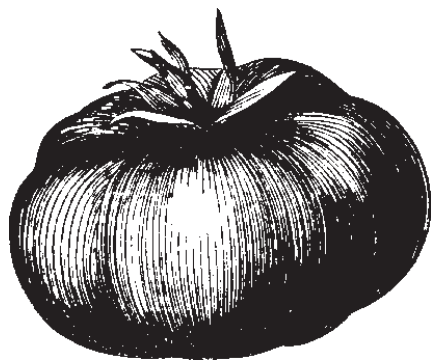


PLANT & PEST ADVISORY

VEGETABLE CROPS EDITION \$1.50

JUNE 9, 2004



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Fungicide Maintenance for Tomatoes

Andy Wyenandt, Ph.D., Post Doctoral Associate in Vegetable Pathology, Wes Kline, Ph.D., Cumberland County Agricultural Agent, and Michelle Infante-Casella, Gloucester County Agricultural Agent

The wet weather in the past few weeks has spurred the likelihood of important fungal disease development in tomatoes. Three important foliar diseases of tomato are **Septoria leaf spot**, **early blight** and **Anthracnose fruit rot**. All three diseases are soil-borne which can lead to pre-mature defoliation and/or fruit rot. Interestingly, the three diseases behave quite differently and are easily identified by the symptoms they produce on infected tomato plants.

Septoria leaf spot will only infect the foliage and stems of the tomato plant. Symptoms to scout for are small, circular lesions with a dark outer edge and brownish-tan center. Black spore producing bodies will develop in the center of these lesions. When scouting, look on the lower foliage of the tomato plant early in the season. The disease will work its way up the plant causing pre-mature defoliation.

Early blight will affect the foliage, stems and fruit. Early blight will produce brown, concentric lesions on the foliage and stems and are much larger than lesions produced by Septoria leaf spot. Early blight, like Septoria leaf spot can also cause pre-mature defoliation. Early blight can also infect green and red fruit through the stem attachment. Lesions that develop on the fruit also produce brown, concentric rings. Anthracnose fruit rot, or red fruit rot, although it can infect green fruit and foliage, symptoms only appear on ripe fruit during the growing season. Anthracnose lesions begin as slightly depressed circular lesions that enlarge. As lesions enlarge they become more flat and develop black, speck-like fruiting bodies in the center of the lesion.

Control of all three diseases should begin with a weekly regular fungicide maintenance program of alternating chemistries. In fields in mountainous areas, not rotated away from tomatoes, and later fields, begin sprays shortly after transplanting. In all other areas, begin sprays when crown fruit reach one-third their final size. This can include chlorothalonil or an EBDC fungicide alternated with strobilurins (Quadris, Amistar, Flint or Cabrio). Strobilurin fungicides have a maximum-season usage and should not be mixed together in a single application or used in back-to-back applications singularly or together. The

SEE FUNGICIDE ON PAGE 3

Vegetable Disease Update

Andy Wyenandt, Ph.D., Post Doctoral Associate in Vegetable Pathology, Wes Kline, Ph.D., Cumberland County Agricultural Agent, and Michelle Infante-Casella, Gloucester County Agricultural Agent

Another week and another week of rain for certain areas. Like they say 'When it rains, it pours' and when it does vegetable diseases develop.

✓ **Cabbage:** A few problems have been seen on maturing cabbage plantings this past week which include **white mold, bottom rot** and **soft rot**. The heavy rains and winds have created wet soils, and blowing soil which can create an entry point for all three diseases on injured plant tissue. Unfortunately, little can be done to correct the problem in maturing plantings. White mold and bottom rot will cause mature outer leaves to wilt, brown out and die. White mold will produce thick, fuzzy white growth on the stem. Black fruiting bodies are produced and easily distinguishable in the fuzzy, white growth. Bottom rot will cause grayish, black lesions on the base

of the mature leaves and extend upward. Grayish-brown mycelium will often be seen on these lesions when leaves are pulled apart. Soft rot will cause cabbage leaves to disintegrate quite rapidly. Leaves often look greasy and wet at first and eventually infected tissue dissolves away creating holes. Crop rotation is the best method to control these diseases. However, cultural practices such as avoiding late season cultivation which may cause wounding of leaves and throwing soil onto the cabbage plant may help.

