

Examination of the High-Oleic Trait Effective Germination of Peanut Seed.

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Seed oxidative stability is an important factor considered by those in the peanut manufacturing industry. Product stability has been shown to increase up to 10-fold when high-oleic peanuts are used. The percentage of U.S. crop that is high-oleic has increased in the past decade, but many producers are resistant to grow high-oleic cultivars due to the uncertainty of the high-oleic effect on agronomic traits, such as seed germination, yield and grade. Experiments were designed and conducted in 2017 to examine the effect of the high oleic trait on peanut seed germination in field plots and in the laboratory on a thermal gradient table. Genotypes used in these experiments included cultivars from each peanut market-type along with their near-isogenic, high oleic counterparts. Seed germination was tested in the field in 4 geographically different regions, as well as in the laboratory on a thermal gradient table, eliminating environmental effects and allowing testing for the effect of temperature on germination of all seed-types. In 2017, the near-isogenic line pairs were planted in field plots (CRB, 3 replications) in the following locations: OAES Caddo Research Station, Ft. Cobb, OK; NCDAs Peanut Belt Research Station, Lewiston-Woodville, NC; Lingo, New Mexico; and Tifton, GA. Stand counts were taken on a weekly basis for the first 3 weeks after planting and averaged over replications. Thermal gradient table experiments on seed germination were conducted on the original seed sources in 2016 and in 2017 on seed harvest from each field location. Results from the 2017 field trials indicated a definite lag in germination in all market-types for high oleic genotypes when compared to their normal oleic counterparts in all locations tested with the exception of New Mexico, where the high-oleic genotypes germinated at a similar rate or earlier than the normal-oleic lines. Thermal gradient table experimental results demonstrated a lag in germination in high oleic genotypes compared to normal oleic counterparts in all market-types, but the effect was lowest in the runner-type pair. Results from these experiments will increase the understanding of the agronomic properties of high-oleic peanut cultivars and could be used to create new standard protocols used by State agencies to test high-oleic peanut germination for registered and certified seed quality labeling.