

# Vegetable Testing Services

## SMALL SEEDED VEGETABLES

**Onions, Peppers, Lettuce, Radishes, Celery, Carrots, & Kale**

Germination testing of most small seed vegetables is conducted in enclosed boxes on blotters (Figure 1) or in paper towels (Figure 2), often positioned in a vertical manner, so seedling roots grow downward and hypocotyls grow upward, making evaluation an easier process. Spacing out seeds so they do not touch and keeping media moisture on the “dry side” is advisable to reduce seed to seedling spread of any secondary infections from fungi or bacteria colonizing seeds. First counts are a good time to re-water media, if needed, remove normal seedlings or any obviously dead seeds which

may cause secondary infection. One method of reducing fungal issues in the box method is to have two layers of blotters and remove top blotter at first count and transfer ungerminated or slow developing seedlings to the lower blotter, thus removing any fungal or bacteria colonies. Light is important for many species, so refer to the appropriate methods, AOSA or ISTA for specific instructions. Sand testing is a good option as a secondary method when fungal issues exist, uniform water uptake is desired or a seedling uniformity rating is needed.



**FIGURE 1.** Brassica seedlings growth at 7 days on blotters in boxes.



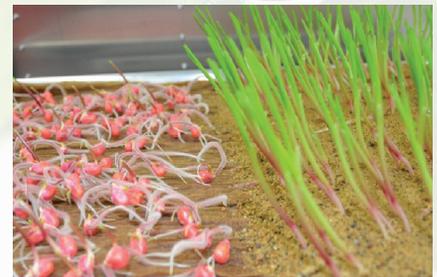
**FIGURE 2.** Sweetcorn “weak” seedlings after 7 days growth in rolled towels.

## LARGE SEED VEGETABLES

**Peas/Beans, Cucurbits/Melons/Pumpkins, & Sweetcorn**

Germination testing of larger seeded vegetables can be done in paper towels (T), sand (S) on top of creped cellulose (TC) or covered with ¾ inch sand (TCS) (Figure 3) as popular methods. One benefit of sand or the TCS method is the ability to use “kiln dried sand” and control the moisture level through the use of pressurized spraying tables. SoDak uses 500ml water/400 seeds on sweetcorn, staying on dry side for best root development, 700ml/400 seeds for peas, navy beans, cucurbits and pumpkins, 1100ml water/200 seeds for large beans (Figure 4). With large beans, there is so much protein that increased water volumes and wider spacing is needed to get complete water uptake for uniform

germination, also we space trays wider apart in carts to facilitate seedling development needed to evaluate the unifoliate leaf development. If trays are spaced too closely in carts, we often see browning and decay of the seedling tissue coming into contact with tray surface above the test sample tray.



**FIGURE 3.** Seedling growth after 7 days at 25°C on the TC (left) and TCS (right) methods. Note the uniformity and faster growth from sand improving water uptake and geotropism.



**FIGURE 4.** Sand emergence of “weak” Black Turtle beans and “strong” Great Northern beans.

## ISTA ORANGE AND ISTA BLUE CERTIFICATES

SoDak Labs is an ISTA accredited laboratory (USML1100) and conducts export testing according to the ISTA (International Seed Testing Association) Rules for Testing Seed. Results are reported on either an Orange or Blue ISTA certificate. ISTA certificates are similar to a passport for seeds and allow seed lots to travel seamlessly across the globe. The certificate is standardized by ISTA therefore regardless of where the seed is shipped, staff at inspection stations are trained to interpret results from these certificates.

Orange certificates are considered a seed lot certificate utilized for exporting seed to other countries and requires sampling by an ISTA authorized sampler.

Blue certificates are considered seed sample certificates and are commonly used for shipping seed from the United States to Canada. Blue certificates do not require sampling to be conducted by an ISTA authorized sampler.

## ISTA AUTHORIZED SEED SAMPLER TRAINING

SoDak offers courses to become an “Authorized Seed Sampler” for ISTA (International Seed Testing Association) Orange Certificates by participating in our Seed Sampling Online Series. This course targets seed production or laboratory staff involved in seed sampling who desire a better understanding of principles and concepts. We offer several training options such as sampling training opportunity, continuing education for current authorized

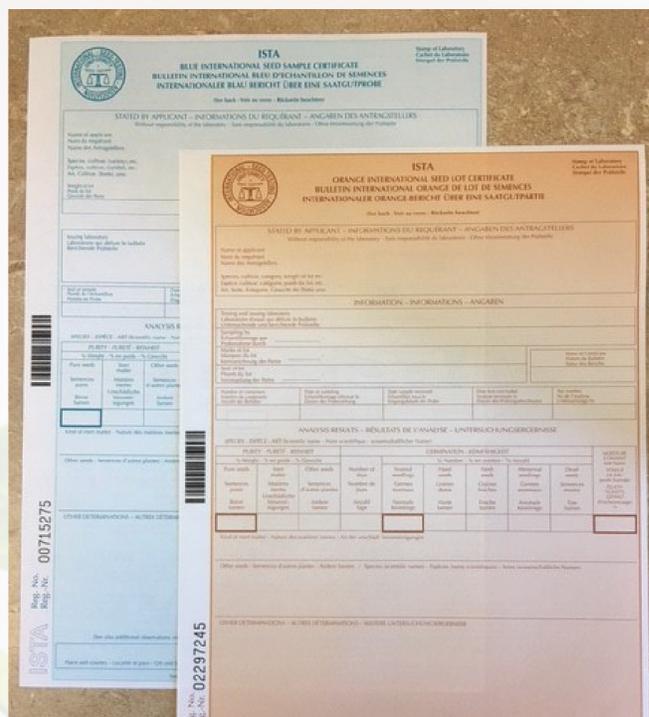


FIGURE 5. ISTA Orange and ISTA Blue Certificates

samplers or achievement of ISTA authorized seed sampler. Upon completion of the online course, written exam and on-site practical exam attendees are eligible to draw samples for ISTA Orange certificate testing. This course allows staff to attend the majority of the training at their facility greatly reducing the travel time and expenses for training.



FIGURE 6. Pie halving method for chaffy species.



FIGURE 7. Double tube probe for many small seeded vegetables.