AGRONOMIC AND ECONOMIC EVALUATION OF COVER CROPS IN THE TEXAS ROLLING PLAINS

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Summary

Cover crops have received a renewed interest in recent years, party due to promotion through the NRCS Soil Health Initiative. Much of the cover crop data in cotton systems have been collected from humid regions. In semi-arid environments, producers are concerned about the amount of soil moisture cover crops may use and the subsequent effect on cotton yields. We initiated cover crop studies on both dryland and irrigated continuous cotton systems on a grandfield sandy loam soil at the Texas A&M AgriLife Chillicothe Research Station in the Texas Rolling Plains. Treatments in the dryland system included (*seeding rate lb/ac): 1) conventional tillage; 2) no-till; and no-till with the following cover crops 3) crimson clover (*20), 4) Austrian winter field pea (30); 5) hairy vetch (20); 6) wheat (30); and 7) mixed species (30). The irrigated treatments included treatments 1, 2, 6, and 7. The mixed species included cereal rye, wheat, Austrian winter field pea, hairy vetch, crimson clover, and turnips. These dryland treatments were implemented in Fall 2011 and the irrigated treatments in Fall 2012. The mixed species was implemented in the dryland system in Fall 2012 and seeded at 40 lb/ac and 30 lb/ac each year thereafter in each system. An economic analysis was conducted over three growing seasons, 2013-2015.

While the study was initiated under exceptional drought conditions, cover crops were established each year and produced biomass in excess of 1200 lb/ac, except crimson clover. Soil moisture in the top 2 ft was lower for cover crop treatments at time of termination than the non-cover crop treatments in each system. However, soil moisture was typically restored with precipitation events prior to cotton planting each year. The first year of the mixed species cover crop mix resulted in numerically lower soil moisture throughout the first year in the dryland system. However, soil moisture was not a limiting factor due to cover crops during the cotton growing season. This is evident in observed dryland cotton yields, where no significant differences in lint yields between non-cover crop treatments and cover crop treatments were observed over the three year period. In 2014 and 2015, there were no significant differences among dryland treatments. Lint yields were not different among treatments in 2013 or 2014 within the irrigated system. However, lint yields were significantly higher for cover crop treatments within the irrigated system in 2015. Over a three-year average, there were no significant differences in net returns for both dryland and irrigated cotton systems. Our data indicate that cover crops can be used successfully in Texas Rolling Plains environments with educated and proper management.