

Managing Strawberry Anthracnose

September 19, 2019

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Introduction

In spring 2019 there were significant outbreaks of strawberry anthracnose in Middle Tennessee. Crops looked good through the early part of the season, but as berries began to ripen symptoms of anthracnose fruit rot and crown rot appeared. An especially wet spring in Tennessee had made perfect conditions for strawberry anthracnose. Some growers lost up to 90 percent of their crops.

The outbreak was likely due to a combination of favorable weather for disease development and infected planting material harboring the pathogen. Tennessee strawberry growers should be familiar with best management practices for strawberry anthracnose to avoid similar losses in the future.

Disease overview

Strawberry anthracnose is a fungal disease that causes two major symptoms of economic concern: crown rot and fruit rot. Crown rot is most commonly caused by the fungus *Colletotrichum fragariae*, while fruit rot is usually caused by *Colletotrichum acutatum*. Symptoms of crown rot appear as plant wilting followed by plant death. If the crown of the affected plant is cut open lengthwise a reddish-brown lesion can usually be observed (Figure 1). Symptoms of fruit rot usually begin to appear as fruit ripens. Lesions begin as small light-brown spots, and eventually expand to cover the entire fruit (Figure 2). Lesions may darken and become black as they age (Figure 2). Lesions usually remain firm and the entire fruit may dry up and mummify. Under humid conditions masses of pink-to-orange conidia (spores) may be observed within the lesions. Disease is favored by warm, wet conditions and can spread rapidly once established in a field.



Figure 1. Anthracnose crown rot on strawberry. Field symptoms are wilting followed by plant death. Note the reddish-brown discoloration visible inside the crown when cut open lengthwise.



Figure 2. Anthracnose fruit rot on strawberry. Lesions begin as small light-brown spots (upper left), and eventually expand to cover the entire fruit. Lesions may darken and become black as they age.

Management

Cultural practices

- The use of certified disease-free plants is the best way to limit losses to anthracnose.
- Avoid excessive nitrogen fertilization.
- Use trickle rather than overhead irrigation.
- Mulch row middles with straw to reduce inoculum spread.
- Scout for disease regularly and remove infected plants and fruit, especially early in the season, to reduce inoculum.
- Avoid working with plants when wet.
- Rotate field out of strawberries for two to three years.
- Resistant varieties are limited and most commercially grown varieties are susceptible.
 - 'Sweet Charlie' is reported to have some anthracnose resistance.

Management with fungicides

Pre-plant/at planting

If anthracnose is suspected on planting material, a pre-plant fungicide dip may be warranted. This treatment is primarily aimed at reducing losses to anthracnose crown rot. The following fungicides are labeled as pre-plant dip applications:

- Abound (azoxystrobin, FRAC 11), 5 to 8 fl oz/100 gal water, completely submerge plants for two to five minutes and transplant treated plants immediately.
- Switch 62.5WDG (cyprodinil + fludioxonil, FRAC 9+12), 5 to 8 fl oz/100 gal water, completely submerge plants for two to five minutes and transplant treated plants immediately.

Fall

If anthracnose symptoms such as black petiole lesions, stunting or plant death are observed during the early season, a fall fungicide application may be warranted to reduce anthracnose crown and fruit rot. Table 1 lists fungicides labeled for strawberry anthracnose. Products containing FRAC 11 fungicides should be reserved for spring applications because of the limited number of FRAC 11 applications allowable, usually four to five depending on product and application rates.

Early bloom to harvest

Resistance to FRAC 11 fungicides has been observed in populations of the anthracnose fruit rot pathogen in the southeastern US. Therefore, growers should rotate fungicides belonging to different FRAC groups. It is also recommended that growers tank mix products in FRAC group 11, such as Cabrio and Abound, with captan. Growers should read the fungicide labels and be mindful of the maximum number of FRAC 11 fungicide applications allowed, usually four to five depending on product and application rates. These fungicides can be applied in rotation with captan to reduce the total number of FRAC 11 applications.

Additional Resources

2019 Southeast Regional Strawberry Integrated Pest Management Guide for Plasticsulture Production. Available at smallfruits.org/files/2019/06/StrawberryIPMGuide.pdf

Table 1. Fungicides recommended for strawberry anthracnose crown rot and fruit rot management.

Product	Active ingredient	FRAC code	PHI (days)*	Crown rot efficacy	Fruit rot efficacy
Abound	azoxystrobin	11	0	Good	Excellent
Cabrio EG	pyraclostrobin	11	0	Good	Excellent
Luna Sensation	fluopyram + trifloxystrobin	7+11	0	Good	Excellent
Merivon	fluxapyroxad + pyraclostrobin	7+11	0	Good	Excellent
Pristine	pyraclostrobin + boscalid	11+7	0	Good	Excellent
Quadris Top	azoxystrobin + difenoconazole	11+3	0	Good	Excellent
Quilt Xcel	azoxystrobin + propiconazole	11+3	0	Good	Excellent
Captan	captan	M04	1	Good	Good
Protocol	thiophanate-methyl + propiconazole	1+3	1	Good	Good
Switch	cyprodinil + fludioxonil	9+12	0	Good	Good
CaptEvate	captan + fenhexamid	M04+17	0	Fair	Good
Thiram	thiram	M03	1	Fair	Good
Tilt	propiconazole	3	0	Fair	Good

*Pre-harvest interval

Precautionary statement

To protect people and the environment, pesticides should be used safely. This is everyone's responsibility, especially the user. Read and follow label directions carefully before you buy, mix, apply, store or dispose of a pesticide. According to laws regulating pesticides, they must be used only as directed by the label.

Disclaimer

This publication contains pesticide recommendations that are subject to change at any time. The recommendations in this publication are provided only as a guide. It is always the pesticide applicator's responsibility, by law, to read and follow all current label directions for the specific pesticide being used. The label always takes precedence over the recommendations found in this publication.

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