UMass Extension

Vegetable Notes

For Vegetable Farmers in Massachusetts since 1975

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In this issue:

See 'Grants for Farmers' in this issue for opportunities to get help with making infrastructure improvements such as washroom upgrades.

Crop conditions

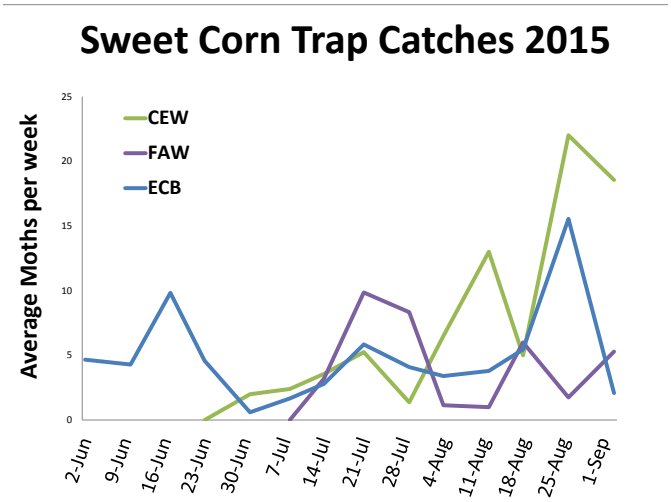
It's been a few weeks without rain on most farms, with erratic afternoon storms drenching some folks but passing others by. Many were scrambling to get everything irrigated, although there is less to water now that more crops are done for the season and are being planted to cover crops or overwintering crops. It's not too late to seed crops for overwintering in low tunnels. Seeding should be timed so that the seeds germinate and the plants begin to mature before they stop growing during what Eliot Coleman calls the "Persephone Period" – the period in winter during which there is less than 10 hours of light each day and the plants are essentially dormant – to resume growth in the spring when day length increases. In the Winter Growing Guide on the Johnny's Seeds website, you'll find a chart to help you decide when to plant various crops by counting back from when this last 10-hour day occurs. In Massachusetts, this is around November 9. The UMass Veg Program spent several years studying the use of low tunnels for overwintering vegetables. In our next issue, we'll present a summary of some of the lessons we learned through our research (including that you can direct seed carrots in early October and get marketable roots by late May)–stay tuned! Speaking of research, the Northeast Sustainable Ag Research and Education Center supports commercial producers who have an innovative idea they want to test using a field trial, on-farm demonstration, marketing initiative, or other technique with their Farmer Grant Program. A technical advisor--often an Extension agent, crop consultant, or other service professional--must also be involved. We have helped farmers with these projects in the past and are happy to offer support, but do get in touch with us soon if you have a proposal you'd like our help with. The deadline for application is November 12th.

Pest alerts

The following contributors have provided pest scouting observations and insight weekly all summer: Andy Radin, Lauren Breene and Liz Jones (URI), Ann Hazelrigg, Gabriella Maia, and Jon Bruce (UVM), George Hamilton and Linda Kundhart (UNH), Eric Sideman (MOFGA), Marion Zuefle (Cornell), Russell Norton (Cape Cod Extension) and Alicia Zolondick (UMass). Squash Vine Borer and Sweet Corn trap counts were provided this year by members of Extension in other states as well as the following farms in Massachusetts: Bars Farm (Deerfield), Four Town Farm (Seekonk), Golonka Farm (Whately), Gove Farm (Leominster), Howden Farm (Sheffield), Simple Gifts Farm (Amherst), Pray Farm (Swansea), Tangerini Spring Street Farm (Millis), Twin Oaks Farm (Hadley), and Ward's Berry Farm (Sharon). Thanks to all of you for making our pest alert network so robust!

Vegetable scouting sheets can be found on the UMass Extension Vegetable Program website. When not given here, refer to the New England Vegetable Management Guide for scouting thresholds and treatment options.

