

UTILIZING STRIP-TILLAGE FOR DRY-LAND CROP ROTATIONS IN THE HIGH PLAINS

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Producer interest is growing in the high plains for a dryland crop rotation system that utilizes strip-tillage. Many producers have concerns with applying N fertilizer on the surface in no-till systems because this increases the opportunity for volatilization or N becoming tied up in surface residue. In the fall of 2003, a study was initiated at OPREC to determine the effect of strip-till timing alone (no fertilizer applied) has on yield. After one year of the strip-till alone study a study where fertilizer was applied with the strip-tiller was began. In 2005 a study with three treatments, no-till, strip-till, and strip-till with fertilizer applied (banded below the surface) was started. The fertilizer rate was the same for all treatments. Fertilizer was surface broadcast in the no-till and strip-till (without fertilizer) treatments. Both strip-till treatments and all the fertilizer was applied in mid March. This date was picked because no differences were observed among dates of the timing study in year one although in the future the strip-till will be done in the summer following wheat harvest. In 2006, two more treatments were added to the study which where no-till and strip-till without any fertilizer applied, also strip-till was done at planting. Grain sorghum was selected as the crop to be grown because it is the most widely grown dryland summer crop in the high plains. Plots are four rows wide and 50 ft long and strip-tilled with an Orthman four-row one-tripper at a depth of 8 inches.

Results

There have been no differences in yield or test weight among the treatments in the duration of this study (Table 1 and 2). Although the no-till had higher yields in 2006 no statistical difference was found. No response to N fertilizer has been observed in the first three years and is difficult to explain. Also, no difference was observed at other locations (Cherokee and Blackwell) in 2005 where yields were higher at 112.9 and 68.2 bu/ac, respectively. It appears from observations from 2006 and 2007 that strip-till for dryland grain sorghum production maybe an option for producers. With no difference observed in yields when strip-till and planting are done at same time. Data from this study initiated further evaluation of the effects of timing of strip-till. In the summer of

2007 a new experiment was initiated to evaluate 4 dates of strip-till and will be reported in the 2008 research highlights.

Table 1. Grain sorghum yield and test weight in 2005 from strip-till fertility study at OPREC.

Treatment	Grain Yield bu/ac	Test weight lb/bu
Strip-till only	43.4	57.4
Strip-till with fertilizer	41.9	57.4
No-till	41.0	57.1

Table 2. Grain sorghum yield from strip-till fertility study at OPREC, in 2006 and 2007.

Treatment	2006	2007	Two-year
No-till no fertilizer	77.3	52.9	65.1
No-till with fertilizer	74.9	47.3	61.1
Strip-till surface fertilizer	65.6	52.3	58.9
Strip-till applied fertilizer	60.3	46.3	53.4
Strip-till no fertilizer	59.9	48.7	54.0