

The University of Maryland Extension Agriculture and Natural Resources Profitability Impact Team proudly presents this bi-weekly publication for the commercial vegetable and fruit industry.

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Field Observations from Southern Maryland

By Ben Beale
Extension Educator & CED, Agriculture
St. Mary's County, UME
bbeale@umd.edu

- ✓ Farmers are busy laying plastic mulch and getting cool season crops in the ground.
- ✓ Early season sweet corn is still behind.
- ✓ Some folks set out tomato transplants this week.
- ✓ There have been some reports of TSWV in high tunnel tomatoes.

Spring Observations from WYEREC

By Michael Newell
Horticultural Crop Program Manager, UME
mnewell@umd.edu

Conditions at WYEREC April 25 2011

Peaches: Late Petal-Fall

At early shuck-spilt, begin sprays for Rusty Spot and Scab control. Captan and Bravo (not labeled for after shuck-fall) work well. Three or four sprays about one week apart will provide good control for Scab with the first two sprays being the most important. A healthy, properly pruned tree that promotes drying and increases spray coverage will help keep scab under control. There are no immune peach varieties and nectarines' may be more susceptible.

Apples: Full Bloom to Petal-Fall

Conditions for Fireblight infections need to be monitored. According to "Maryblyt" the first apple infection occurred April 24 here at WyeREC. For best blossom blight control, apply Streptomycin just before an anticipated infection, then re-apply it in 4 days if high risk conditions persist. High risk occurs with any combination of three out of the following four criteria: 1) blossoms open, 2) bacteria present on blossom surface, 3) average temperature for the day of 60° F, and 4) sufficient moisture in the form of rain or dew.

Note that infection of susceptible cultivars is very likely to occur if all four of these criteria are satisfied, especially if there is a history of the disease. Streptomycin applied after infection can provide acceptable control, however the level of control that is achieved declines with time and declines more rapidly as temperature increases.



Photo by R. D. Myers

Plasticulture Strawberries: Bloom to Small Green Fruit

Two fungicide sprays during bloom will go a long way to reducing Gray Mold (*Botrytis Blight*) problems. If the season becomes excessively rainy or the bloom period is extended, additional fungicide sprays will be needed. If Anthracnose has been a problem in the past, additional fungicides may need to be applied as a preventive measure. Always understand the products you intend to use to reduce fungicide resistance.

Continue to monitor weather conditions for heat related problems, before, during and after bloom. Use the least amount of overhead irrigation (1/10 inch per hour) to cool the plants without increasing disease problems or decreasing fruit quality.

Plasticulture Strawberries: Nitrogen Management

Leaf and petiole sampling for nutrient analysis should continue. In general nitrate nitrogen concentration should never be below 500 ppm. Exceptions to this general rule would be during early winter dormancy (December-January) and after fruiting (July). During plant establishment (fall), petiole nitrate-nitrogen should approach 1500 - 2000 ppm. During vegetative growth (early spring), nitrate-nitrogen should increase to 3000 - 4000 ppm at early harvest and then decline to 500 ppm by the end of fruiting. Excess Nitrate-nitrogen (over 10000 ppm) may depress yield and will likely limit quality.



Vegetable Crop Insect Update

By Joanne Whalen
DE Extension IPM Specialist
jwhalen@udel.edu

Asparagus

Be sure to check for asparagus beetles laying eggs on asparagus spears. As a general guideline, a treatment is recommended if 2% of the spears are infested with eggs. Since adults will also feed on the spears, a treatment is recommended if 5% of the plants are infested with adults.

Cabbage

Continue scouting fields for imported cabbage worm and diamondback larvae. As a general guideline, a treatment is recommended if you find 5% of the plants infested with larvae.

Peas

Be sure to sample for pea aphids on all stages of peas. On small plants, you should sample for aphids by counting the number of aphids on 10 plants in 10 locations throughout a field. On larger plants, take 10 sweeps in 10 locations. As a general guideline, a treatment is recommended if you find 5-10 aphids per plant or 50 or more aphids per sweep. Be sure to check labels for application restrictions during bloom.

