

Have you ever wondered how wheat planting date affects the number of fall and spring tillers produced and how those tillers contribute to grain yield?

A study was established at the South Central Experiment Field near Hutchinson to provide answers to those questions. The study site was a Clark clay loam soil. Two wheat varieties, Jagger and 2137, were planted September 28, October 11, October 28, and November 13 at 60 pounds per acre in 8 inch rows. Throughout the growing season, tillers were counted and labeled to identify fall and spring tillers and final tiller counts were taken at the late boot stage.

The number of fall tillers produced by the September 28 planting date was 1266 per yd<sup>2</sup>. For the October 11 date there were 916 fall tillers per yd<sup>2</sup> and there was 183 fall tillers per yd<sup>2</sup> produced by the October 28 date. The November 13 date produced 147 fall tillers per yd<sup>2</sup>.

Of the fall tillers produced from the September 28 planting date, only 22 % produced grain (281 tillers per yd<sup>2</sup>). For the October 11 date, 39 % of the fall tillers produced grain (360 tillers per yd<sup>2</sup>) and 83 % of the October 28 fall tillers produced grain (152 tillers per yd<sup>2</sup>). Of the 147 fall tillers per yd<sup>2</sup> from the November 13 planting date, 80 % of them produced grain (117 tillers per yd<sup>2</sup>).

Spring tiller formation for the September 28, October 11, and October 28 planting dates was 584, 659, and 600 tillers per yd<sup>2</sup>, respectively. With the November 13 date, only 213 spring tillers per yd<sup>2</sup> were formed. However, the number of spring tillers that produced grain was 195, 192, 272, and 144 tillers per yd<sup>2</sup> for the September 28, October 11, October 28, and November 13 planting dates, respectively.

The total number of tillers (fall + spring tillers) that produced grain was 476 tillers per yd<sup>2</sup> for the September 28 date, 552 tillers per yd<sup>2</sup> for the October 11 date, 424 tillers per yd<sup>2</sup> for the October 28 date, and 260 tillers per yd<sup>2</sup> produced grain for the November 11 planting date. Thus, fall tillers from the September 28 planting constituted 59 % of the total productive tillers and fall tillers from the October 11 date contributed 65 % of the total productive tillers. Whereas, for the October 28 date, fall tillers contributed only 36 % of the total number of productive tillers and for the November 11 date, fall tillers contributed 45 % of the productive tillers.

Grain yields were 39, 58, 55, and 30 bushels per acre for the September 28, October 11, October 28, and November 13 planting dates, respectively. Fall tillers produced more kernels per head than did spring tillers from the same planting date. Weight of both the straw and grain was greater for productive fall tillers than for productive spring tillers.

What's the bottom line?

Wheat tiller formation is very important for grain yield. However, excessive fall tiller formation from early planting causes competition among tillers resulting in lower tiller survival and productivity. Late planting dates do not allow much time for tillering before the wheat goes dormant. This causes an inadequate number of fall tillers. When this occurs the number of spring tillers may exceed the number of fall tillers, unfortunately spring tillers aren't as productive as fall tillers. This is the reason higher seeding rates are recommended for later planting dates, because with higher seeding rates there are more plants growing in the fall and they are more productive than spring tillers.

For details about this research see:

Planting date effects on tiller development and productivity of wheat. 2002. Keeping Up With Research SRL133, K-State Research & Extension.

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