



Great Lakes Fruit, Vegetable & Farm Market EXPO Michigan Greenhouse Growers EXPO

December 4-6, 2018

DeVos Place Convention Center, Grand Rapids, MI



64 Vine Crops

Where: Grand Gallery Room E & F

MI Recertification Credits: 2 (1B, COMM CORE, PRIV CORE)

OH Recertification Credits: 0.5 (presentations as marked)

CCA Credits: CM (1.5) PM (0.5)

Moderator: Ben Phillips, Michigan State University

- 9:00 AM Pumpkin Variety Review**
- Nathan Johanning, University of Illinois Extension
- 9:30 AM No-Till Pumpkin Production**
- Alan Walters, Southern Illinois University
- 10:00 AM Managing Mildews (OH 2B, 0.5 hr)**
- Sally Ann Miller, The Ohio State University
- 10:30 AM Pollination in Vine Crops**
- Zsofia Szendrei, Michigan State University
- 11:00 AM Session Ends**

At the conclusion of the Vine Crops session the USDA will be holding a brief talk to discuss crop insurance for squash.

Pumpkin Variety Review

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In 2018, the University of Illinois Extension conducted an observational pumpkin variety trial in southern Illinois at the University of Illinois Extension, Ewing Demonstration Center, located in Ewing, IL. The trial was conducted as a part of the 2018 Pumpkin Field Day hosted at the Center September 6, 2018. The trial was a single replication including 75 pumpkin, gourd, and winter squash varieties divided into 4 categories: Gourds, Pie-sized, Specialty, and Jack O'Lantern. Specialty Pumpkins included anything of "carving size" and colors other than orange (white, red, blue, warted, etc.). The Jack O'Lantern pumpkins were also grouped as Medium (under 30 lbs) and Large (over 30 lbs).

Pumpkins were grown in a no-till system, double cropped after winter wheat. Pumpkin transplants were seeded on June 6, 2018 into 72-cell plug trays. Transplants were planted with a no-till mechanical transplanter on June 30, July 1 & 2, 2018 into wheat stubble. Plants spacing was set based on the category with Gourds and Pie-sized planted at 2.5 ft x 6 ft (between plant x between row) (15 sq ft/plant), Specialty and Medium Jack O'Lanterns at 4 ft x 6 ft (24 sq ft/plant) and Large Jack O'Lanterns at 4 ft x 8 ft (32 sq ft/A). All plots were 2 rows wide and 40 ft long. Prior to planting pumpkins, a burndown application of Gramoxone 2 SL 4 pt/A, Sandea 0.5 oz/A, Reflex 1 pt/A, Dual Magnum 1.33 pt/A, plus Nonionic Surfactant at 0.5% v/v was applied. Based on soil test values no added Phosphorus or Potassium was needed and 60 lbs Nitrogen as ammonium nitrate was applied sidedress on August 1, 2018. Select Max was applied for grass control at 16 fl oz/A on August 1, 2018 with 0.25% v/v nonionic surfactant. Protectant fungicide and insecticide applications were made every 7-14 days throughout August and early September based on recommendation from the Midwest Vegetable Production Guide ID-56.

Observational harvest data (number of fruit, weight and notes on color, shape and other characteristics) were collected in late September by harvesting a subsample within the center of each plot, representing the area of 5 plants at the given plant spacing for that variety.

There are many factors, including yield, shape, size, and color to consider and most especially what would be marketable in your region through your marketing outlets.

This handout has been abbreviated for the sake of space. To see the full report including pictures visit the Midwest Vegetable Variety Trial Report for 2018 at <https://ag.purdue.edu/hla/fruitveg/Pages/MVVTRB.aspx>

Many thanks to all of the seed companies listed for their seed donations for this trial and to my colleagues, Bronwyn Aly, Elizabeth Wahle, Julie Zakes, Marc Lamczyk, Katie Bell, Maggie Ray, Talon Becker, and Laurie George for all of their help in planting, maintenance, and harvest!