It's Time to Review Application Methods for Imidacloprid:

Compiled By Ben Beale
Extension Educator & CED, Agriculture
St. Mary's County, UME
bbeale@umd.edu

Imidacloprid, originally sold under the brand name Admire, provides very good control of sucking insects such as aphids and certain chewing insects such as Colorado Potato beetle and Cucumber Beetle. As a soil applied systemic with long residual action, imidacloprid was quickly adopted by producers who have been using it on a regular basis for over 10 years. Over the last couple of years, I have received complaints that imidacloprid was not working as well as expected. After visiting many of these farms and reviewing the situation I believe many of these complaints are due to failures with application rate and method. Here are a few pointers taken from Galen Dively, UMD Entomologist; Jerry Brust, UME Vegetable Specialist and others:

- **Know your formulation:** There are a number of new generic products on the market, of which most are the 2F formulation containing 21.4% imidacloprid. Admire Pro has 42.8% imidacloprid or double the amount of active ingredient. Be sure to use the correct rate for the product you purchase. Use of the Admire Pro rate with a generic formulation will result in one-half the effective application rate to the crop.
- **Cucumber beetle populations are showing up earlier and earlier in the spring.** The use of season extending technology and warmer springs may be impacting this. Populations build up quickly and infest plants when they very small, causing severe feeding damage as well as transmitting bacterial wilt. Many foliar treatments are effective but only if timed properly and applied frequently. This can be time-consuming and one missed spray can lead to a wilt-infested crop. For this reason, many folks are treating with imidacloprid early on smaller plants. A very effective method for getting imidacloprid in the plant early is through a transplant drench.
- **Imidacloprid is photodegradable.** Exposure to sunlight will quickly breakdown imidacloprid. Thus, spraying imidacloprid on top of the ground without incorporation with water will result in poor performance. Imidacloprid must be taken up by plant roots so it is critical that it reach the root profile. As a general rule of thumb, each plant should receive at least 1 cup of water with a drench application. Drip lines should be adjacent to plants and calibrated to soak the root zone.
- **Rotate and use an alternative strategy:** Finally, producers should not expect imidacloprid to work miracles year after year. The risk of resistance development exists when producers rely exclusively on the neonicotinoids products for pest control. An

example may be Admire applied early followed by Assail later in the season for cucumber beetles. Rotate to products with a different mode of action.

- **Calibrate your application equipment:** There are several application methods for applying imidacloprid. Soil incorporated, transplant drench, band spray or drip application. A good description of how to calibrate and apply imidacloprid for different application methods is provided by University of Massachusetts Extension and is given below. Note: This was written in 2002, when the only formulation was Admire 2F. **Be sure to follow the rate on the label of the formulation you are using.**

UMass Extension: Striped Cucumber Beetle and Bacterial Wilt Management in Vine Crops 5/16/02

Systemic Controls

Imidacloprid (Admire 2F) has the potential to improve and simplify early season control of cucumber beetles and thus wilt. In contrast with other insecticides labeled for this pest, Admire can be applied to soil before or after seeding or transplanting which enables product to be in leaf tissue when an early invasion of beetles occurs. Admire is a systemic which it is taken up by the roots, translocates to new leaf tissue and persists through the critical early plant stages. Additionally, it has a relatively safe toxicological profile. There are several ways that Admire can be applied.

Using Imidacloprid in Direct Seeded Crops

Admire 2 F can be applied in a narrow band within 2 weeks before planting, as an in- furrow spray or narrow surface band during planting, or as a post-seeding drench. It is important to get Admire into the soil to avoid photochemical breakdown; this can be accomplished by placing it in the furrow or irrigating it in. The best system for an in- furrow treatment is to attach an injector to the planter for placement at the seed level. Studies conducted by Meg McGrath on Long Island showed slightly better control with an in-furrow treatment compared to a band over the top.

The label gives a range of 16 - 24 oz per acre or 0.9 to 1.3 oz per 1000 feet of row. Studies have found a rate of 1.1 oz per 1,000 feet to be sufficient for controlling cucumber beetle in the critical early weeks. Given the wide range in row spacing with these crops and the fact that it is a banded application, the best way to calculate rates is based on the number of row feet per acre. For example, for 9 foot row spacing, divide 43,560 sq ft/acre by 9 feet, (which equals 4,840 linear feet). Divide that by 1,000, and then multiply by the Admire rate per 1,000 feet. For a rate of 1.1 oz per 1000 feet of row, that would mean 5.3 oz per acre.

