

Cotton

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Seed and Seedling Diseases

Rapid emergence and strong early-season growth are recognized as being most important to success in cotton production. Seedling diseases occur more frequently under cool, wet conditions immediately after planting. Soil temperatures at the 4-inch depth should average above 60° F and the forecast should favor continuation of these conditions over the next 3 days. Daily soil temperatures and cotton degree days are available on the Web at <http://www.ipm.vt.edu/infonet/>. It is also advisable to check the 10-day forecast at <http://www.weather.com>. Other factors, such as planting too deep, heavy soil crusting, sting and/or reniform nematodes, and misuse of herbicides may increase the problem. Seedling diseases do not usually kill an entire seedling population, but rather cause uneven, slow growing stands with skips in the row.

The first line of defense against seedling disease is to plant high quality seed that is coated with seed protectant fungicides and insecticides. Try to obtain seed with cool germination levels of 80 percent or higher. Avoid seed with cool germination levels below 70 percent. All commercial seed is routinely sold with protectant fungicide coatings which include Captan, Thiram, or Baytan plus PCNB, and metalaxyl. New treatments include Dynasty CST (azoxystrobin, fludioxonil, mefenoxam) and Trilex Advanced (Trilex, Baytan, Allegiance) for seedling diseases and Avicta Complete Pak (Dynasty CST, Cruiser, Avicta) and Aeris (thiodicarb, imidacloprid) for control of thrips and nematodes.

If additional protection is desired, an in-furrow fungicide treatment, or hopper-box treatment can be used. Benefits would most likely be seen in fields with a history of seedling disease problems when planting early or when cold, wet weather is expected shortly after planting. Field trials at multiple locations in Virginia since 1990 have not shown an economic benefit from the use of in-furrow or hopper-box fungicide treatments.

Table 3.31 - In-furrow and Hopper-box Fungicides for Cotton

Disease	Fungicide Common Name	Fungicide Trade Name	Formulated Rate	Remarks
Seedling disease; Damping-off; seed rot.	PCNB +	Terraclor Super X 12.5G	8.0-12.0 lb/A	Apply to seed furrow at planting. Read and follow all label restrictions.
	etridiazole	Terraclor Super X 18.8G (Note: also available in liquid formulation)	6.0-9.0 lb/A	
	metalaxyl +	Ridomil PC (Note: Also available in liquid formulation.)	7.0-10.0 lb/A	Same as above.
	PCNB			
	azoxystrobin	Quadris	0.4-0.6 fl oz (per 1000 row ft)	Same as above.
	carboxin + PCNB +	Prevail	8.0-16.0 oz/cwt	Apply to seed in hopper at planting.
	metalaxyl			

Nematodes

Nematodes cause significant damage to cotton in some fields in Southeastern Virginia. The sting nematode is recognized as highly destructive to cotton because of the crop's extreme sensitivity to this nematode. Root knot nematodes are generally not a problem when peanut and cotton are rotated in the same field. However, southern root knot nematodes have become an increasing problem where cotton is grown continuously for 5 or more years. Stubby root nematodes are parasitic on cotton and may represent a common cause of crop damage in Virginia.

Diagnostic assays for nematodes in soil planted to cotton are provided free of charge by the Plant Disease Clinic at Virginia Tech. Nematode population thresholds for damage to cotton are available on the Web at <http://ipm-www.ento.vt.edu/states/va.html>.

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The Virginia Predictive Nematode Assay Program offers growers an opportunity to locate problem fields prior to planting. The best time to collect soil samples for assay is in the fall. Assay forms, sample bags, and instructions should be obtained from a local Virginia Cooperative Extension office before collecting samples. A service charge of \$11.00 for vermiform or \$19.00 for cyst nematodes is levied on each sample. Counts of vermiform species are all that is needed if cotton is the only crop to be grown. However, if soybean or possibly tobacco might be considered as possible alternative crops, then counts of cyst nematodes would be more important or even critical.

Nematode control is best accomplished by preventing the buildup of harmful numbers of nematodes in soil through crop rotation and good weed control. If nematodes pose a threat to cotton production, chemical control can be used to minimize the risk of crop damage.

Table 3.32 - Nematicides for Use in Cotton

Nematode	Nematicide Common Name	Nematicide Trade Name	Formulated Rate	Remarks ¹
Sting, Reniform, Lesion, Lance, Root knot, Stubby root	aldicarb	Temik 15G	5.0 lb/A	Apply in seed furrow. Higher rates reduce seedling emergence.
			7.0-10.0 lb/A	Apply in a 4- to 6-inch band over row and incorporate.
	1,3 - D	Telone II	3.0 gal	Apply 8-12 inches deep in row and bed soil. Wait 7-14 days before planting.
	abamectin	Avicta Complete Pak (seed treatment)	Mixture of Dynasty CST + Cruiser + Avicta	Must be applied by commercial applicator equipment with rate adjusted for seed size. Mixture protects against seedling disease, early season thrips, and early season root damage by nematodes.
	thiodicarb	Aeris Seed-applied Insecticide/Nematicide	Mixture of thiodicarb + Gaucho	Same as above, except lacks a fungicide for additional seedling disease control, and must be applied as an overcoat on fungicide-treated seed.

¹Read product label carefully. Note application hazards, re-entry statements, restrictions on feeding livestock, rotation restrictions, and protective clothing required before treatment. Read and observe all requirements as defined on labels.

Fungicides

Foliar applications of fungicides are generally not needed for control of foliar disease or boll rots in Virginia. Boll rots are often a result of excessive insect damage coupled with excessive moisture. Management of boll rot is best achieved indirectly through control of insect damage to bolls and use of growth regulator to prevent rank vegetative growth. Hardlock in cotton is a new problem that causes the locks of cotton in bolls to remain in a compact mass (like sections in an orange). Since the cotton fibers do not string out from the boll, it can not be gathered by harvest equipment. As a result, most of the hardlock cotton is left on the ground in fields. Both fungi and insects have been implicated in the cause of hardlock. Research is currently being done in Virginia to determine the cause of hardlock and assess the benefit of fungicide sprays.