

Volume 27, Issue 26

Vegetable Crops

Maintain Weed Free Greenhouses to

Reduce Pest Problems - David Owens, Extension Entomologist; owensd@udel.edu

Winter annual weeds continue to germinate. Destroying weeds and maintaining clean greenhouses will go a long way to reducing the potential for spider mite colonization of transplants next spring.

Controlling Worm Pests in Cole Crops -

David Owens, Extension Entomologist; owensd@udel.edu

Diamond back moth numbers have been elevated this season. Larvae are small, smooth, green, often hold their anal prolegs out in a V-shape and wiggle violently when disturbed. Imported cabbageworm on the other hand is a larger, velvety green worm that will not move when poked or prodded. Imported cabbageworms are easily controlled with insecticides, but diamond back moth are resistant to pyrethroids and resistance to other classes have been reported in various populations. Resistance management for DBM is therefore extremely important, and skipping a 'worm product' in favor of a pyrethroid may allow unnoticed small worms to do some extensive feeding before the next application. We have 8 effective mode of action classes for DBM. Representative insecticides

September 20, 2019

include Radiant and Entrust (G5), Proclaim (G6), Dipel (G11), Rimon (G15), Confirm and Intrepid (G18), Torac (G21), Avaunt (G22), and Coragen, Verimark, Exirel, Harvanta, Durivo, Voliam Flexi (G28).

In the fall, we can expect about 3 generations of diamondback moth. A treatment window approach is the best way to manage for resistance. This works by alternating among these mode of actions (MOAs) with each application and generation, reducing selection pressure on any one product. So, in the first month of the fall plantings, use alternating MOAs, then in the second month use altogether different, alternating MOAs, and in the third month again use completely different MOAs. If one mode of action was used in transplant house, do not use it in the field. G18 materials should target small worms only.

There are numerous parasitoid wasps that attack diamondback moth and imported cabbageworm. Pyrethroids, organophosphates, and carbamates are all highly disruptive to them. These products are traditional beetle and bug products. Other effective products for flea beetles include neonicotinoids (G4), Torac (G21), Harvanta, Exirel, and Verimark (G28). The neonicotinoid class (group 4) is also effective on harlequin bugs. A few products combine both a neonic and a diamide as a premix (Durivo and Voliam Flexi) and would help preserve parasitoid activity. Bt is the most natural enemy friendly product, followed by G5 and G28 spinosyns and diamides, then G6 G22 and G21 (Proclaim, Avaunt, and Torac), then foliar G4 and G1B neonics and Ops and lastly, Lannate and pyrethroids.

Once a field has been harvested, crop residue should be tilled under as soon as possible to destroy any surviving diamond back moth larvae.

Harvest and Post-Harvest Handling of Fall

<u>Root Crops</u> -Gordon Johnson, Extension Vegetable & Fruit Specialist; <u>gcjohn@udel.edu</u>

Radishes are harvested throughout the fall. They are bunched with tops or wrapped/bagged without tops. For bunching, plants are pulled and gathered with rubber bands or twist ties. Shelf life is 10-14 days. Rapid cooling is essential to achieve the full storage potential of both bunched and topped roots. Radish is often topiced to maintain temperature and contribute moisture for retaining a crisp texture. Under these conditions common red radish may be expected to maintain acceptable quality for 7 to 14 days with tops and 21 to 28 days if topped. Daikon-type radish may last from 3 to 4 months at these same conditions. Store at 32°F and 95-100% relative humidity.

Fall **Turnips** are harvested through up to a heavy freeze. Turnips are dug mechanically or by hand and either bunched or topped. They are washed and may be hydrocooled, forced air cooled, or room cooled. Topped turnips can be stored over 4-5 months at 32°F and at 95% relative humidity.

For **Rutabagas**, pull and trim tops in the field. Bruised, damaged, or diseased rutabagas will not store well. Wash rutabagas in clean water, spray-rinse with clean water, then dry as rapidly as possible before waxing or shipping. Rutabagas are commonly room cooled. For short term storage the root does not need to be waxed. Waxed rutabagas can be stored 4-6 months at 32°F and 95-100% relative humidity.

