Determining the Cause of and Cure for Black Root of Cotton. (S04-gascho145839-Poster)

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Abstract:

Black root is a major problem for cotton (Gossypium hirsutum L.) farmers in poorly drained Atlantic coastal flatwoods soils. The symptoms of black root are defined as roots that are black with raised and crusty epidermal tissue. Additionally, when black root is severe, leaves are cupped and mottled (often with some reddening), stems are S-shaped, flowers are abnormally shaped with stigmas protruding above florets, bolls abscise from the stems or are hard- locked, and yield is very low. No causal organism has been isolated. Because of previous studies showing that susceptible soybean (Glycine max L.) cultivars are subject to chloride toxicity in the same soils, we initiated a soil survey and greenhouse and field experiments. All indicated strong relationships between high soil Cl content and black root. For a given field, the incidence of black root increased with an increase in soil Cl concentration. No cotton cultivar was tolerant of high soil chlorides. Increasing chloride application rate induced black roots in the greenhouse. In a field study in 2001, we alleviated black root symptoms and increased lint yield in all five experiments by application of 9 Mg broiler litter/ha. Black root was not alleviated by applications of several other amendments or by synthetic fertilizers. Research continues in order to determine the ingredient in broiler litter responsible for the alleviation of black root.

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