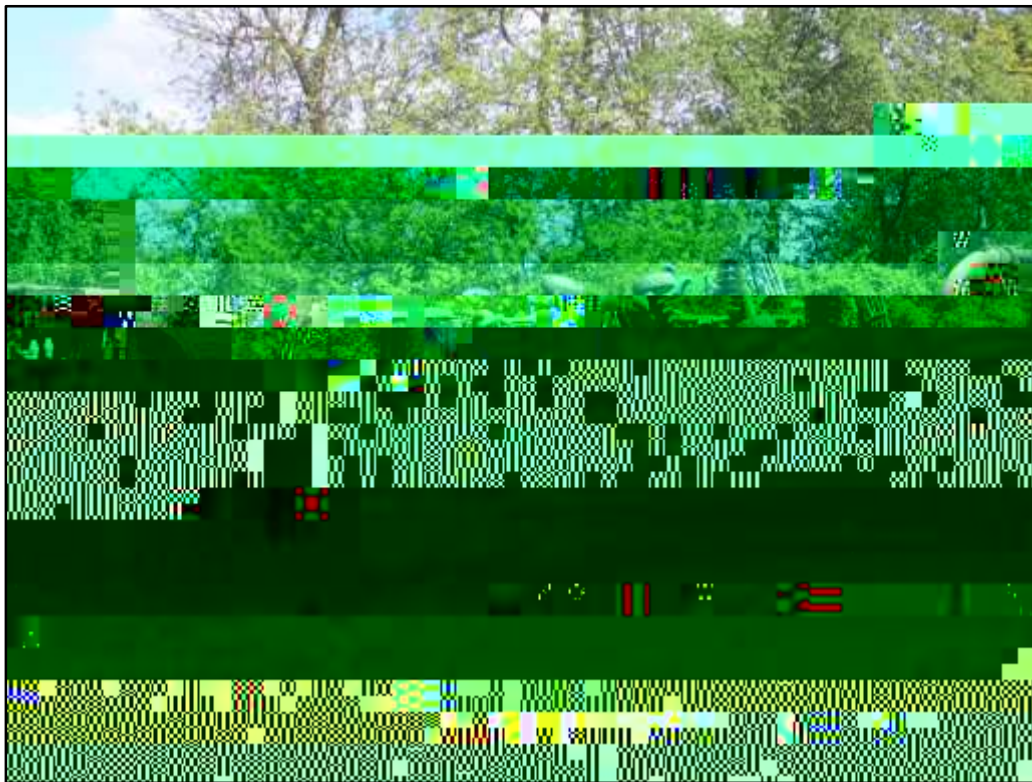


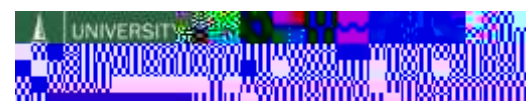


2015 Manure Incorporation and Reduced Tillage Corn Trial



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2015 MANURE INCORPORATION AND REDUCED TILLAGE CORN TRIAL

incorporated. Strip and vertical tillage were completed with a Blu-Jet Coulter Pro and a John Deere 2623 Vertical Tillage machine VT, respectively, on 15-May (Figure 1).

Figure 1. Blu-Jet Coulter Pro strip tillage, left, and John Deere 2623 VT vertical tillage, right.

TMF2Q419 Mycogen, 96 RM). At planting, a 10-20-20 starter fertilizer was applied at 250 lbs ac⁻¹. Soil samples were collected on 3-Jun and 17-Jun; nitrate levels were tested at ions were assessed on 23-Sep just prior to harvest.

Table 2. Trial specifics for manure incorporation and reduced tillage corn trial, Alburgh, VT, 2015.

Location	Borderview Research Farm Alburgh, VT
Soil type	Benson rocky silt loam
Previous crop	Corn with winter rye cover crop
Plot size (ft)	12 x 40
Replications	4

the FOSS NIRS DS2500 for crude protein (CP), neutral detergent fiber (NDF), acid detergent fiber (ADF), non-fiber carbohydrates (NFC), and starch.

