WINTER WHEAT STUDIES IN MONTANA WITH SPECIAL REFERENCE TO WINTER KILLING

(Abstract)

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Reliable statistics show that 14% of the annual winter wheat acreage in Montana has been abandoned in the spring on account of winter killing.

The furrow drill method of planting has increased the yield 6 bushels per acre in a three-year test over other methods.

As severe winters cause varying amounts of winter-killing in spite of any method used, a study of the possibility of seeding winter wheat in the early spring months was made. This included, naturally, a study of the dormancy period of winter wheat.

1. From a review of the literature and from the actual experience of farmers and others it was anticipated that the normal habit of growth of winter wheat might be changed or at least altered by a treatment involving soaking and freezing before planting seed.

2. In order to accomplish this end samples were soaked for various periods of time (10 minutes to 48 hours) after which they were frozen for 1, 2, 3, and 4 hours at −4°C., and studied under greenhouse conditions. Similar soaking periods and longer freezing periods were studied under field conditions.

3. A study of the growth of the plants under greenhouse conditions with suitable checks revealed that little or no effect upon the subsequent vegetative growth was produced by any of the treatments.

4. When the moisture content of the seed was above 25%, the survival under sudden freezing and thawing for any temperature and for any length of time was greatly reduced.

5. The length of the freezing period of 1, 2, 3, and 4 hours did not affect survival as much in proportion as the length of the soaking period.

6. When the moisture content was above 25%, freezing tended to delay germination in case any grain germinated.

The remaining facts were demonstrated in field studies:

7. The shorter periods of soaking (10 minutes, 30 minutes, 1 hour, and 2 hours) did not materially decrease the survival.

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