Fall **Carrots** are harvested from September into early winter. Fresh market carrots should be over 5 inches long and 0.75-1.5 inches in diameter. Fresh market carrots in small plantings are harvested by loosening the soil around the plants with a garden fork and then pulling carrots gently out of the ground by the tops. For larger acreages carrots with intact tops are harvested with a belt pick-up harvester that lifts carrots by their foliage then cuts off the tops. Fresh market carrots are washed, sorted, and packed into 48 1-lb plastic bags, or 24 2-lb plastic bags per carton, or loose in 50-lb mesh or plastic sacks. Mature topped carrots can be stored 7-9 months at 32-34°F (0- 1°C) and 98-100% relative humidity. Air circulation between crates or pallet boxes with carrots is desirable to remove respiratory heat, maintain uniform temperatures, and help prevent condensation. An air velocity of about 14-20 ft/min is adequate at low storage temperatures.

Market Beets are harvested when they reach a size of 1.5-3 inches in diameter. Beets can withstand temperatures as low as 12°F and can be harvested throughout the fall and early winter. For bunching beets, roots are undercut and carefully pulled by the tops. For larger acreages, beets for roots may be topped and machine dug using a modified potato digger. Store topped beets at 32°F (0°C) and 98-100% relative humidity. Like other root crops, beets are well adapted to storage. Topped beets stored at 32°F can keep 4-6 months provided the humidity is kept sufficiently high to prevent dehydration. Before storage, beets should be topped and sorted to remove the ones with disease symptoms or mechanical injuries. Beets should be stored in well-ventilated containers such as ventilated bin boxes or slatted crates to help dissipate respiratory heat. Bunched beets are much more perishable than topped beets, but they can be stored at 32°F for 10-14 days. A relative humidity of at least 95% is desirable to prevent wilting. Satisfactory precooling is accomplished by vacuum cooling or hydrocooling. Crushed ice helps keep the bunched beets cold, especially if refrigeration is not available. Bunched beets are commonly shipped with package and top ice to maintain freshness.

How to Build a Spray Program for Pumpkins

- Kate Everts, Vegetable Pathologist, University of Maryland; <u>keverts@umd.edu</u>

A frequent question that I get from growers is "what is the best spray program for my pumpkin crop?". It is a challenging question to answer, in part because each field/farm may have different disease pressure, and Ag Chem suppliers may only stock some fungicides. With that in mind, I have come up with the following step by step procedure to use as a guide in designing an individualized pumpkin program. The numbers in parenthesis that follow the fungicide name are the Fungicide Resistance Action Committee (FRAC) code for the product. Except for chlorothalonil, mancozeb and copper, always alternate fungicides with different FRAC codes.

Step 1

Use all available cultural practices to reduce disease pressure, including planting host resistant cultivars when possible, using good rotations, planting disease free seed, etc. If possible, modify your spray equipment to get excellent fungicide coverage on both the upper and lower surfaces of leaves.

Step 2

Learn to identify key diseases: powdery mildew, downy mildew, Plectosporium blight, and bacterial leaf spot.

Step 3

Begin a basic preventative spray program with a chlorothalonil or mancozeb product. Spray every 7 to 14 days, beginning when vines run. (Organic alternative: copper)

Step 4

Scout for disease presence and if the following diseases occur, use the following guidelines:

Bacterial leaf spot - Add a copper product to the basic preventative program (applied every 7 to 10 days).

Powdery mildew - Add powdery mildew specific products to basic preventative program. Alternate FRAC codes.

• Select one of these: Torino (U6), Vivando (U8), Luna Experience (3+7), or Quintec (13).

• And alternate with one of the following: Rally (3), tebuconazole (3), Procure (3), Proline (3), Inspire Super (3+9), Aprovia Top (3+11), TopGuard (3+11), or Pristine (7+11).

• (Organic alternative: Micronized Wettable Sulfer)

Downy mildew - Add downy mildew specific product to the basic preventative program. Select two downy mildew products with different FRAC codes and alternate them. *Downy* *mildew products include*: Orondis Ultra (U15+40), Orondis Opti (M5+U15), Ranman (21), Previcur Flex (28), Presidio (43), Elumin (22), Zing! ((M5+22), Ariston (M5+27), Tanos (11+27), Curzate (27), Forum (40), and Zampro (40+45).

