hinge mechanism nailed to each end, and regulate the planting depth. Since the planter in Figure 1 leaves \( \frac{1}{2} \) inch of the planter blades below the boards on either side, it will plant seed at a uniform depth of \( \frac{1}{2} \) inch. (This planting depth has been very satisfactory for grass seeds ranging in size from bermudagrass to sudangrass. Where greater planting depths are desired, the planter blades should be allowed to extend farther than \( \frac{1}{2} \) inch beyond the depth-regulating boards.) Two small pieces of sheet metal are fastened with 3 nails to the board on 1 side of the planter and with 1 nail on the other to hold the planter blades in place and provide the hinge mechanism needed in the planting operation (Figure 1).

This planter works best in dry or near-dry soil. It is placed in the position in which the row is to be planted by holding the two planter blades together and pushing the planter into the soil until the wooden depth gauges are flush with the soil surface (Figure 2). Seeds are then distributed from a seed packet, as shown in Figure 3. The planter blades are then spread enough to free the seeds from the planter and the planter is removed from the soil (Figure 4). If the soil is dry, loose soil will roll into the void left as the planter is removed. This soil will partially cover the seed, as is shown to the left of the planter in Figure 3 and the partially filled furrows indicate that the row has been planted. When all rows are planted, a small straight-edged board, about a foot long, is moved lightly over the surface of the soil to fill the furrows. Care must be exercised not to allow the board to sink deeply enough to move seeds from one row to another. With seeds planted \( \frac{1}{2} \) inch or more in depth, there is little likelihood of this happening.

**HERBICIDES AND THEIR EFFECT ON THE YIELD OF GRASS SEED**

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In established grass seed fields, weeds reduce crop yields through competition in the field and cleaning losses in the mill. In addition to these losses, weed seeds remaining in the cleaned grass seed lower its quality and price. The use of the dinitro butylphenols (DNBP) to control annual weed infestations and the wide-spread utilization of the chlorinated phenoxyacetic acids to selectively kill annual and perennial weed species in both new and established grass seedlings have been recommended for several years. The literature on chemical weed control methods in grass seed production has been reviewed by Garrison with mention of 3-(3,4-dichlorophenyl)-1, 1-dimethylurea (Diuron), isopropyl N-(3-chlorophenyl)-carbamate (CIPC), and 4-(2,4-dichlorophenoxy) butyric acid (2,4-DB) in addition to the older phenoxyacetic acid derivatives.

1958, S-143 orchardgrass, 'Climax' timothy, fescue, and 'Seaside' creeping bentgrass were tested for the effect of annual applications of herbicides the 1 year after establishment. Plot size was 3 feet apart and 20 feet long. There were 6 rows, randomized block design. The experiment prior to planting at a rate equivalent to 1 acre of 10-8.8-16.6 (N-P-K). Inter-row spacing to maintain soil tilth and to control weeds, volunter grass infestation, and after the initial treatments no hand-weeding was done.

Herbicide treatments were applied with a mounted plot sprayer in a total volume of 80 gallons at a pressure of 40 psi. All applications were made annually in late April or early May, at 2 pounds per acre. The herbicides used were the mixtures of, 24-dichlorophenoxyacetic acid (2,4-D), diflufenac acid formulation of 2,4-D, 2-methyl-4-chlorophenoxyacetic acid (MCPA), isopropyl N-(3-chlorophenyl)-3-(3,4-dichlorophenoxy)butyric acid (2,4-DB), propylene glycol ether ester of 2,4-dichlorophenoxyacetic acid (2,4,5-T), and 2-(2,4,5-trichlorophenoxy) propionic acid (Silvex).

Sixteen feet of the middle row of each plot were harvested and cleaned twice in a Clipper Offvest. Yields were taken for the 3-year period. Seed yields were measured and reported on a weight basis. Germination tests were made from samples of all plots by the Washington State University Seed Laboratory in 1959. Infestations of weeds were negligible over the entire experiment, no estimates of weed control were made.

Three-year seed yield averages for orchardgrass, timothy, and red fescue are shown in Table 1. Grass seed yields are for 2 years only. Orchardgrass yields, when compared with plots treated as the standard, were significantly decreased by 2,4-D, Silvex (although yields from these plots did not differ significantly from the check. Silvex and MCPA applications in the red fescue plantings significantly reduced seed yield of this species when compared to the check. MCPA applications. Furthermore, Silvex resulted in a significantly lower yield of red fescue than was obtained from the check (no herbicide). Treatment may have been a factor in causing the lower orchardgrass and red fescue, since the treatments resulted in no significant reduction in either of these two species. No treatment was significant difference among the seed yields of orchardgrass and timothy.

Germination tests were run on all treatments in no case was there a practical difference among