Managing Mildews in Vine Crops

Great Lakes Expo 2018

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The most important mildews in vine crops are powdery mildew and downy mildew. The mildew that causes any particular grower the greater headache depends on the specific vine crops being produced, time of season and geography. Both require intensive management to protect the crop. Neither of the pathogens causing these diseases overwinter outdoors in the Great Lakes region. Both are obligate pathogens, requiring a living host to survive, and both are generally host specific. Since vine crops and any very near relatives are killed by freezing temperatures, the pathogens don't survive outdoors during the winter. However, downy mildew pathogen can survive on living cucumbers in greenhouses during the winter. In each new season both pathogens arrive on wind currents from warmer environments. In Ohio, Michigan and Ontario, downy mildew usually arrives around the 4th of July, while powdery mildew symptoms are usually seen in early to mid-July, although this can vary.

Downy Mildew

This very serious disease is caused by *Pseudoperonospora cubensis*, and has been causing major problems in cucumber/pickle production for the last 10 years or so. Melons are also affected, but are generally a bit less susceptible to downy mildew than cucumbers. Pumpkins, squash and watermelons are also affected, but usually later in the summer in this region, and by different pathotypes. Cucumber varieties vary in resistance to downy mildew, but none are highly resistant. However, using a variety on the higher end of the available disease resistance spectrum may allow growers to reduce fungicide spray intervals or get better results from some fungicides. Currently the slicing cucumbers Bristol, SV3462CS and SV4719CS, and the pickling cucumbers Citadel, Peacemaker and SVCN6404 have intermediate resistance to downy mildew. Due to the lack of highly effective downy mildew treatments suitable for organic production, organic growers should always use disease resistant varieties if they are in downy mildew-prone areas. Downy mildew-resistant varieties are not available for pumpkins and squash, and some melon and watermelon varieties have low levels of resistance.

Since downy mildew's arrival is not consistent in every location every year, and it is critical, especially in cucumbers, to catch it early, intensive scouting is highly recommended. There are many resources available to follow when downy mildew appears on cucumbers and other vine crops by county, including the Cucurbit Downy Mildew ipmPIPE website (www.cdm.ipmpipe.org/) and the blogs or websites of state vegetable Extension specialists. Cucumbers and melons should be protected with effective fungicides before downy mildew is

potted in the area, and spray intensity should be increased and the more effective products used when downy mildew arrives and environmental conditions (cool, overcast, rainy) favor disease development and pathogen spread. Development of fungicide resistance can occur in downy mildew pathogen populations so it is important to develop a fungicide spray program that alternates fungicides with different modes of action and includes a broad-spectrum protectant such as chlorothalnil or mancozeb. Results of our 2018 bioassay in Ohio indicated that Ranman 400SC, Curzate 60DF, Previcur Flex 6SL, Manzate Pro-Stik 75DG, and Orondis Opti were highly effective, with > 95% disease control. Bravo Weather Stik 6F, Omega 500DF, Zampro 525SC, Gavel 75DF, Zing! And Tanos 50DF controlled downy mildew by 77-93% compared to the non-treated control. Quadris 2.08F, Revus 2.08SC, Forum 4.16SC and Presidio 4SC provided control of 0 - 45%.

Powdery Mildew

Powdery mildew, caused by *Podosphaera xanthii*, is also a problem in vine crops, although it does not get out of hand quite as quickly as downy mildew. Therefore, scouting can be very effective for initiating fungicide applications. Fungicide applications can wait until powdery mildew is spotted, but incidence is still very low.

Powdery mildew is a bigger problem on pumpkins and squash than melons and cucumbers, for which highly resistant varieties are available. Resistance in pumpkins and squash, where available, tends to be intermediate, and fungicides are usually needed to protect foliage and stems. Fungicide resistance also occurs in powdery mildew pathogen populations, and spray programs that alternate fungicides with different modes of action are necessary. In 2017, we conducted bioassays of powdery mildew fungicide efficacy in northern, central and southern Ohio. Fungicide efficacy varied by location: Procure 480SC, Quintec 2.08SC, and Rally 40WSP were very good in all three locations; Aprovia Top EC and Inspire Super EW were very good in two of three locations; and Fontelis 1.67SC, Merivon Xemium and Torino 0.85SC were very good in one of three locations. Pristine WG and Bravo Weather Stik 6SC were fair or poor in all three locations.

The best options for organic growers are to select the most powdery mildew-resistant varieties available, and follow up with OMRI-approved fungicides preventatively as needed. Sulfur-based fungicides tend to be effective, but care should be taken to avoid phytotoxicity. Biological products such as Serenade Max and Sonata, as well as potassium bicarbonate (MilStop) can be included in a fungicide program to reduce disease severity.