Using Imidacloprid on Transplants

The best time to treat is about 1 day prior to planting in the field. The rate used per transplant is very low: 0.02 ml/plant. To treat a flat of 200

transplants with Admire 2F at this rate, a grower would need to dilute 4 ml (0.135 oz) of Admire 2F in a volume of water sufficient to soak the soil mix evenly. Accurate measuring of small amounts is very important! A plastic syringe, available from the local drug store, can help ensure that these small measurements are accurate! To help make other conversions: multiply 0.02 ml per plant times the number of plants in your flat. For example, use 20 ml to treat 1000 transplants. You can convert ml to oz by dividing by 29.6 (there are 29.6 ml in one fluid oz).

Be careful of phytotoxicity (burning the plants) at higher rates. In Pennsylvania, burning of leaf margins was observed at 0.04 ml/melon plant at the 2- leaf stage, although these plants did grow out of this in about 2 weeks. The transplant treatment should be sufficient to carry the plants through the early crop stages. Scouting can determine if any foliar applications are needed. One concern is whether this treatment will last long enough on transplants set out in early May. It is possible that slightly higher rates would last longer, but there is also the risk of phytotoxicity at higher rates. Remember that the older the plants are when beetles arrive, the less serious is the damage that beetles cause.

This method of application is, obviously, less expensive than a furrow drench. Admire can also be used for Colorado potato beetle or flea beetle control on tomato, pepper and eggplant transplants. Again, be cautious not to use too high a rate, as phytotoxicity can result. The suggested rate of Admire 2F for tomato transplants is 15 ml - or 0.5 ounce - per 1000 transplants.

Drip Application

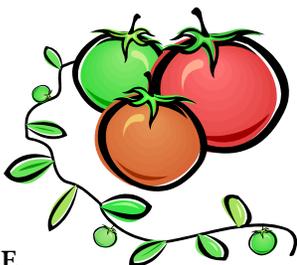
A drip system can be used for Admire 2F applications to either direct seeded or transplanted crops. Apply early enough to allow root systems to take up the material before beetles arrive (which is typically between June 10 and 17, depending on the weather). The system should be primed with water first, and imidacloprid injected slowly. More emitters provide a more even distribution of product. Make sure to use enough water to soak the area between emitters.

Calculate Admire rates based on 100 ft of row. For a 16 oz/acre rate, use 0.110 oz/100 ft bed (assumes a 3-ft bed, either one row or multiple rows.). If you have a drip system for transplants that go out in May, applying Admire through the drip may have an advantage as a pre-plant drench, because you can wait until just before beetles arrive to make the application.

Note: The foliar form of imidacloprid, Provado 1.6F, is not labeled on vine crops. Imidacloprid is highly toxic to bees. Translocation into flowers from soil applications of Admire is reported to be below levels that would cause toxicity to bees.

Using Reduced-Risk Chemical Program for Pest Control in Tomatoes

By Jerry Brust
IPM Vegetable Specialist, UME
jbrust@umd.edu



Stage of plant development or pest and the chemicals to use

1) Transplants in field *Admire PRO*

2) 3-4 weeks of control, but if not and have problems with.....

Colorado potato beetle

Radiant 2SC or SpinTor2SC, Agri-Mek EC

Worms

Bt-XenTari, Synapse WG, Proclaim 5WDG, Avaunt 30WDG

Flea beetles

Venom 70SG, Actara 30WDG, Thionex 3EC

Aphids

Fulfill 50WDG, Dimate 4EC, Movento

3) After 3-4 weeks apply to: Plants flowering and small fruit

Coragen through drip or drench

Coragen 1.67SC----5.0-7.5 oz/a (Total under plastic-10oz)

Note: 5.0-apply second application 20-30 days after first; 7.5- apply only once

4) 6-8 weeks of control, but if not and pests start...

Thrips

Radiant 2SC, SpinTor 2SC, Venom 70 SG

Stink bugs (BMSB)

Thionex 3EC, Lannate LV, Warrior II, Baythroid

TSSM

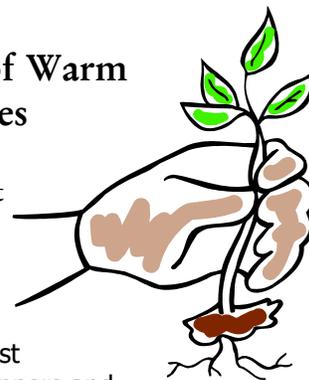
Agri-Mek EC, Oberon 2SC, Acramite 50WS

Worms

Synapse WG, Proclaim 5WDG, Avaunt 30WDG, Coragen 1.67 SC (no more than 15.4 oz applied to a crop)

