

Have you ever wondered how continuous wheat responds when planted in a no-till system compared to a conventional tillage system and no-till wheat planted in a soybean-wheat-grain sorghum rotation in South Central Kansas?

A continuous wheat study that included no-till and conventional tillage was established in 1987 at the South Central Experiment Field near Hutchinson to provide answers to those questions. The study site was a Clark clay loam soil. Two tillage treatments, no-till and conventional tillage (plow after wheat harvest and disk as needed) and six nitrogen treatments, 0, 25, 50, 75, 100, 125 pounds N per acre, were used. In 1991, a complimentary rotational study was established that included soybean-wheat and grain sorghum.

When averaged over the 14 years of the study and over all nitrogen treatments the wheat yield for the conventional tillage system (47.6 bu/a) was 11.5 bushels per acre greater than for the no-till wheat system (36.1 bu/a). The lowest average wheat yields for both tillage systems was with the 0 N rate, which was 42.8 bushels per acre for the conventional tillage and 24.8 bushels per acre for the no-till system. At each incremental N increase the conventional tillage wheat yield was always higher than for the no-till wheat. At the 25, 50, 75, 100, and 125 pounds N per acre rates the conventional tilled wheat yields were 49.8, 50.3, 50.5, 46.8, and 45.5 bushels per acre and the no-till wheat yields were 35.8, 37.0, 41.0, 39.8, and 38.2 bushels per acre, respectively.

Interestingly, for the first five years of the study conventional and no-till wheat yields were similar, but cheat became a serious problem. By 1993, no-till yields ranged from 2 to 11 bushels per acre while the conventional wheat yields ranged from 26 to 31 bushels per acre. In 1994, spring oats were planted to help eliminate the cheat and no wheat yields were available.

The no-till wheat yields in the soybean-wheat-grain sorghum rotation for the 0, 25, 50, 75, 100, and 125 pounds N per acre rates were 24.1, 35.1, 41.6, 44.7, 45.4, and 45.8 bushels per acre, respectively.

What's the bottom line?

Farmers will give up wheat yields if they use no-till plantings in a long-term continuous wheat system compared to a conventional tilled system or wheat rotated with other crops. Cheat and foliar diseases, such as tan spot and speckled leaf blotch are more prevalent in a continuous wheat system and that problem is accentuated in a no-till, continuous wheat system. However, there are farmers interested in planting no-till wheat after wheat. This can be successful if they use disease-resistant varieties and if they have only two years of wheat and then rotate to a row crop.

For details about this research see:

Field Research 2000. Report of Progress 854. P. 134-138. K-State Research & Extension.

Field Research 2002. Report of Progress 893. P. 108-114. K-State Research & Extension.

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