inservice**

S. J. Fleischer, Department of Entomology

A multidisciplinary group of faculty have pulled together an inservice on genetic engineering applications in plant food production that will occur on March 15-16. This is a two-day inservice tagged onto the end of March inservice week, 2001. As the first of a series of workshops designed to help agents and faculty understand the current situation, this two-day workshop will cover:

- the scientific basis for genetic engineering
- human health and ecological issues
- genetic engineering technologies in current use
- the regulatory system
- risk communication
- consumer concerns and viewpoints

Agents will have the opportunity to ask questions and provide feedback on a basic approach to food system education, teaching materials will be provided, and Continuing education credits will be obtained. I encourage you to attend the entire session, which we hope to include both Family Living and Ag Production agents. We all need to understand the science and the controversy surrounding this subject.

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## **Bug vs. Bug**

### **Biological Control of Aphids in Greenhouse Vegetable Production**

Cathy Thomas, Intergrated Pest Management Program, Pennsylvania Department of Agriculture

Effective and timely control of aphid populations in greenhouse vegetable production is important due to their ability to develop into large populations quickly. There are many different aphid species in PA greenhouses including, green peach aphid, potato aphid and melon aphid. The aphid that is usually found to infest vegetable crops, especially tomatoes (Solanaceae crops) is potato aphid (*Macrosiphum euphorbia*). In addition to the ability to transmit viruses, aphids cause direct damage by feeding on plant sap to acquire the proteins and sugars needed for their reproduction. Aphids secrete excess sugars in the form of sticky 'honeydew'. Honeydew supports the growth of black sooty mold that affects plant photosynthesis, possibly reducing plant yields. Removing sooty mold from fruit increases handling time and can possibly render fruit unsaleable.

Life cycle

In greenhouse production, aphids are very prolific. Instead of reproducing by eggs, female aphids (stem mother) give birth to live offspring (3-10/day) which start to feed immediately. Within a week, this offspring will be ready to reproduce. Aphids can have two forms: winged or wingless.

As colonies enlarge, aphids develop wings to migrate to less populated areas in the crop.

The most outstanding characteristic for identifying aphids is by the two cornicles ("tail pipes") on the rear of their abdomen. Color is variable among species and is not accurate for identification. As aphids increase in size, they shed their exoskeletons (cast skins). These white cast skins, often mistaken for adult whiteflies, can be found on leaves or stuck in honeydew excretions.

## Monitoring

Plant monitoring should begin at the seedling stage and continue through the duration of the crop cycle. Start plant inspection on lower leaves and continue up the plant to the growing tips. As aphids feed on growing tips, the leaves curl, sometimes looking like virus symptoms.

Yellow sticky cards are useful in detecting winged aphids. Hang sticky cards 4 – 6 inches from growing tips. IPM Labs ([ipmlabs@baldcom.net](mailto:ipmlabs@baldcom.net)) sells a chart with drawings of important insects found on sticky cards. Unfortunately, winged adults on sticky cards may indicate that there are clumped populations already established in the crop and they are migrating to less populated areas. The presence of ants in the greenhouse may indicate aphid development, since the ants feed on the excreted honeydew and thus protect the aphids. When introducing natural enemies, place them in an area protected from ants and control ants with baits or traps.

## Biological Control

Several long-lasting and effective biological controls are commercially available for aphid control. Each natural enemy has an effective introduction strategy that will be discussed further in upcoming issues of this column.

### Predators for aphid control

Ladybeetles (*Hippodamia convergens*)– Ladybeetles are sold as adults in pints, quarts and gallons. A general predator, ladybeetles are effective for cleaning up hot spots. They also feed on scales, thrips, and other soft – bodied insects.

Lacewings (*Chrysoperla rufilabris*) – Lacewings are sold as eggs, larvae. The larvae are voracious predators known as "aphid lions". They will also feed on mealybugs, scales, spider mites and thrips.

Predatory Midge (*Aphidoletes aphidimyza*)- This midge is sold as the adult to be released in greenhouse. The adult midge lays eggs near aphid colonies and the orange larvae feeds on aphids.

Parasites for aphid control

**Caution:** Parasites for aphid control are very species specific. Identify the aphid species infesting your crop before ordering from your supplier.

***Aphidius colemani*** – Used to control green peach aphid and melon aphids. This tiny parasitic wasp lays an egg in the aphid. The egg hatches into a larva which spins a cocoon, producing a new wasp. The wasp exits the aphid body, leaving behind a brown shell called an aphid mummy.

***Aphidius ervi*** – Used to control potato aphids. This parasite has a similar appearance and life cycle as *Aphidius colemani*. This parasitic wasp is about twice the size of *A. colemani*.

***Aphelinus abdominalis*** – Used to control larger aphid species such as potato aphid and glasshouse potato aphid. This wasp is about 3 mm long. The main advantage to using this parasite is that the female adult will parasitize for several weeks and it will also feed on the aphids.

Other effective controls for aphids include: screening vents, removing weeds in the greenhouse and outside greenhouse, inspecting incoming plant material, disposing of plant debris, and avoid growing ornamentals in vegetable production area.

