

## Abstract 03

### Seed Vigor and Germination at Different Temperatures in Tomato Near-Isogenic Lines for the Ripening Inhibitor (*rin*) Gene

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Tomato seed germination and stand establishment can be reduced under adverse (extreme) temperatures. Seed performance at different environmental conditions depends on its physiological quality and genetic background. The wild type ripening inhibitor (*Rin*) allele is a MADS-box gene necessary for complete tomato fruit ripening. A recessive mutation controls extended fruit shelf life by slowing the ripening process and interfering with the ethylene synthesis. Ethylene-responsive genes are associated with a number of physiological traits in plants. However, little is known about their effects on seed germination under extreme temperatures. Seeds of two near-isogenic tomato lines for the gene *rin* were employed in the present study. The line TX 625-20 (*rin/rin*) and TX 625-97(*Rin/Rin*) were germinated at 6 °C, 12 °C, 20/30 °C and 35 °C. Accelerated aging, cold, and seedling emergence tests were also performed. Allelic differences (*Rin* versus *rin*) in the lines were confirmed using PCR-based markers derived from the cloned *rin* sequence. At alternated temperatures (20/30 °C), seed germination of TX 625-97 and TX 625-20 was 100% and 95%, respectively. However, under low (6 and 12 °C) and high (35 °C) temperatures germination in the two lines was lower when compared to the standard alternate (20/30 °C) conditions. TX 625-97 seed germination was higher than TX 625-20 in all temperatures. The results of seed vigor on the accelerated aging, as well as in cold and seedling emergence tests, showed a superiority of TX 625-97, indicating the wild type (*Rin*) allele provides better tolerance to adverse conditions.

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