2012 Minimum Tillage Corn Trial

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planted on 10-Jun. No-till plots were planted with a John Deere 1750 corn planter; zone-till plots were planted with a White 6100 zone-till planter; and strip-till plots were prepared with a Blu-Jet Coulter Pro and planted with a John Deere 1750 corn planter. No-till and strip-till plots had four rows and were -till plots had six rows and were . A 10-20-20 starter fertilizer was applied at 200 lbs per acre to the strip-till and no-till plots. A liquid 9-18-9 starter fertilizer was applied at 5 gallons to the acre in the zone-till plots. Additionally, the strip till plots had 15 gallons per acre of 10-34-0 and 25 gallons per acre 32-0-0 UAN banded in at a depth of 8 inches when the strips were created. A pre-plant glyphosate herbicide, Roundup®, was applied at a rate of 2 quarts per acre to all plots.

Table 1. Agronomic information for the 2012 Minimum Tillage Corn Trial at Borderview Research Farm.

Location	Borderview Research Farm Alburgh, VT
Soil type	Benson rocky silt loam
Previous crop	Winter rye
Corn Variety	Mycogen TMF2T108 (82-RM)
Plot size	12 x 45 (no-till and strip-till); 15 x 45 (zone-till)
Replicates	4
Seeding rate	36,000 seeds ac^{-1}
Row width	30
Planting date	8-Jun zone-till
	10-Jun strip-till and no-till
Starter fertilizer	200 lbs. ac^{-1} 10-20-20 (no-till and strip-till),
	5 gal ac^{-1} of 9-18-9 (zone-till)
Pre-plant fertilizer	15 gal ac^{-1} 10-34-0, 25 gal ac^{-1} 32-0-0 UAN (strip-till)
Pre-plant herbicide	RoundUp®, 2 qts. ac^{-1}
Additional fertilizer	80 lbs. available N ac^{-1} of Urea (46-0-0), 12-Jul (zone-till and no-till)
	50 lbs. available N ac^{-1} of Urea (46-0-0), 12-Jul (strip-till)
Harvest date	9-Oct

Urea (46-0-0) was applied as a sidedress at a rate of 80 lbs available N per acre for the zone-till and no-till plots and at a rate of 50 lbs available N per acre on the strip-till plots on 12-Jul, according to pre-sidedress nitrate test results. Populations were again counted immediately before harvesting the corn plots on 9-Oct. A John Deere two-row chopper was used to harvest corn, and whole-plant silage was collected in a forage wagon and weights calculated from wagon mounted scales. A subsample of chopped silage was taken to determine moisture and quality of the forage.

Silage quality was analyzed using wet chemistry at Cumberland Valley Analytical Services in Hagerstown, MD. Plot samples were analyzed for crude protein (CP), starch, acid detergent fiber (ADF), neutral detergent fiber (NDF), and digestible neutral detergent fiber (dNDF). Mixtures of true proteins, composed of amino acids, and non-protein nitrogen make up the CP content of forages. The CP content of forages is determined by measuring the amount of nitrogen and multiplying by 6.25. The bulky characteristics of forage come from fiber. Forage feeding values are negatively associated with fiber since

hybrids is real or whether it might have occurred due to other variations in the field. At the bottom of each table, a LSD value is presented for each variable (i.e. yield). Least Significant Differences (LSDs) at the 0.10 level of significance are shown. Where the difference between two hybrids within a column is equal to or greater than the LSD value at the bottom of the column, you can be sure that for 9 out of 10 times, there is a real difference between the two hybrids. Hybrids that were not significantly lower in performance than the highest hybrid in a particular column are indicated with an asterisk. In the example below, hybrid C is significantly different from hybrid A but not from hybrid B. The difference between C and B is equal to 1.5, which is less than the LSD value of 2.0. This means that these hybrids did not differ

Analysis of the yield data indicates there were signi

planting rate but a 40% reduction is excessive. This may be attributed to soil conditions at the time of planting or shortly after planting resulting in poor germination rates. Reduced tillage fields have been noted to be colder and wetter as compared to conventional tillage. These environmental variables could cause reduced populations. Decreased populations could also be a result of mechanical issues with the planters, particularly the planter used for the no-till and strip-till treatments. The average yield was 15.7 tons per acre, which is low compared to yields of similar relative maturity corn planted by means of conventional tillage. However, the strip-till treatment averaged 18 ton of corn silage per acre, and for a 82 RM day corn this is similar to what one would expect from conventional tillage practices. Increased yields in the strip-till plot may be a result of the extra fertilizer applied pre-plant. Also, of the different tillage systems evaluated in this trial, the strip-till system makes the best seedbed to place the corn seed into which may have helped the corn plants to get a more vigorous start. The dry matter rates on the harvested corn varied between tillage methods as well. The analysis of the data indicates that the zone-till plots had the lowest moisture content and the no-till plots had the highest moisture content. The data seems to indicate that the no-till corn plots were probably not as physiologically mature as the strip-till and the zone-till corn plots due to the differences in planting methods and fertilization. The no-till corn probably germinated later and with less uniformity than the other two tillage methods. This conclusion is based on the lower population rates observed in the no-till treatments and low yields recorded. This could result in higher moisture levels in the plant at harvest.

Minimum tillage did not significantly impact corn silage quality indicating that strip-till, zone-till, and no-till have comparable effects on quality. The only significant difference observed was in milk per acre. The corn silage harvested in this trial was similar in quality to corn planted conventionally. This was the second year of reduced tillage practices in this research plot and yields overall were improved compared to 2011 results. Additional years of reduced tillage trials in this trial area will help determine if and how long a field must be in minimum tillage to overcome yield drags associated with soil condition.

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