Effects of Freezing on Germination of Sorghum Seed

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Producing sorghum seed of good quality that germinates well has become very important since the introduction of sorghum hybrids and the resulting rapid increase in sorghum acreage. Early frosts before the seed matures can reduce germination materially. Although most seed production fields are in the Southern Great Plains, early fall freezes may occur even there before the seed matures. This study was conducted to determine the extent that germination is reduced when sorghum seed, at various stages of maturity, is frozen at different temperatures and for varying lengths of time.

Review of Literature

The literature on the effects of freezing temperatures on the germination of sorghum seed is scanty. Robbins and Porter (6), using seed of several sorghum varieties, found that seed exposed to 33°F was not injured. At 20°F, injury generally occurred when the moisture content of the seed was above 35%; however, no injury occurred when moisture content was 35% or lower. They found that when frozen at —20°F, seed with moisture of 19% or less showed little damage, but when moisture was above 22% and especially above 30%, germination was often reduced to zero. They also froze soybean seed and found that seed with 30 to 32% moisture was not injured by freezing at 20°F.

Carlson and Atkins (2) froze moistened as well as immature sorghum seed. They found that viability of seed containing 10 to 20% moisture was not reduced by freezing at 26, 20, and 14°F, whereas, the germination of seed with 30 to 45% moisture was reduced considerably. They found little reduction in seedling vigor due to freezing. In their study, Combine Kafir-60 was injured less in most cases than RS610, RS501, and Norghum.