

THE VEGETABLE GAZETTE

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In This Issue: Comments from the Editor
Small Fruit Program Update
That's a Berry Good Question!
1999 Sweet Corn Weed Control
Nutsedge - *Cyperus esculentus*
Insect Pest of the Month: Colorado Potato Beetle
Garlic Production
The Potato Section
 Potato Musings
 1998 Washington County Potato Trial Results
Upcoming Meetings

Tip for the Month: For all the graduates throughout Pennsylvania-best wishes as you begin another exciting chapter in your lives..Remember you never stop learning..

Comments from the Editor

Bill Lamont, Department of Horticulture

The warmer weather is certainly accelerating the level of activity on farms across the Keystone State. As I travel around the state, I have been enjoying the beauty of the natural landscape that is dotted with redbuds and dogwoods. The fields are alive with activity, as farmers prepare ground for planting. At the Horticulture Research Farm, we have already planted early sweet corn under ultra-thin gauge, clear plastic film and the other day, Mike Orzolek and his crew applied a whole myriad of different colored plastic mulches for testing this coming season. We have planted three on-farm potato variety trials out in the state- in Lehigh, York and Cambria counties and if the weather continues to hold, we should be able to plant the potato research plots at the Horticulture Research Farm next week. We had another very successful "hands-on" high tunnel in-service training program with agents at the Horticulture Farm and would like to take this opportunity to thank Pete Ferretti for preparing such excellent meals. The program was a delicate blend of educational training, socializing and story telling. I am sure that we will have the need for additional training as the high tunnel program continues to develop at Rock Springs and around the state.

I would like to welcome Kathy Demchak, Extension Small Fruit Specialist to our team and note that she will be contributing articles to the vegetable gazette each month. I want to thank those colleagues in the other departments that are supporting the Vegetable Gazette with contributions and would like to encourage others to send in an article next month. The "Insect Pest of the Month" is very popular and we look forward to a "Disease of the Month" that covers vegetables and potatoes for each issue. Dr. Orzolek's alternating "Weed of the Month" and "Herbicide of the Month" that is

really a great addition to the line-up. There are several articles by extension agents: Nutsedge-Cyperus esculentus written by Eric Oesterling, Extension Agent, Westmoreland County and Growing Garlic written by Steve Bogash, Extension Agent, Blair County and Tom Ford, Extension Agent, Fulton County. I would like to remind George Perry, Extension Agent, Schuylkill County that he is on deck for an article next month.

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.

Small Fruit Program Update

Kathy Demchak, Department of Horticulture

Dear Small Fruit Growers:

I wanted to take a few minutes to bring you up-to-date on the Small Fruit program at Penn State. As most of you are aware by now, Barbara Goulart had resigned her position at Penn State effective April 15. This, of course, has left a void. The question of how to fill this void had been the subject of numerous meetings and much consideration. The final outcome was that I was awarded the opportunity to lead the Small Fruit program. So, let me tell you a little about my background, and what I hope to be able to accomplish in this role.

I am a native of Pennsylvania. I graduated from Penn State with a B.S. degree, and from Virginia Tech with an M.S. degree, both in Horticulture. Since returning to Pennsylvania, I've worked as a technician in the Horticulture Department; from 1983-90, mainly with Cyril Smith in Plant Nutrition, and since 1991, with Barb in Small Fruit. During Barb's sabbatic leave in 1997, I filled in as much as possible, and got a little taste of the work that would be ahead.

This position exists largely to address the needs of the Small Fruit grower, with 2 overall goals - to provide needed information to the growers, and when that information does not exist, to do the research to find the answers. This is a big task, especially considering that there is one person involved where there had been two. Consequently, I will be seeking your advice in order to target areas that will be of the most benefit.

So, what's in store for this year? First, I hope to meet and talk to a number of you during the upcoming growing season. I will be asking for your input on your needs, and ways to address them. Second, I will be continuing with field research projects which are in 'midstream' (IR-4 Magnitude of Residue studies, and evaluations of strawberry genotypes for breeding purposes), and I'll be establishing a new field experiment on strawberries (more on that later). Third, as the year progresses (i.e., as the growing season winds down) I will be working on getting extension materials updated, so that you and County Extension personnel have the information you need. I will be using this newsletter to get information to you on a more current basis.

