

## 2018 Silage Corn Row Spacing and Seeding Rate Trial at Minot

The primary objective of this trial was to compare seeding rate and row spacing combinations to achieve maximum silage yields. A secondary objective was to observe agronomic and silage quality characteristics associated with these seeding rate and row spacing combinations. The trial was comprised of two hybrids with relative maturities of 91 and 100 days that were planted into 15 inch and 30 inch rows with seeding rates of 20k, 25k, 30k and 35k seeds per acre. Data was tabulated and analyzed for statistically significant differences between these factors.

The trial was planted on May 14 into soybean stubble that was minimally tilled and harvested on September 11. The soil type was a Williams Loam.

Table 1 shows individual treatment means and statistically significant differences between these treatments.

**Table 1. Individual Means**

Hybrid	Row Spacing	Seeding Rate	Harvest Stand	Days to Silk	Ear Height	Harvest Moisture	Protein	TDN	Silage Yield
RM		seeds/A	plants/A	DAP <sup>1</sup>	inches	%	%	%	tons/A <sup>2</sup>
91 day	15"	20k	21,672	77	35	62.8	7.8	70.0	18.6
		25k	26,006	74	33	59.9	7.6	70.9	19.6
		30k	27,451	74	34	60.1	8.4	69.6	17.3
		35k	34,675	75	35	55.0	7.2	71.1	28.3
	30"	20k	13,725	76	33	63.3	8.4	70.3	13.4
		25k	18,782	76	31	61.7	8.5	71.6	14.6
		30k	20,227	77	33	63.0	8.8	69.9	15.3
		35k	23,839	75	33	61.6	8.2	69.9	16.7
100 day	15"	20k	23,116	82	37	69.0	8.3	68.0	18.7
		25k	26,006	81	40	67.8	8.3	68.1	16.3
		30k	34,675	81	37	67.6	8.0	67.5	24.7
		35k	33,230	82	36	70.3	9.2	66.6	19.8
	30"	20k	14,448	82	40	68.2	8.9	68.6	12.3
		25k	24,561	84	37	71.6	9.3	68.3	16.0
		30k	20,227	86	34	72.6	9.7	68.4	12.0
		35k	25,284	84	31	70.7	9.1	68.2	12.1
C.V.%		16.9	2.3	8.2	3.5	7.0	1.8	9.0	
LSD 5%		6,830	3	5	3.8	1.0	2.1	2.6	

Table 2 shows the combined means for row spacing. 15 inch row spacing produced 40% more harvested plants which corresponded to a 44% higher silage yield compared to 30 inch row spacing. A 15 inch row spacing allows for more plant-to-plant spacing within each row compared to 30 inch rows, thus providing for more uniform plant distribution and efficiency in resource utilization such as sunlight, soil moisture and plant nutrient. In addition to higher silage yield, the 15 inch row spacing also initiated silking earlier, produced taller plants (ear ht), had a lower harvest moisture and produced slightly less protein than 30 inch rows.

**Table 2. Row Spacing Combined Means**

Row Spacing	Harvest Stand	Days to Silk	Ear Height	Harvest Moisture	Protein	TDN	Silage Yield
	plants/A	DAP <sup>1</sup>	inches	%	%	%	tons/A <sup>2</sup>
15"	28,353 a	78 a	36 a	64.1 a	8.1 a	69.0 a	20.4 a
30"	20,137 b	80 b	34 b	66.6 b	8.8 b	69.4 a	14.1 b

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Table 3 shows the combined means for seeding rates. As would be expected, there was a trend for increasing silage yields with increasing seeding rates with the highest rate producing significantly more silage than that produced with lower seeding rates.

**Table 3. Seeding Rate Combined Means**

Seeding Rate	Harvest Stand	Days to Silk	Ear Height	Harvest Moisture	Protein	TDN	Silage Yield
seeds/A	plants/A	DAP <sup>1</sup>	inches	%	%	%	tons/A <sup>2</sup>
20k	18,240 a	79 a	36 a	65.8 a	8.3 a	69.2 a	15.7 a
25k	23,839 b	79 a	35 ab	65.3 a	8.4 a	69.8 a	16.7 ab
30k	25,645 b	79 a	34 b	65.8 a	8.7 a	68.8 a	17.3 b
35k	29,257 c	79 a	34 b	64.4 a	8.4 a	68.9 a	19.2 c

Table 4 shows combined means for hybrids. Again, as would be expected, each hybrid expressed differences between agronomic, silage quality and silage yields. An unexpected difference was for the 100 day hybrid producing significantly less silage yield than the 91 day hybrid. A possible explanation for this may be from the 100 day hybrid sustaining severe stalk lodging.

**Table 4. Hybrid Combined Means**

Hybrid	Harvest Stand	Days to Silk	Ear Height	Harvest Moisture	Protein	TDN	Silage Yield
RM	plants/A	DAP <sup>1</sup>	inches	%	%	%	tons/A <sup>2</sup>
91 day	23,297 a	75 a	33 a	60.9 a	8.1 a	70.4 a	18.0 a
100 day	25,193 a	83 b	36 b	69.7 b	8.8 b	67.9 b	16.5 b

<sup>1</sup>DAP = Days After Planting

<sup>2</sup>Silage Yields are adjusted to 65% moisture

Values followed by different letters are statistically significant ( $p < 0.05$ )

Although this was a single year trial, it shows the potential impact that row spacing and seeding rates can have on silage corn production. Silage yields were significantly higher when 15 inch rows were utilized compared to 30 inch rows. Higher seeding rates translated into higher established plant densities and higher yields while maintaining silage quality. Hybrid selection is critical and should be based on unbiased testing in environmentally similar growing regions.