Sweet corn: This is the last week we will be reporting sweet corn pests, and we wanted to take the opportunity to review our regional pest monitoring network's findings. The graph represents trap captures from 8 locations in MA, 3 in NH and 1 each in RI and VT. Not all locations monitored for all pests; ECB was trapped at all 13 locations, CEW at 11 locations,



Location	FAW	ECB	CEW	Spray Interval for CEW
Western MA				
Hadley	*na*	0	*na*	*na*
South Deerfield	4	1	5	*5 days*
Whately	2	1	15	*4 days*
Central & Eastern MA				
Leominster	*na*	0	27	*4 days*
Sharon	*na*	1	48	*4 days*
Sheffield	*na*	5	10	*4 days*
Swansea	0	3	19	
NH				
Litchfield	18	0	18	*4 days*
Hollis	10	0	3	*6 days*
Mason	2	0	22	*4 days*
Burlington, VT	1	12	*na*	*na*

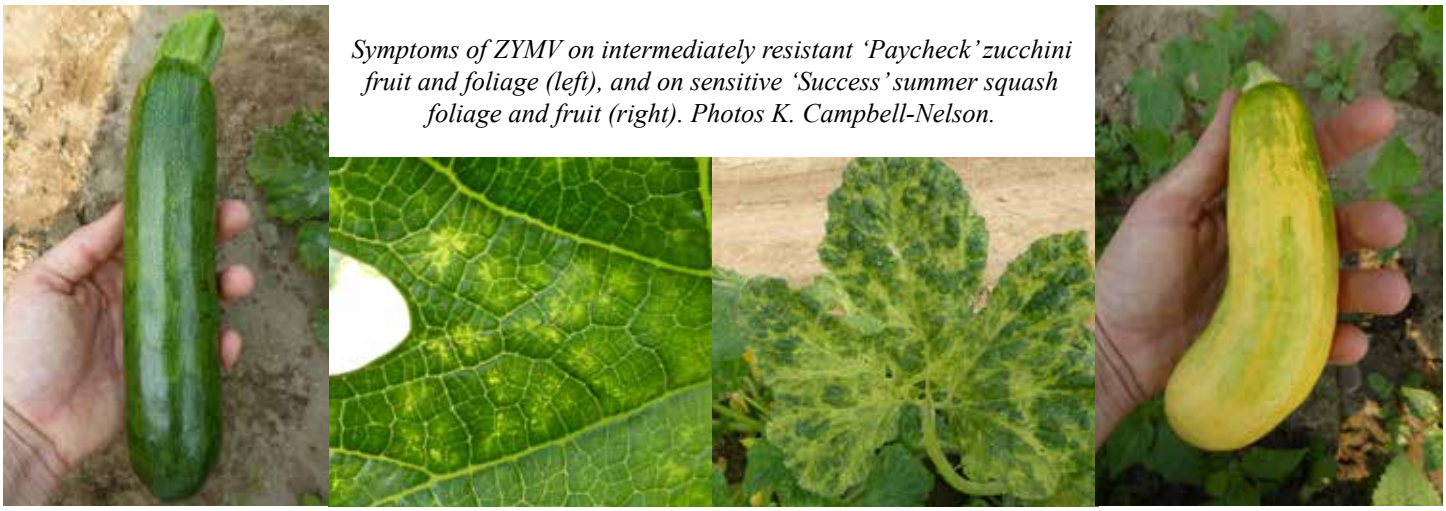
and FAW at 7 locations. The first flight of our resident pest **European corn borer** occurred in early June, and many growers released *Trichogramma ostriniae* as a biological control at that time. The second flight of ECB peaked just last week, when pressure from corn earworm (CEW) was also at its highest level yet this season. ECB pressure has fallen back down this week but CEW remains high. Those using *T. ostriniae* to control ECB in pepper would have released that parasitoid in mid-August. Exact timing for releasing the biocontrol was determined by trap captures at each location. **Corn earworm,** like fall armyworm, is a migratory pest that is carried into the area on storm fronts, but then builds up and usually becomes more of a pest later in the season. This year CEW first arrived in the end of June, when we got our first southerly storm of the season on June 28th. However, looking back at rainfall data for the season, CEW peaks on the graph DO NOT seem to coincide with other storm events. CEW trap captures remain high this week in some locations, but have dropped in Western MA. **Fall armyworm** captures have been low in MA, RI and VT, but have spiked in NY, with one location capturing 321 moths! Over the season, we saw our first peak of FAW in mid-July, likely coming in on early storm fronts as with CEW. We can tell that this pest is not one that typically causes economic damage in sweet corn based on the low trap captures and low damage observed this season. **Syrphid fly larvae** (photo) were found in very high numbers in one NY field and adult flies were abundant in one MA field this past week. This beneficial insect feeds on aphids and even fungi–don't spray this one!