I am looking forward to this new opportunity, and to meeting many of you.

With best wishes....

Kathy

That's a Berry Good Question!

Kathy Demchak, Department of Horticulture

In keeping with the Item of the Month theme, there will be a new monthly feature starting in next month's newsletter - The Small Fruit Question of the Month. So, is there something concerning small fruit that you've always wondered about? Some question you've wanted to ask, but thought you'd sound silly? Don't like to speak up in a crowd at meetings? No one ever notices your hand is up?? Well, send your questions to me, Kathy Demchak, 102 Tyson Bldg., University Park, PA 16802. If you don't mind getting credit for asking a great question, include your name. However, if you'd rather remain anonymous, or don't want your name associated with the question, just say so. All wishes will be respected. Questions will be answered based on 1) how frequently they were asked, and 2) how easily I can find the answer (just kidding-really)! Thanks - I'll be looking forward to hearing from you!! Questions can be sent anytime.

1999 Sweet Corn Weed Control

Mike Orzolek, Department of Horticulture

Weed management in the 1999 sweet corn crop should include both cultural and chemical considerations. Cultural considerations would include: choosing a field with minimal weed pressure (especially perennial weeds) from the previous year, utilizing plant spacings that optimize early plant canopy development (specifically with the very early maturing sweet corn varieties – less than 68 days) and no-tillage. The date of planting will also dictate the weed management strategies since very early sweet corn production under plastic will enhance growth of sweet corn before many of the annual weed seeds begin to germinate (late March through April) or an extremely late crop (October) when seeds of many of the summer annuals will not germinate or be competitive with sweet corn in the field. However, production of sweet corn under clear plastic mulch will still require the application of a pre-emergent herbicide to control early grass and broadleaf weeds emerging with the sweet corn under the plastic. With conventionally grown sweet corn, the following herbicides are suggested for either pre-emergence or post-emergence application.

Pre-emergence

MicroTech (alachlor) applied at the rate of 1.5 to 3.0 quarts/A. Will provide good control of annual grasses and some broadleaf weeds including pigweed, nightshade and galinsoga. MicroTech does suppress yellow nutsedge if preplant incorporated. Weak on lambsquarters. Combine with either atrazine or Extrazine (combination of Bladex and atrazine) to improve control of other broadleaf weeds.

Dual II Magnum or Dual Magnum (metolachlor) applied at the rate of 1.3 to 1.7 pts/A. Will provide good control of annual grasses and some broadleaf weeds including carpetweed, pigweed, nightshade and galinsoga. Dual II Magnum will also suppress yellow nutsedge. Weak on lambsquarters. Combine with either atrazine or Extrazine (combination of Bladex and atrazine) to improve control of other broadleaf weeds.

Atrazine 4L (atrazine) applied at the rate of 1.0 to 1.5 quarts/A. Will provide good control of mainly broadleaf weeds. Suggest combination with grass control herbicide (Dual Magnum, MicroTech, or Sutan+) to improve control of annual grasses. Use the lowest recommended rate of atrazine when combined with an annual grass herbicide or to reduce the risk of herbicide residues which may affect triazine sensitive crops planted the following year.

Bladex 90DF (cyanazine) applied at the rate of 0.55 to 0.83 lbs/A. Will provide good control of mainly broadleaf weeds. Suggest combination with grass control herbicide (Dual Magnum, MicroTech, or Sutan+) to improve control of annual grasses and pigweed species. DO NOT apply to soils classified as sands or loamy sands with less than 1% organic matter, if corn has emerged, or if soils are cold or wet, or crop injury may result. Sweet corn varieties may differ in their tolerance to Bladex 90DF. USE WITH CAUTION ON NEW VARIETIES.