✓ **Peppers:** Another problem has been the development of the crown rot phase of **Phytophthora blight** on maturing peppers. Symptoms are just now beginning to show up due to the rains of last week. Pepper plants are beginning to show the characteristic signs of wilting and blackened stems. Growers should scout regularly for wilted plants and look for blackened stems. Applications of mefenoxam should be done if symptoms begin to develop. Also, do your best to allow for water flow out of the ends of rows or in low spots in the field. Trenches may need to be dug to remove standing water. If Phytophthora infected plants are found, remove them from the field to eliminate inoculum. If the infected

SEE DISEASES ON PAGE 3

Weekly Weather Summary

Keith Arnesen, Ph.D., Agricultural Meteorologist

Temperatures averaged much below normal, averaging 61 degrees north, 63 degrees central and 65 degrees south. Extremes were 83 degrees at Toms River on the 3rd, and 47 degrees at Newton and Charlotteburg on the 4th. Weekly rainfall averaged 1.05 inches north, 1.40 inches central, and 1.49 inches south. The heaviest 24 hour total reported was 0.86 inches at Toms River on the 31st to 1st. Estimated soil moisture, in percent of field capacity, this past week averaged 96 percent north, 89 percent central and 82 percent south. Four inch soil temperatures averaged 61 degrees north, 63 degrees central and 65 degrees south.

Weather Summary for the Week Ending 8 am Monday 6/ 7/ 4											
WEATHER STATIONS	RAINFALL			TEMPERATURE				GDD BASE50		MON %FC	
	WEEK	TOTAL	DEP	MX	MN	AVG	DEP	TOT	DEP		
BELVIDERE BRIDGE	1.08	11.83	-.45	80	47	60.	-6	684	236	98	
CANOE BROOK	.87	14.75	1.29	81	50	63.	-3	715	304	89	
CHARLOTTEBURG	.74	14.17	.80	78	47	60.	-3	615	319	89	
FLEMINGTON	1.51	14.60	1.83	79	49	62.	-4	697	266	92	
LONG VALLEY	.94	12.18	-1.56	74	50	60.	-4	596	256	92	
NEWTON	1.17	13.38	1.44	78	47	59.	-5	609	263	95	
FREEHOLD	1.39	14.70	2.01	82	53	63.	-4	758	256	100	
LONG BRANCH	1.31	13.20	.21	82	55	63.	-4	594	145	90	
NEW BRUNSWICK	1.19	13.52	1.05	81	53	63.	-6	716	177	99	
TOMS RIVER	2.21	15.00	2.36	83	54	63.	-1	791	333	100	
TRENTON	.88	11.94	.45	81	54	64.	-5	768	182	69	
CAPE MAY COURT HOUSE	1.07	12.68	1.54	80	56	64.	-3	727	214	88	
DOWNSTOWN	1.56	12.34	.93	79	53	64.	-5	869	269	85	
GLASSBORO	1.33	15.73	3.52	81	58	66.	-3	914	334	79	
HAMMONTON	1.44	13.53	1.64	81	53	65.	-3	891	320	85	
POMONA	1.27	11.56	.61	81	54	65.	-2	815	317	85	
SEABROOK	2.25	14.62	4.00	80	55	66.	-3	977	372	96	
SOUTH HARRISON	MISSING										
WES KLINE — GDD BASE 40 PINEY HOLLOW	Last Week 200 (Ending 5/31/04) This Week 169 (Ending 6/7/04)										

Pest Notes

Gerald M. Ghidui, Ph.D., Specialist in Vegetable Entomology

✓ **Carrots:** Carrot weevil adults remain active, and are continuing oviposition in carrots. Asana XL and Baythroid 2EC are labeled for adult weevil control in carrots. Vydate 2L can be applied as a directed spray at the base of the plant when eggs are first noticed in the carrots. Management of carrot weevils in May and June is essential to reduce damage caused by carrot weevils later during the growing season.

✓ **Cole crops:** Imported cabbageworms are the primary pest found in cole crops and leafy vegetables at this time. Many materials are labeled for control of this pest, and all are effective, including the biological insecticides such as the *Bt*'s. For a listing of available materials recommended for imported cabbageworm see page F15 of the 2004 Commercial Vegetable Growers Recommendations for New Jersey.

