

INHERITANCE AND LINKAGE OF NINE ELECTROPHORETIC VARIANTS IN HELIANTHUS ANNUUS L. Charles Lay, James Gerdes, Alex Kahler, Richard Whalen. Department of Plant Science, South Dakota State University, Brookings, SD 57007 USA. Biological Sciences Manager, Garst Seed Co. P.O. Box 500, Slater, IA 50244. Biology Dept, South Dakota University, Brookings, SD 57007 USA.

A total of eighteen enzyme systems were resolved using starch gel electrophoresis. Six of the systems were monomorphic in the thirty inbred lines assayed. Four other systems were not used in this study because of inconsistent resolution. The remaining eight enzyme systems which were polymorphic were Acp (acid phosphatase), Gpi (glucose phosphate isomerase), Idh (isocitrate dehydrogenase), Mdh (malate dehydrogenase), Prx (peroxidase), Pgm (phosphoglucomutase), Pgd (6-phosphogluconate dehydrogenase), and Sdh (shikimate dehydrogenase). Acp was polymorphic at two loci. Thus, segregation data was obtained for nine enzyme loci. Inheritance of Prx3, Mdh1, Pgd1, Gpi2, Pgm4, and Idh2 were previously described by Kahler and Lay (J. of Heredity 76: 335-340, 1985).

Chi-square goodness-of-fit tests verified 1:2:1 segregation in the F2 generation of six crosses for Idh2, Prx3, Pgd1, Pgm4, Gpi2, Acpl, and Sdh3. Mdh1 and Acp2 failed the goodness-of-fit tests because of an excess of heterozygotes. Linkage was detected for Prx3/Pgm4 (recombination value = 0.055 +/- 0.01), and Acpl/Pgd1 (recombination value = 0.05 +/- 0.01).

These results indicate that the nine enzyme loci mark seven different linkage groups.