Row Configurations and Planting Rates of Sunflower at Minot

Summary: The main objective of this trial was to compare 15 inch, 30 inch and 30 inch twin row planting configurations along with four planting rates within each row configuration. Trials were planted during the 2018, 2019 and 2020 growing seasons with a SRES small plot planter using Great Plains no-till openers and Monosem seed singulation meters. The twin row configuration consists of 10 inch paired rows that are planted on 30 inch centers. A twin row configuration allows for more plant to plant growing space within each row compared to traditional single rows. Two hybrids with distinctly different genetic backgrounds were also used in each comparison. Comparisons between row configurations showed 15 inch rows and twin rows produced more productive plants which translated into significantly higher yields along with higher oil content than the traditional 30 inch row spacing. On average, 15 inch rows produced 179 pounds per acre more and the twin rows produced 251 pounds per acre more than the 30 inch rows. Actual harvested plant stands did not match with the 15k and 20k planting rates and are believed to be a result of inaccurate seed metering. The harvested stand for the 15k and 20k planting rates were almost identical and produced almost identical results. 25k and 30k planting rates also produced statistically similar results to each other, but were statistically higher in oil content and yield than the 15k and 20k planting rates. In conclusion, this crop is known for its ability to adjust head size according to micro-environmental growing conditions. This study shows merit in growing this crop in 15 inch rows or in a twin row configuration with a planting rate of 25,000 seeds per acre. Other considerations include the cost of twin row planting equipment and combine headers for narrow rows. Sunflower stalks are relatively brittle at harvest and twin rows have a tendency to break over with a 30" combine header. Plants in narrow rows canopy over more quickly, providing for better weed competition.

Combined Means - Row Configuration

Row Configuration	Harvest Stand	Days to Bloom	Days to Mature	Plant Height	Test Weight	Oil Content	Yield
	plants/A	DAP*	DAP*	inches	lbs/bu	%	lbs/A
15"	25,512a	70a	113a	50a	30.1a	44.6a	2062a
30"	21,691b	70a	113a	48b	30.0a	43.4b	1883b
30" Twin	26,607a	70a	113a	50a	30.2a	44.8a	2134a

Means followed by the same letter within each column were not statistically different.
**Days After Planting*

Combined Means - Planting Rate

Planting Rate	Harvest Stand	Days to Bloom	Days to Mature	Plant Height	Test Weight	Oil Content	Yield
	plants/A	DAP*	DAP*	inches	lbs/bu	%	lbs/A
15k	20,515a	70a	113a	48a	29.8a	43.6ab	1916a
20k	20,192a	70a	113a	48a	30.0a	43.3a	1829a
25k	27,783b	70a	113a	51b	30.1a	44.7bc	2131b
30k	29,923b	70a	114a	51b	30.4a	45.5c	2230b

Means followed by the same letter within each column were not statistically different.
**Days After Planting*

Planting Date: May 25, 2018, May 20, 2019 and May 29, 2020
Harvest Date: Oct. 23, 2018, Nov. 4, 2019 and Oct. 19, 2020
Previous Crop: Spring wheat
Tillage System: Minimum Till
Soil Type: Williams Loam