Syrphid fly larvae on sweet corn.
Photo M. Zuefle

Basil Downy Mildew continues to spread. At the UMass Research Farm in South Deerfield, MA, disease onset was delayed by two weeks on the tolerant variety Eleonora compared to the more susceptible Genovese and Purple basils.

Brassicas: **Cabbage aphids** are above threshold of 10% infestation (2% for organic fields) in a Chittenden Co., VT field. Outbreaks in organic fields in Franklin and Hampshire Cos., MA several weeks ago have subsided after treatment with tank mixes of pyrethrum, neem, insecticidal soap, mixed with an adjuvant. Lepidopteran pests (**imported cabbage worm**, and **diamondback moth**) were at threshold in multiple brassica crops in Chittenden Co., VT and Franklin Co., MA.

Eleonora basil (left) is more tolerant of BDM than Genovese (right).
Photos K. Campbell-Nelson



Symptoms of ZYMV on intermediately resistant 'Paycheck' zucchini fruit and foliage (left), and on sensitive 'Success' summer squash foliage and fruit (right). Photos K. Campbell-Nelson.

Cucurbits: Zucchini yellow mosaic virus (ZYMV) was confirmed on 'Paycheck' zucchini this week causing almost 100% infection in Hampshire Co., MA. This disease has not been known to occur in the Northeast, but several cases have been diagnosed regionally in the past few years, indicating that it may be building up. While Paycheck has intermediate resistance to ZYMV, a few rows of 'Success' yellow squash without any resistance was growing in the same field, and had severe foliar symptoms. ZYMV only affects cucurbits. Insecticides are not a good option for controlling aphids and reducing spread of disease since most aphid species rarely colonize fuzzy cucurbit leaves and are therefore difficult to target with an insecticide and the insecticides may increase probing activity and virus spread. Once symptoms are present, the crop is infected for the rest of the season. The best course of action is to claim your crop insurance and till the crop under to keep the source of inoculum down. The virus does not reduce the postharvest quality of the fruit but can be rejected by wholesale buyers. See the article this issue on other management strategies for viruses in cucurbits. Striped cucumber beetle are active again in many cucurbit fields and in NH have been found chewing on fruit. Cucurbit downy mildew and Powdery mildew are infecting many cucurbit fields this time of year.

Solanaceous: Sclerotinia white mold was found in greenhouse tomatoes in Hampshire Co., MA this week. Signs of the pathogen include white, cottony mycelial growth and presence of hard, black resting structures called sclerotia that look like mouse droppings in stems or fruit. Deep plowing is NOT the best cultural practices for getting rid of this pathogen because the sclerotia can survive for 8 or more years in the soil. Remove and cull as much crop residue as possible. This disease has a broad host range, but non-host crops you may rotate to include grains and onions. A commercially available biological control agent, *Coniothryium minitans* (trade name Contans) can reduce field populations of *S.sclerotiorum* by parasitizing sclerotia. Contans must be incorporated into the soil and is best applied 3-4 months before re-planting or in the fall. Septoria is now being seen more often than early blight by the VT diagnostic lab, as temperatures are decreasing. While the two pathogens differ in their lifecycles, cultural practices to manage them are similar except that early blight also affects potato, and eggplant while Septoria only affects tomato. Rotate out of fields with Septoria or early blight for 3-4 years. Hot water treat seeds or used certified disease free seed (early blight is known to be seed-borne and Septoria spores can survive on seed surfaces). Both pathogens can also survive on solanaceous weed hosts such as jimsonweed, horsenettle, ground cherry, and nightshade. Some cultivars with tolerance to early blight and Septoria (and late blight!) are available. Late blight is poking up around the state in VT, but not many more outbreaks have been reported in MA. The hot dry weather is keeping this disease at bay and a few more weeks of good harvest may be expected.

White, cottony mycelial growth of white mold on tomato stem. Photo S. Scheufele.

Sclerotia inside tomato stem. Photo S. Scheufele

CUCURBIT VIRUSES AND TRANSMISSION

Within the last couple of weeks, several cucurbit viruses have shown up across the state on a variety of crops–diagnosis of submitted samples is ongoing. Cucurbits are susceptible to more than 32 viruses, which can cause a wide variety of symptoms, including color breaking or mottling of fruit, mosaic or mottled patterns on leaves, and darkening, distortion, and/or blistering of leaf tissue. Most cucurbit viruses are part of the Potyvirus family (which includes potato virus y, though this virus does not affect cucurbits), and are vectored by aphids. Species of aphids that prefer potatoes are moving on to alternate host crops such as cucurbits now that potato vines are being mowed or desiccated. Please submit suspicious samples to the UMass Diagnostic lab.