Plectosporium blight - Chlorothalonil and mancozeb are good on Plectosporium blight. Cabrio can be added to the program to improve management.

Step 5

Special cases: Avoid planting pumpkins in a field with a history of Phytophthora fruit rot.

To manage Phytophthora fruit rot, select two of the following Phytophthora products that are in different FRAC code groups and rotate them. Phytophthora fruit products include Orondis Ultra (U15+40), Revus (40), Zampro (40+45), Presidio (43), Gavel (M3+22), Tanos (11+27), Ranman (21) and Forum (40).

Agronomic Crops

Fall Small Grain Insect Pest Management -

David Owens, Extension Entomologist; owensd@udel.edu

Planting winter wheat and barley is coming up. There are two historically important insect pest groups to be mindful of: Hessian fly and the aphid complex. Hessian fly lays eggs on leaves and larvae move to the base of the leaf sheath and tiller to feed. Fall infestations are the most severe, resulting in dead or severely stunted tillers. This insect strongly prefers wheat but will go after barley. Hessian fly has not been an important pest in the mid-Atlantic for some time and my predecessor can count the number of affected fields she has seen over the course of several decades on one hand, although there is a hypothesis that this may change with increasing wheat cover crop and later and later first freeze events. The average date of the first freeze is called the 'fly-free' date. Planting after this date should minimize Hessian fly activity and impact. The fly-free date for Sussex County is October 10, Kent is October 8, and New Castle is October 3. At this time, insecticides are probably not necessary.

The other pest group that could affect fall small grain plantings is the aphid complex, and

planting after the fly free date limits the amount of time that aphids will be active to colonize fall plantings. Our two most common aphids are bird cherry oat (BCOA) and English grain aphids (EGA). Winged BCOA is a black color while EGA is a green color with two dark thoracic lobes. Wingless EGA are green with long black antennae and long black tailpipes or cornicles. Wingless BCOA are a bulb shaped olive green color with red patches at the base of the cornicles.

BCOA is the most important vector for barley yellow dwarf virus. English grains are not considered to be an effective, economical vector. Numerous Extension recommendations indicate a fall aphid population exceeding 12 -20 per foot between emergence and the beginning of tillering (Feekes 4) may benefit from an insecticide application if BCOA is present. If BCOA is not present, an insecticide application will most likely not provide a positive return on investment. If control is deemed necessary, the best options are insecticides containing pyrethroids (such as Warrior) or a pyrethroid-neonic premix like Endigo. What about seed treatment? Last year we had two locations in which wheat was planted after the fly-free date with and without a seed treatment. Subplots were treated with a foliar insecticide in November. The only aphid species present in the fall was English grain aphid, and in extremely low numbers, never exceeding 4 per foot in any individual plot. In the spring, large numbers of both BCOA and EGA aphids arrived and colonized these plots, meaning fall aphid management had no effect on spring population growth. BYDV was also practically non-existent, and it's been a few years since BYDV epidemics have been observed. Some states much farther south have, in the past, reported a yield bump from an early spring insecticide application as opposed to a fall or a seed treatment application, but with our current low levels of BYDV, I think even this is unnecessary. Recent research from University of Maryland suggest that seed treatments may actually decrease parasitoid activity in the following spring. Other factors that reduce the BYDV risk is high seeding rate and a hot, dry preceding summer, which we certainly have had.

Bottom line: planting after the fly free date will minimize both Hessian fly and aphid activity.

BYDV incidence has been low the last couple of years, and if BCOA is not present in fields, insecticides are not recommended. An insecticide option may help if planting before the fly free date, especially if growing a higher value small grain like malt barley and if BCOA is present.

2019 Rainfall and Temperature Trends for

<u>Delaware</u> - Jarrod O. Miller, Extension Agronomist, jarrod@udel.edu

With corn harvest progressing across the state, it is a good opportunity to observe how summer temperature trends may have played into yields. It is hard to avoid high daytime temperatures in the summer, and your luck is really poor when nighttime temperatures stay above 72°F. This year, any corn pollinating around July 22 underwent a period of higher nighttime temperatures. This could have potentially affected corn planted the last week of May through early June.

