

Doley, William P, American Crystal Sugar Co, Research Center, PO Box 1227, Moorhead, MN 56561-1227. - Relationship between *in Vitro* Response of Leaf Disc and Ovule Explants of Tetraploid Sugarbeet Genotypes.

Since ovule culture is highly labor intensive, relationships between response of leaf disc explants and ovule explants might be useful for predicting which genotypes will respond best to ovule culture, thus increasing the overall response rate. Thirty one elite sugarbeet populations were evaluated for *in vitro* behavior by culturing leaf discs on PG_{OB} medium + 1 mg/L BA. Of 300 plants tested, 260 produced callus and 69 regenerated shoots from callus. Overall, 52.6% of 5812 leaf discs initiated callus, and 10.8% of the calli regenerated shoots. ANOVA revealed significant differences both within and between populations for frequencies of callus initiation and shoot regeneration. Diploid populations (15 of 17 were monogerm) had significantly greater rates of regeneration and numbers of shoots per explant. Thirteen tetraploid multigerm populations were utilized for development of diploids via ovule culture on a modified PG_{OB} medium + 0.3 mg/L BA + 0.05 mg/L 2,4-D. Of 298 ovule donor plants, 266 regenerated plants from ovules, representing all 13 populations. Overall 4.2% of the 42,225 ovules that were cultured responded. ANOVA revealed significant differences both within and between populations. Population response varied from less than 1% to almost 10%. There were 100 plants sampled in both experiments. Correlations on a plant mean basis between response of leaf disc explants and ovule explants were nonsignificant except for frequency of callus initiation ($R=0.23$, $\text{Prob}>R 0.03$). Therefore, only 5% of the variation in ovule response can be explained by callus initiation frequency. Elimination of a number of confounding variables may improve the relationship and increase the possibility of predicting ovule response via leaf disc response.