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### **That's a Berry Good Question!!!**

Kathy Demchak, Department of Horticulture

Q. Are there blackberry cultivars that can be chosen to extend the harvest season? (Paul Hauser).

A. Yes. If your farm is in a location where you get reliable crops, as Paul does, you

could grow 'Darrow' or 'Shawnee', both of which should produce for a fairly long season. Both are thorny. You can extend the season in the 'early direction' by growing Choctaw (another thorny one), which also blooms early, and so may be subject to frost. Navaho (a thornless one) produces late. Time of ripening varies in different sites, with soil texture and temperature affecting when the crop will come in, and even the order in which they ripen to a certain extent. Other cultivars you are likely to find in nursery catalogs will produce within these ranges.

Got a question? Send it to Kathy Demchak, at 102 Tyson Bldg., University Park, PA 16802. You will be credited with the question, or can remain anonymous, as you wish.

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### **Changes with Small Fruit Pesticides**

Kathy Demchak, Department of Horticulture

There are a number of changes in labels for small fruits pesticides. Some of the more notable changes for the upcoming season are:

Ronilan can no longer be used on raspberries. Even though you may have a package labeled for use on raspberries, it can no longer be used on raspberries.

Diazinon, which had been labeled for use on strawberries, no longer is.

Nova 40W (myclobutanil, Rohm and Haas) has a supplemental label for use on caneberries, strawberries, gooseberries, and currants for a number of diseases. Probably of most interest is the use as an orange rust protectant for black raspberries and blackberries. Rates and timings for these uses vary with the crop and disease, so consult the label for specifics. In all of the above uses, applications may be made up to the day of harvest.

Confirm 2F and Confirm T/O (tebufenozide, Rohm and Haas) are labeled for use on blueberries and caneberries against some species of leafrollers and gypsy moth, and other pests that vary with the crop. See the label for rates and timings, as these vary with the pest targeted.

Savey 50WP (hexythiazox, Gowan) is labeled for two-spotted spider mite control on strawberries. It is effective against the eggs and immature mites, but not adults. This means that it should be applied when mite populations are still low. The rate is 6 oz/acre, and only application can be made per year. The pre-harvest interval is 3 days.

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### **Potato Musings**

**Potato Sessions at the Mid-Atlantic Fruit and Vegetable Meeting**

Bill Lamont, Department of Horticulture

Mark down the dates on your long-range planner for next years Mid-Atlantic Fruit and Vegetable Convention as January 29, 30 and 31, 2002. The potato sessions will be organized similar to this year starting at 1:30 PM on January 29th and then running all day on January 30th. See you next year in Hershey. If you have suggestions for topics for next year, contact Dr. Bill Lamont, Program Chair for the Potato Program.

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### **County Winter Potato Meetings**

Bill Lamont, Department of Horticulture

March 1, 2001: Lehigh/ Schuylkill County Potato Growers Meeting. Contact: Bob Leiby (610) 391-9840

March 14, 2001: Erie County Potato and Vegetable Growers Meeting. Contact Andy Muza (814) 825-0900

March 15, 2001: Western Pennsylvania Potato and Vegetable Meeting. Contact Tom Zundel (724) 662-2323

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### **2000 Potato Desiccant Trial with ET-751**

M. D. Orzolek, Department of Horticulture

A large potato desiccant trial was planted on May 30, 2000 with the potato variety 'NY112' at the Horticulture Research Farm, Rock Springs, PA. The objective of the trial was to evaluate the effectiveness of a new desiccant ET-751 from Lehigh Agricultural and Biological Service, Inc located in Hamburg, PA. The study was designed to compare the ET-751 applied at different dates with the standard "Diquat" treatment. The 'NY 112' potato variety was planted on May 30, 2000 in a Randomized Complete Block Design with 3 replications. Each treatment consisted of 4 rows 30' long. All desiccant treatments were applied on September 8 and September 14, 2000. 'NY 112' was showing signs of plant senescence on the September 8 spray date. A non-ionic surfactant, Agri\_Dex, was added to all Diquat and ET-751 treatments. Also on the September 14 spray date, a light to moderate dew was visible on the potato plants. After the initial application of the desiccant treatments, all plots were rated for the rate of desiccation using the following scale: 1=plants green to 5=plants (stems and leaves) brown (dead). Treatments included the following:

<u>Treatment</u>	<u>Rate (lbs a.i./A)</u>	<u>Application</u>
1- ET-751 2.5% + Agri-Dex	20g ai/HA +	Senescence and 7 days later

