Date: June 30, 2021

Title: Effects of temperature on *Helianthus annuus* Seed Germination on different media substrata.

Purpose of Study: According to the Association Official Seed Analysts (AOSA) Rules for Testing, sunflower seed (*Helianthus annuus* L.) shall be grown at 20°C on paper toweling (T), between blotters (B), or sand media (S), or an alternate method of 25°C on top of creped cellulose paper with sand (TCS). However, the International Rules for Seed Testing (ISTA) recommends 25, or 20°C seed on TPS. The study objective is to determine if a rule proposal is warranted to add 20°C to TCS to standardize testing.

Justification: Recent survey results presented by the germination uniformity working group displayed discrepancies of germination temperatures of *Helianthus annuus*, L. between laboratories, specifically 20°C with TCS. A comparison of 20°C and 25°C on TCS may help understand the severity of this discrepancy or warrant a rule change to AOSA.

Research Design: A randomized block design of four replicates of one hundred seeds from four subspecies will be analyzed for warm germination with two germination temperatures (20 and 25°C) Samples shall be grown on TCS or T with a first and final count at 4 and 7 days, respectively. This testing will be completed at four seed testing laboratories for cross lab validation.

Research Method: Participating laboratories will receive four subspecies of *Helianthus* for germination analysis with the use of two different germination temperatures (20 and 25°C) and tested at time of receival on TCS or T based on laboratory standard operating practices. Response variables include normal and abnormal seedlings and dead and dormant seeds. Ungerminated seeds will be subjected to tetrazolium (TZ) testing to determine if dead or dormant. Data will be returned to the investigator for statistical analysis for LSD and significant differences ($P<0.05$) of treatment means and interlaboratory repeatability and interlaboratory reproducibility.

Publication of Results: Study description and results will be presented as a paper at the annual AOSA/SCST meeting. If warranted, an AOSA Rule Proposal will be submitted for the substrata and germination temperature for *Helianthus* species.

Budget: Purchase and shipping of four species for $200.00 Laboratory Testing $800.00. Total: $1,000

Estimated Completion Date (Note: A report is due 12 months after funding): May 2022.

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