

## **TIMING OF DRY-LAND STRIP-TILLAGE FOR GRAIN SORGHUM PRODUCTION IN THE HIGH PLAINS**

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With the growing interest in strip-till throughout the high plains, a study was initiated in the fall of 2003 to determine if timing of strip-till would affect yield of dry-land grain sorghum. After three years it appeared that strip-till reduced grain yields when compared to no-till. But one question was not answered in the previous study was would strip-tilling just before planting reduced yields. Therefore in the summer of 2007 a new study with four dates of strip-tilling was initiated. The dates were immediately after wheat harvest, fall, spring, and on the same day as planting. The immediately after harvest date was selected for two reasons, generally a good time when producer have time do tillage and the chance to receive rainfall and replenish the tilled strips with moisture. The fall date was selected due data from the previous study, in 2005 yield for fall strip-till was same as no-till (Table 1). This can be explained by the strip-tillage having been done before a significant rainfall event in November of 2004. With the amount of rainfall received 3.51 inches the tillage strips were replenished with moisture before planting, therefore no reduction in grain yields was observed. The spring date was selected because again it is time when producers can do tillage work. One of the concerns many producers have with no-till is that nitrogen (N) is tied-up in the crop residue when surface applied or volatilized. Nitrogen tie-up and volatilization is greatly reduced with strip-till due to the N being placed below (generally 3 – 8 inches) seeding depth. Many irrigated producers in the region are doing strip-till from late fall to early spring. This original study was designed to determine what the affect of strip-till (no fertilizer applied) at different dates would have on grain sorghum yield. In the new study all fertilizer in the strip-till treatments is applies with the strip-till unit, and only the no-till fertilizer is applied on the surface. Grain sorghum was selected as the crop to be grown, because it is the most widely grown summer row crop in the region. Plots were four rows wide by 50 foot long and strip-tilled with an Orthman four-row one-tripper at a depth of 7 inches.

Table 1. Grain sorghum yield (bu/ac) for selected years from a timing of dry-land strip-till experiment at OPREC.

Timing	2004	2005	2006	Two-year
No-till	62.5 a <sup>†</sup>	81.7 a	80.1 a	74.8 a
March (spring)	47.6 b	77.6 a	54.1 b	59.1 b
September (fall)	45.5 b	66.9 a	56.6 b	57.9 b
January	42.1 b			
November	37.9 b			

<sup>†</sup>Yields with same letter not significantly different

### Results

Due to climate condition 2008 was not a great year to start a new study looking at strip-till. The planting date was delayed due to dry conditions until 1.29 inches of rainfall was received on June 20<sup>th</sup>. With the delay in planting grain sorghum yields were affected. Due to variation no statistical difference between any of the treatments was observed although the spring yield was lower numerically (Table 2). It appears that possibly doing strip-till immediately after harvest or at planting will have yields as high as no-till.

Table 2. Grain sorghum yield (bu/ac) for 2008 timing of dry-land strip-till experiment at OPREC.

Strip-till Timing	2008
At planting	50.7
After harvest	48.1
Fall	45.4
No-till	44.2
Spring	31.8