✓ **Eggplant:** If Colorado potato beetles are still a problem in eggplant, it is advised to use an insecticide OTHER THAN a neonicotinoid class insecticide (Actara, Admire, Assail, Provado, Platinum). The biological insecticides such as the *Bt*'s (Novodor, Raven) and neem-based materials (Azadirachtin, Ecozin, Neemix, etc) are effective against small to medium-sized larvae. Cryolite (Kryocide, Prokil Cryolite), SpinTor, Thionex (Thiodan), and Vydate are effective against both larvae and adults. Thionex and Vydate also have a high level of activity against leafhoppers and aphids. The key is to avoid the neonicotinoid insecticides to reduce the potential of insecticide resistance developing within the beetles against this class of insecticides.

✓ **Tomato:** Several growers have had problems with Colorado potato beetles, primarily from early treatments of Admire or Platinum no longer being effective. As with the eggplant information listed above, it is important to NOT USE an insecticide of the neo-nicotinoid class of insecticides (Actara, Admire, Assail, Platinum, Provado) to reduce the potential of the development of insecticide resistance to these materials. Many effective alternatives are labeled, including the biological insecticides such as the *Bt*'s and neem-based materials (Azotin, Azadirachtin, Ecozin, Neemix) for small to medium-sized larvae, Agri-Mek, cryolite, SpinTor, Thionex (Thiodan), or Vydate. All of these materials are different classes of insecticides, and a spray rotation of these materials is recommended. Use the recommendation guide to assist you in determining which materials are especially effective against other pests: cryolite is also very effective against flea beetles, Agri-Mek against spider mites, SpinTor against worm pests, Thiodan and Vydate against aphids. This may help you decide which material to use at any particular time for potato beetle.

✓ **White Potato:** In-furrow or seed treatment potatoes are still effective against Colorado potato beetles. Although many adults are still found near fields, the larvae are not surviving on these potatoes. It would be wise to plan ahead at this time to develop a spray schedule of materials to use over the next 60 days for both Colorado potato beetle and potato leafhoppers. Monitor for surviving Colorado potato beetle larvae, and plan to use a material OTHER THAN those in the neonicotinoid class (Actara, Admire, Assail, Platinum, Provado). Labeled insecticides include the biological insecticides (*Bt*'s and neem-based materials) for small to medium-sized larvae, Agri-Mek EC, Avaunt WDG tank-mixed with piperonyl butoxide (PBO), cryolite (Kryocide or Prokil Cryolite), Imidan WP, SpinTor SC, Thionex (Thiodan) EC, and Vydate L. Use high-pressure high volume for thorough coverage of the plant tissue for maximum benefit.

Also, potato leafhoppers are beginning to appear on potatoes and other crops. These pests can cause significant damage before many growers realize they have a problem. A threshold of 1 adult per sweep of the net, or 1 nymph per 10 leaves, is used to determine if a spray is needed. Monitor frequently for this pest, and treat before the threshold is exceeded. □

FUNGICIDE FROM PAGE 1

alternation of fungicide chemistries helps to reduce the potential for the build-up of fungicide resistance. Begin this alternation with chlorothalonil and then with a strobilurin. Remember that any fungicide maintenance program should begin with scouting and identifying the disease. Scouting on a regular basis will help growers stay on top of potential problems and may reduce the high cost of fungicide use! Always remember to read the pesticide label before using any product. □

DISEASES FROM PAGE 2

plants are at the end of a row, remove the plants, cut the plastic and end the plastic where the plants are healthy to inhibit movement of spores in the soil to travel up the row. Soil-water management is one of the most important tools of Phytophthora control.