Post-emergence

Basagran 4SC (bentazon) applied at the rate of 1.5 to 2.0 pts/A. Will provide good control of broadleaf weeds and partial control of yellow nutsedge. Best results with Basagran when applied to weeds at the 2-4 leaf stage of growth. Basagran will not control grasses. Basagran works mainly as a contact material; therefore, weeds must be thoroughly covered with spray. Labeled crops are tolerant to Basagran; some leaf-speckling and leaf bronzing may occur under certain conditions, but crops generally outgrow this condition within 10 days.

2,4-D Amine applied at the rate of 0.5 to 1.0 pt/A of the 4EC formulation. Apply after sweet corn and weeds emerge. Use drop nozzles when corn is over 8 inches tall to avoid spraying the foliage or into the whorl of the corn. Warm, wet weather at application may increase the possibility of crop injury. Delay cultivation 8 to 10 days after application to avoid damaging sweet corn due to temporary stem brittleness sometimes caused by 2,4-D. Sweet corn varieties may differ in their tolerance to 2,4-D. USE WITH CAUTION ON NEW VARIETIES. In addition, other vegetable and fruit crops nearby may be sensitive to 2,4-D application.

Sweet Corn Label Additions

Herbicides that should get sweet corn labels in 2000 include: Topnotch – excellent pre-emergence material with much better control of lambsquarters than current pre-emergence herbicides. Tough – good post-emergent broadleaf material which will also control triazine resistant pigweed and lambsquarter problems. Aim – a sulfated urea material used at extremely low rates as a post-emergent material with good activity on broadleaf weeds. Labeling of Beacon, Accent, Liberty, Authority and other sulfonated urea herbicides labeled for field corn looks doubtful for the near future.

Nutsedge - *Cyperus esculentus*

Eric Oesterling, Extension Agent, Westmoreland County

Nutsedge, (often called nutgrass) is a perennial grass-like weed that can be very hard to control in certain vegetable crops. It is a weed in most agricultural crops. Infestations often start in low wet areas of the field and then spread but it can grow in well drained soils as well. It grows yellowish green grass-like leaves and appears as a wide bladed grass. It is important to stress that this is a sedge and not a grass despite the similar appearance. The unique characteristic that distinguishes nutsedge from grasses is the fact that it has three ranked leaves - making the stem triangular. This is easy to observe just by feeling the stem with your fingers or cut the stem off with a knife and then look down on the cut surface - it will be obviously triangular.

Nutsedge is a warm season perennial weed - growth really doesn't start until the soil warms up in late May. Most plants grow from overwintered tubers germinating near the soil surface. Leaves emerge and a primary basal bulb is formed in the top 3/4 inch of soil. The bulb then grows a fibrous root system and then produces rhizomes, secondary basal bulbs and then tubers (nutlets) at the end of the rhizomes. Nutlet formation begins in late June and continues until early fall. The tubers are white at first but gradually darken to black by the end of the season. One plant can produce hundreds or even thousands of nutlets before the top of the plant dies in late summer or early fall. Each of these nutlets will grow into a new plant but not until they have gone through a chilling period - which means the next season. Some nutlets can survive in the soil for several years until they are finally exposed to the right conditions for growth. Also, small seedheads are formed above the plant from July to September and the seed can be a source of some seedlings. However, seed is considered an insignificant means of reproduction, compared to the nutlets.

There are no "silver bullets" in nutsedge control. Nothing will eliminate it in one easy treatment. Control should be based on a complete program that uses a variety of methods to attack the weed. The most important single ingredient is persistence. Plan rotations so that you eliminate or reduce nutsedge in an area before growing crops where you are not able to use effective herbicides. In certain crops such as cole crops, vine crops, and strawberries there are no herbicides labeled to control nutsedge.

Roundup or Gramoxone, where they can be used, will kill the tops of actively growing nutsedge but even with Roundup you do not kill the nutlets, so they remain in the soil for the future. Control nutsedge early in June to prevent nutlet formation. And remember this is a sedge, so post-emergent grass herbicides like Poast or Fusilade have no effect.

There are a number of pre-emergent herbicides that are fairly effective in suppressing nutsedge.

