

VEGETABLE CROPS HOTLINE

A newsletter for commercial vegetable growers prepared by the Purdue University Cooperative Extension Service

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ANTHRACNOSE, DOWNY MILDEW AND PHYTOPHTHORA, OH MY! – (Dan Egel, egel@purdue.edu, 812-886-0198) I have had many questions recently about protecting late season vegetables from diseases. See below for some ideas.

Watermelon and anthracnose - watermelon growers have contacted me about protecting developing fruit from anthracnose lesions. The most important concern, I believe, are the lesions that may develop on the watermelon fruit. These lesions may make the fruit unmarketable. Even worse, lesions that develop during shipment may cause the entire load to be rejected. Therefore, the issues are, what fungicide, if any, to apply and how to select fruit that won't develop lesions.

First, no fungicide will 'cure' a field of anthracnose problems. The best that can be achieved is to slow the spread of the disease. In this regard, the fungicides Pristine®, Quadris® and Luna Experience®, among others, have all proven effective. Whether such an expense is warranted at this time of year is another question. It is my opinion, that expensive fungicides are best used earlier in the season to prevent the disease from becoming severe.

Watermelon should be inspected carefully to avoid packing fruit infected with anthracnose. However, it is possible to overlook a fruit with a lesion too small to be seen with the naked eye. Such a lesion may cause problems during shipment. To minimize the selection of fruit that may have small developing lesions, avoid selecting fruit adjacent to vines with heavy anthracnose damage. However, there is no way to insure the selection of healthy fruit.

Downy mildew of cucurbits - This disease has been confirmed on multiple cucurbit hosts in LaPorte

and Knox counties (see Figure 1). Details of this disease can be found in Issue #588 of the *Vegetable Crops Hotline* and in Purdue University Extension Bulletin BP-140. All cucurbit growers with developing fruit to protect should consider applying fungicides effective for downy mildew, some of which are listed below. However, before spending a lot of money for a fungicide application, growers should consider that downy mildew does not affect fruit directly, only the leaves. Those growers with fruit that will be harvested soon may not notice much if any loss (it might make them easier to pick). However, if fruit are developing that have a good chance of maturing, then the cost of a fungicide application can be weighed against the probable returns of the developing fruit. Fungicides that are listed in the *Midwest Vegetable Production Guide for Commercial Growers 2014 (ID-56)* as effective include: Curzate®, Gavel®, Presidio®, Previcur Flex®, Ranman®, and Tanos®. Not all of cucurbit crops are listed on all the listed products. Read the label for details.



Figure 1. Symptoms of downy mildew on butternut squash in LaPorte County. All cucurbits in the area may be affected. (Photo by Liz Maynard)

Phytophthora blight on cucurbits - Heavy rains over much of the state have raised concerns about this disease. The threat of Phytophthora blight is higher under conditions of standing water and driving rains. Phytophthora blight attacks all above ground parts of the plant and can be very aggressive. Fungicides to manage this disease are addressed below. Since this

disease may affect fruit directly, the threshold for deciding whether to treat for Phytophthora blight will differ from the downy mildew discussion above. As discussed in the section on anthracnose above, growers should remember that no fungicide will cure a field of Phytophthora blight. One should concentrate on slowing the spread of the disease and protecting relatively healthy portions of the field. Fungicides that are listed in the *Midwest Vegetable Production Guide for Commercial Growers 2014 (ID-56)* as effective include: Gavel[®], Presidio[®], Ranman[®], Revus[®] and Zampro[®]. Again, read the label for important details such as the cucurbit crops on which these products are labeled.



