

THE VEGETABLE GAZETTE

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Tip for the Month: “The future will favor those who possess that uncanny ability to stay on the leading edge of progress by accepting the new, but not too new, and by abandoning the old before it becomes too old”--Dr. Harold B. Tukey, Sr.

Comments from the Editor

Bill Lamont, Department of Horticulture

We have now begun Volume 3 of the Vegetable Gazette. I look forward to continuing working as editor and serving your needs throughout the next year. For all my colleagues in the other departments just a reminder that the Vegetable Gazette will come out as near to the 1st of each month and this means that I would like to receive your articles the last week of the previous month. I would love to have an “Insect Pest of the Month” and a “Disease of the Month” that covers vegetables and potatoes for each issue to go along with Dr. Orzolek’s alternating “Weed of the Month” and “Herbicide of the Month”. In this issue we have the first in a series of articles written by county agents that will cover a variety of topics. I would like to thank Eric Vorodi, Extension Agent, Franklin County for his excellent article on the results of his Squash Variety Trial and remind Tim Elkner that he is on deck with an article for February. As always, the Vegetable Gazette Team encourages your feedback so that we can better serve your needs and address your concerns. The month of January also presents growers with time to attend some of the excellent upcoming educational opportunities at the county, state and national levels. I would refer you to the extensive listing of upcoming meetings at the end of the gazette.

Squash Trial Results

Eric Vorodi, Extension Agent, Franklin Co.

The following article is a summary of results taken from squash variety trials conducted in Pennsylvania and Kentucky during the last two years. For copies of the complete reports, contact Eric Vorodi @ (717) 263-9226.

Introduction: In recent years, viruses in cucurbits have caused considerable trouble and in many cases a reduction in yield of marketable fruit of zucchini, yellow straightneck squash and yellow crookneck squash. Pumpkins, acorn squash, butternut squash and cantaloupes have also been affected. Depending on the year, location of the field, time of planting and varieties grown, losses can vary from zero to 100%. Research and interest in other states indicate that viruses of cucurbits are a significant problem in the Mid-Atlantic region.

During 1997, farm visits in the Cumberland Valley of Pennsylvania revealed that viruses were present, causing severe symptoms on zucchini and yellow summer squash plants and reducing yields of marketable fruit in later plantings. Pumpkins, acorn squash and butternut squash yields were also reduced. This situation generated interest and a resulting on-farm variety trial in Franklin County, PA in 1998. Meanwhile, research was already going on in Kentucky in the form of a large variety trial in 1997. Rowell, Nesmith and Snyder trialed nine zucchini, eight yellow straightneck and eight yellow crookneck squash varieties.

The Kentucky researchers compared varieties in a late summer planting for yield, quality and disease resistance at the University research farm in Lexington. Plants were transplanted in raised plastic beds with trickle irrigation on August 5th. A virus susceptible variety was interplanted to enhance virus spread throughout the planting. Plots were harvested up to 24 times but harvesting of each variety was discontinued when most of the fruits showed symptoms.

In Kentucky, during 1997, virus infections were late in the season and symptoms were not typically observed until the first fruit were harvested from trial plants on August 26th. Viruses did cause greening of fruits and early termination of harvest of some yellow squash varieties but symptoms were absent from zucchini varieties during most of the trial. Only a few fruits of 'Zucchini Elite' were culled due to virus symptoms.

Among the yellow squashes, hybrids with the precocious yellow gene were highest yielding in spite of virus incidence ranging from 70-100%. Even plants with severe foliar symptoms yielded marketable fruit. (Note: The precocious yellow gene causes yellow pigment to mask the affects of virus which would show up as green rings and blotches on yellow fruit.) The highest yielding yellow straightnecks included; Fortune, XPHT 1816, Multipik, Sunbar, Seneca Supreme and Liberator III. Of these, XPHT 1816 and Liberator III claim resistance to four and three viruses respectively and the others all have the precocious yellow gene.

Prelude II and Destiny III were clearly superior in terms of yields among yellow crookneck varieties with yields nearly double those of the lowest yielding crooknecks. Yields of several of the traditional crookneck hybrids (Dixie, Goldie, Pavo and Picasso) were greatly reduced by greening of fruit associated with virus diseases. Prelude II was also noted for its partial resistance to powdery and downy mildew.