Transmission. Viruses have been classified as non-persistent, semi-persistent, and persistent, depending on the length of time the insect vector can retain infectious virus particles, which can range from minutes to hours (non-persistent) to days (semi-persistent) and to life-time and even inheritance by the insect progeny (persistent). Most of the viruses we encounter in cucurbit fields in the Northeast are non-persistently transmitted by aphids, except for Squash Mosaic Virus which is transmitted semi-persistently by cucumber beetles. Many species of aphid transmit viruses non-persistently, meaning that they acquire and spread virus particles quickly. Aphids probe plants as they move along to determine if they are preferred hosts or not–even this quick probing activity can be enough for an aphid, which may not even be a pest of a given crop, to spread the virus. Aphids can pick up the virus particles anywhere along their path and are very efficient at spreading them, often causing 100% of the crop to be affected. Because of this probing behavior, aphids should not be controlled using insecticides, which cause increased muscle twitching and more probing (insecticidal soaps and horticultural oils do not have this effect). Once the virus is present it is there to stay, though fruit may not be affected if the virus was acquired after pollination occurred. Mechanical transmission of viruses from plant to plant may also occur via movement of plant sap by equipment or workers (e.g., in pruning or harvesting). Some viruses can be seed-borne and other may overwinter on weed hosts.

Prevention. Once a virus becomes visible in your crop there is no cure or chemical treatment, so prevention is essential. Furthermore, the severity of disease caused by viruses is usually determined by the timing of infection—the earlier infection occurs, the greater the impact on plant growth, fruit symptoms, and fruit set. Delaying the onset of infection by several weeks can have a dramatic effect on the amount of damage.

Cultural Practices

- Start with certified virus-free seed, some viruses can be seed-borne in particular crop species.
- Where possible, do not grow ornamental plants and vegetable transplants in the same greenhouse, as viruses often have large host ranges including vegetables, ornamentals, and woody plants and may be introduced on infected plugs.
- Plant resistant cultivars. Many resistant varieties are available in a variety of crops including cucumber, summer squash and melons. Resistance is derived from traditional breeding as well as through genetic engineering, while some species are naturally resistant to certain viruses.
- Cover the crop with floating row covers in the spring to prevent the early influx of virus-carrying aphids. Be careful with this tactic, as aphid populations can develop quickly under row cover if present when the crop is covered, and row covers will exclude beneficial insects that might otherwise help control aphid populations. Make sure plants are not already infested before you apply row covers.
- Reflective mulches can repel aphids. Though slightly more expensive, they may be cost-effective if viruses are a chronic problem.
- Eliminate weed host reservoirs such as shepherds purse, dandelion, field bindweed, purple dead nettle, and Canadian goldenrod.
- *Prunus* species (peaches, cherries, etc.) are attractive to green peach aphids. Removing wild cherry trees from around fields can make the area less attractive to green peach aphids. The green peach aphid is not the only aphid that transmits viruses, but it is important because it is a universal vector.
- Handle plants as little as possible, clean tools frequently, and work in clean fields first and affected fields last to minimize mechanical transmission by workers and equipment
- Remove and destroy affected plants to prevent a source of virus for further infections.

Insecticides. Because most cucurbit viruses are transmitted non-persistently (rapidly), insecticides DO NOT act quickly enough to prevent infection or control disease spread. Systemic materials are generally the most effective insecticides available for aphid control because they are taken into the plant tissue and ingested by aphids when feeding. However, when probing a leaf an aphid is not feeding and does not ingest plant sap or insecticide. In fact, the presence of an insecticide may actually stimulate aphids to probe more quickly, and to move from plant to plant rapidly, in an effort to find a suitable feeding site. This can increase the spread of non-persistently transmitted viruses in cucurbit crops. Mineral oil sprays have been used to deter aphids from feeding, but this method can be costly and unreliable. Conversely, controlling spotted and striped cucumber beetles can effectively reduce the spread of Squash Mosaic Virus through a field because those insects transmit SqMV semi-persistently, feeding for 5 minutes before the virus is acquired and retaining the virus for many days (up to 20).

