SEEDLING EMERGENCE OF SMALL-SEEDED LEGUMES AND GRASSES

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THE poor stands of seedlings frequently associated with the culture of the small-seeded legumes and grasses have often hindered the use of many of these valuable crops. It appears evident from the high cost of seeds, the frequency of undesirable stands, and the value of these crops to a permanent agriculture that a need exists for critical investigation of the factors that influence seedling emergence.

The results of a study of certain of these factors are presented in this paper. Major consideration is given to the effect on seedling emergence of depth of planting, mulching, kinds of crop seed, size of seed, and soil differences.

REVIEW OF LITERATURE

In reporting the cause of poor stands of seedlings, Thatcher, Willard, and Lewis (5) state that critical experiments on depth of planting are lacking, but that they observed thin stands following deep seeding with a seed drill. They are of the opinion that a relationship exists between date of seeding and depth of coverage upon seedling emergence; and that in the spring, after the soil becomes dry enough to work, coverage is increasingly important. Kinney, Kenny, and Fergus (2); Ahlgren (1); and Murphy and Arny (3) found that grass and legume seeds, unless planted very shallow, did not produce a high percentage of emerged seedlings. Williams (6) observed that poor stands of red clover resulted from plantings made while the surface soil was wet, because of the number of seeds that would cling to the upper surface of the wet clods. Furthermore, he believes that lack of food reserve in the seedling accounts for poor seedling emergence when plantings are made at a depth of 2 or 3 inches.

Thatcher, Willard, and Lewis (5) found that organic mulches were extremely valuable in preventing the formation of hard crusts and in maintaining over a long period of time sufficient soil moisture for the establishment of seedlings. The extent to which the mulch aids seedling emergence, however, was not determined.

No data have been obtained relative to the interactions on seedling emergence of such factors as depth of plantings, mulching, kind of crop seed, seed size, and soil.

MATERIALS AND METHODS

Some of the studies here reported were carried out at Columbus, Ohio, and some at Knoxville, Tenn. At Columbus, plantings were made in the greenhouse on Miami silt loam and Brookston silty clay loam, and in the field on Miami silt loam.