

DeVries, M., A. S. Goggi, and K. Moore. 2007. Determining seed performance of frost damaged seed lots. **Crop Science** 47:2089–2097.

Abstract

Seed quality of maize (*Zea mays* L.) can be negatively impacted by a fall frost event. It is important for the seed industry to detect frost damage early and to make marketing decisions before the seed lots are conditioned for sale. This study compared several seed quality tests (standard germination [WG], accelerated aging [AA], saturated cold [SC], and soak tests) for their ability to quantify frost damage. Additionally, these tests were used to predict field emergence under poor and average to good field conditions. Two genotypes (B73 × IRF311 and Mo17 × IRF311) were harvested at three moisture contents (300–350, 400–450, and 500–550 g H₂O kg⁻¹ fresh weight). An artificial frost treatment was applied to the seed and damage was determined by testing seed after approximately 0, 1.5, 3, 4.5, and 6 mo of storage. The artificial frost treatment significantly decreased viability and vigor of all the seed lots except Mo17 × IRF311 harvested at 300 to 350 g H₂O kg⁻¹ fresh weight. As seeds matured, the damage associated with frost treatment decreased. Laboratory tests did not accurately predict field emergence of frost-damaged seed under poor field conditions; however, AA at 0 mo, SC at approximately 0, 1.5, and 3 mo, and soak at approximately 0, 1.5, and 3 mo had strong relationships to field emergence under average to good field conditions. These results indicate that frost damage in seed lots is quantifiable using the SC and soak tests during approximately the first 3 mo of storage and both tests accurately predict field emergence.

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