Important Viruses. Listed below are the six viruses you are most likely to encounter in New England cucurbit fields. Of these, CMV and WMV occur every year and PRSV occurs most years in the Northeast. SMV would mostly be introduced via contaminated seed and ZYMV has not been seen in the Northeast for many years.

Cucumber Mosaic Virus (CMV): causes severe plant stunting, prominent foliar mosaic, malformation, downward cupping and reduced size of leaves. Flowers may be malformed or have greenish petals. Fruits may be distorted, discolored, and small and may not produce many seeds. Summer squash, some melons, and some pumpkins are most severely affected, while cucumbers, watermelons, and winter squashes are less severely affected. The host range of CMV includes at least 1200 plant species including many vegetables, ornamentals, and woody tree species. CMV is non-persistently transmitted by over 60 species of aphid, including green peach, potato, and foxglove aphids. CMV may be seed-borne in some cucurbit crops and weeds including chickweed (*Stellaria media*). Most varieties of cucumber are bred to have good CMV-resistance. Some summer squash varieties carry a "precocious yellow gene"

Cucumber mosaic virus (CMV) on squash leaves

Papaya ringspot virus (PRSV) on squash leave and fruit


Watermelon mosaic virus (WMV) on a squash leaf

Zucchini yellow mosaic virus (CMV) on a squash leaf

which masks the color-breaking effect caused by CMV infection, some have intermediate resistance, and others carry high transgenic resistance to CMV. Melons may carry intermediate resistance to CMV, though no commercial muskmelon varieties are resistant. Most watermelon varieties are naturally resistant to the most prevalent strains of CMV.

Papaya Ringspot Virus Type W (PRSV-W): causes prominent foliar symptoms including a green mosaic, malformation, puckering, distortion and narrowing of leaves. Affected fruit is malformed, knobby, and exhibits color-breaking. PRSV-W is non-persistently vectored by over 20 species of aphid, including cowpea, melon, foxglove, potato, and green peach aphids. PRSV-W is not seed-borne. PRSV-W can be effectively prevented by host resistance in cucumber, melon, winter and summer squash, but no watermelon varieties are resistant.

Squash Mosaic Virus (SqMV): affects squash and melons and some species in the family Chenopodiaceae. Foliar symptoms include green vein-banding, mottling, a dark green mosaic, blistering and hardening of leaves, ringspots, and protruding of veins at margins. Infected fruits are mottled and infected melons lack netting. SqMV can be transmitted by seed, and this is the primary source of inoculum for outbreaks. Once introduced SqMV is transmitted by spotted and striped cucumber beetles. Beetles acquire the virus after feeding on an infected plant for 5 minutes and can retain the virus for 4-20 days—in the case of SqMV, controlling insect populations *will* help reduce spread of disease.

Watermelon Mosaic Virus (WMV): causes green mosaic, rough wrinkled leaves, darkening of leaf veins, chlorotic rings and malformation. While foliar symptoms can be severe, especially in winter and summer squash, fruit is generally not affected. Yellow colored summer squash fruit may develop green spots. The host range of WMV includes most of the Cucurbitaceae and the virus overwinters primarily in wild legumes (*Trifolium* spp., e.g., clovers), as well as members of the Chenopodiaceae and Malvaceae families. WMV is non-persistently vectored by over 20 species of aphid, including foxglove aphid, potato aphid, and cowpea aphid. WMV is not seed-borne in cucurbits or legumes. Resistant varieties of cucumber are available.

Zucchini Yellow Mosaic Virus (ZYMV): causes a yellow leaf mosaic, severe malformation and blistering, reduced leaf size and plant stunting. Squash and pumpkin fruit are reduced in size and greatly deformed and knobby. Muskmelon and watermelon fruit are also reduced in size and deformed, causing deep cracks. Of the cucurbits, pumpkin, summer squash, muskmelon and watermelon are especially affected. ZYMV is also non-persistently transmitted by aphids, including melon and green peach aphids. New varieties of squash, melon, and cucumber have been developed with high, transgenic resistance.

