controlled by a lever connected to the shaft on which the double-discs are mounted. Pack wheels are of the open-center type.

A rigid three-point linkage to a tractor is used.

The planter operator sits on an implement seat while spreading seed, or, if two operators are available, they stand on the framework supporting the pack wheels (figure 1). A seat for two operators could be added. Racks for two seed trays are mounted beside the V-belt frames.

Rows are planted to the middle of the alley where the tractor is stopped, the belts cleaned, and new seed spread. One planter operator can plant per day 2,000 to 2,500 or more rows which are trimmed to 8 feet at harvest; two operators double this rate. In practice the machine has been found practical for seeding all types of yield and breeding plots at a rate double or more that of a hand-operated V-belt. As good or better stands as with a field drill have been obtained where moisture was at all favorable.—JOHN D. MILLER, Assistant Professor, Fort Hays Branch of the Kansas Agr. Exp. Sta., Hays, Kans., and W. M. ROSS, Associate Agronomist, Field Crops Research Branch, A.R.S., U.S.D.A.

LITERATURE CITED

BREEDING FOR RESISTANCE TO YELLOW DWARF VIRUS IN BARLEY

The yellow dwarf virus disease has probably reduced yield of barley, wheat, and oats in California by more than any of the other cereal crop diseases in each year since its discovery in 1951. This virus, its general effect, its vectors, and its host range have been recorded. Because of its economic importance, and the likely importance of breeding for its control, this report on the nature and on the inheritance of a "resistance" difference seems timely.

The resistance of the Rojo variety and of a few F₂ segregates from a Rojo X California Mariout backcross was first observed in 1951. It was recognized then that some other varieties possessed a higher level of resistance than Rojo, but that no other breeding material could be adapted for wide use against this virus as quickly as this backcross population.

Since this was a new disease, appropriate testing and evaluation technics had to be developed. In estimating comparative injury from yellow dwarf on a 0 to 4 scale, Rojo has generally been assigned a value of 1 and California Mariout a value of 3. In plant or population assays under common growth stage and natural mass infection synchronizations this range translates into a 10 to 35% yield difference. This varietal difference is distinct from the actual yield level where time (duration) of infection is singularly important. Thus in California Mariout a near lethal reaction results from seedling stage infection, but this is an unlikely event under normal cropping conditions.

During 1952 and 1953 the levels of persistent yellow dwarf infection were not sufficient for precise plant classification, but with information integration resistant lines were successfully advanced. The dominance of susceptibility was established. In 1954 a backcross population, the equivalent of 895 F₂ plants derived from 12 parental lines proven equivalent to Rojo in resistance, was classified. This population divided distinctly into three classes: 641 susceptible, 209 resistant, and 45 escaping infection. This clearly indicates a single recessive gene difference between Rojo and California Mariout. Since this gene, after four backcrosses, is now set in plants predominantly like California Mariout, it seems destined for early use to reduce yield losses from yellow dwarf in the extensive areas where this variety is adapted.—COIT A. SUNESON, Research Agronomist, Field Crops Branch, A.R.S., U.S.D.A. and Department of Agronomy, Univ. of California, cooperating.


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