## IMPORTANCE OF FUNGAL PATHOGENS IN STUNTING OF LONREN COTTON LINES GROWN IN RENIFORM NEMATODE-INFESTED FIELDS

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## <u>Abstract</u>

The LONREN-1 and LONREN-2 cotton lines derived from Gossypium longicalyx are virtually immune to reniform nematode (*Rotylenchulus reniformis*). When plants are inoculated with pure nematodes in controlled environments, populations in soil are often reduced by 95-98 percent in two months. Yet when planted in naturally nematodeinfested fields these lines often show severe stunting, compared to their nematode-susceptible sibs, at two to three weeks after planting. The affected plants show symptoms typical of fungal root rots, and diverse fungal pathogens were isolated from the roots. We compared the ability of three fungicide drenches, Terraclor<sup>®</sup> (500 ppm, a.i.) Terrazole<sup>®</sup> (300 ppm, a.i.) and Benlate<sup>®</sup> (100 ppm, a.i.), applied at a rate of 50 ml per 600 g of soil, to prevent stunting in reniform-infested soils from Weslaco and Snook, Texas; Baton Rouge, Louisiana; and Arkansas. Benlate<sup>®</sup> almost completely prevented stunting in all soils. Terrazole<sup>®</sup> initially caused stunting in nematodesusceptible sib plants, but reduced it in LONREN plants in the Louisiana and Weslaco soils. Terraclor<sup>®</sup> either increased stunting or had no effect. None of the fungicides significantly reduced nematode populations. In controlled inoculation studies the soil-borne pathogens Thielaviopsis basicola, Pythium ultimum, Pythium aphanodermatum and Rhizoctonia solani caused more severe root rot of LONREN lines in the presence of reniform nematode than in the absence of the nematode. Damage from Alternaria, Diplodia, Fusarium, Macrophomina and Phoma species were not favored by the nematode. These results indicate that the hypersensitive reaction to the nematode that results from the Renlon gene increases susceptibility to necrotrophic fungal pathogens that cause root rots. Optimal use of germplasm with the Renlon gene will require maximal control of the fungal root pathogens, especially during the first year in a reniform-infested field. Rotations with sorghum or corn in the year prior to planting LONREN lines have greatly increased the agronomic performance of LONREN lines in Texas, probably by reducing both nematodes and fungal propagules prior to planting cotton. Broad spectrum seed treatments and infurrow fungicides that suppress *Pythium* and *Thielaviopsis* as well as *Rhizoctonia* should also be useful. Ultimately, increasing the level of host resistance to the fungal pathogens either by genes from Gossypium or transgenes from other crops should improve the performance of LONREN germplasm.