Zucchini varieties showed no statistically significant differences in yields between varieties although numerical differences in yields were apparent. (See table)

In the 1998 Pennsylvania trial, plants were seeded into 2" cells in early June. On June 24th transplants were placed at 2' spacing on raised beds with trickle irrigation and black plastic mulch on a commercial farm in Franklin Co. where viruses were severe on zucchini in 1997. Four replications of 25 plants each were planted in a randomized complete block design. Four zucchini and six yellow straightneck squash were trialed. In each case a non-resistant standard was used as a control. The other varieties had varying claimed resistances or tolerances to viruses or simply the precocious yellow gene (see table.) Plants were observed weekly for virus symptoms on foliage and fruit. Fruit were harvested most days from July 17th through 30th and then weekly through August 21.

Some plants had mosaic symptoms on foliage by late July. Fruits were not always affected and at times were not affected until after passing the marketable harvest size. Of the zucchini, Tigress, Dividend and Revenue were much less affected than Zucchini Elite. Of the yellow straightneck squash, Liberator III was by far the least affected in terms of both foliage and fruit. Multipik, Superpik and Fortune also were able to yield marketable fruit despite virus infection as evidenced by foliar symptoms. (See tables)

Marketable Yield - Yellow Straightneck Squash, Kentucky, 1997

Variety	Seed Source	Claimed resistance/tolerance or py	Mkt. Yield - box/A
Fortune	Rogers/Novartis	py	1710
XPHT 1816	Asgrow	ZYMV, CMV, WMV, PRSV	1699
Multipik	Harris Moran	py	1669
Sunbar	Petoseed	py	1563
Seneca Supreme	Petoseed	py	1541
Liberator III	Asgrow	ZYMV, CMV, WMV	1535
Seneca Prolific	Petoseed		1199
Lemondrop-L	Asgrow		959

Marketable Yield - Yellow Crookneck Squash, Kentucky, 1997

Variety	Seed Source	Claimed resistance/tolerance or py	Mkt. Yield - box/A
Prelude II	Asgrow	ZYMV, WMV, PM	1599
Destiny III	Asgrow	ZYMV, CMV, WMV	1571
Sundance	Petoseed		1225
Prelude	Asgrow		1006
Dixie	Asgrow		898
Goldie	Petoseed		894
Pavo	Asgrow		888
Picasso	Ferry Morse		836

Marketable Yield - Zucchini, Kentucky, 1997

Variety	Seed Source	Claimed resistance/tolerance	Mkt. Yield - box/A
Revenue	Rogers/Novartis	ZYMV, CMV, WMV	2220
President	Petoseed		2170
Dividend	Rogers/Novartis	ZYMV, CMV, WMV	2125
Zucchini Elite	Harris Moran	ZYMV, WMV	2116
XPHT 1814	Asgrow	ZYMV, WMV	2108
XPHT 1777	Asgrow	ZYMV, WMV	2040
Senator	Asgrow	ZYMV, WMV	1923
Jaguar	Harris Moran	ZYMV, WMV	1783
XPHT 1776	Asgrow	ZYMV, WMV	1589

Virus Symptoms - Yellow Straightneck Squash, Franklin Co., PA 1998

Cultivar	Seed Source	Claimed resistance/tolerance or py	% fruit with mosaic symptoms - 7/30 - 8/14
Seneca Prolific	Seneca		98.0a
General Patton	Asgrow	py	51.0 b
Fortune	Rogers/Novartis	py	24.7 c
Superpik	Harris Moran	py	25.4 c
Multipik	Harris Moran	py	15.3 c
Liberator III	Asgrow	ZYMV, CMV, WMV	00.0 d

Virus Symptoms in Zucchini Squash, Franklin Co., PA 1998

Cultivar	Seed Source	Claimed resistance/tolerance	% fruit with mosaic symptoms - 7/30 - 8/14
Zucchini Elite	Harris Moran		89.1a
Revenue	Rogers/Novartis	ZYMV, CMV, WMV	66.0 b
Dividend	Rogers/Novartis	ZYMV, CMV, WMV	48.5 c
Tigress	Harris Moran	ZYMV, WMV	40.4 c

py = precocious yellow gene

Combining the results of both trials leads to some recommendations for squash varieties being grown in areas with a history of virus problems. Based on yield, virus resistance/tolerance and fruit quality, the Kentucky researchers considered the following varieties to be superior: Zucchini - *Revenue* and *Dividend*. In Pennsylvania, we would look at *Tigress* and *Dividend* due to their lower incidences of virus infected fruit. As for yellow straightnecks: *Fortune*, *Multipik*, *Seneca Supreme* and *Liberator III* were tops in Kentucky and *Liberator III* was superior in Pa in terms of virus free fruit, followed closely by *Multipik*, *Superpik* and *Fortune*. Top yellow crooknecks as determined only in Kentucky include *Prelude II* and *Destiny III*.