At our research station, corn planted on May 2 underwent pollination around July 1, while corn planted on May 16 underwent pollination on July 8. The yields were very different, with the May 2 planting yielding 201 bu/acre, and the May 16 field yielding 146 bushels. This is not a study, but just an observation of events from this season. Next year's weather will determine whether those who plant later are luckier.

Rainfall trends (Figure 2) are based off a planting date of April 14. In Figure 2, you can see that most parts of the state received similar rainfall, until the beginning of June. At that point, Newark and Dover received more rainfall than the southern part of the state; however, irrigation should have made up for the deficit. In August, most regions, besides Dagsboro, went flat and received very little rainfall until the end of the month. Georgetown did received rainfall, but it appears the readings are not available from the weather station.

For total rainfall (Figure 3), Newark led the state with 24.3 inches since April 14 through September 18. Every other town saw at least 20 inches, besides Georgetown with 18.5 inches.









Figure 3: Total rainfall by weather station since April 14th.

Preparing for 2020 Small Grains Disease

<u>Management</u> - Alyssa Koehler, Extension Field Crops Pathologist; <u>akoehler@udel.edu</u>

Preparing for 2020: Small Grains Disease Management

The small grains planting window will be here soon. To get a head start on disease management for next spring, here are a few factors to consider.

Variety

Variety selection is one of the most important pieces of integrated disease management. In the case of wheat, varieties may have varying levels of resistance to powdery mildew, leaf rust, stripe rust, Fusarium head blight, and other diseases. When selecting your varieties, consider what diseases have been an issue in the past and, when possible, select resistant varieties to reduce the risk of disease developing in 2020. Fusarium head blight is typically the disease of biggest concern in our area. While there is not complete resistance, there are FHB resistance genes available in many lines to help reduce disease severity and the amount of mycotoxin (DON) that accumulates in the grain. The University of Maryland conducts an inoculated

misted nursery trial to test varieties for FHB/DON. In this trial, the fungal pathogen is added to the field prior to flowering and plants are misted daily to create the perfect environment for disease development. Wheat plants in this trial are under a "worst case scenario" for disease, so FHB index and DON levels tend to be much higher than would be seen in a natural field setting, but this allows for separation of varieties to see which have the lowest levels of disease and DON content. 2019 results can be found at

https://psla.umd.edu/sites/psla.umd.edu/files/ _images/Wheat%20and%20Barley%20FHB%20ratin gs%202019.pdf

Planting Date

While we do not often see Hessian flies, planting after the Hessian fly-free day helps to reduce the chance of issues with viruses like Barley Yellow Dwarf Virus (BYDV). Aphids spread BYDV, so if you are planting before the Hessian fly-free day, make sure to have a variety with tolerance to BYDV and follow IMP practices for aphid management. Early planting can also allow for infection and overwintering of several foliar fungal pathogens that could lead to more disease the following spring.

Stands and Nutrition

High plant populations tend to create favorable environments for disease due to reduced airflow and increased canopy humidity. High levels of fertilizer promote lush, rapid growth that can favor disease; keeping fertility balanced reduces the chance of disease development.

General

<u>Guess the Pest! Week 23 Answer: Common</u> <u>Chickweed</u> - David Owens, Extension Entomologist, owensd@udel.edu

Congratulations to Mark Sultenfuss for correctly answering this week's Guess The Pest Challenge, common chickweed. Mark will be sent a sweep net and entered in the end of season raffle.



From Mark VanGessel, Extension Weed Management Specialist

Common chickweed is a winter annual weed that begins emerging in the late fall, with some spring emergence occurring as well. Common chickweed is one of the first weeds to flower and set seeds in the spring. Herbicides used to burndown no-till fields will provide good to excellent control of common chickweed, but these fields are often not treated early enough to prevent seed production. Some populations of common chickweed have developed resistance to ALS-inhibiting herbicides (group 2), so products such as Harmony Extra are no longer effective means of controlling it in small grains.