EPTC (Eptam, Eradicaine) may be the most effective but is not used much anymore. It requires immediate incorporation. Sutan is also good and still labeled for sweet corn but requires the same incorporation and is used even less. More popular and easier to use, Dual is fairly effective in suppressing nutsedge at the two pint rate. It is labeled for a number of vegetable crops including sweet corn, snap beans, potatoes, peppers and onions. Partner/Microtech and some of the other chemicals in the choloacetamide family also suppress nutsedge but Dual is the most effective and has the widest label. In sweet or field corn, atrazine at higher rates or combined with Dual is fairly effective but be aware of re-cropping restrictions and carryover potential.

Since nutsedge emerges late it can take growers by surprise. There are few post-emergent options available once the crop is planted. Cultivation and hoeing are always

options and can be effective when done well and with persistence. Gramoxone as a directed spray can be used in snap beans, vine crops, onions and possibly other crops. In snap beans, sweet corn, and peas, basagran is an effective burndown on nutsedge and will get some broadleaf weeds as well. In sweet corn atrazine and oil or atrazine and basagran (laddok) with crop oil gives good burndown. Carefully follow all pesticide label directions.

So nutsedge control is pretty simple. Identify it, eliminate before planting, plan crop rotations to allow use of effective chemicals, and control escapes early in the season with cultivation and/or labeled post-emergent herbicides. Nothing to it as I sit here typing my thoughts into a computer.

References:

- Weeds of the Northeast, Uva, Neal and DiTomaso, Comstock Publishing 1997
- Commercial Vegetable Production Recommendations, Penn State, 1999
- The Agronomy Guide, 1999 - 2000, Penn State

Insect Pest of the Month: Colorado Potato Beetle

Shelby Fleischer, Chris Harding and Zane Smilowitz, Department of Entomology

Colorado potato beetle (CPB) feeds exclusively on solanaceous crops and weeds, and can be a significant pest of potatoes, tomatoes and eggplant. Adult beetles have characteristic cream and black stripes across the back. Females deposit eggs in clusters on the underside of leaves. The eggs are orange and each mass will contain between 20-45 eggs. CPB larvae are crimson in the early instars with black legs and two rows of black spots on the sides of their body. Large larvae are orange and appear bloated and humpbacked. Pupae are located in the soil.

The beetle has 2 reproductive generations per growing season in Pennsylvania. The 1st comes from overwintering adults, and the second from in-field reproduction. Overwintering adults emerge in early May, locate a host and begin to feed and mate. Oviposition (egg-laying) occurs early to late June in central Pennsylvania, and earlier in warmer parts of the state. As with most insects, all forms of activity and development from one life stage to the next is temperature dependent. A female can produce up to 500 eggs in her lifetime. Eggs hatch in about a week depending on temperature. The larvae go through 4 instars (growth stages) in the span of about two weeks. Fourth instar larvae drop from the plant and burrow into the ground to pupation. The pupal stage lasts about a week, and marks the end of the first reproductive generation. Emergence of adults from these pupae in the summer marks the beginning of the 2nd generation. The behavior of these summer adults varies greatly based on photoperiod (day length), crop fed upon, and temperature. Adults emerging in late July and early August will generally mate and begin oviposition (starting another generation). Adults emerging after the middle of August usually feed for a few days, then burrow into the ground or fly to the edges of woodlots to enter diapause for the winter. The summer generation of adult beetles diapause within the crop field or fly to nearby trees or hedgerows before burrowing into the soil to diapause.

Crop rotation is an effective cultural practice to reduce CPB problems. Rotation prevents overwintering beetles emerging directly in the fields regardless of the distance

that you rotate. The distance that you rotate influences the degree of reduction of immigrating adults. The further a field is located from the previous year's potato or tomato field, the longer overwintering adult CPB take to infest it. A field that is 1500 feet from previous year's potatoes can delay infestation about 7 days. Rotation by at mile is best, if possible. Infestation can be further delayed by having winter wheat or hay between rotated fields. Another cultural practice is no-till, or using straw mulch. We are not sure why this works, but it has been effective in several studies with tomatoes, including observations in Lackawanna County. It is possible that the stubble or straw interferes with adults finding the fields, or the straw environment may harbor more predators.