Early Transplanting of Warm Season Vegetables

Gordon Johnson
DE Extension Vegetable & Fruit
Specialist; gcjohn@udel.edu



Earliest plantings of watermelons, cantaloupes, summer squash, and tomatoes will begin in the next 10 days. First transplanting of crops such as peppers and eggplant will begin in early May. One of the characteristics that all of these crops have in common is that they are warm season vegetables that are sensitive to cold temperatures, both in the root zone and above ground. There has been a tendency to risk earlier and earlier plantings as growers try to hit the early market. Over the years, many of our early plantings of summer vegetables have suffered because of early cold damage and inadequate provisions to protect plants.

For early transplanted warm season vegetables choose the lightest ground that warms up quickly. Plant higher sections in the field first. Avoid areas that receive any shade from woods or hedgerows. Early fields should be protected from extreme wind and should not have frost pockets. Rye windbreaks planted between each bed are desirable for early plantings because they limit heat transfer by wind. If no rye windbreaks have been planted, then consideration should be given to using row covers to protect the plants – either clear slitted or perforated low tunnels or floating row covers. Even where windbreaks have been used, row covers may be necessary for extremely early plantings.

Lay plastic mulch well ahead of time to warm soil. Black plastic mulch should have excellent soil contact. Firm beds and tight mulch are much more effective in warming soils. Make sure that there is good soil moisture when forming beds and laying plastic because soil water will serve as the heat reservoir during cold nights.

When producing transplants, use larger cell sizes and grow plants so that they have well developed roots in those cells for the first plantings. Large cell sizes will perform better than small cells in early plantings. Careful attention needs to be paid to hardening off warm season vegetable transplants that will be planted early. Gradual acclimation to colder temperatures will reduce transplant shock. Do not transplant tender, leggy plants or plants coming directly out of warm greenhouse conditions for these early plantings.

Watch extended weather forecasts and plant at the beginning of a predicted warming trend. Monitor soil temperatures in plastic beds and do not plant if they are below 60°F. Soil temperature in beds should be measured at the beginning of the day when at the coolest. When soil temperature conditions are not favorable, wait to plant. Avoid planting in extended

Commercial Vegetable Production Recommendations Maryland EB 236



On-Line at:

<http://extension.umd.edu/agriculture/mdvegetables/files/2011%20COMPLETE%20MARYLAND%20BOOK%20.pdf>

Also available in a new very interactive format at the Delaware Extension site at:

<http://ag.udel.edu/extension/vegprogram/publications.htm#vegrecs>

cloudy periods, especially if plants have come out of the greenhouse after an overcast period. These plants will not perform well. Extra caution should be taken to minimize root injury during transplanting. When transplanting, make sure that there is good root to soil contact and there are few air pockets around roots.

In years with cold, cloudy, windy weather after transplanting, we have had large losses of transplants in the field. It is critical to have warm soil conditions after transplanting to allow roots to grow out into the bed quickly. In cold, cloudy conditions, plants shut down physiologically, little root growth occurs, and the existing roots on the transplant do not function well. If there is any wind, plants lose more water than they can take up and they die due to desiccation. This is accelerated when the sun does come out – the first sunny day after an extended cold, cloudy period is when you will see the most wilting of weakened transplants.

If cold weather occurs after transplanting, warm season vegetables vary in their ability to tolerate adverse weather after being set out. Tomatoes will stop growth but will grow out without much damage once warm weather returns. Summer squash and cucumber transplants may be temporarily stunted but generally grow out of the condition. Watermelons will hold if they have been hardened off properly. Cantaloupes can be stunted if exposed to excessively harsh early conditions. Peppers and eggplants will not put on any root growth until temperatures are warm enough. If stunting occurs on any of these warm season vegetables, you may lose the early advantage you were seeking. In addition, remember that all of these vegetables are susceptible to frost damage and will be killed by a late freeze.

No-Till and Strip-Till Fresh Market Vegetables

Gordon Johnson

DE Extension Vegetable & Fruit Specialist;

gcjohn@udel.edu

Most fresh market vegetable crops are either grown under conventional tillage or plasticulture systems requiring significant tillage. From a soil health perspective organic matter is the driver for healthy soils and the more the soil is worked, the faster that organic matter is decomposed and lost from soils. One solution for this dilemma is using no-till, where organic matter can be conserved or increased. The best success story with no-till vegetables has been with pumpkins, which are commonly direct seeded through a killed cover crop mulch (often hairy vetch or rye) or through crop residue (most commonly barley or wheat small grain stubble). The mulch provided keeps pumpkins off of the ground and has greatly reduced fruit diseases and improved quality. Other seeded crops such as sweet corn and snap beans have been successfully no-tilled in the region.