Tobacco Ring Spot Virus (TRSV): is rare in MA but has been observed in PA. Initial symptoms on cucurbits are pinpoint necrotic spots with bright yellow haloes that develop into a bright yellow mosaic on young leaves. The initial onset of symptoms is followed by a slow recovery. Older leaves are dark green but reduced in size and plants are not very productive. Fruits of infected watermelon plants may develop elevated pimples and ringspots. This disease is primarily vectored by dagger nematodes, but can be mechanically transmitted by equipment or workers, and can be seed-borne.

-by Bess M. Dicklow and Susan B. Scheufele, Umass Extension

IN SEARCH OF *PHYTOPHTHORA CAPSICI* FROM WATERWAYS IN THE CONNECTICUT RIVER VALLEY.

In 2013 and 2014, water and soil samples were collected at 20 sites in Massachusetts to determine the incidence and distribution of *Phytophthora* species. The majority of the sample sites were situated in the Connecticut River Valley watershed with the remaining sites in central and eastern Massachusetts. The primary goal of the study was to determine if *P. capsici*, a non-native vegetable pathogen in New England, is present in the Connecticut River and its various tributaries. A secondary goal was to determine the assemblage of all other *Phytophthora* species present to verify if other potentially destructive, non-native species are also present in natural waterways. Additionally, a large collection of *P. capsici* isolates, collected from throughout Massachusetts over a 15-year period, were used in a popula-

tion genetics study to better understand how the pathogen is spread in agricultural settings. We hypothesized that *P. capsici* is present in natural waterways, providing it with a means of dispersal to new sites during periods of flooding or when farmers irrigate directly from streams and rivers. *Phytophthora* species produce swimming, asexual spores that can be readily captured by securing plant baits in flowing water or through water filtration. From May through October, isolates of *Phytophthora* were collected from rivers, streams and irrigation ponds directly adjacent to active agricultural lands using this baiting technique. Many of the farms where samples were collected had a prior history of disease outbreaks from *P. capsici* on cucurbits, peppers and tomatoes.

At the UMass Plant Diagnostic Laboratory, isolates of *Phytophthora* were identified to species-level using visual characteristics and DNA sequences. Over 450 isolates, representing 18 different species of *Phytophthora*, were collected during the two-year study. The results highlight the rich assemblage of species in the area. *Phytophthora* species were recovered from water with temperatures as low as 50° and as high as 84° F. Of the 18 species identified, three represent new species that had not been formally classified prior to this study. In contrast to our original hypothesis, *P. capsici* was not recovered from water or soil collected from natural waterways and irrigation ponds. Furthermore, none of the *Phytophthora* species identified are known as, or are suspected of being, legitimate pathogens of vegetable crops grown in the region. At one site in 2014, a confirmed outbreak of *P. capsici* occurred on pepper and squash in a field directly adjacent to the Connecticut River. Yet, despite repeated water sample collections, *P. capsici* was not found. While the field bordered the Connecticut River, it was buffered by a mature floodplain forest composed of silver maple, elm and cottonwood, among other minor tree species. This floodplain forest buffer likely created a barrier preventing infested soils from flowing into the river under normal conditions. Unless infested soils can flow uninhibited directly into a stream or river, natural waterways do not appear to be a mode of dispersal for *P. capsici*. At the same time, viable propagules of *P. capsici* may be present in the Connecticut River and its various tributaries but were simply not captured at sites surveyed for this study.

Results of the population study revealed a high level of genetic diversity of *P. capsici* in Massachusetts. Diversity was high both within and between sites, meaning that a given farm might have many different isolates unique to that location and were not seen on other farms. This finding is consistent with results from previous studies on population diversity of *P.capsici* in the Northeast. However, there were a few cases where two farms shared an identical genotype, or clone, of *P. capsici*. This uncommon finding may indicate that overland spread of the pathogen from one farm to another is occurring in the Connecticut River Valley, likely through sharing fields and/or equipment, when infested soil is moved from farm to farm on the wheels of a tractor or boots. *Phytophthora capsici* overwinters in soils and may persist for several years at a site, even when susceptible crops (cucurbits, peppers and tomatoes) are rotated with non-host crops. To conclude, waterways in Massachusetts are home to a rich assemblage of *Phytophthora* species. Many of these species, however, are woody plant pathogens that pose little to no risk to agricultural crops. While the non-native vegetable pathogen *P. capsici* is well established in the area, widespread dispersal of the pathogen by natural waterways may occur only under extreme flooding events and may not be a major means of dispersal.

