COMPARISON OF *AVENA STRIGOSA* (BLACKOAT) TO ADAPTED WINTER CEREALS AS COVER CROPS FOR COTTON

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Abstract

Small grain cover crops provide ground cover during the winter, scavenge residual fertilizer nitrogen left in the soil from the previous crop, reduce weed pressure by acting as a surface mulch, and increase soil organic matter by adding carbon to the soil. In Brazil, blackoat (*Avena strigosa*) is the most widely used winter cereal as a cover crop. We conducted a greenhouse and a field study to compare blackoat to adapted winter cereals as a cover crop for cotton on the SE USA Coastal Plain. In the greenhouse study, plant material from field plots of blackoat, rye, and crimson clover was mixed with soil and placed in pots. The pots were then watered and the plant material was allowed to decompose for one week. Cotton seeds ('Coker 315') or radish seeds were then planted into each pot. At seven days after seeding, we measured total emergence and taproot length of the seedlings. Blackoat, rye, wheat, and oats, were seeded into field plots in mid-October, early-November, and early-December in 1994 and 1995. Cotton ('Stoneville 453') was planted after in-row subsoiling on May 3 in 1995 and 1996 into these plots. Measurements in the field study included winter cover biomass and N content, cotton stands, cotton leaf N content at 2 weeks before first flower, and cotton yield. In the greenhouse study, crimson clover reduced cotton emergence. Neither of the cereal species reduced cotton seedling emergence. No differences occurred between green manure treatments for emergence in the radish test. Crimson clover inhibited root growth of young cotton and radish seedlings more than the winter cereals did. Between the two cereals, the blackoat inhibited root length of the cotton and radish seedlings more the rye did. In the field study, blackoat biomass production and N accumulation were similar to the other winter cereals in the 1994-95 season. In the 1995-96 season, rye had the highest biomass and N accumulation at all seeding dates. It was the only winter cover that was not damaged by a hard freeze during February in 1996. Blackoat was similar to wheat and oats for biomass and N accumulation in that season. In both years, N concentration in the aboveground tissues tended to be higher for the blackoat than for the other winter cereals, especially for the December seeding date. Among the treatments where the cereals were planted in October, cotton plant populations following blackoat were lower than following the other winter cereals. Although all cotton leaf N values were above deficiency (3.5%) levels at two weeks before flowering, there was a tendency for lower leaf N concentrations in those treatments that had highest winter cover biomass accumulation. Winter cover and winter cover seeding date did not influence cotton lint yield. Blackoat appears to have potential as a winter cover crop for cotton in the SE USA. Additional research is needed to study the apparent increased sensitivity of cotton to the deleterious compounds from decomposing blackoat plant tissues.

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