No-till also has been shown to work with transplanted crops. Systems were developed and tested for tomatoes on hairy vetch and for numerous crops transplanted through small grain cover from peppers to cantaloupes. There were several no-till transplanters developed and we tested one at UD back in the 1990s.

Incorporating leguminous cover crops into these systems can reduce nitrogen needs for the vegetable crop being grown. In the pumpkin no-till into hairy vetch system, typically no additional N will be needed. There are several reasons why no-till has not been more widely adopted for vegetable crops. No-till vegetables cannot be grown for early crops which are often the most profitable, due to soil temperatures remaining cooler, longer. Establishment can be an issue, especially through thick cover crop mulches. Weeds are controlled partially by the mulches and herbicides can be used for residual control; however, weed escapes can be problematic because cultivation is not available as a tool. Certain pests such as slugs, mites, and several insects can be an issue in no-till.

Drip irrigation is also more difficult to use in no-till. An alternative that combines some of the benefits of no-till with conventional tillage is strip-till, where cover is maintained between rows and a 6-12 ft tilled strip is where vegetables are seeded or transplanted. Strips can be formed with narrow rotary cultivators or with strip till coulters. This allows for earlier crops and for better establishment. A subsoiler can be run in the strips to improve root development. Management of the strip area needs to be planned ahead of time so that cover crops do not get too large – strips are formed when cover crops are small. There is also potential to install drip irrigation in the strips. In a strip-till system weed management is critical and residual herbicides will be critical.

Research has shown that for many vegetables, yields in strip till and no-till are comparable or higher than similar season conventional or plasticulture production.



Photo by R. D. Myers

Keys to success with no-till fresh market vegetables:

1. Well drained soils are best for no-till and strip-till.
2. Fields to be no-tilled or strip-tilled should have minimal weed seed banks and little or no perennial weed problems.
3. An effective cover crop is required for no-till and strip-till systems to work. The cover crop should produce enough biomass to cover the soil and provide mulch that limits light and weed germination. Winter cover crops that have worked well for vegetable no-till in our area are hairy vetch, crimson clover, rye, vetch-rye combination, ryegrass, and subterranean clover. For late summer no-till vegetable crops, several of the millets have provided good cover.
4. The cover crop should be easy to kill by chemical or mechanical means and have little or no-regrowth potential. Proper timing of cover crop kill is necessary to avoid reseeding in no-till systems. For strip-till systems, strips need to be formed early in the growth stage of the cover.
5. Attention needs to be paid at planting in no-till systems to provide good soil-seed contact for direct seeding or root placement and firming for transplants.
6. Provision should be made for moving residual herbicides into the soil through the mulch cover. This may require overhead irrigation.
7. Provision should be made to manage weed escapes. This may require spot spraying or hand weeding.

Thrips on Winter Annuals

Jerry Brust
MD IPM Vegetable Specialist
jbrust@umd.edu

Vegetable and bramble growers in Maryland have called me often over the last couple of years about fruit problems in their fields possibly caused by thrips. As an overall study of the possible impact thrips may be having on vegetable and fruit quality I have been conducting surveys for their numbers and species. I have taken weed samples throughout the winter and early spring from vegetable fields and high tunnels looking to see if any thrips were overwintering and if so what species they were. Below is a 9-point summary of the sampling program.

1. For most samples very few thrips were found.
2. In 14 of the 20 sample sites thrips were found in December through January on winter annuals.

3. At 9 sample sites thrips were found in March.
4. The worse sample sites were high tunnels that had chickweed and/or henbit winter annuals growing along the outer or inner edge of the base of the high tunnel (Fig 1). 87% of the sampled winter annual weeds at these sites over the last two years had at least 3 female thrips (one sample had 23 female thrips).
5. Of the total thrips found 76% were female adults, 19% were males and 5% were immatures or pupae.
6. Western flower thrips were found to overwinter in Maryland, Delaware, SE Pennsylvania and NE Virginia, although only in low numbers (Fig 2).
7. Chickweed was found to harbor 66% of all thrips with wild mustards and henbit being the next best winter hosts.
8. Sampling-sites near high tunnels or woods had a greater probability of containing thrips than sites out in a field.
9. Farms where thrips were found to overwinter had greater probabilities of infestations during the season.

