yield glucose-1-phosphate from starch and inorganic phosphate. In addition phosphohexoisomerase activity (fructose-6-phosphate⟶glucose-1-phosphate) and phosphoglucomutase (glucose-6-phosphate⟶glucose-1-phosphate) have been identified in our preparations. These enzymes would suggest possible utilization of sucrose as a source of glucose-1-phosphate, however the enzymes needed to cleave sucrose or sucrose phosphate to its monosaccharide components have not been identified. These activities have been identified chromatographically or by coupling the reactions with UDPG dehydrogenase or glucose-6-phosphate dehydrogenase. The activities described have been identified in pollen, seedling and seed preparations.

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Inheritance of susceptibility and tolerance to Leaf Freckles and Wilt (Corynebacterium nebraskense) of corn — A six-line diallel in 1973 and a seven-line diallel in 1974 were evaluated for reaction to Leaf Freckles and Wilt (LFW) disease, Corynebacterium nebraskense, in an effort to determine the mode of inheritance of resistance. Four resistant inbreds (B37, N10, N6 and H49), one intermediate (PC81) and one susceptible (B14A) comprised the 1973 experiment. Susceptible inbred A632 was added to the diallel in 1974.

The 1973 experiment was grown in two replications at each of three locations, Lincoln, Holdrege and Holbrook, in Nebraska. The latter two were planted on sites heavily infected with LFW in 1972 and were expected to become naturally infected. The Lincoln plots were artificially inoculated three times with a mixture of six isolates of the bacterium, and the Holdrege plots were inoculated once when no disease appeared by pollination time. Disease readings from individual plants in a plot were recorded on a 0 to 4 scale (0 represents no disease and 4 represents dead plant tissue) one to four weeks after inoculation in Lincoln and prior to desiccation at Holdrege and Holbrook. Means were computed for a maximum of 40 plants per plot. Considerable variation between inoculation dates was observed in Lincoln in terms of the overall disease level in the experiment, apparently due to environmental conditions following inoculation. Hot, dry environments at Holdrege and Holbrook resulted in very little disease development, even with the artificial inoculation at Holdrege.

The 1974 experiment was grown in two replications at Lincoln, and the plants were artificially multi-needle inoculated (See Calub et al., Crop Science 14:716-718, 1974) in the seedling stage with only the most virulent isolate rather

than with a mixture of isolates as used in 1973. Disease readings were based upon the same scale for 20 plants per plot in this experiment.

The inheritance of susceptibility and resistance appeared to be quantitative in nature, so the Gardner-Eberhart model was used to partition the variation among generation means into line effects (additive) and heterosis effects. When the analyses were conducted with parents included (Analysis II), heterosis effects were subdivided into average, line and specific heterosis effects. Without parents (Analysis III), general and specific effects were estimated.

Significant additive effects were detected in the analyses of the Lincoln data for both years and for the combined locations in 1973. This variation in parental contributions of homozygous loci amounted to 80.7-88.7% of the total variation among genotypes for the different analyses. Heterosis effects were significant only for the Lincoln data where syringe inoculation at pollination time was used, in which case specific heterosis effects accounted for 7.0% of the total variation. This was probably due to the specific effects of susceptible line B14A crossed onto the more resistant lines. Analyses with and without parents gave similar results.

Partial dominance for susceptibility to LFW is indicated by the fact that the F_1 readings of crosses between resistant and susceptible lines are generally greater than the midparent values.

Breeding techniques concentrating on additive gene effects should be effective in breeding for resistance to LFW. Testing over several locations is recommended due to significant genotype-by-location interactions. It appears, however, that LFW will become an economically serious disease only when plant injury occurs in conjunction with very warm and moist environmental conditions and the presence of the disease organism.

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Comparison of nuclear DNA from corn, Tripsacum and their hybrids — Tripsacum hybridizes with its relative, corn, and we have been able to characterize corn, Tripsacum and their hybrids for the buoyant density of nuclear DNA. It was of particular interest to determine if the parents of an intergeneric cross could vary in buoyant density and thus in their guanine + cytosine ratio. It was also important to make the rather novel comparison of parents versus hybrid with regard to buoyant density.