Several predators are known to feed on CPB eggs, including one ladybird beetle (*Coleomagilla maculata*), and a predaceous stinkbug. Not all ladybird beetles feed on the eggs. In addition, the early hatching larvae feed on the eggs that have not yet hatched, reducing egg hatch by about 10%. One parasitoid, *Endovum putlerri*, has been very effective on CPB, but only on eggplant. In home gardens, hand-picking and row covers are effective.

We typically see much greater CPB pressure in eggplant and potatoes than tomatoes. In one recent study, a summer generation did not develop in tomatoes, but did develop in neighboring potatoes. By far, the greatest damage to plants is by the late instar larvae and adults. CPB affect potato yields more severely during tuber formation and less so during vegetative growth. Fortunately these growth phases are easy to determine. Tubercization is coincident with the flowering of potatoes; thus controlling pests during flowering is more essential than during other plant growth phases. For example, 4 big eaters (large larvae and adult CPB) per 10 plants requires treatment during flowering, whereas prior to or after the bloom period, a spray would not be needed until 15 big eaters were found per 10 plants. For established tomatoes, begin treatments (typically against overwintering adults) when densities exceed 15 adults per 10 plants. If chemicals are not needed for overwintering adults, wait for egg hatch, and direct sprays against densities exceeding 20 adults or larvae per 10 plants.

Chemical control is often used, but this insect had developed resistance to every class of insecticides that has been developed (see Table 1), and resistance management needs to be practiced with the use of chemical controls. Fields should be scouted, and treatments applied only when needed. CPB is often localized within a field, and spot-treatments are recommended when this is observed. Many growers are currently using imidacloprid (Admire or Provado) which is labeled now in potatoes, tomatoes and eggplant. Admire is formulated and labeled for soil application, and Provado for foliar application. Both formulations are very effective against CPB, potato leafhopper and aphids. Imidacloprid as with any insecticide, should be alternated with insecticides using different modes of action. For example, if Admire was applied at planting for overwintering adults and first generation larvae do NOT apply Provado to the second-generation CPB. If Provado was used for overwintering adults and first generation larvae do NOT use it on second-generation beetles. Some growers are applying Admire to the rows along the field edge where the immigration front is expected. This resistance management practice is in response to the observation that beetles tend to be in higher densities near field edges, edges adjacent to previous years fields. This "border treatment" can kill many of the immigrating beetles while they are entering the field and

can significantly reduce the CPB population. In transplanted tomatoes or eggplant, drenches applied to roots can prevent establishment of populations by controlling overwintering adults, but care must be taken with rates to avoid phytotoxicity.

There are other biorational materials also becoming available. One type of Bt, *Bacillus thuringiensis tenebrionis*, is effective when it is sprayed onto hatching eggs and very young larvae. It must be the *tenebrionis* strain of Bt (which is in the formulations called Novodor or Raven), and it must be applied to very young (1st and early 2nd) instars. Transgenic potatoes (the New Leaf cultivars) express the Bt *tenebrionis* protein within the plant. These Bt options only control CPB, and not worms or leafhoppers. Spintor and Agri-Mek are effective microbial metabolites against CPB. Agri-Mek is registered in both tomatoes and potatoes, and SpinTor is labeled in tomatoes and eggplant (but not potatoes). Consult the commercial vegetable guide for recommended pest control materials for potatoes or tomatoes, AND ALWAYS CHECK THE LABEL.

Table 1. History of Colorado potato beetle resistance to insecticide active ingredients in Long Island, New York. Adapted from Forgash.

Active Ingredient Introduced and Date of 1st Failure

Arsenicals	1880 1940's
DDT	1945 1952
Dieldrin	1954 1957
Endrin	1957 1958
Carbaryl	1959 1963
Azinphosmethyl	1959 1964
Monocrotophos	1973 1973
Phosmet	1973 1973
Phorate	1973 1974
Disulfoton	1973 1974
Carbofuran	1974 1976
Aldicarb	1974 ----
Oxamyl	1978 1978
Fenvalerate	1982 1983
Permethrin	1979 1981
Fenvalerate + PBO	1982 1983
Rotenone + PBO	1984 1990
Cryolite	1985 ----
Arsenicals	1880 1940's
BT	1986 1991
Imidacloprid	1995 ???
Transgenic potatoes	1996 ???