Herbicide of the Month-Clomazone

Mike Orzolek, Department of Horticulture

TRADE OR OTHER NAMES

Command, Commence, Gamit, Magister and Merit.

Clomazone is a broad spectrum herbicide used for control of annual grasses and broadleaf weeds in cotton, peas, pumpkins, soybeans, sweet potatoes, pumpkins tobacco, winter squash and fallow wheat fields. It can be applied early preplant, preemergent or preplant-incorporated depending on the crop, geographical area and timing. Because clomazone is an inhibitor of plant pigments, users must exercise caution to avoid drift or vapors which may cause bleaching damage to non-target foliage. Clomazone was originally developed as an emulsifiable concentrate formulation.

Since soil applied herbicides are susceptible to losses through volatilization it is not uncommon to find measurable levels offsite. Clomazone is one of the most volatile herbicides used in agriculture. Bleached vegetation can be observed after volatilization of the herbicide occurs. In the past, the most commonly used formulation of this compound has been an emulsifiable concentrate (EC). A microencapsulated (ME) formulation of clomazone has been derived by FMC to reduce volatilization. We have conducted laboratory and field experiments to determine some differences in volatilization between the two formulations. All experiments have included mixtures with trifluralin and EPTC for comparison purposes. These studies were conducted on either Roxana silt loam (Typic Udifluent) or Dardanelle silt loam overwash (Typic argiudoll) soil. Laboratory experiments consist of comparing volatilization of 1) clomazone formulations, 2) the ME formulation on two soil types, 3) both formulations under two temperatures, and 4) both formulations under two moistures. The field experiment was developed to monitor volatilization of the ME formulation under two soil moistures while monitoring soil and air temperature, and relative humidity. Soil samples were collected for measuring moisture and herbicide content. Results from laboratory experiments showed that the ME formulation volatilized less than the EC formulation, and that higher temperatures increased volatilization of the ME formulation while moisture had little effect on volatilization of either formulation.

(Monitoring volatile herbicide emissions from soil. - Robert D. McCall*, J. D. Mattice, and T. L. Lavy, University of Arkansas, Fayetteville.)

TOXICOLOGY

Clomazone is a slightly toxic material by ingestion, inhalation and dermal exposure. Clomazone is not mutagenic. EPA states that clomazone does not cause tumor formation (4). No tumor formation occurred in mice or rats given dietary doses as high as 100 mg/kg for 2 years (3, 5). Metabolism studies in rats show that 90 to 99% of the product Command administered to rats was excreted within 72 hours and there was no significant retention of the herbicide in rat tissues (4).

ENVIRONMENTAL FATE

Clomazone is relatively stable to degradation by UV light (3). It is highly volatile and can drift during or after application, causing damage to sensitive, non-target plants such as ornamental trees and shrubs, roses, small grains, alfalfa, sunflowers, and vegetable crops (4).

Clomazone is highly soluble in water, but it has a moderate tendency to adsorb to soil particles. It therefore has a low to moderate potential to contaminate groundwater (2, 9). The product Command has low mobility in sandy loam, silt loam and clay loam soils. It is moderately mobile in fine sand (3).

Microbial degradation of Command is promoted by high soil moisture, warm temperature, and by increasing the pH to 6.5. Degradation was faster in a sandy loam than in silt or clay loams (3). In field studies, the half-life of clomazone was 28 to 84 days, depending on soil type and the organic matter content (3).

Clomazone inhibits synthesis of chlorophyll and carotenoids in plants. It is absorbed by plants through the roots from the soil and by shoots. It is then translocated in the xylem and diffuses within leaves. It does not move downward in plants or from leaf-to-leaf. There is no foliar absorption of clomazone. Clomazone is metabolized by plants (3).

