Pros and Cons of Cover Crop Use in Texas Cotton

In semi-arid ecoregions dependent on irrigation for cotton production and limited groundwater resources, cover crops using stored soil moisture is a major concern. Although farmers recognize the soil and environmental benefits of conservation practices, their decision to use cover crops is often based on the farm’s irrigation capacity and operating budget.

In an article recently published in Agronomy Journal, researchers quantify the long-term impacts of conservation tillage and cover crop use on cotton production. The team found that cotton lint yield and gross margins were less with a no-tillage rye cover crop system than conventional tillage. However, these differences did not exist between the conventional tillage and mixed species (rye, hairy vetch, Australian winter field pea, and radish) cover crop treatments. The benefits of conservation practices were found in the soil with greater organic carbon with a no-tillage and rye cover crop system compared with conventional tillage after 17 years and more rapid carbon gain using a mixed species cover crop than the rye cover crop in a three-year period.

The research fails to demonstrate increased lint yield revenues using no-tillage compared with conventional tillage. However, gross margins were not different between the systems, which may demonstrate economic feasibility of using rye and mixed species cover crops with no-tillage in semi-arid climates. It is possible that with further investigation to regionally optimize management practices (e.g. irrigation, fertility, and cover crop seeding and termination dates), cover crop use can be an environmental and economical practice for cotton production on the High Plains of Texas.


Cotton planted in residue of a rye cover crop (left) and mixed species (rye, hairy vetch, Australian winter field pea, and radish) cover crop (right).

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