

Row Spacing and Plant Population Influence on Sunflower Performance

Burton L. Johnson¹, Mark E. Zarnstorff², and Jerry F. Miller³

¹Department of Plant Sciences, North Dakota State University, Fargo, ND

²National Crop Insurance Services, Overland Park, KS

³USDA-ARS, Northern Crop Sciences Laboratory, Fargo, ND

Abstract

Interest in narrow row sunflower (*Helianthus annuus* L.) production was initially raised in the 1980's by potentially higher yields. Recent advances in planting equipment, post emergence weed control, and crop insurance availability continue to benefit this production practice. The study objective was to determine the effect of row spacing and plant population on oilseed and nonoilseed hybrid performance. Studies were conducted at Casselton and Minot, North Dakota, from 1996 to 1998. A separate study was conducted for each sunflower type. Each study was a RCB in a split-plot arrangement with row spacing (6, 12, 18, and 30 in) the main plot. Subplots for each study were a factorial arrangement of hybrid and plant population. The oilseed study hybrids were Interstate 6111 and Cargill 187 at plant populations of 18,000, 22,000, and 26,000 plants acre⁻¹. Hybrids for the nonoilseed study were Pioneer 6946 and Red River Commodities 2331 grown at 14,000, 18,000, and 22,000 plants acre⁻¹. Stands were oversown and thinned to exact populations at the V2 to V4 stage. Results from the oilseed study indicated greater yield (33, 37, 24, and 16 %) from plants grown at the 12 compared to 30 in row spacing in four of six station-years. Yield was greater (11, 25, and 9 %) from plants grown at 18,000 compared to 26,000 plants acre⁻¹ in three of six station-years. Seed oil content was influenced by row spacing and plant population but differences were not biologically important. The effect of row spacing on nonoilseed hybrid yield was confined to two station-years where yield was greater from plants grown at a 12 compared to 30 in row spacing. Row spacing did not influence percentage seed over a 20/64 sieve, and plant population did not influence yield, at any station-year. In two station-years a greater percentage of seed over a 20/64 sieve was produced from plants grown at the 14,000 compared to 22,000 plants acre⁻¹ population. The row spacing by plant population interaction was not significant for yield, seed oil content, and percentage seed over a 20/64 sieve. Results from these studies indicate greater potential for yield enhancement from narrow row production with oilseed hybrids.