BASIC MANUFACTURER

FMC Corp.
Agricultural Chemicals Group
2000 Market St.
Philadelphia, PA 19103
Emergency: 800-331-3148

REFERENCES

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The Potato Section

Into 1999

Bill Lamont, Department of Horticulture

As we enter 1999 one should already be reviewing the past growing season and noting things that worked good and those that didn't work as expected. We are boiling, baking and chipping the potatoes from our variety trials and will be reporting on the results in upcoming issues of the Potato Section. We are putting together our 1998 Pennsylvania Potato Extension and Research Report that we be mailed out and available at meetings. I am encouraging my colleagues in the Entomology and Plant Pathology Departments to contribute articles on insect and disease problems that are negatively impacting potato production in Pennsylvania. I look forward to them reporting on the results of their research or a highlight of an insect or disease problem.

Just a reminder that there are several upcoming potato meetings that you should mark on your calendars: January 26-28, 1999: Potato Session at the Mid-Atlantic Fruit and Vegetable Growers Convention, Hershey, PA.; February 10, 1999: Cambria and Somerset Potato Meeting; February 11, 1999 (evening): Potato Growers Meeting, York County; February 16, 1999: Western Pennsylvania Potato Meeting; February 24-25, 1999: PA Potato Growers Cooperative Annual Meeting; March 3, 1999: Lehigh/ Schuylkill County Potato Growers Meeting; March 15, 1999: Potter County Vegetable and Potato Growers Meeting; March 16, 1999: Erie County Potato and Vegetable Growers Meeting.

In 1999 we will continue to be innovative in our approach to solving problems and will always strive to better serve the potato growers and potato industry in Pennsylvania. We welcome your visits, comments, feedback and suggestions as we go about our work.

Speakers and Topics for the Potato Session in Hershey

Bill Lamont, Department of Horticulture

Tuesday Afternoon-January 26, 1999

“Update on the Most Promising Cornell Potato Lines”-Dr. Donald Halseth, Cornell University

“A Look at Internal Browning and Heat Necrosis”-Dr. Joe Sieczka, Cornell University

“Potato Production in the Great Plains”-Dr. Chuck Marr, Kansas State University

“Impact of Seed Handling on Potato Yield and Quality “-Dr. Donald Halseth, Cornell University

“Red, White and Blue Potatoes-Dr. Bill Lamont, Penn State University

Tentative Program for the 48th Annual Potato Growers Institute

Bill Lamont, Department of Horticulture

Dates February 24-25, 1999 Place Nittany Lion Inn, Penn State Campus

Wednesday

“Physiology and Field Results on Fertility Uptakes of Potatoes”-Dr. Keith Kelling, Univ. of Wisconsin

“Internal Browning and Quality Problems Associated in Tuber Production”-Dr. Rikki Sterrett, VPI

“Verticilium and Early Dying of Potatoes”-Dr. Barb Christ, Penn State

Potato Cultivar Trials and Selection Results of Promising New Varieties- Dr. David Douches, Michigan State University
“Penn State Variety and Evaluation Trial Results”-Dr. Bill Lamont, Penn State
“Agricultural Benefits and Services”-Mr. Peter Switalski, Agri-Services Agencies, Inc.

Thursday

“Evaluations of Maxim on Potatoes”-Dr. Kiaran Shetty, Novartis
“Silver Scurf Updates and Preventions”-Dr. Neil Gudmestad, North Dakota University
“Concerns of Resistance to Admire/Provado”-Dr. Franklin Chow, Bayer Corp
“Insect Management Strategies”- Dr. Zane Smilowitz
“Potato Scouting Services with Potential Cost Savings to Growers”- Mr. Mark Otto, Agri Business Consulting Inc.
“Update for Management Decisions on Late Blight”- Dr. Barb Christ, Penn State
“PA Germplasm Trial Results”-Dr. Barb Christ, Penn State
“Seed Piece Qualities and Emerging Problems in Seed Production”- Dr. Terry Bourgoïn, Director, Div. Plant Industry, Augusta, ME

Potato Cull Piles

Dr. Bill Lamont, Department of Horticulture

It is never to late to make a New Years resolution that you will take care of those potato cull and rock piles before the new growing season. It is just part of an entire sanitation program and it may save you alot of headaches down the road. We know that we had some problems last year so just a heads-up as we move into 1999..