-by Nicholas J. Brazee, UMass Extension Plant Pathologist

FALL WEED MANAGEMENT ADVICE

Weed management is still important at the end of the season. There are three main activities that need to be completed. They are: fall field scouting, preventing weed seed production, and controlling perennial weeds.

End of Year Weed Scouting

It is worthwhile to take the time to check fields for weed problems at this time of year. A quick scouting can identify problems that will be expensive to solve if they get out of control and can provide clues that will help in designing a weed management program for next year. Mapping weedy spots, and keeping some kind of permanent record of weed surveys, can help you evaluate your weed management over the years. Make a map of each field and fill in the following information:

How Many? How dense are the weeds? If weeds are very dense, they may be having an impact on yields. This is especially true if these weeds emerged early in the season, when competition is greatest. If weeds were actively growing during the period of greatest crop growth, consider changing the weed management program.

Which Weeds? Identifying weeds can help identify potential problems before they get out of hand, and can help you decide if you need to modify your weed control program. Weeds like yellow nutsedge, field bindweed, and quackgrass are spreading perennials, which have underground parts that enable them to spread throughout whole fields. Because these weeds can be very damaging, and are very difficult to control, they are worth "nipping in the bud". In addition, keep an eye out for annual weeds that are new to a field or are increasing in numbers. Some weeds can be very difficult to control in some or all of the crops in your rotation. Galinsoga, for example, is hard to control in cole crops, peppers, and squash. Nightshades are difficult to control in tomatoes for growers who rely on herbicides for control, because they are in the same family as tomatoes. Velvetleaf is hard to control in sweet corn.

What worked? It is also useful to look at the whole field and evaluate the effectiveness of your weed control efforts. If some weeds are generally escaping, identify them. They may point to weaknesses in your herbicide or cultivation program. If mostly grasses, or mostly broadleaves are escaping, it may require an adjustment of either the rates or the timing of grass or broadleaf herbicides. You may also find the New England Vegetable Management Guide useful. This manual contains a chart listing the effectiveness of vegetable herbicides on most of the common weeds in New England. Use this guide to find an herbicide labeled for your crop that might give better control than the one which was used.

Where are the weeds? Weeds in the rows or planting holes are much more damaging to crop yields than between-row weeds. Weeds in rows may be an indication that cultivation equipment needs adjustment, or cultivation needs to be done earlier.

Preventing Weed Seed Production

Annual weeds produce incredible amounts of seeds. Annual grasses normally produce 3,000 to 5,000 seeds per plant, small seeded annual weeds such as pigweed and lambsquarters can produce 100,000 to 250,000 seeds per plant, and larger seeded broadleaf weeds such as velvetleaf and smartweed can produce 5,000 or more seeds per plant. Perennial weeds can also produce seeds or other reproductive structures. For example, one yellow nutsedge plant can produce 2000 tubers. Perennial weed management is covered below. Once fields are harvested, they should be tilled or disked as soon as possible to prevent seeds from maturing. Be especially concerned with weeds that are new to a field or are in abundant supply. If time is short, one alternative is to mow the weeds. This will remove the primary seed stalk but will also encourage lateral branching. Eventually, however, these branches will produce seeds and must be destroyed. For some weeds, like Galinsoga, seed maturation may continue after mowing or pulling–these plants should be removed from the field if possible.

Perennial Weed Management

The best time to control perennial weeds is in the Fall. All perennial weeds have storage structures (tap roots or rhizomes) below ground that enable these plants to survive the winter and regenerate themselves the following year. Fall tillage of perennial weeds will kill top growth and fragment the storage organs but will not kill the weed. Frequent tillage will, over a long period of time, control perennial weeds but, in most cases, this is not practical.

Perhaps the best control technique for perennial weeds is an application of glyphosate (Roundup) before the plant goes dormant. Perennial broadleaf weeds such as bindweed or dandelion should be sprayed while they are still actively growing which is usually before a hard frost. Perennial grasses, such as quackgrass, can be sprayed as late as mid-November. Use 10 to 20 gallons of water per acre when spraying Roundup. Two quarts of the herbicide will provide much better control at 10 gallons of water per acre than at 40 gallons of water per acre. Spraying on a mild afternoon following a cold or cool morning is best to encourage translocation of the herbicide to the below-ground storage structures. Disking or tilling two weeks after application will also improve control of the weeds.