Garlic Production

Steve Bogash, Multi-County Commercial Horticulture Agent, Blair County

Tom Ford, Extension Agent, Fulton County

Garlic (Allium sativum), a member of the onion family, has become one of the most popular culinary and medicinal herbs on the market today. In the period from 1990 to 1997, annual consumption of garlic increased from 1.3 to 2.1 pounds per person in the United States.

Marketing--at the wholesale level, garlic is normally traded as 5, 22, 30 pound boxes, 3 pound ropes and braids, and cases of 48- 2 bulb boxes. Wholesale prices have been fairly stable from 1994 to 1997 at \$.80 - \$1.20 per pound for bulk cartons of CA standard white garlic (California garlic sets the wholesale price nationally). Garlic can be sold by the pound, by the braid or rope, and at farmers markets by the individual bulb or by a bundle of freshly dug bulbs. Retail garlic prices vary considerably. Area supermarkets sell garlic at approximately \$2.00 per pound, organic grocers sell garlic for as high as \$4-\$5 per pound and some skilled direct marketers sell garlic for as high as \$1.00 or more per bulb.

When getting into commercial production it is very important to know the preferences of your customers. Garlic flavors range from very mild (elephant garlic) to very strong (Romanian Red). Producers need to know what your customers prefer before selecting varieties.

Site Selection--garlic can be grown successfully in any well-drained soil. Poorly drained soils predispose garlic to fusarium bulb rot and other bulb diseases. Soils that are rich in organic matter with a pH of 6.0-6.5 are ideal. Heavy clay or stony soils are difficult to work in and may cause misshapen bulbs. A grower's microclimate and soil conditions must be taken into consideration when selecting garlic cultivars. Grower's must practice good crop rotations and plant garlic following a heavy cover crop such as buckwheat or rye. Cover crops discourage pests, reduce disease inoculum, build soil organic matter, and limit weed pressure.

Planting--garlic growers have developed their own specific techniques for setting or planting garlic. Small market gardeners often place each clove by hand into raised beds with rows 6-12" apart and cloves set 4-6" apart (depending on the size bulb grown). Larger growers using specialized "cups" on their transplanters will place their cloves at similar spacings as allowed by the machinery. When setting garlic be sure to allow adequate room for effective weed control measures. Garlic is a weak competitor and will suffer if weed pressure is high. Most garlic cultivars are planted with 1-1.5" soil cover, while Elephant garlic should be planted deeper with 2-2.5" of soil covering each bulb. Garlic cloves should be set early enough in the fall so that a good root system can develop, but late enough to prevent shoot emergence above the soil line. A 2-4" straw mulch at planting will help preserve moisture, discourage frost heaving, and prevent most weeds.

Irrigation--garlic requires a steady supply of moisture to develop market-sized bulbs. The application of one inch of water per week during dry periods until mid-June will ensure good sizing. Avoid irrigating garlic after this period to encourage maturation and to discourage bulb diseases.

Fertilization--garlic is considered a heavy feeder. For commercial production, 160 lb. of nitrogen, 116 lb. of phosphorus, and 44 lb. of potassium per acre are required. Phosphorus, potassium and pH levels should be adjusted preplant and incorporated to soil test recommendations. A pH of 6.0 - 6.5 is ideal for garlic. To reduce fertilizer runoff, nitrogen applications should be split. Apply one half at planting and the remainder in the spring just after the shoots emerge from the soil. Fertilizer can be applied by banding or broadcasting a granular product or by injection through a drip irrigation system.

Cultural Practices--retail customers pay premium prices for large garlic bulbs. To meet this need a grower must remove the scape (flower stalk) as soon as it is visible. If the scape is allowed to develop it will compete with the bulb for nutrients resulting in a reduction in bulb size and quality. Once removed, scapes should be disposed of to limit one source of disease inoculum.

