

FACTORS AFFECTING STAND ESTABLISHMENT IN THE RED RIVER VALLEY

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ABSTRACT

Optimum plant populations promote maximum yields of high quality, high yielding sugarbeets in Minnesota and North Dakota. Tare lab and field determination of harvestable root numbers indicate growers frequently harvest 5,000 to 10,000 fewer roots per acre than is optimum. Minn-Dak Farmers Cooperative yield of recoverable sugar per acre averaged about 4,000 lb/A from 1975-1984 with populations of 20-25,000 plants per acre. Average recoverable sugar per acre yields for 1990-1994 were greater than 5,000 lb/A with populations of 30,000 plants per acre or more. Field research/demonstration experiments were conducted in 1993 at the University of Minnesota, Northwest Experiment Station to dramatize to growers factors effecting stand establishment

Factors evaluated included (1) sugarbeet planter maintenance; (2) planter operating speed; (3) starter fertilizer rate; (4) broadcast fertilizer rate; (5) and planting depth. Other recent research determined effects of herbicide application rate, and rate and method of insecticide application on sugarbeet yield and quality. Field experiments were also conducted by North Dakota State University/University of Minnesota scientists to determine the effects of excessive post thinning sugarbeet plant population on crop yield, quality and harvestable root number.

Use of excessive planter operation speed decreased sugarbeet stand establishment by 13%. Sugarbeet emergence was reduced 31% by excessive planting depth. Poor plate planter maintenance reduced plant establishment by 12%. Broadcast urea nitrogen applications of 100 and 200 lb/A reduced plant emergence by 12 and 30% respectively. Use of higher than recommended modified in-furrow liquid starter fertilizer application reduced sugarbeet stand by 23%. Improper rate or method of use of insecticide application reduced sugarbeet stand establishment by 10 to 50%. Higher than recommended plant populations in excess of about 175 beets per 100' of 22" row (41,580 plants/A) at post thinning time (4-6 leaf stage) significantly reduced or tended to reduced recoverable sucrose per acre. Weight per harvestable root also decreased from approximately 1.5 to 0.9 lb/beet as plant population increased from 150 to 300 beets per 100' of row (71,280 plant/acre). Sugarbeet processing companies believe loss of sucrose is increased from storage piles with a high percentage of small roots.

Sugarbeet growers must pay careful attention to every production practice that could reduce plant population. Optimum plant populations increase the potential profit per acre from a growers best management practices designed for high yield, high quality sugarbeet production. Optimum sugarbeet plant populations remain a key to successful sugarbeet culture.