Many growers fight perennial weeds such as quackgrass in corn fields year after year because their primary goal in the fall is to plant a cover crop. This is usually followed by a spring application of Roundup which provides top kill but does not kill the whole weed. Applying Roundup at the proper time is the only way to achieve good control. Delaying the seeding of a cover crop may be a necessary evil in the fight against perennial weeds.

In conclusion, remember to scout and map your fields, prevent weed seed production, and apply Roundup at the right time to control perennial weeds.

- by Rich Bonanno, UMass Extension Weed Specialist

Grants for Farmers

Greener Fields Together (GFT) engages farmers, distributors, foodservice operators and retail locations in efforts to work toward safer produce from seed to fork. GFT is offering grants in the amount of $3,000 – $10,000 for a number of categories including Food Safety and Good Agricultural Practices (GAP) improvements, certification assistance, infrastructure development, and marketing / communications. Applicants must be GFT members or submit paperwork for membership by **October 25th, 2015**. For more about this grant opportunity and to apply click here: http://www.greenerfieldstogether.com/cultivating-change

Northeast SARE is offering farmer grants for commercial producers who have an innovative idea they want to test using a field trial, on-farm demonstration, marketing initiative, or other technique. A technical advisor--often an extension agent, crop consultant, or other service professional--must also be involved. Projects should seek results other farmers can use, and all projects must have the potential to add to our knowledge about effective sustainable practices. Grants are awarded up to $15,000 and the application deadline is **November 12th, 2015**. Click here for the application: http://www.nesare.org/Grants/Get-a-Grant/Farmer-Grant

Events

Basics of Tractor Safety, Operation & Maintenance

When: Monday, September 14, 2015 from 8:30am to 4:30pm

Where: Hutchins Farm, 754 Monument St, Concord, MA 01742

University of Vermont Extension is presenting this workshop on how to keep your tractor's engine running smoothly and efficiently. This one day tractor course will provide you with the skills and hands-on experience to keep your tractor in tip top condition. You'll get hands-on practice in checking and changing fluids and filters, servicing the battery, checking radiator hoses, grease fittings, and more in a small-group.

Instructor, Shane J. LaBrake, has over 25 years of experience as a farmer and a trainer. Instructor Eero Ruuttila is the Incubator Farm Coordinator for the New Entry Sustainable Farming Project in Lowell, MA and a Sustainable Agriculture Specialist for UConn Extension's Scaling Up program for Beginning Farmers. Shane and Eero have taught together and have more than four decades of combined experience in safe tractor operation and maintenance.

This workshop is also being held on September 17 in Brattleboro, VT and on October 13 in Poultney, VT.

Twilight Meeting: Nutrient Management, Soil & Crop Fertility

When: Friday, October 2, 2015 from 4pm to 6pm

Where: Langwater Farm, 209 Washington St, North Easton, MA

This year's Twilight Meeting will focus on nutrient management from the bottom up and will feature:

- Explanation of new statewide nutrient management regulations which will go into effect on December 5, 2015 by MDAR
- Cover crop-based fertility and on-farm composting at Langwater Farm
- Compost analysis and interpretation by Katie Campbell-Nelson
- Weed management by Rich Bonanno

Langwater Farm is a 50 acre certified organic farm in Southeastrern MA run by Kevin O'Dwyer. Before starting Langwater in 2010, Kevin was head grower at Ward's Berry Farm in Sharon, where he started farming at age 14.

The 2015 New England Vegetable and Fruit Conference

When: Tuesday, December 15 to Thursday, September 17, 2015

Where: Radisson Hotel – The Center of New Hampshire, 700 Elm St, Manchester, NH 03101

New England Vegetable & Fruit Conference and Trade Show includes more than 25 educational sessions over 3 days, covering major vegetable, berry and tree fruit crops as well as various special topics. A Farmer to Farmer meeting after

each morning and afternoon session will bring speakers and farmers together for informal, in-depth discussion on certain issues. There is also an extensive Trade Show with over 100 exhibitors.

This conference is special because it is put together with close collaboration between growers and Extension from across the region. The steering committee gathers the best speakers from within our region and across the country to tell you about the latest innovations and advances in the fruit and vegetable industry. Almost every session includes both farmers and research or extension personnel, so you are getting the "best of both worlds."

Registration will open soon!

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Vegetable Notes. Katie Campbell-Nelson, Lisa McKeag, Susan Scheufele, co-editors.