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The IPM Scout

"Rotation" is not just for crops anymore. Read on to see how "rotation" applies to using fungicides.

The two general types of fungicides are protectant (or contact) fungicides and eradicant (or systemic) fungicides. Protectant fungicides do just that: protect plants from infection by disease-causing organisms, usually fungi (molds). They are called contact fungicides because they work "on contact" with fungal spores. These fungicides stay on the plant surface, that is, are not absorbed into leaves. A layer of chemical (however thin) must be present on the plant surface for these fungicides to work. Protectant fungicides labeled for pumpkin are maneb (Maneb, Manex) and chlorothalonil (Bravo, Echo).

Eradicant fungicides both protect plants from future infections and also stop existing infections from spreading. They can do this because they are systemic, that is, are absorbed by the plant (usually the leaves) and move to a certain degree inside the plant. Because they get inside the plant, the chemical can reach fungi which have already infected the plant and are growing inside leaves. Some eradicant fungicides move to new parts of leaves which expand after the fungicide is applied, whereas others will only move from the top to the bottom side of existing leaves. (This is a very useful characteristic for control of mildews.) Systemic fungicides labeled on pumpkin are Benlate, Topsin M, Bayleton, Ridomil, and Aliette.

Protectant fungicides are general poisons,

stopping several different physiological processes in fungi. This property makes protectant fungicides work against many disease-causing fungi. Most eradicant fungicides, on the other hand, are specific poisons with a specific target. Thus, most eradicant fungicides are useful only against certain diseases.

Because protectant fungicides attack fungi at several different points, it is unlikely that fungi will develop resistance to protectant fungicides. Therefore, it is not necessary to rotate, or alternate, protectant fungicides in a season-long spray program. Factors such as EPA crop registration, reentry interval, preharvest interval, and cost may dictate which protectant fungicide is used at a given time, but fungicide resistance is not a concern with protectants.

However, fungicide resistance is a danger with systemic fungicides and is the main reason for rotating fungicides. Because systemic/eradicant fungicides have very specific targets, some fungi have become resistant to them. On pumpkin, powdery mildew resistant to Benlate and/or Bayleton has been found in several parts of the country, including Florida. Since powdery mildew spores blow northward, fungicide-resistant powdery mildew could become a problem in South Carolina. There was a report of Ridomil-resistant downy mildew, but this resistance has not yet been found elsewhere.

Which fungicides should be rotated? For powdery mildew control, Benlate or Topsin M, which are chemically very similar, should be rotated with Bayleton. As an additional precaution against fungicide resistance, these systemic fungicides can be mixed with a protectant (maneb or chlorothalonil). When using a mixture, the standard recommendation is to use the highest rate of the protectant and the lowest rate of the systemic. (Reach, a relatively new fungicide on the market, is a mixture of chlorothalonil with Bayleton.) For downy mildew control, alternate Ridomil-containing products with

Aliette. Ridomil fungicides for foliar application are sold as mixtures, Ridomil Gold/Bravo or Ridomil/Copper. Growers should choose the former over the latter, as Bravo is more useful than copper as a protectant.

A basic fungicide program for pumpkin in South Carolina should begin with maneb or chlorothalonil as the protectant. Systemic fungicides for downy and powdery mildew should be added to the spray program at the first sighting of mildew, or several weeks after transplanting. The mildews likely will be the most damaging fungal diseases in the lower half of the state; powdery mildew can also be severe in the Up-state. Remember that the combination products Reach and Ridomil Gold/Bravo contain chlorothalonil, so they can be used in place of the protectant, but Benlate, Topsin M, Bayleton, and Aliette should be used with a protectant.

Cultivar Corner



‘Aspen F1’ is a hybrid cultivar released in 1992 by Hollar Seeds. It has a semi-bush plant type and fruit mature in 90 to 95 days. Stems are large

and sturdy. The “rich orange” fruit average 13” tall by 12” in diameter and weigh about 20 pounds, depending on growing conditions. According to Hollar Seeds, these pumpkins store and ship well. Contact Hollar Seeds, P.O. Box 106, Rocky Ford, Colorado 81067-0106. Telephone (719) 254-7411, FAX (719) 254-3539.

Market Window

The South Carolina Dept. of Agriculture’s Marketing and Promotion Division is compiling a list of pumpkin producers who will have fruit for sale in 1997. If you were not listed in 1996, contact Martin Eubanks at 803-734-2200 to be added to the list.

Ask the Great Pumpkin

Q: Should I spray before a rain or after?

GP: There is no good answer to this question and I know of no studies which have directly addressed your question. Disease-causing fungi and bacteria are active when the leaves are wet. It is important to have protectant fungicides in place on leaves before rain activates fungal spores. In South Carolina, we often get enough rain at one time so that it is difficult to get into the field with a ground sprayer immediately after a rain. This is another argument for spraying before a rain, especially if it has been longer than the minimum period between sprays according to the fungicide label. If the fungicide has dried on the leaves before the rain, it probably does not need to be reapplied after the rain.

The situation is different for insecticides. If you have scouted your field and know you need an insecticide, it is better to wait and apply it after an impending rain. According to Randy Griffin, Extension Entomologist at Clemson University, most insecticides are easily washed off during rain. If an insecticide is washed off shortly after it is applied, it usually requires reapplication as soon as possible after the rain is over.

Send your questions about growing, selling, or buying pumpkins in the Southeast to: SC Pumpkin News, c/o Dr. Anthony P. Keinath, Coastal REC, 2865 Savannah Highway, Charleston, SC 29414-5332; fax: 803-571-4654; or via the Internet to: tknth@clemson.edu.

Next issue (Oct ‘97): Pumpkin trial results, part 1.

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