✓ **Pickles/Cucumbers:** Phytophthora development on pickle fruit was also discovered. Symptoms on developing fruit include the characteristic white, slightly fuzzy growth. Overhead applications of mefenoxam or strobilurin-based fungicides should be considered to help control the fruit rot stage. Also control cucumber beetle since they transmit bacterial wilt. Keeping this insect under control will lessen the infection rate in the field. Also be aware of this insect and bacterial wilt in other cucurbit crops. □

IPM Update

Kristian Holmstrom, Program Associate in Vegetable IPM

Sweet Corn

Cooler evening temperatures over the weekend resulted in reduced trap catches of adult **European corn borer (ECB)** throughout the state. With the return of warmer temperatures, there should be an increase in activity, at least for the short term. Areas of highest activity over the past week include parts of Morris, Hunterdon and Mercer Counties as well as lower Burlington, Atlantic and Camden Counties (see ECB map). Feeding in sweet corn plantings has increased dramatically over the past week, with some whorl and pretassel stage plantings over 30% infested. It is important to check fields weekly for presence of ECB feeding. Consider treating if 12% or more plants are infested. Look in the emerging tassels for characteristic discoloration indicating that small larvae are present. It is also important that an insecticide treatment be applied at the full tassel to first silk stage to eliminate remaining ECB larvae as they move down the stalk to re-enter at lower points on the plant. For plantings in the silk stage, it is advisable to treat weekly as long as the ECB flight continues. At present, there are very few adult **corn earworm (CEW)** being caught in the state and no map will be generated as a result. The highest average nightly **ECB** blacklight trap catches are:

Sergeantsville	5	Denville	2	Hopewell	2
Chester	3	Folsom	2	Indian Mills	2
Allentown	2	Georgetown	2	Lawrenceville	2
Burlington	2	Hammonton	2	Little York	2

Cole Crops

Warmer weather this week has increase activity of **imported cabbage butterflies (ICW)**, and heavy egg laying is now occurring. In addition, **diamondback moth larvae (DBM)**, and small **cabbage loopers (CL)** have been found this week on plantings of cabbage and broccoli in the northern counties. Continue to watch for these pests, consider treating when greater than 20% are infested prior to heading or 5% are infested when heads are present. It is important to check the youngest leaves, as this is often where ICW are found. For collards, kale and mustard, consider treating if greater than 10% of the plants are infested at any time. On new transplants or newly emerged seedlings, do not let **flea beetles** infest more than 50% of the plants without treating to suppress them. They will cause significant injury to young plants if allowed to build up to high numbers.

Tomatoes

An incidence of **bacterial canker** has been reported from one Salem County field this week. This disease causes marginal necrosis and a sharp upward rolling on

affected leaves in its initial stages. Canker can become systemic and will cause death of entire branches, and ultimately the whole plant. Canker may be present on seed, or may possibly be acquired from sources within the field. This report serves as a reminder that at all times field workers should exercise caution when in tomato plantings. As much as possible, avoid the fields when foliage is wet. When pruning and tying, sterilize all tools and implements between rows, and always work in youngest plantings first so as not to transmit the disease to subsequent plantings. Copper treatments may be of some value at limiting in field spread once the disease has become apparent. See the *2004 Commercial Vegetable Production Recommendations* for materials and rates.

Peppers

ECB eggmasses continue to be found on young pepper plants throughout northern New Jersey. This situation is certainly occurring in the southern counties as well. Check fields weekly, looking at two leaves per plant on 5 consecutive plants each in 10 random locations throughout the field. If 2 or more eggmasses are found on 100 leaves, consider treating if fruit are present, or plants are small. Also consider treating weekly if fruit are present on the plants and the local ECB trap catches are averaging 1 or more per night (see ECB map). Cross-hatched areas on the map (green on the web version) represent adult ECB populations that warrant preventive treatments if fruit are present.

Pumpkins

Fields planted around two weeks ago are now emerging and in the seed leaf stage. From now until the 4 true leaf stage, it is critical to protect plants from feeding by the **striped or spotted cucumber beetles**. These pests are capable of causing significant injury to young plants as well as vectoring **bacterial wilt**. Scout fields weekly, looking at 5 consecutive plants each in 10 random locations. Consider treating if 2 or more beetles are found at more than half of the sites. The use of a systemic insecticide at planting will reduce the incidence of beetle feeding.

SEE ECB DISTRIBUTION MAP ON PAGE 5

Pollination in Pumpkins - an Important Topic

H. Chris Wien, Cornell University

Reprinted from the May 2004 issue of "The Vegetable Grower News", Volume 38, No. 5.