FALL IS A GOOD TIME TO CONTROL PERENNIAL BROADLEAF WEEDS - (*Liz Maynard, emaynard@purdue.edu, 219-531-4200 ext. 4206*) - Perennial broadleaf weeds—those that survive winters as tubers, roots, rhizomes, or crowns—can be difficult to manage in vegetable crops. Canada thistle, field bindweed, and horsenettle are common examples. Applying control measures at key times in the weed life-cycle is important. Late summer and fall before a killing frost is one of those times. At this time of year, perennial weeds move sugars out of leaves and down into underground storage organs. There, the energy-rich compounds will remain until spring, when they are mobilized to provide energy for growth of new stems, leaves, and roots. A number of herbicides move along the same pathway in plants (the phloem) as sugars do, including glyphosate, 2,4-D, and dicamba. When these phloem-mobile herbicides are applied to perennial plants at this time of year, they move down into the underground storage organs and kill or disrupt growth and development of those plant parts. The result is a weakened or dead plant the following spring. For herbicides to be most effective, leaves of the perennial plant should be healthy and green at the time of application. Control can be improved if it is possible to till weeds a week or so after herbicide application, let them regrow, and then make a second application. Combinations of herbicides work better than a single ingredient. Refer to herbicides labels for rates recommended for specific weeds.



ESTABLISHMENT OF COVER CROPS - (*Tristand Tucker, ttucker@purdue.edu, 812-201-8796*) - Generally speaking very little equipment is needed to successfully establish a cover crop in the fall. The basic principle of seeding is to get seed covered and in contact with the soil. The seed covering can be the crop residue or it can be soil, and if conditions are such that the soil surface remains moist, crop vegetation or residue will provide sufficient coverage to get the cover crop established. However, considering variability of Indiana weather, it would be best to

provide at least minimal soil coverage: ¼ to ½ inch for small seeded species such as clover and radish, and ¾ to 2 inches for larger seeded species like rye and vetch.

Methods used to successfully establish a cover crop can be quite variable: anything from seeding small areas by hand, to aerial seeding into standing corn, and even using precision seeding technology with GPS guidance systems to seed alternating rows or different species of cover crops. Whatever equipment is used the basic principles are the same: provide the seed coverage or good contact with the soil. Using some creativity and ingenuity a grower can come up with a seeding method and equipment that best fits their operation and budget.

With that said, a grain drill is a probably the best tool to plant cover crops. Planting depth can be adjusted and accurate calibration for seed mixes is possible. If no grain drill is available a second option would be to use equipment that is on hand to broadcast seed onto an area that has been worked, and then follow it with a cultipacker, harrow, or some other piece of equipment to cover the seed.

In a trial conducted at the Meigs Horticulture Research Facility four different seeding methods were compared using four different cover crops. The seeding methods were: Gandy air spreader, Gandy air spreader followed by cultipacker, Tye no-till drill, and a Brillion type seeder. Plant stand counts were taken 2 and 4 weeks after seeding. Plots were tilled leaving a rough surface and seeded mid-September 2011. All four seeding methods achieved adequate stands but the general trend was that the larger the seed, the more soil cover needed to germinate and emerge. Oilseed radish did best with seeding methods that slightly cover the seed.

See references below for additional information on seed depth, planting techniques and what cover crops to choose.



TIPS ON COVER CROP USE AND SEEDING IN VEGETABLES - (*Dan Perkins, daniel.perkins@in.nacdn.net, 219-866-8008 ext. 115*) - Hello Vegetable Crops Hotline readers. I work as a Watershed and Conservation Program Specialist for the Jasper county soil and Water Conservation District and also operate a vegetable farm in Northwest Indiana. Much of my work involves cover crops. In this article, I want to share my top three rules of successful cover cropping establishment that I have used on my own farm and with farmers I have consulted with. I also want to challenge readers to consider seeding cover crops before they harvest vegetable crops.

My first rule of thumb for successfully seeding cover crops from is 'Timing, timing, and timing.' No matter the establishment method used to seed, timing is critical. You may be able to get the seed in the ground, covered, and germinated, but if that is all that occurs then you haven't successfully cover cropped, you have just wasted your money. It is critical that the cover crop has enough

time to grow to maximize the multiple benefits that cover crops do provide. This means a window of 4-6 weeks of frost-free growth for most cover crop seeding in the fall, the exception being cereal rye—it can be seeded quite late. For a lot of corn and bean farmers in the North that means aerial seeding into standing crops, which works really well with cereal rye, oats, radish, rape seed, annual ryegrass, turnips, and crimson clover, but not at all for winter peas and any similarly large-seeded cover crop. In vegetables the same rules apply: we can do lots of ‘aerial seeding’ to meet the 4-6 week window rule. Using fertilizer carts or hand spinners to broadcast can simulate aerial seeding and can result in good stands when rainfall or irrigation occurs.

