

# Seed Health Testing

## SODAK LABS IS ACCREDITED FOR SEED HEALTH TESTING

SoDak Labs is accredited for seed sampling, visual inspection for phytosanitary testing, and seed health testing through the National Seed Health System (NSHS, Figure 1) and International Seed Testing Association (ISTA). Viral, fungal, or bacterial pathogens can be screened for in various crops with internationally recognized published methods from NSHS, International Seed Health Initiative (ISHI), and/or ISTA.

To facilitate the movement of plant and soil samples for testing, a Plant Protection and Quarantine (PPQ) 526 Permit has been issued for SoDak Labs from the U.S. Department of Agriculture.

ISTA Orange and Blue certificates can be issued for shipping seed internationally.

SoDak Labs also offers ISTA authorized seed sampling training, providing both online, and in person workshops to ensure accurate and representative sampling for issuance of ISTA certificates.

Common methods for seed health testing at SoDak Labs include selective media, blotter method, ELISA, and PCR based testing (Figure 2–5).

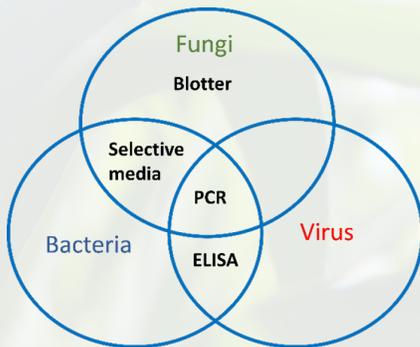


FIGURE 3. Recommended seed health testing methods for fungi, bacteria, and viruses at SoDak Labs.

- ◆ Official seed sampling for phytosanitary testing
- ◆ Seed health testing for the following crops (effective 9/27/2022):
  - ❖ *Brassica* spp. for the pathogens:
    - Phoma lingam*
    - Xanthomonas campestris* pv. *Campetstris*
  - ❖ Cucurbitaceae for the pathogen:
    - Acidovorax citrulli* (ISHI method)
  - ❖ *Glycine max* (soybean) for the pathogens:
    - Pseudomonas syringae* pv. *glycinea*
    - Soybean mosaic virus
    - Tomato ringspot virus
    - Bean pod mottle virus
  - ❖ *Zea mays* (maize) for the pathogens:
    - Fusarium*
    - Maize chlorotic mottle virus
    - Maize dwarf mosaic virus
    - Pantoea stewartii*
- ◆ Visual phytosanitary seed inspection

FIGURE 1. Seed Health Accreditation list for SoDak Labs from National Seed Health System.

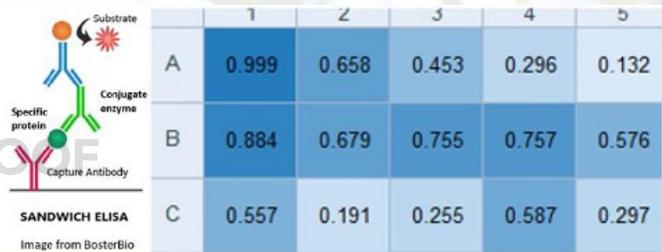
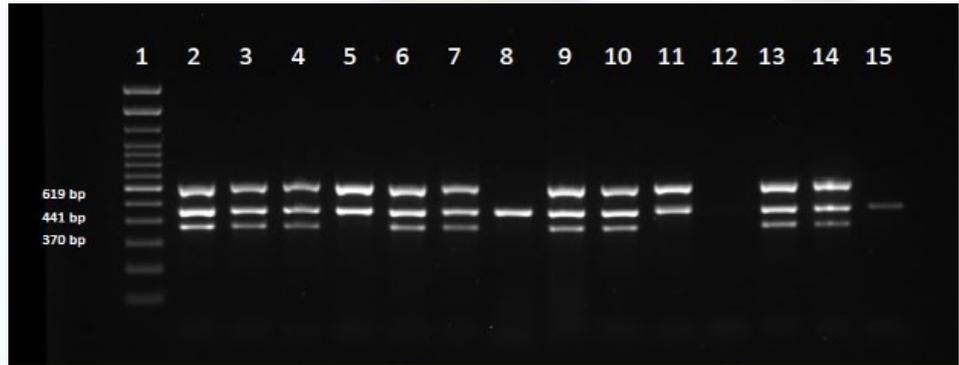


FIGURE 2. ELISA graphic and quantitative analysis of protein reaction.



FIGURE 4. Blotter method for *Leptosphaeria* spp. (Blackleg) detection on Brassica.



**FIGURE 5.** *Xcc* is a plant pathogenic bacterium that poses a threat to a wide range of crops, including broccoli, cauliflower, cabbage and rice. SoDak Labs uses a combination of agar isolate (left) and PCR (right) for its detection. Method NSHS Br 1.1, ISTA 7-019a.

PCR Gel interpretation:

- 3 bands, 370, 441, 619; XCC-positive
- 2 bands, 441 + 619; not XCC but another *X. campestris*, e.g. *pv. raphanior armoraciae*
- 2 bands, 370 + 441; XCC-neg, unknown organism
- one band at 441 bp, universal bacterial primer
- no band –negative

**Blackleg**

**Percentage of infection: 0 Negative**

**Scientific name of Pathogen:** *Leptosphaeria maculans* (- *Anamorph Phoma Lingam*)

**Sample size:** 1000 Seeds

**Test Method:** *Leptosphaeria maculans* on BRASSICA NAPUS

**Additional Information:** International Rules for Seed Testing 2021. Validated Seed Health Testing Methods, 7-004:Detection of *Leptosphaeria maculans* and *Plenodeomus biglobosus* in BRASSICA NAPUS

**FIGURE 6.** Example of report remarks for *Leptosphaeria maculans* testing.

**Test Name:** *Clavibacter michiganensis* subsp. *nebraskensis* ELISA

This sample was tested utilizing ELISA. ELISA kit provided from Agdia, INC (Catalog no. SRA 44001) and known controls provided from Agdia, INC (Catalog no. LNC 44001) and ARS Culture Collection (B-41134). Four pools of 100 seeds were tested and 0 pools were positive for *Clavibacter michiganensis* subsp. *nebraskensis*.

**FIGURE 7.** Example of report remarks for *Clavibacter michigaensis* subsp. *nebraskensis* testing.