Pollination of pumpkins was never a subject of great concern among growers in the Northeast, but weather conditions in recent years and the threat of low honeybee populations due to bee diseases and predators have encouraged us to pay attention to a neglected topic.

Pumpkins are members of the cucurbit family of crops, and have separate male and female flowers. In order for fruit to be set, pollen from the male flower must be transferred to the female flower. This is usually done by bees, either the common honeybee, or by several other species such as bumblebees or the native squash bee. Honeybee hives may be placed in or near the pumpkin fields during the flowering period, or the grower may depend on wild or feral colonies nesting in hollow trees or old buildings. If bee hives are used:

- Make sure that the colonies are vigorous and active
- Place hives in the sun, off the ground
- Face hives south or east
- Use one hive for every one to three acres

In observations on Long Island and parts of upstate New York, we have had strong indications that squash bees and bumblebees are more important pollinators than honeybees. We compared fields furnished with hives and others without honeybee hives in the Capital District of New York in the mid-1990's, and could find no difference in fruit set between them. This was during a period when bee diseases and bee mites had sharply reduced the number of wild bee colonies.

The native squash bee is very prevalent in the Northeast, and can commonly be found visiting pumpkin flowers during the growing season. It has a lifestyle quite different from the honeybee, in that it is solitary, and nests in the ground in tunnels from 3-24 inches deep. The new adults emerge from their nests in Mid-July, at a time that the pumpkin is starting to flower. Both male and female squash bees visit the flowers to gather nectar and pollen, and thus bring about pollination. For more information on the habits and management of squash bees see the Pumpkin Production Manual, recently published by NRAES (see <http://www.nraes.org/publications/nraes123.html>).

Pumpkin flowers typically open early in the morning and close by noon, so bee activity must occur in the morning to be effective. Generally, the squash bee tends to be active early, before the honeybee starts flying. The pollen grains of pumpkin and squash are relatively large and sticky, requiring several visits to flowers to transfer

enough pollen for successful fruit set. Our studies indicate that about 1,500 to 2,000 pollen grains are needed per flower for good fruit set. Since individual bees carry about 250 pollen grains per visit on average at least 6 to 8 visits will be needed for each female flower.

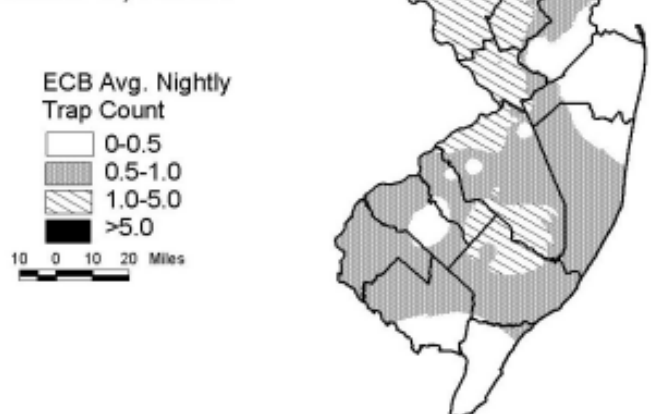
During the hot summers of 1999, 2001, and 2002, another problem appeared that may have adverse effects on pumpkin production. During hot weather (highs in the 90's with night temperatures in the 70's lasting nearly a week), the flower buds that form female flowers will turn yellow, shrivel and die. We first became aware of this problem in a grower's field of 'Howden' in 1994, but have duplicated this disorder in the greenhouse and in variety trials in Maryland and Florida since then.

The female flowers don't open, and the plants continue to produce leaves and male flowers, but the formation of fruit is much delayed. In the case of the Florida planting, in which temperatures averaged 82 degrees during most of the growing season, normal female flower production and fruit set was delayed until cooler fall conditions, but too late to produce a marketable yield for the Halloween season. Although there were differences among varieties in the response, additional work is needed to identify superior lines with heat resistance.

In the wet summer of 2003, growers reported poor fruit set, especially during periods of rainy weather. We suspect that if the inside of the flowers get wet, fruit set may be inhibited. We started some greenhouse experiments in fall 2003 to check this out.