My second rule of thumb is ‘Leave no bare soil.’ I accomplish this by ‘aerial inter-seeding’ in vegetables. For example, over-seeding cover crops in tomato, peppers, or eggplants in late August or at full bloom, or seeding a low-growing clover at last cultivation time in sweet corn. I also inter-seed 3-5 weeks before final harvest in most summer vegetables. For small scale intensive farms an Earthway seeder works for many types of cover crops. Between melons and winter squash I either have roller/crimped cereal rye planted the fall before, or seed a low-growing clover right before branching out to leave no bare soil.

My third rule of thumb is ‘Plan, plan, and plan again.’ Find out every window of opportunity to cover crop and come up with a complete plan from seeding to terminating in wet or dry conditions. A 30 -day window between spring and fall cole crops is perfect for a quick shot of buckwheat. If you have 45-60 days cowpeas or sunn hemp may be just right. Lots of options exist, but make sure you have your goals in mind, the timing and management planned out, and plan your complete cover cropping and cash cropping system from start to finish. Cover cropping will then reap great rewards.



RECOMMENDED COVER CROP RESOURCES - (Tristan Tucker, ttucker@purdue.edu, 812-201-8796 & Dan Perkins, daniel.perkins@in.nacdn.net, 219-866-8008 ext. 115)
Managing Cover Crops Profitably. USDA-SARE, 2007. <http://www.sare.org/Learning-Center/Books/Managing-Cover-Crops-Profitably-3rd-Edition>
Northeast Cover Crop Handbook. M. Sarrantonio. 1994. Rodale Institute.
Cover Crop Selection Tool from Midwest Cover Crops Council. <http://www.mccc.msu.edu>
Cover Crops on the Intensive Market Farm. John

Hendrickson. 2009. UW-Madison Center for Integrated Agricultural Systems, College of Agricultural and Life Sciences. <http://www.cias.wisc.edu/cover-crops-on-the-intensive-market-farm/>

Using Manually-Operated Seeders for Precision Cover Crop Plantings on the Small Farm. Mark Schonbeck and Ron Morse. Virginia Association for Biological Farming Information Sheet.

http://www.sare.org/content/download/69537/985541/Cover_crop_seeders_for_small_farms.pdf?inlinedownload=1



SARE FARMER RANCHER GRANTS AVAILABLE FOR 2015 - (Liz Maynard, emaynard@purdue.edu, 219-531-4200 ext. 4206) - Do you have an idea that might help your farm stay in business for the long run? Be a better place to work or contribute more to the community? Conserve or improve natural resources like soil and water? Reduce use of fossil fuels? The North Central Region Sustainable Agriculture Research and Education program (NCR SARE) of the USDA wants to fund ideas like these and others to make agriculture more sustainable – economically, socially, and environmentally.

The 2015 Farmer Rancher Grant Program of NCR SARE offers grants for farmer-initiated projects of up to \$7,500 for individuals, \$15,000 for partners, and \$22,500 for groups. Grants applications are due in the NCR SARE office on Thursday, November 20, 2014. To learn more about the grants and download a grant application, visit <http://www.northcentralsare.org/Grants/Types-of-Grants/Farmer-Rancher-Grant-Program>. To receive a hard copy or email file of the call, contact Joan Benjamin at NCR-SARE, 573-681-5545 or benjaminj@lincolnu.edu.



SURVEY ABOUT WASTEWATER REUSE - (Liz Maynard, emaynard@purdue.edu, 219-531-4200 ext. 4206) - Anne Dare, a graduate student in Ag and Biological Engineering at Purdue, is conducting a survey about using treated wastewater in agriculture. She needs to hear from farmers in Indiana. This is a timely topic for vegetable producers. Participation in the survey is anonymous and voluntary, and will take about ten minutes. Find the survey here: https://purdue.qualtrics.com/SE/?SID=SV_4GH7gUyyAuszd13.

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