ROW SPACING EFFECTS ON THE GROWTH AND YIELD OF HYBRID CORN (ZEA MAYS L.)

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ABSTRACT

Traditionally, corn (Zea mays L.) has been grown in rows spaced from 30 to 40 inches apart in South Dakota. Interest in corn planted in narrow (less than 30 inch) rows is developing as a potential method to increase the yield of hybrid corn by maximizing sunlight, water and nutrient absorption. The objective these experiments was to determine the effect of narrow row spacing on corn growth and yield in South Dakota.

Five full season genotypes were used in the preliminary 1996 experiment year. Ten genotypes ranging in relative maturity from 70-104 days were used in the following 1997 and 1998 years. Experiments were conducted at four different environmental locations in Eastern South Dakota. Growth data was measured at the Brookings location.

In the 1996 experimental year, row spacing did not significantly affect grain yield across locations. The 15-inch row spacing increased yield by 2.4% when averaged across nine environments and the years of 1997 and 1998. The increase in yield was highly variable between locations with a highly significant row spacing x location interaction. Narrow row spacing increased leaf area exposure for sunlight absorption. The increased leaf area index provided by narrow rows benefited the mid-season maturing hybrids more than full and early-season hybrids.

Plant height was reduced with narrow row spacing over the three years tested. Root capacitance was reduced in 1997 and 1998 with narrow row spacing. This may indicate differences in root size or structure between row spacing treatments. Stalk lodging was not affected by row spacing in 1996. The following two years pooled across hybrids resulted in a 2.64% increase in stalk lodging with narrow row spacing. Stalk lodging was affected by the environment and hybrid tested. Percent crude protein and harvest percent grain moisture were not affected by row spacing.

The effects of narrow row spacing on yield were generally small. Yield advantages from narrow rows was not consistent between years at most locations. This influence of years and locations minimizes the potential of 15-inch row spacing as a management technique for improving and/or stabilizing grain yield for farmers in South Dakota where full season maturing corn hybrids are planted.