Even though several thrips species, including Western flower thrips, were found to overwinter in the mid-Atlantic area it does not mean we have a thrips problem. However, growers do need to watch for any early season infestations in their field and high tunnel brambles and not overreact by spraying an insecticide unless really needed. Most brambles can have at least 5 thrips or more per fruit/flower before there is any possibility of damage. The species of thrips you have should be determined only if you think thrips are causing fruit quality problems at low densities. I would be glad to look at your thrips if you send them to me: 2005 Largo Rd, Upper Marlboro, MD 20774 or you can call 301-627-8440 or email me: jbrust@umd.edu.



Figure 1. Winter annual weeds along outside (under snow) and inside border of high tunnel

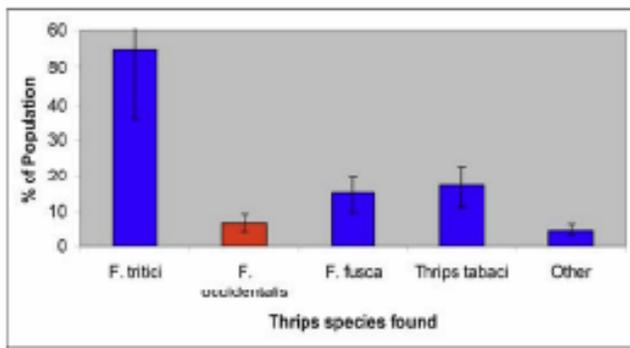


Figure 2. The proportion of thrips species found to overwinter at the 20 sample sites

Late Blight Found in Wisconsin Grown Seed Potatoes

Bob Mulrooney

DE Extension Plant Pathologist

bobmul@udel.edu

Plant pathologist, Amanda Gevens, confirmed the late blight pathogen, *Phytophthora infestans*, in potato seed grown in Wisconsin on April 12, 2011. Dr. Gevens says:

"Given the sampling method and size, it is not known how widespread or with what incidence this disease risk may be. Additionally, our testing methods are highly sensitive and our levels of detection were weakly positive, indicating low quantity of pathogen. This notification is to make potato seed and production growers aware of the potential risk of late blight in the 2011 crop. Infected seed may result in a poor stand or delayed emergence, and can initiate an epidemic when disease spreads from seed piece to sprout and foliage." *Long Island Fruit and Vegetable Update. 4-21-2011*

Given the above information, growers in Delaware and elsewhere should be watchful this season, inspecting crops on a regular basis and adhering to spray schedules when risk of disease infection and/or spread is high.

Managing Root Knot Nematodes

Bob Mulrooney

DE Extension Plant Pathologist

bobmul@udel.edu

Root knot nematodes are microscopic roundworms that are widely distributed in Delaware agricultural soils and can cause varying degrees of damage to susceptible crops. Most of the damage caused by root knot nematodes is evident as stunting on vegetables such as pickling cucumbers, cantaloupe, watermelon, squash, and lima beans. Root knot populations are favored by the sandy, low organic matter soils in Kent and Sussex counties. There are several species of root knot nematodes that could occur here but Southern root knot nematode, *Meloidogyne incognita* is the most

commonly found root knot species here. Most of the field crops grown in Delaware; corn, small grains, sorghum, alfalfa, Sudan grass, and Sudex are not good hosts of root knot and can reduce populations of root knot, but not eliminate them.

Small grains are a good rotation crop because if planting is delayed until soil temperatures at planting depth are below 65°F, root penetration does not occur. Soil temperatures are generally too low during most of the small grain growing season for root knot to increase. Small grains are poor hosts to begin with and the crop basically avoids infection or penetration by root knot. In my long career here I have never seen root knot nematode affect small grains (wheat, barley, oats, triticale, etc.).

