Disease and Resistance Management

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Pumpkin disease management begins with cultural and preventative controls such as site selection, proper field preparations and use of resistant varieties, and by remembering that excess water is the enemy of your pumpkin planting. Think about it this way: in a dry year, any Boy Scout can grow great pumpkins…it's the wet seasons that separate the pros from the amateurs. Since many diseases are influenced by the duration of leaf wetness and humidity within the plant canopy, planting pumpkins on the top of a hill or in other open sites with good air circulation can limit disease infection and the speed of spread. Leaf wetness time can also be influenced by plant spacing, so crowding plants should be avoided. Fields should be located away from, and upwind of, early summer squash plantings, which tend to develop powdery mildew before pumpkin crops. This practice – along with the use of resistant varieties - can also slow disease transmission and delay initial fungicide applications. Choosing well-drained sites and not planting low areas prone to flooding can help reduce the potential for infection by fruit rot organisms. Improving drainage by using deep zone tillage or sub-soiling equipment can also help remove excess water, and cover crop residue in no-till and zone-till plantings has been shown to provide a protective barrier between the fruit and the ground.

Once preventive controls are tended to, there are four major diseases you can help manage with a good fungicide program: powdery mildew, Plectosporim blight, black rot and downy mildew (DM). Powdery mildew (PM) tends to be the most common and the most important in many years, so we design the spray schedule around it.

Start by scouting your pumpkin fields on a weekly basis. Check the underside of 50 older leaves per field for the first sign of PM, which usually appears as a small, white, round spot half the size of a dime. Time your first systemic fungicide application with the first sign of PM. Powdery mildew is almost always more severe on the undersurface of the leaves and deep in the plant canopy where humidity is high, so a systemic fungicide that moves through the plant or foliage is an important tool in managing this disease. The goal is to limit how fast the fungus forms spores and infects new foliage and stems, while simultaneously protecting the systemic tools that are so critical to combat this disease.

It is important to remember that systemic fungicides are very prone to resistance problems because they generally have a single method or mode-of-action in stopping infection by the fungus, and this fungus has a history of quickly adapting to new chemistry. To help slow or manage resistance there are several techniques you can use, but none are as important as limiting how frequently the fungus is exposed to each family or resistance group of systemic fungicide. Therefore, the very best resistance management strategy involves using one product from each group a single time per season, at roughly 10-day intervals. A protectant, such as Bravo, that has multiple modes-of-action and some efficacy against important fruit rot diseases should be mixed with the systemic to slow the development of resistance, while providing a broad range of disease protection. We currently have three groups of effective systemic chemistry to choose from: fungicide resistance groups 3, 7 and 13. In group 3, we have three products to choose

from: Procure, Inspire Super and Rally. Recent fungicide efficacy studies have shown that Procure provides the best control in this group. We have a single product registered on pumpkins in both group 7 and 13: Pristine and Quintec, respectively. Of all the systemic products, Quintec is currently the most effective. Therefore, Quintec should be used in your first PM application, Procure in the second, and Pristine in the third. If additional applications are needed to protect the crop from PM until mid-September, then a combination (i.e. sulfur + Bravo) or a single protectant should be used (i.e. Bravo alone).

In wet years, Plectosporium blight and black rot are both serious threats to the fruit. Effective fungicide choices here include protectants such as Bravo, Dithane, and Manzate Pro-stick and the group 11 systemics Quardis, Cabrio, Flint and Pristine (groups 7 & 11). The group 11 systemics tend to be the most effective to combat Plecto.

In some years, downy mildew - which only attacks the foliage and not the fruit - may enter the region as early as late July or early August. Since DM is a water mold (like late blight and Phytophthora blight) and not a fungus, the fungicides mentioned above do not tend to work well to control it. What makes managing this disease more confusing is that, depending upon which strain of DM enters the region each year, different products will either be effective or fail to work. What works one year for a particular strain of DM may not work the next, and vice-versa. The only solution to this dilemma is to scout weekly for the first sign of this disease, and then try one of the following products when the disease first appears: Ranman, Presidio, Revus, Tanos, Curzate, Ridomil Gold/Bravo, or a phosphorus acid-type material such as ProPhyt. These can be mixed with the PM products unless the last application occurred just before DM appeared. Since multiple applications may be needed before September - when pumpkin fruit reach full size and foliage is no longer critical - and since any one product may or may not work in a given season, it is best to have two products on hand in late summer.

The same products used for DM may also reduce the aerial spread of Phytophthora blight. Unfortunately, they will not control the crown rot phase of the disease which is so destructive. Cultural methods that prevent water from standing in the field for 48 hours are more effective than fungicides at containing damage from Phytophthora blight.

Use of these practices and spray schedules has proved successful for the past 8 years on large pumpkin plantings in CT, where growers have achieved 90-99% marketable fruit in both wet and dry years.

Organic growers do not have this vast array of effective products to help manage the disease complex on pumpkins. Sulfur and mineral oils are relatively effective products that can help control PM. Copper may help with some fruit rots, but has been known to cause phytotoxicity problems on many of the newer pumpkin varieties.