2- ET-751 2.5% + Agri-Dex	*5g ai/HA + 10 g ai/HA + 1.0%	Senescence and 7 days later
3- ET-751 2.5% + Agri-Dex	*10g ai/HA +10g ai/HA + 1.0%	Senescence and 7 days later
4- ET-751 2.5% + Agri-Dex + Diquat 240 EC	*5 gal/HA + 137.5 g ai/HA + 1.0%	Senescence and 7 days later
5- ET-751 2.5% + Agri-Dex + Diquat 240 EC + NIS	*10 gal/HA + 1.0% 137.5 g ai/HA + 0.25%	Senescence and 7 days later
6- Diquat 240 EC + NIS	*275g ai/HA + 0.25%	Senescence and 7 days later
7- Diquat 240 EC + NIS	*137.5g ai/HA + 0.25%	Senescence and 7 days later
8- ET-751 2.5% + Agri-Dex	20g ai/HA +	Senescence only
9- Diquat 240 EC + NIS	275g ai/HA + 0.25%	Senescence only
10- Untreated control		

Desiccation ratings were made every 2 days after the September 8 application until September 20 and then a final rating was made on September 30 (22 days after 1st desiccant treatments). Most Diquat treatments desiccated approximately 60-65% of the potato plants 2 days after treatment (Table 1). While potato plants treated with the ET-751 material did not reach the same stage of Diquat desiccation until 6 days after treatment. Most Diquat treatments were totally brown (dead) within 10 days after treatment. All of the potato plants treated with ET-751 did not attain the brown stage (dead) until 22 days after initial treatment. ET-751 will desiccate potato plants, but the length of time required to brown the plant might enable late blight to infect the green tissue of potato plants.

Table 1. The desiccation ratings of ET-751 and/or Diquat applied to 'NY 112' potatoes grown at the Horticulture Research Farm, Rock Springs, PA – 2000.

#### Desiccation Ratings

Treatment	10-Sep	12-Sep	14-Sep	15-Sep	18-Sep	20-Sep	30-Sep	Average
9	3.8	4.5	4.8	4.8	5.0	5.0	5.0	4.7
6	3.5	4.0	4.6	4.8	4.9	4.9	5.0	4.5
7	3.3	4.2	4.6	4.7	4.8	4.9	4.9	4.5

1	2.5	3.0	3.8	3.9	4.1	4.3	4.9	3.
5	2.0	2.8	3.4	3.8	4.3	4.4	4.9	83.7
3	2.3	3.0	3.4	3.5	3.9	4.1	4.7	3.6
8	2.0	3.0	3.6	3.8	4.0	4.4	4.5	3.6
2	2.2	2.7	3.5	3.5	3.9	4.1	4.9	3.5
4	2.0	2.5	2.9	3.3	4.1	4.3	4.8	3.4
10	1.0	1.0	1.0	1.0	1.0	1.0	2.0	1.1

Desiccation Ratings based on a 1 to 5 scale where 1= green plant and 5= dead (brown) plant.

There was no significant difference in the marketable yield of 'NY 112' among the different desiccant treatments applied to the potato plants (Table 2). The highest marketable yield of potatoes was harvested from plants treated with a combination of ET-751 and Diquat (295 cwt). The lowest yield of 'NY 112' was harvested from potatoes treated with the intermediate rate of ET-751 (233 cwt). Potatoes treated with the ET-751 desiccant produced significantly fewer #3 size potato tubers than potatoes treated with a single application of Diquat. Because of the time it takes to completely kill the plant, but initial application of ET-751 may reduce/stop both photosynthesis and water uptake therefore resulting in smaller potato tuber sizes.

**Conclusions:**

1. Application of the desiccant ET-751 to 'NY 112' potato plants did not kill the plants as quickly as the standard Diquat. However with time, the ET-751 did desiccate the potato plants but several green stems were still visible in treated plants 22 days after initial application of desiccant material. The critical question is: would the green tissue support late blight fungal infections?
2. There was no significant affect on marketable potato yield between ET-751 applications and Diquat applications.
3. Recommend the application of ET-751 with 0.75 to 1.0 pt/A of Diquat for rapid and complete potato plant desiccation.

Table 2. The marketable yield of 'NY 112' potatoes treated with either ET-751 or Diquat grown at the Horticulture Research Farm, Rock Springs, PA – 2000.

**US  
#1  
and  
2  
US#3 Pickouts**  
**Marketable  
yield**

Treatment	Cwt.	Cwt.	Cwt.	Cwt.
4	295	73	148	29
10	287	56	145	32
9	281	51	157	30
5	278	63	148	32
1	270	43	152	37
8	256	51	138	37
2	250	46	143	31
6	244	48	123	26
7	243	53	131	31
3	233	61	99	33
LSD .05	80	22	51	19

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### **Upcoming Meetings**

Bill Lamont, Department of Horticulture

### **Local**

March 1, 2001: Lehigh/ Schuylkill County Potato Growers Meeting. Contact: Bob Leiby (610) 391-9840

March 5, 2001: North Central Vegetable Meeting, Lockhaven, PA. Contact: Tom Butzler, (570) 726-0022

March 13, 2001: North Central Vegetable Producers Conference, Coudersport, PA. Contact: Greg Burns (814) 776-5331

March 14, 2001: Erie County Potato and Vegetable Growers Meeting. Contact Andy Muza (814) 825-0900

March 15, 2001: Western Pennsylvania Potato and Vegetable Meeting. Contact Tom Zundel (724) 662-2323