Unfortunately soybeans, unless they are a resistant cultivar, are susceptible to root knot nematode. Soybeans can tolerate low populations of root knot without producing visible symptoms but yield loss can occur depending on growing conditions, especially low rainfall. High populations and adverse growing conditions can cause stunting as severe as that produced by soybean cyst nematode. Root knot resistance has been available in soybean for a long time but it has been in group 5 or later maturity groups. Recently, advances have been made to incorporate resistance into group 4 varieties. There are a few resistant group 4s available that were posted on the VIPS website (<http://www.vipsoybeans.org>): Schillinger 479.RC, Southern States RT 4470N, HS HiSoy FS 41T80, FS HiSoy HS 4426, FS HiSoy HS 46T80. There should be an updated list on the VIPS site soon of soybean varieties rated in 2010. Another source of information is a soybean variety selector from North Carolina. There are no group 4, only group 5 resistant soybeans on this site: <http://www.soybean.ncsu.edu/soyvar/>. Root knot resistant soybeans would be an excellent rotation crop for vegetable growers who plant susceptible fresh market or processing vegetables.

Field corn varies in its susceptibility to southern root knot nematodes. There is no current data on corn hybrid screening for resistance to root knot nematodes. Earlier studies indicated that there was wide variation in susceptibility to root knot in corn. A test conducted at Auburn University in 2009 of hybrids grown in the South showed that none were resistant.

Irrigated corn is not likely to be damaged by low to medium root knot populations, but can support damaging population levels if followed by a susceptible vegetable crop. It might be very difficult to even see symptoms of high root knot populations in field corn especially if it is irrigated. Nematode numbers in corn seem to be increasing but it is difficult to know for sure. It has been thought that the increase in Bt corn and the shift to pyrethroid insecticides has had an impact. Growers are not using the granular and liquid carbamate and organophosphate insecticides at planting which would suppress nematode populations as well as control the target insects.

Managing Root Knot Nematodes

Rotation is often a limited control strategy for root knot because it has such a wide host range. Alfalfa and oats are thought to be the safest crops to use in a rotation to reduce root knot nematodes. Increasing organic matter in fields with low organic matter and high levels of root knot or other plant parasitic nematodes can have a suppressing effect on root knot populations. Fall planted rape and other mustards may also be useful to suppress root knot populations as a biofumigant when they are plowed under before they go to seed in the spring prior to planting the crop. Rape can be infected with root knot if populations are high and soil temperatures are above 65°F at planting or the fall is warm. (See under small grains above). It is the decomposition of the plant parts when tilled into the soil that releases the chemicals that kill the nematodes, not root exudates from living plants. **Soil sampling** in the fall right after harvest is the best way to know if you have high root knot populations in your soil. Unfortunately spring is not the best time to sample because the nematode overwinters primarily as eggs which are not detected in the methods used for processing soil samples for nematode analysis. Soil sampling this time of year can underestimate the number present or not detect low populations.

Root Knot Nematode Symptoms



Typical stunting from root knot nematode in an irregular area of a lima bean field



Heavily galled and stunted lima bean roots dug from an infected area. Soybeans can be this badly infected as well. Corn and other field crops produce much smaller and less evident galling

Bacterial Fruit Blotch in Watermelon & Late Blight Update

By Kate Everts

MD/DE Vegetable Pathologist

keverts@umd.edu

I just received word from Dr. David Langston in Georgia that bacterial fruit blotch (BFB) was confirmed on seedlings destined for shipment to other watermelon producing areas. Some plants may have been shipped before the outbreak was identified. At this time we do not know if any seedlings were shipped to Maryland or Delaware. However, increased scouting of transplants is warranted. Because BFB is seed-transmitted, locally grown transplants should also be examined.

BFB of watermelon is caused by the bacterium *Acidovorax avenae* subsp. *citrulli*. The disease is damaging because it causes large olive green to brown water-soaked lesions on fruit (Figure 1), making them unmarketable. Symptoms of BFB on seedlings are water-soaked areas of the lower surface of the cotyledons and inconspicuous lesions on leaves (Figure 2). BFB lesions will become necrotic often with yellow halos. Lesions are frequently delimited by veins. Infected seedlings collapse and die.

Conditions in greenhouse transplant houses are highly favorable for the development of BFB symptoms and the spread of disease. If BFB is suspected, please send plants to a diagnostic lab (University of Maryland or University of Delaware) for identification. In the meantime, destroy all trays with symptomatic plants. Remove adjoining trays to a separate – isolated – area for observation. Monitor these isolated seedlings daily and destroy trays where symptoms develop. After symptomatic plants and adjoining trays are discarded, spray the remaining trays with a labeled fungicide and continue applications until the plants are shipped or transplanted to the field.



