EFFECT OF SEED TREATMENT ON STANDS OF SOME FORAGE LEGUMES

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RELATIVELY little has been done with respect to the possible effects of seed treatment on stands of various clovers and other forage legumes. A brief abstract by Bucholtz (2) describes the effect of an organic mercury dust as a seed treatment on stands of alfalfa, white sweet clover, alsike clover, white dutch clover, red clover, and lespedeza. Horsfall (6, 7) states that zinc oxide gave better stands than red copper oxide when used on the seed of alfalfa and clover. The purpose of this paper is to present results obtained in the greenhouse with various seed treatments on stands of forage legumes of the general Lespedeza, Lotus, Medicago, Melilotus, and Trifolium.

MATERIALS AND METHODS

Eighteen species of forage legumes were used. The fungicides tested were 5% ethyl mercury phosphate (New Improved Ceresan), 2% ethyl mercury chloride (2% Ceresan), zinc oxide (Vasco 4), cuprous oxide (Cuprocide), and an organic sulfur compound (DuBay 1286A). Cuprocide and Vasco 4 were selected as representatives of cuprous oxide and zinc oxide on the basis of results of Anderson, Kadow, and Hopperstead (1) and of Cook (3), respectively.

Seed of the various species, when necessary, were scarified with sand-paper to facilitate germination before treatment with the various fungicides. The seed were treated by adding an excess of the fungicides, shaking, and screening off the excess material. In the dosage studies, the seed were weighed, treated as above, and then reweighed, the difference between the two weights being the quantity of dust retained on the seed. From these weights, the proportionate dosages for each species were calculated and added to the seed without dilution. Three replications of 1,000 seed each were used in a test, except where otherwise noted. Over a million seed were planted in the tests.

Except in one series of experiments the plantings were made in non-sterilized field soil in flats in the greenhouse. In this one series the soil was sterilized 1 to 2 hours at 15 to 20 pounds pressure in an autoclave. Watering was done whenever necessary to maintain soil moisture at a relatively high level. Plants which damped off after emerging were removed and recorded every other day. Stand counts were made after post-emergence damping off had practically ceased, usually 10 to 15 days after planting.

All plantings were randomized to permit analysis of variance according to the method of Fisher (4). The percentage of post-emergence damping off was calculated by dividing the number of plants which damped off after emergence by the total number of plants emerging. These data were analyzed both as percent-