Weed Control--garlic is a weak competitor and does not thrive in weedy fields. Growers must start with a weed-free planting bed and mulch with clean straw after planting. There are only a limited number of herbicides currently registered for use in garlic. Herbicide recommendations can be found in the most recent issue of the Pennsylvania Commercial Vegetable Production Guide.

Insects and Disease--onion thrips are the major insect pest of garlic in Pennsylvania. Adults and larvae overwinter in clover, alfalfa, and small grain fields. Thrips cause a bronzing or whitening of the garlic foliage. Insect controls for garlic can be found in the Pennsylvania Commercial Vegetable Production Guide. Several diseases affect garlic including basal rot (*Fusarium*), white rot (*Sclerotinia*), and occasionally *Botrytis*. Long crop rotations and the planting of disease-free stock will limit most of these diseases. Harvest & Storage--garlic is ready to harvest when 40 - 60 % of the leaves have yellowed (generally 6 leaves). Garlic maturation is a function of daylength. Most varieties are ready by mid-July with some minor varietal variation. Early harvests reduce storage quality. Bulbs harvested too late will start to split open. Split bulbs have no commercial value and can only be utilized by the grower for planting stock. Be sure to discard any planting stock that has blemishes or obvious disease signs. Freshly harvested garlic is cured by placing it on racks with good airflow. The racks should be placed in a location out of direct sunlight and the weather for approximately three weeks or until the outer two leaves are completely dry. Many smaller growers spread their bulbs on the wooden floor of a barn to cure. Once cured, trim the tops and the roots and clean the remaining soil from the bulb. Place the cured bulbs into clean cardboard boxes or burlap bags and store at 32 - 35°F and 65-75% relative humidity. Curing is only important for storage, garlic is ready to eat after harvest. Many direct marketers do not cure their garlic after harvest and move it directly to their retail customer.

Potato Section

Potato Musings

Bill Lamont, Department of Horticulture

As I travel around the state there are potatoes that have been planted and potatoes that are being planted. Farmers are the eternal optimist!! Next year will be better..What if farmers didn't want to take the gamble and decided not to plant a crop--where would the world be? The potato industry in Pennsylvania is changing and there are forces at work some of which growers have no control over and which directly impact their farming enterprises. Take for example the article in our local newspaper. The Center Daily Times, which had an article "Strike at Potato Chip Factory Leaves Some Spud Farmers Holding the Bag". There was a picture of Bob Hite sorting through a pile of potatoes in his storage. The article is a case in point of how some factors are beyond the control of the growers. We will continue to take a look at factors that we can control and how to maximize the positive factors and reduce the negative influences. I have included the results of the 1998 Washington County Potato Trial. The Insect Pest of the Month: Colorado Potato Beetle by Shelby Fleischer, Chris Harding and Zane Smilowitz, Department of Entomology is an excellent review of one of the major insect pests of potatoes. We will also continue to keep you updated on our research plots around the state and at the Horticulture Farm at Rock Springs.

1998 Washington County Potato Trial Results

Bill Lamont and Terry Simpson, Department of Horticulture
 Eric Oesterling, Extension Agent, Westmoreland County
 Bob Trax, Grower

Table 1. Washington County - Yield and Size Distribution

Variety	Yield (cwt/A)		Size Distribution in Percent						%	P.O.	P.O.	Comment
	Total	Saleable Yield	1 1/2 - 1 7/8 - 2 1/2 - 3 1/4 -									
			No. 1	1 7/8"	2 1/2"	3 1/4"	4"	Over 4"	P.O.	Cwt/A		
Chieftain	488.8	405.0	83	6	23	53	7	4	7	16	GC,MS,SB	
Nordonna	449.8	382.2	85	11	33	52	0	0	4	19	SE	
ND2225-1R	341.0	305.0	89	8	60	30	0	0	2	7	SB	
ND2224-5R	419.7	356.5	85	8	19	58	8	0	7	28	SB,MS	
NY97	439.5	386.6	88	5	21	61	7	0	6	28	MS,GC,SB	
Dk Red	459.4	413.8	90	6	33	57	0	0	4	19	SB	
Norland												
Caribe	467.5	352.0	75	4	44	31	0	0	21	98	MS,GC,SB	
BO811-13	380.8	328.6	86	8	27	57	2	0	6	21	MS	
NY101	585.0	527.0	90	6	21	50	18	0	4	24	GC	
Carola	502.7	399.8	80	9	32	41	6	0	12	60	MS,SB	
Sierra	328.6	230.9	73	13	35	38	0	0	14	48	MS,SB	
Island	271.3	206.6	76	19	58	18	0	0	5	13	MS,SB	
Sunshine												
Yukon	509.4	393.3	77	3	9	40	28	12	8	37	SB,GC	
Gold												
Norwis	546.9	487.3	89	3	16	52	21	6	2	10	SB	
GoldRush	370.5	269.8	73	8	38	35	0	0	19	72	MS	
Castile	495.4	427.0	86	5	19	65	3	3	5	28	MS	

