

COTTON DISEASE CONTROL

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SEEDLING DISEASES

Seedling diseases occur on cotton in South Carolina every year. *Rhizoctonia solani* is the most common pathogen with *Pythium* spp. occurring primarily on early-planted cotton or cotton planted on heavy or cool, wet soils. One or both of these seedling pathogens are present in almost every cotton field. Disease incidence and severity in a given field are determined by environmental factors such as soil temperature and moisture and by seed quality and vigor. Seedling disease management relies on the integration of cultural practices and prudent use of fungicides. There are no varieties that offer any level of resistance to seedling diseases. Crop rotation is also ineffective since *Rhizoctonia solani* and *Pythium* spp. are capable of infecting most commonly grown rotation crops such as corn, peanuts and soybean. The most important cultural practice to limit seedling disease severity is to delay planting until soil temperatures at the 4-inch depth are above 68° F for three consecutive days.

In general, the fungicides which control *R. solani* do not control *Pythium* spp. and the fungicides which control *Pythium* spp. do not control *R. solani*. Therefore, using a combination of fungicides which control the two fungi will provide the highest probability of limiting damage from seedling diseases. If higher levels of protection are desired than are provided by the base treatments provided by seed companies, in-furrow fungicides will provide the highest level of control. Liquid in-furrow fungicides are more effective than granular in-furrow fungicides. Commercially applied additional seed treatments are normally effective except under extremely high disease pressure. Grower-applied seed treatments or hopper-box treatments provide the lowest levels of additional control. The fungicide must be thoroughly mixed with the seed to achieve disease control. Seed treatment products that include fungicides and insecticides are available. Always read the label. Do not use treated seed for feed or food.

FUNGICIDES AVAILABLE FOR COMMERCIAL SEED TREATMENTS, INCLUDING COMBINATIONS OF FUNGICIDES, INSECTICIDES AND NEMATOCIDES.

Fungi controlled	Product	Application method	Re-entry interval	Comments
<i>Pythium</i> spp.	Apron XL	Commercial seed treatment	48 hrs.	Must be applied by commercial seed treaters.
<i>R. solani</i>	EverGol Prime	Commercial seed treatment	12 hours (see label exceptions)	Must be applied using commercial slurry or mist-type seed treatment equipment
<i>Fusarium</i> spp. + <i>Pythium</i> spp. + <i>R. solani</i>	Seed Shield Cotton	Commercial seed treatment	See Label	Must be applied by commercial seed treaters.
<i>Fusarium</i> spp. + <i>Pythium</i> spp. + <i>R. solani</i>	Trilex Advanced	Commercial seed treatment	See label	Must be applied by commercial seed treaters.
<i>Fusarium</i> spp. + <i>R. solani</i>	Vortex	Commercial seed treatment	See label	Must be applied by commercial seed treaters.

AVAILABLE HOPPER BOX OR SEED TREATMENTS

Fungi controlled	Product	Application Method	Rate per 100 lb. seed	Re-entry interval	Comments
<i>Pythium spp.</i>	Allegiance-FL	Seed Treatment	0.75 – 1.5 oz	24 hrs.	See label for specific directions on applying this product
<i>Pythium spp.</i>	Allegiance-LS	Seed Treatment	1.2 - 2.4 fl. oz.	24 hrs.	See label for specific directions on applying this product
<i>Pythium spp.</i> + <i>R. solani</i>	Dynasty CST	Seed treatment	3.1 – 3.95 fl. oz.	48 hrs.	Be sure to thoroughly mix product with seed. Always use high-quality planting seed.
<i>Fusarium spp.</i> + <i>R. solani</i>	Kodiak HB	Hopper box	4.0 – 8.0 oz.	Not applicable	This is a biological control agent (<i>Bacillus subtilis</i> GB03) which is best used in combination with chemical seed treatments. See label for application instructions
See Label	Manzate Pro-Stick	Hopper box	3.0 oz	24 hours	See label
See Label	Manzate Max	Hopper box	4.8 fl. oz.	24 hrs.	See label
<i>Fusarium spp.</i> + <i>R. solani</i>	Maxim 4FS	Hopper box	0.08 – 0.16 fl. oz.	12 hrs.	Be sure to thoroughly mix product with seed. Always use high-quality planting seed
See label	Penncozeb 80WP	Hopper box	3.0 oz	24 hrs.	See label
See label	Penncozeb 75DF	Hopper box	3.2 oz	24 hrs	See label
<i>Pythium spp.</i> + <i>R. solani</i>	Prevail	Hopper box	8.0 – 16.0 oz.	Not Applicable	Be sure to thoroughly mix product with seed. Always use high-quality planting seed.
<i>R. solani</i>	Spera 240 FS	Commercial or Hopper box	1.25 – 4.0 fl. oz.	48 hrs.	Available for commercial or hopper box treatments. See label for directions
<i>Pythium spp.</i> + <i>R. solani</i>	Trilex 2000	Seed treatment	2.0 fl. oz.	24 hrs.	Be sure to thoroughly mix product with seed. Always use high-quality planting seed.
<i>R. solani</i>	Vibrance	Seed treatment	0.08 – 0.60 fl. oz.	12 hrs.	Be sure to thoroughly mix product with seed. Always use high-quality planting seed.