A big thank you to this season's Guess The Pest participants. I hope that it was fun and useful to you. Next week the final winner will be revealed! Stay tuned.



Delaware Spotted Lanternfly Quarantine Zone Expanded - David Owens, Extension Entomologist, owensd@udel.edu

As of September 18, Delaware Department of Agriculture has expanded the quarantine zone for spotted lanternfly to include all areas of New Castle County north of the canal. What this means is that if you are moving produce, plant material, equipment and even your personal vehicle out of the quarantine zone, you should perform a visual inspection when leaving to ensure that you are not unwittingly carrying spotted lanternfly adults or eggs. You can find more information at DDA's spotted lanternfly website:

https://agriculture.delaware.gov/plantindustries/spotted-lanternfly/. This website includes a quarantine checklist for folks to print off and use when going north of the canal as well as trainings for business that operate on both sides of the canal to comply with regulations and permits.

If you suspect you have a spotted lanternfly (this is the time of year they are hitchhiking), please report it to <u>Hitchhikerbug@delaware.gov</u> or take

a photo and send to your friendly county Extension agent! These are severe pests of landscapes, vineyards, and potentially tree fruits. We do not want them to establish in large populations here in Delaware, especially before management research can be done to figure out how to deal with them.



Extension Risk Management Education Competitive Grants Program

The Northeast Extension Risk Management Education Center in conjunction with the <u>North</u> <u>Central</u>, <u>Southern</u>, and <u>Western</u> ERME Centers announces a competitive funding opportunity for educational projects designed to help agricultural producers improve their economic viability through targeted risk management strategies. The Northeast Center expects to fund 18-month Education Projects (awards of up to \$50,000) to be conducted between April 1, 2020 and September 30, 2021. The Center also expects to award up to 5 Exploratory Projects (maximum amount \$3,500) to support planning, development, and piloting efforts leading to a future ERME Education Project.

All applications are due by 5 pm EST, Thursday, November 14, 2019.

Eligibility: This announcement seeks applications from qualified public and private groups, organizations, and institutions including land grant colleges and universities, Cooperative Extension, other colleges and universities, and other public and private entities with a demonstrated capacity to develop and deliver results/impact-based risk management education projects for agricultural producers and their families. The Northeast Center serves the region which includes Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, West Virginia, and the District of Columbia.

Application Process: To view the complete Request for Applications, please visit the <u>Northeast ERME Center's website</u> under "Funding" > "Apply for Funding" (<u>http://www.nerme.org/funding/apply-for-</u> funding/).

An applicant webinar will be conducted on Wednesday, October 2, at 1:00 pm EDT. Please join us to learn more about the RFA and for tips on writing successful applications. There is no fee to participate, however please register by sending an email to <u>mmccull@udel.edu</u>. Information about how to join the webinar will be posted on the <u>Northeast ERME Center's</u> <u>website</u>, and will also be emailed to registered participants.

Questions or comments regarding this RFA may be directed to Laurie Wolinski (<u>lgw@udel.edu</u>, 302-831-2538) or Susan Olson (<u>sbolson@udel.edu</u>, 302-831-6540).

Announcements

Farm Management Classes for Women

Tuesdays Oct 15 – Nov 19 5:00-8:00 p.m. Eldorado Brookview Fire Department Hall 5752 Rhodesdale Eldorado Road Rhodesdale, MD 21659

The University of Maryland and Delaware Cooperative Extension will conduct an Annie's Project for Women Managing Commercial Poultry during the fall of 2019 in Rhodesdale, Maryland. Annie's Project focuses on the many aspects of farm management and is designed to empower women in overall farm decision making and to build local networks throughout the state. The target audience is farmwomen and women involved in agriculture with a passion for business, agriculture, and involvement in farm operation. Topics for the sessions cover the five areas of Risk Management – Production, Marketing, Financial, Legal Risk, and Human Resources. This course is open to anyone interested in farm management practices.

Annie's Project for Women Managing Commercial Poultry is 6 classroom sessions on Tuesday evenings, October 15, 22, 29, Nov 4, 13, 19 from 5:00 pm - 8:00 pm.

