

COVER CROPS FOR ANNUAL CROPPING SYSTEMS

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OBJECTIVES: To identify and research cover crops suitable for use in cotton production systems (major emphasis is to determine the beneficial aspects of cover crops in managing weeds in cotton).

PROCEDURES: Five cover crops (annual ryegrass, barley, hairy vetch, subterranean clover, and tall fescue) were seeded into four row plots that were 65 feet long on 11/7/89. Additional treatments included a non-cover crop treatment that would be no-till planted as the five cover crops, and several planting beds that would be conventionally planted to cotton. Cover crops were furrow-irrigated and grown until early April. On April 3, April 5, and April 20, the two south rows of all plots were sprayed with glyphosate or paraquat to kill covercrops. The two north rows of plots were flail-chopped on 4/5/90. After cotton was no-till planted on April 19, all rows of plots were flail-chopped on April 25. All plots were furrow-irrigated as needed during the summer of 1990. Soil samples were taken for N, P, and K analyses on 11/28/89 and 5/23/90. Cotton leaf petiol samples were taken for NO₃-N analyses on 6/25/90 and 7/30/90. Plant counts and heights were recorded on May 25, June 11, June 26, July 19, and August 13, 1990 just before the two south rows were handweeded on each date. Cotton was defoliated on 9/26/90 and harvested on 10/4/90.

RESULTS: Covercrops (barley, ryegrass, and vetch) that provided 90 to 100% ground cover by March 1 reduced winter annual weed populations the greatest (2-10 weeds/130 f. row). This compared to populations of 34, 150, and 250/130 ft of row for clover, fescue, and weedy-check plots, respectively. Flail-chopping was not successful in killing cover crops. Except for ryegrass, two applications of glyphosate and one application of paraquat provided 85% or greater control of covercrops until June 1. Control of ryegrass was only 55%. Costs of growing and managing cover crops ranged from \$256 to \$296/acre where herbicides were used and \$116 where crops were flail-chopped. No-till planted cotton stands were adequate (2 plants/foot or greater) for vetch, clover, fescue, and non-cover crop plots where cover crops were chemically killed. Although residues from some covercrops temporarily delayed the emergence of summer annual weeds (pigweed, barnyardgrass, and nightshade), they provided little long-term control of these weeds. In plots where the cover crops were chemically killed and summer weeds were removed, yields of cotton were similar for no-till planted beds of clover, fescue, vetch, and non-cover crops as for conventionally planted beds. Because of poor crop stands, yields of cotton were reduced 50 and 75%, respectively, on no-till planted beds of barley and ryegrass.

FUTURE PLANS: The same covercrops were replanted in late October 1990, and the experiment will be conducted in 1991 as it was in 1990. If reasonable results are obtained from the second year of the study, the study will be discontinued and the results prepared for publication.