Figure 1. Olive green water-soaked lesion on watermelon fruit. (Image courtesy David B. Langston, University of Georgia, Bugwood.org)

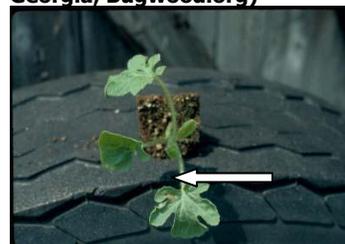


Figure 2. An inconspicuous lesion of bacterial fruit blotch on a watermelon transplant.

Late Blight Status – Late April

Currently there are a few reports of late blight (caused by *Phytophthora infestans*) from elsewhere in the United States. In Connecticut late blight was confirmed on tomatoes grown from farmer-saved seed, and on potatoes grown from organic seed pieces (cultivar 'Australian Crescent'). In Wisconsin, late blight has also been confirmed on potatoes seed. Again, these confirmations are not local; however, increased scrutiny of tomato and potato for symptoms is warranted.

Symptoms on tomato leaves are lesions that initially appear as light green or grey water soaked areas that expand. Sporulation is white to grey on the under surface of the leaf. Infected leaves die. Petioles and stem lesions are dark brown and irregular.



Figure 1. Symptoms of late blight on a tomato leaf and stem (Courtesy of E. Gugino, The Pennsylvania State University).

PennCap-M (methyl parathion) Cancellation

Joanne Whalen
DE Extension IPM Specialist
jwhalen@udel.edu

PennCap-M (methyl parathion) – It should be noted that the notice to cancel all uses of this product was posted in the Federal Register on Feb 25, 2011. Any distribution, sale, or use of the products subject to this cancellation order is permitted only in accordance with the terms of this order, including any existing stocks provisions. For information on the details of this cancellation as well as existing stocks provision please refer to the Federal Register posting:
<http://www.federalregister.gov/articles/2011/02/25/2011-4140/product-cancellation-order-for-certain-pesticide-registrations>

Note: Registered Trade Mark® Products, Manufacturers, or Companies mentioned within this newsletter are not to be considered as sole endorsements. The information has been provided for educational purposes only.

Last Round of Dates Scheduled for Farmers' Market Nutrition Program and Fruit & Vegetable Check Program: Farmer Training

ANNAPOLIS, MD (April 22, 2011) – To help farmers understand the recent changes and addition of new federal nutrition programs that can be accepted at farmers' markets, the Maryland Department of Agriculture (MDA) is partnering with the Maryland Department of Health and Mental Hygiene (DHMH) to offer training for both the Farmers' Market Nutrition Program (FMNP – WIC and Seniors) and the Fruit and Vegetable Check (FVC) Program. This training is mandatory for farmers who want to accept checks from participants at authorized farmers' markets.

Training participants will learn about the different federal nutrition benefit programs, be provided with the policies and procedures for both the FMNP and the FVC program, and upon completion of the training will receive new signs to display at their market stands.

Training Dates, Times and Locations:

May 3 – Talbot County: Chesapeake College Todd Performing Arts Center (Room AUD 01), Routes 50 & 213, Wye Mills, MD 21679 from 10am to noon

May 4 – Prince Georges County: Accokeek Foundation, 3400 Bryan Point Road, Accokeek, MD 20607 from 2pm to 4pm

May 5 – Caroline County: 4-H Youth Park, N 4th Street, Denton, MD Denton MD 21629 from 10am to noon

May 9 – Anne Arundel County: MD Department of Agriculture Headquarters, 50 Harry S Truman Pkwy, Annapolis MD 21401 from 10am to noon

May 10 – Online, from 1pm to 3pm – register in advance here (note there is limited space)

If you plan to attend, or have questions, please contact Amy Crone at 410-841-5776 or croneaq@mda.state.md.us

Vegetable & Fruit Headline News

A bi-weekly publication for the commercial vegetable and fruit industry available electronically in 2011 from April through September on the following dates: April 14 & 28; May 12 & 26; June 9 & 30; July 14 & 28; August 18; September 8

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Submit Articles to:

Editor,
R. David Myers, Extension Educator
Agriculture and Natural Resources
7320 Ritchie Highway, Suite 210
Glen Burnie, MD 21061
410 222-6759
myersrd@umd.edu



Article submission deadlines for 2011: April 13 & 27; May 11 & 25; June 8 & 29; July 13 & 27; August 17; September 7