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 the less digestible portions of plants are contained in the fiber fraction. The detergent fiber analysis system separates forages into two parts: cell contents, which include sugars, starches, proteins, non-protein nitrogen, fats and other highly digestible compounds; and the less digestible components found in the fiber fraction. The total fiber content of forage is contained in the neutral detergent fiber (NDF). Chemically, this fraction includes cellulose, hemicellulose, and lignin. Because of these chemical components and their association with the bulkiness of feeds, NDF is closely related to feed intake and rumen fill in cows. Acid detergent fiber (ADF) is used to determine the digestibility and energy derived from a forage

Variations in yield and quality can occur because of variations in genetics, soil, weather, and other growing conditions. Statistical analysis makes it possible to determine whether a difference among 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 at right, 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 in yield. The difference between C and A is equal to 3.0, which is greater than the LSD value of 2.0. This means that the yields of these hybrids were significantly different from one another. The asterisk indicates that hybrid B was not significantly lower than the top yielding hybrid C, indicated in bold.

Impact of Tillage Method

Corn silage quality indicators were impacted significantly by tillage treatment (Table 6). Crude protein was the greatest in no-till plots, though not significantly greater than the strip tilled or plowed plots. The vertical tillage treatment had the greatest values for ADF and NDF, however these were not significantly different from the strip tilled or plowed plots. There was no significant difference across tillage treatments concerning NFC or starch. The greatest estimate for pounds of milk per ton of corn silage would be produced by feeding the no-till treatment (2572 pounds per ton of dry matter), though it was not significantly greater than the strip tilled treatment. There was no significant difference between treatments regarding milk production measured in pounds of dry matter per acre.

Table 6. Corn silage quality indicators by tillage method, Alburgh, VT, 2015.

There was no significant difference in yield by manure incorporation treatment (Table 8). The trial mean was 21.6 tons per acre. Injection plots had the highest number of plants per acre, but did not have significantly higher populations than plowed plots (Table 8). Both injection and plowed plots had significantly greater populations than the Aerway and broadcast manure treatments on 19-Sep.

Table 8. Impact of manure incorporation on yield and populations, Alburgh, VT, 2015.

Treatment	Yield tons ac ⁻¹	Population plants ac ⁻¹
Aerway	21.0	27860
Broadcast	21.7	27785
Injection	21.9	29464*
Plow	21.8	29025*
Trial mean	21.6	28534
LSD (0.10)	NS	1246

*Treatments with an asterisk are not significantly different than the top performer in **bold**.

NS No significant difference amongst treatments.

Plots treated with broadcasted manure had significantly higher levels of aggregate stability, but this was not significantly higher than Aerway and injection treated plots (Table 9). The plowed plots were significantly lower than the others. The trial mean was 81% aggregate stability. Aerway plots had the highest level of active carbon with 54 mg kg⁻¹. Broadcast plots were not statistically different from the top performing aerway plots. The trial mean was 50 mg kg⁻¹ of active carbon.

Table 9. Impact of incorporation method on aggregate stability, Alburgh, VT, 2015.

Tillage method	Aggregate stability (%)	Active carbon mg kg ⁻¹
Aerway	82.8*	54*

Corn silage quality did not differ by manure incorporation method (Table 10). There was no significant difference in CP, with a trial average of 6.9%. Acid detergent fiber was not significantly different by manure treatment, and averaged 23.1%. There was no significant difference between treatments for NDF, NFC, or starch. Projected milk production did not differ by treatment in pounds produced per ton or acre of corn silage. Overall, there was no best manure incorporation treatment in regards to the quality indicators for corn silage.

Table 10. Corn silage quality indicators by manure incorporation method, Alburgh, VT, 2015.

Treatment	Forage Quality Characteristics					Milk	
	CP	ADF	NDF	NFC	Starch	tons ⁻¹ lbs	ac ⁻¹ lbs
	% of DM	% of DM	% of DM	% of DM	% of DM		
Aerway	7.0	22.2	43.6	46.2	42.7	2563	23237
Broadcast	6.8	23.0	44.6	45.8	42.3	2513	24212
Injection	6.9	23.4	44.6	45.9	42.3	2512	23008
Plow	7.0	23.8	45.7	43.9	39.6	2484	23409
Trial mean	6.9	23.1	44.6	45.5	41.7	2518	23467
LSD (0.10)	NS	NS	NS	NS	NS	NS	NS

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