SOIL COMPACTION IN COTTON DOUBLE-CROPPED WITH GRAZED AND UNGRAZED WINTER COVERS

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Abstract

Soil compaction may be a factor in reduced productivity of cotton crops planted with minimum tillage following grazed winter annual forages. The objective of this study was to assess the soil compaction characteristics of seven cotton-winter annual grass systems under minimum tillage in the presence and absence of grazing cattle. DBL. 5690 cotton was planted following >Ro-till= seedbed preparation in late April-early May 1994, 1995, 1996. Winter annual grasses were planted to follow cotton as both grazed forage and winter cover. Soil strength (cone index) was measured after removal of cattle in late winter. Most soil strength differences (P#0.05) attributed to forage type in 1994 were found between 4 and 14 cm in soils under both grazed and ungrazed covers. No differences in soil strength were detected at any depth among the grazed forages in 1996. However, in the ungrazed covers, differences were found from 2-6 cm and 30-34 cm. Soil strength was higher under grazed forages, however, soil strength increased with time in both grazed and ungrazed conditions. Major differences in soil strength between grazed and ungrazed covers were detected in soils under ryegrass (*Lolium multiflorum* Lam. cv >Marshall=) alone in 1994 and 1996, and in all ryegrass mixtures in 1996. In 1994, soil strength was two to three times higher in soil profiles under grazed ryegrass+rye (*Secale cereale.* cv >Wintergrazer 70=) than in soil under the same ungrazed mixture. In 1996, soils under grazed ryegrass, rye and all ryegrass mixtures had soil strengths three to six times higher than soils under similar ungrazed plantings. It appears that the inclusion of ryegrass, either alone, or in combination with other species, enhances potential for increased compaction shallow in the soil profile when these winter covers are grazed.

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