Submitted by Michelle Infante-Casella, Gloucester County Agricultural Agent. □

Distribution of Adult European Corn Borer for the Week Ending June 9, 2004



Data collected and processed by: Kris Holmstrom, Marilyn Hughes
Rutgers Cooperative Extension & Center for Remote Sensing

Rest and Rebuild those Fields

*John Mishanec, Vegetable IPM Educator,
Cornell Cooperative Extension*

Adapted from Vegetable Notes, June 3, 2004, Volume 15, Number 6, University of Massachusetts Extension.

Everyone should know it is not a good idea to plant the same crop in the same field year after year. Everyone should also know the importance of rotating plant families. Something not enough farmers do though is plan a rest and soil building year into their rotation. An often-heard argument against a rest year is the grower does not have enough good land. Resting good land is sometimes a hard sell. Growers say if a field is not in a cash-earning crop then it is money out of his pocket. Commercial fertilizers and pesticides have lessened the need (in many people minds) for good soil building practices. On many farms, good soils have lost their tilth (structure), crust over, are poorly drained and have low soil organic matter. Fortunately, it's never too late to rebuild your soils with a little rotational management.

Consider taking at least one of your fields out of production this summer. In Orange County, NY, we did a number of studies on onions where we took fields out of production and employed different rotation crops. We found sudangrass by far the best rotational crop. Sudangrass puts down deep roots to help soil drainage, you receive a lot of organic matter and if plowed down green, it turns into a natural soil fumigant and eliminates soil pathogens. Yields following sudangrass increased from 15% to 40% depending on the soils and years.

Why not try a field or two in sudangrass? If you rotate 20% of your fields, in five years, your whole farm will have had a year's rest and reinvigoration. Plant sudangrass at the 50-lb. rate per acre. You might want to broadcast around 50 lbs. of N before planting. You can drill or broadcast the seed. If you broadcast, gently work the seed in with a light disking. The sudangrass will grow quickly if it has moisture. When the plants reach about three feet in height, you need to mow it down. This will force tillering, that is, where you had one stem, when it re-grows, you will have five or six stems. Root growth will also be increased by at least fivefold. Let the sudangrass grow till late August or early September. It is very important to mow or chop the sudangrass and then plow it in before it is hit by frost. The plants become woody if hit by frost. You will never be able to plow down all the organic matter, as your disk will just roll over the stems. When plowed down green, the sudangrass material turns to a natural fumigant. Now you can come in with a rye planting for winter cover.

If you are going to lose a year of production from a field, you want to maximize the benefits to the soil. Sudangrass is one of the best ways to maximize all the good things your soil needs. □

UV Rays

Jayne Sojka, Lady Bug IPM

Reprinted from Cranberry Crop Management Newsletter, Vol. XVIII, No. 2, May 20, 2004, University of Wisconsin Cooperative Extension

The sun produces both visible and invisible rays. The invisible rays, known as ultraviolet –A (UVA) and the ultraviolet-B (UVB), cause most of the problems. Both cause suntan, sunburn, and sun damage. There is no "safe" UV light.

Harmful UV rays are more intense in the summer. The sun's harmful effects are also increased by wind and reflections from water and sand. Even on cloudy days UV radiation reaches the earth and can cause skin damage. The UV index is a prediction of ultraviolet intensity in a given location. It can be found in the weather section of most newspapers and some television weather forecasts.

A good number of growers and I have been talking about the long term effects of the sun. One gentleman shared that he has skin cancer on his nose, ears and back of his neck. These are areas that one has a more difficult time covering with clothes and may miss with sunscreen but yet these areas are the most vulnerable.

To protect your skin from the sun, the American Academy of Dermatology recommends:

- 1) Wear effective sun protective clothing
- 2) Avoid the sun between 10 A.M. and 4 P.M.
- 3) Wear a hat with a 4-inch brim and sunglasses
- 4) Use better than 25 SPF broad spectrum sunscreen
- 5) See a doctor for an annual skin exam if you have areas of concern.

Now let's face it, avoiding the sun between 10:00 A.M. and 4:00 P.M is not practical in our line of work. So the answer for our working environment is Sunscreen and protective clothing. I came across an excellent source of information on sun protective clothing. Check it out:

Sun Precautions
2515 Wetmore Avenue
Everett, Washington 98201
1-800-882-7860 or on the internet
www.sunprecautions.com

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