**Date:** June 30, 2021
**Title:** Effects of Dormancy Breaking Methods on *Sesamum indicum* Seed Germination for freshly harvested seed

**Purpose of Study:** Determine the impact of dormancy breaking methods such as a 10°C seven-day prechill, 30°C 48-hour precondition, and the addition of 0.2% $KNO_3$ or 500 ppm of Gibberellic acid (GA3) as a moistening agent on the warm germination results of sesame seed. Additionally, the impact of moving the final count to seven days and scarifying swollen seeds identified on the final day and extending the warm germination test by two days. The result of this study may help standardize testing and warrant a rule proposal.

**Justification:** According to the Association Official Seed Analysts (AOSA) Rules for Testing, sesame seed (*Sesamum indicum*) shall be grown at 20-30° C, with a first and final count at 3 and 6 days, respectively. There are no comments in the dormancy or specific requirements section.

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| *Sesamum indicum*<br>sesame | P | 20-30 | 3 | 6 | | |

Preliminary research presented at the AOSA/SCST 2021 meeting reported a significant increase in germination in sesame seed with 500 ppm $GA_3$ as the moistening agent compared to 0.2% $KNO_3$ and water. However, no significant difference was observed when seed lots were tested at a later timepoint.

**Research Design:** A randomized block design of four replicates of one hundred seeds from four seed lots will be analyzed for warm germination with a 10°C seven-day prechill, 30°C 48-hour precondition, and the addition of 0.2% $KNO_3$ or 500 ppm of $GA_3$ as a moistening agent. Samples shall be grown at 20-30° C, with a first and final count (s) at 3, 6 and 7 days, respectively. Additionally, swollen seeds identified at the final count will be scarified and the test extended by two days. This testing will be completed at four seed testing laboratories for cross lab validation.

**Research Method:** Four (4) laboratories will receive four freshly harvested seed lots for warm germination with a 10°C seven-day prechill, 30°C 48-hour precondition, and the addition of 0.2% $KNO_3$ or 500 ppm of $GA_3$ as a moistening agent. Additionally, swollen seeds identified at the final count will be scarified and the test extended by two days. These lots will be tested at time of receival and then stored at 10°C and retested four months later. Response variables will 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 ($P<0.05$)

**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 with notes for the dormancy or specific requirement sections.

**Budget:** Shipping of seed lots: $200.00, Participation Compensation: $800.00, **Total: $1,000.00**

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

**Investigator Contact Information:** Lauren Shearer, 236 32nd Ave Brookings, SD 57006. (605)-692-2758. Lauren.shearer@sodaklabs.com