IN-FURROW FUNGICIDES

Fungus controlled	Product	Application Method	Rate per 1,000 row ft.	Re-entry interval	Comments
<i>Pythium</i> spp.	Reason 500 SC Fungicide	In-furrow liquid spray	0.45 fl. oz.	12 hrs.	Apply in a spray volume of 3 to 5 gal per acre. Direct the spray in-furrow behind seed drop but before furrow closure
<i>Pythium</i> spp.	Ridomil Gold GR	In-furrow granular	1.5 – 3.0 oz.	48 hrs.	Controls only seed rots caused by <i>Pythium</i> spp.
<i>Pythium</i> spp.	Ridomil Gold SL	In-furrow liquid spray	0.075 - 0.15 oz.	48 hrs.	For use primarily in early-planted cotton with cool, wet soils
<i>Pythium</i> spp.	Terramaster 4EC	In-furrow liquid spray	4.0 to 8.0 fl. oz. per acre based on 40 inch rows.	12 hrs.	Mix with 5 to 15 gallons of water.
<i>R. solani</i>	Headline SC fungicide	In-furrow	0.1 – 0.8 fl. oz.	12 hrs.	Use a minimum of 2.5 gallons of water per acre. Apply into the furrow before the seed is covered.
<i>R. solani</i>	Meteor	In-furrow liquid spray	0.25 to 0.5 fl. oz.	24 hrs	Apply in at least 2.5 gal. water per acre to deliver in an open seed furrow
<i>R. solani</i>	Priaxor	In-furrow liquid spray	0.2 to 0.6 fl. oz.		Apply in at least 2.5 gal. water per acre into an open seed furrow
<i>R. solani</i>	Rovral 4 Flowable Fungicide	In-furrow	0.25 – 0.5 fl. oz.	4 hrs.	Apply at planting as a banded spray over the seed and covering soil
<i>R. solani</i>	Headline	In-furrow liquid	0.4 - 0.8 fl. oz. /1000 row ft.	12 hrs.	Spray a 4-8 inch band over seed prior to covering with soil
<i>R. solani</i> + <i>Pythium</i> spp.	Quadris Flowable	In-furrow liquid	0.40 - 0.80 oz. /1000 row ft.	4 hrs.	Apply as a spray in 5 to 15 gal. of water over the open furrow at planting to the soil around the seed and covering soil.
<i>R. solani</i> + <i>Pythium</i> spp.	Ridomil Gold PC GR	In-furrow granular	8.6 – 12.3 oz. /1,000 row ft.	48 hrs.	Apply product at planting over the seed and to covering soil
<i>Fusarium</i> spp. + <i>R. solani</i> + <i>Pythium</i> spp.	Terraclor Super X 18.8G	In-furrow	6.7 - 12.3 oz. /1000 ft. row	12 hrs.	Apply product at planting over the seed and to covering soil
<i>R. solani</i> + <i>Pythium</i> spp.	UNIFORM	In-furrow spray	0.32 - 0.48 fl. oz. /1000 ft. row	0 hrs.	Apply as an in-furrow spray in 5 to 15 gallons of water per acre at planting.

LEAF SPOTS AND BOLL ROTTS

Most leaf spots caused by fungi are not severe enough to warrant fungicide applications. In many cases disease severity is increased by nutrient deficiencies, especially shortages of potassium. Leaf spots that occur in South Carolina include *Alternaria* leaf spot, *Ascochyta* blight, *Cercospora* leaf spot, *Phoma* blight, and *Stemphylium* leaf spot. Boll rots are caused by many different fungi. These include *Alternaria* boll rots, Anthracnose boll rot, *Ascochyta* boll rot, *Diplodia* boll rot, and *Phoma* boll rot. Many boll rots are caused by bacteria and cannot be controlled by a fungicide. Control of either leaf spots or boll rots with fungicides is difficult to achieve. In recent years Target spot, caused by *Corynespora cassiicola*, has become common in some areas of the Southeastern United States including the Savannah Valley of South Carolina. There are fungicides labeled for Target spot control. However, reliable application timings and rates have not been established. Always read the label for appropriate application rates.

FUNGICIDES FOR FOLIAR APPLICATIONS ON COTTON

Diseases controlled	Product	Application method	Rate	Re-entry interval	Comments
Numerous leaf spots and boll rots: see label for specific fungi	Elatus	Foliar spray	5.0 – 7.3 fl. oz. per acre	12 hrs.	45 day preharvest interval. Only two applications are allowed.
Numerous leaf spots and boll rots: see label for specific fungi	Headline fungicide	Foliar spray	6.0 – 12.0 fl. oz. per acre	12 hrs.	30 day preharvest interval. Two applications are allowed
Numerous leaf spots and boll rots: see label for specific fungi	Headline SC fungicide	Foliar spray	6.0 – 12 fl. oz. per acre	12 hrs.	30 day preharvest interval. Two applications are allowed
Numerous leaf spots and boll rots; see label for specific fungi	Priaxor	Foliar spray	4.0 – 8.0 fl. oz. per acre	12 hrs.	30 day preharvest interval. Maximum application of 24 fl. oz. per acre per season. Maximum 3 applications per season.
Numerous leaf spots and boll rots: see label for specific fungi	Quadris	Foliar spray	6 – 9 fl. oz. per acre	12 hrs.	45 day preharvest interval. Maximum application of 27 fl. oz./acre/season
Numerous leaf spots and boll rots: see label for specific fungi	Topguard	Foliar spray	7 to 14 oz. per acre	12 hrs.	30 day preharvest interval. Only 2 applications allowed per year.
Numerous leaf spots and boll rots: see label for specific fungi	TwinLine	Foliar spray	7 - 8.5 fl. oz. per acre	12 hrs.	30-day preharvest interval. Three applications are allowed.