Upcoming Meetings

Bill Lamont, Department of Horticulture

Local

January 18, 1999: New Holland Vegetable Day, Summit Valley Elementary School, New Holland, PA. Contact: Jeffrey Stoltzfus (717) 354-1522

January 19, 1999: Morrison’s Cove Produce Auction Meeting, Martinsburg, PA. Contact: Steve Bogash (814) 693-3265

January 26-28, 1999: Mid-Atlantic Fruit and Vegetable Growers Convention, Hershey, PA. New name--used to be the State Horticultural Association of PA and Vegetable Conference. Contact: Bill Troxell (717) 694-3596.

February 2, 1999 Susquehanna Regional Vegetable Meeting. Contact: Jeff Mizer (717) 837-4252

February 3, 1999: Northeast Pennsylvania Regional Vegetable Meeting, Thompsons Dairy Bar, Clarks Summit, PA. Contact: John Esslinger (717) 963-4761

February 10, 1999: Cambria and Somerset Potato Meeting. Contact: Ron Hostetler (814) 472-7986

February 11, 1999: Franklin, Cumberland, Adams Counties Vegetable Growers Day, Huntsdale, PA. Contact: Eric Vorodi (717) 263-9226

February 11, 1999 (evening): Potato Growers Meeting, York County. Contact: John Rowehl (717) 840-7408

February 16, 1999: Western Pennsylvania Potato Meeting. Contact: Tom Zundel (724) 662-2323

February 18, 1999: Elk and Cameron County Vegetable Meeting. Contact: Greg Burns (814) 776-5331

February 23, 1999: Schuylkill County Vegetable Growers Meeting. Contact: George Perry (717) 622-4225

February 24-25, 1999: PA Potato Growers Cooperative Annual Meeting, Nittany Lion Inn, Penn State, University Park, PA. Contact: Roger Springer, Manager, PA Potato Cooperative (800) 222-2138 or Dr. Bill Lamont, Department of Horticulture, Penn State (814) 865-7118.

February 24, 1999: Bucks, Montgomery County Vegetable Growers Meeting. Contact: Scott Guiser (215) 345-3283

February 25, 1999: Berks County Vegetable Growers Meeting. Contact: Judy Schwank (610-378-1327

March 3, 1999: Lehigh/ Schuylkill County Potato Growers Meeting. Contact: Bob Leiby (610) 391-9840

March 15, 1999: Potter County Vegetable and Potato Growers Meeting, Coudersport, PA. Contact: Sam Crossley (814) 274-8540

March 16, 1999: Erie County Potato and Vegetable Growers Meeting. Contact Andy Muza (814) 825-0900

April 7, 1999 Greenhouse Vegetable Growers Meeting, Cashtown, PA. Contact: Eric Vorodi (717)-263-9226

Regional

January 19-21, 1999: New Jersey Annual Vegetable Growers Meeting, Trump Taj Mahal, Atlantic City, NJ. Contact: Phil Traino (609) 985-4382.

January 26-27, 1999: Indiana Horticultural Congress, Adam's Mark Hotel, Indianapolis, IN. Contact: Jim Simon (765) 494-1328.

February 1-3, 1999: New York State Farmers Direct marketing Conference, Adams Mark Hotel, Buffalo, NY. Contact: Bob and Judy Schultz (716) 484-7300.

February 3-5, 1999: Ohio Fruit and Vegetable Growers Congress, Sea Gate Centre, Toledo, OH. Contact: Mike Pullins (614) 249-2424.

February 1-4, 1999: New York Vegetable Conference, Holiday Inn and Convention Center, Syracuse, NY. Contact: Jean Warholic (607) 539-7648.

February 17-20, 1999: Mid-Atlantic Direct Marketing Conference and Trade Show, Princess Royale Hotel, Ocean City, MD. Contact: Jarvis Caine (301) 405-1265.

National

January 18-22, 1999: Great Lakes Vegetable Growers Convention, Grand Center, Grand Rapids, MI. Contact: Bernard Zandstra (517) 353-6637.

January 27-31, 1999 – The 4th Annual Herb Business Winter Getaway Conference, Palm Coast Resort, Palm Coast, Florida. For information, please contact: Maureen Rogers, THGMN, P. O. Box 245, Silver Springs, PA 17575. Phone – (717) 393-3295.

February 6, 1999: New England Vegetable and Berry Association Annual Meeting. Contact: Dominic Marini (508) 378-2546.

February 21-23, 1999: Fresh Fruit and Vegetable Annual Conference, Marriot Madison West, Madison, WI. Contact: Teryl Roper (608) 262-9751.

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 (814) 238-7045.