Andover	398.4	299.2	75	2	14	55	6	0	23	90	SB
Eramosa	537.3	435.8	84	3	19	51	14	0	13	85	MS,SB
Elba	413.8	298.5	72	6	13	48	10	3	20	78	MS,SB
AF1615-1	395.4	302.0	76	9	24	47	5	0	15	57	SB
AF1437-1	360.5	266.9	74	8	29	34	11	0	18	65	GC,SE
NYE11-45	370.6	272.2	73	7	12	48	14	0	19	76	SB
Allegany	355.0	187.4	53	3	7	36	11	2	41	147	SB
NY110	476.3	354.6	74	2	9	46	19	0	24	113	SB,GC
NY103	444.0	291.0	66	3	10	44	12	0	31	140	SB
Reba	502.7	428.5	85	4	23	59	4	0	10	53	SB
Kennebec	330.8	102.9	31	3	8	20	2	0	67	218	SB,GC
Katahdin	437.4	304.3	70	6	8	46	16	0	24	107	SB

Table 3. Washington County - Specific Gravity, Bake and Boil

Variety	Specific Gravity	Bake	Boil
Chieftain	1.064	1.5 very good	2.5 fair+
Nordonna	1.077	3.0 fair	2.5 fair+
ND2225-1R	1.057	2.5 fair+	2.5 fair+
ND2224-5R	1.060	1.5 very good	2.5 fair+
NY97	1.059	1.5 very good	1.5 very good
Dk Red Norland	1.062	2.0 good	2.5 fair+
Caribe	1.069	1.5 very good	1.5 very good
BO811-13	1.066	2.0 good	2.5 fair+
NY101	1.067	1.5 very good	1.5 very good
Carola	1.070	1.5 very good	2.0 good
Sierra	1.060	2.0 good	1.5 very good
Island Sunshine	1.090	1.5 very good	2.5 fair+
Yukon Gold	1.075	1.5 very good	1.5 very good
Norwis	1.063	1.5 very good	2.0 good
GoldRush	1.062	1.5 very good	2.5 fair+
Castile	1.074	1.5 very good	2.0 good
Andover	1.078	1.5 very good	2.5 fair+
Eramosa	1.066	2.0 good	2.5 fair+
Elba	1.066	1.5 very good	1.5 very good
AF1615-1	1.069	1.5 very good	1.5 very good
AF1437-1	1.061	1.5 very good	2.5 fair+
NYE11-45	1.069	1.5 very good	2.0 good
Allegany	1.079	1.5 very good	2.5 fair+
NY110	1.072	1.5 very good	1.5 very good
NY103	1.070	1.5 very good	2.0 good
Reba	1.075	1.5 very good	1.5 very good
Kennebec	1.065	2.0 good	2.0 good
Katahdin	1.060	2.0 good	1.5 very good

Upcoming Meetings

Bill Lamont, Department of Horticulture

National

May 16-20, 1999: 6th National Symposium on Stand Establishment, Roanoke, VA.
Contact: Greg Welbaum (540) 231-5801.

May 19-20, 1999: 28th National Agricultural Plastics Congress, Tallahassee, FL.
Contact: Pat Heuser, Executive Secretary, American Society for Plasticulture (814) 238-7045.

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.