The program will be held at Eldorado Brookview Fire Department Hall, 5752 Rhodesdale Eldorado Road, Rhodesdale, MD 21659.

The cost of the entire course including meals and materials is \$75. There is an additional \$100.00 fee for FSA Borrower Training attendees.

Please register by October 5th - space is limited. For more information and to register visit the website <u>http://extension.umd.edu/annies-project/class-</u> <u>information</u> or call 410-758-0166 or email jrhodes@umd.edu. If you require special assistance to attend the classes, please contact the site at least two weeks prior.

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Invasive Pond Plants Workshop

September 26th 5:00 p.m. DSU Outreach and Research Center 884 Smyrna Leipsic Rd., Smyrna, DE 19977

Invasive pond plants are non-native species that spread very quickly. They threaten the diversity of other native plant species and also have a negative effect on the natural balance of local bodies of water. This presentation will give some examples of some invasive species to keep an eye out for as well as some management strategies for dealing with invasive pond plants. The presenter will be Mr. Brian O'Neill from Weeds Inc.

Aquatic Pesticide Applicator Credits: 2

This workshop is free. For more information, or for assistance due to disabilities, contact: Megan

Pleasanton, Extension Educator: 302.857.6438 or <u>mpleasanton@desu.edu</u>

Designer Ditches Workshop

October 22 1:00 p.m. St. Jones Reserve Coastal Training Center 818 Kitts Hummock Rd., Dover, DE 19901

Ditches can quickly move floodwaters away from our properties and roadways. This workshop will give examples on how we can help reduce erosion, and help increase the absorption of excess nitrogen and phosphorus from leaching into our waterways. Planting the right plants in our ditch areas can reduce pollution, help water soak into the ground to replenish ground water, provide habitat for birds, butterflies, and pollinators, promote diversity by planting natives, and beautify our yards.

This workshop is free. For more information, or for assistance due to disabilities, contact: Megan Pleasanton, Extension Educator: 302.857.6438 or <u>mpleasanton@desu.edu</u>

2019 Mid-Atlantic Crop Management School

November 19 - 21, 2019 Princess Royale in Ocean City, MD

The Mid-Atlantic Crop Management School will be held at the Princess Royale in Ocean City, MD from November 19 - 21, 2019. The school offers a $2\frac{1}{2}$ day format with a variety of breakout sessions. Individuals needing training in soil and water, nutrient management, crop management and pest management can create their own schedule by choosing from 5 program options offered each hour. Emphasis is placed on new and advanced information with group discussion and interaction encouraged. Online registration will close at 11:59 p.m. EST on Monday, November 11, 2019. Registration Fees are \$285 by Sunday, September 15, \$295 from September 16 through October 31, and \$335 from November 1 through November 11. We look forward to seeing you there.

Registration and program details are online at: https://app.certain.com/profile/form/index.cfm?PKfor <u>mID=0x3034320abcd</u>

Building Wood Duck Boxes

January 30, 2020 5: 00 p.m. DSU Outreach and Research Center 884 Smyrna Leipsic Rd., Smyrna, DE 19977

Build them and they will come. Justyn R. Foth, Ph.D., Environmental Scientist and Waterfowl, Turkey, and Upland Gamebird Biologist for DNREC, will give a brief presentation about the importance of wood ducks and why we should promote the species. You will be able to build and prepare a wood duck box and take it home with you free of charge.

This workshop is free. For more information, or for assistance due to disabilities, contact: Megan Pleasanton, Extension Educator: 302.857.6438 or <u>mpleasanton@desu.edu</u>

Weather Summary

Carvel Research and Education Center Georgetown, DE

Week of September 12 to September 18, 2019

Readings Taken from Midnight to Midnight

Rainfall:

0.11 inch: September 15 0.05 inch: September 17

Air Temperature:

Highs ranged from 94°F on September 12 to 72°F on September 18. Lows ranged from 71°F on September 12 to 52°F on September 18.

Soil Temperature:

74.7°F average Additional Delaware weather data is available at <u>http://www.deos.udel.edu/</u>

Weekly Crop Update is compiled and edited by Emmalea Ernest, Associate Scientist - Vegetable Crops

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