

# Oregon State Seed Lab

Traditional and customized seed testing and research services



*OSU Associate Professor Sabry Elias, Ph.D., with the lab's thermo-gradient germination table. The table is an effective tool to demonstrate the germination of a seed lot under a range of temperatures from 5°C to 45°C (41°F to 113°F).*

*(Insert) Annual ryegrass (top) and red clover germinating in soil on the thermo-gradient table. No germination above 35°C and slow germination below 15°C.*

The Oregon State University (OSU) Seed Laboratory is the official seed testing laboratory of the State of Oregon for certified samples. The lab provides standard AOSA and ISTA testing for grasses and a wide range of crops including purity, germination, tetrazolium, moisture content, ploidy by cytometry, endophyte, growout, vigor, as well as specialized and custom-designed tests. “Being associated with

the university gives us more resources not only for seed testing, but also for improving methods and protocols, as well as for research and education to share with other labs and with the seed industry,” says OSU Associate Professor Sabry Elias, Ph.D. “What distinguishes the OSU Seed Lab from other labs is that we have the academic resources to develop new seed testing methods and improve the accuracy, uniformity, and efficiency



*Sabry Elias co-edited the AOSA Seed Vigor Testing Handbook.*

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<http://seedlab.oregonstate.edu/>

## Key Personnel

- Sabry Elias, Ph.D., Associate Professor
- David Stimpson, Lab Manager
- Jodi Keeling, Quality Manager
- Carrie Lewis, Purity Supervisor
- Dale Brown, Germination Supervisor
- Yea-ching Wu, Ph.D., Seed Analyst, Special Testing Unit

## Company Profile

- Full-service seed testing facility.
- ISTA certified and Australian Quarantine and Inspection Service (AQIS) approved.
- Customized tested and micro-cleaning of seed lots.
- Genetic and trait testing.
- Imaging and information services.
- 25 permanent analysts and staff plus 15-30 seasonal employees.
- Emil Zivney Seed Collection.
- Established 1908.

of the current protocols and procedures, and to respond to the emerging needs of the dynamic seed industry.”

Because some of the industry’s seed testing rules are 50 to 100 years old, Elias says OSU’s seed lab is working with other labs and with the seed industry to make improvements and change rules as new technology becomes available to seed testing.

Elias is one of four editors who compiled the Association of Official Seed Analysts (AOSA) 2009 edition of the Seed Vigor Testing Handbook, a procedure manual used by AOSA seed testing laboratories in the United States.

## Facilities and Services

The seed lab and its adjacent 800-sq.-ft. greenhouse are located near the center of

the OSU campus in Corvallis, OR, in the heart of the Willamette River Valley's turf and forage grass seed production region.

The lab is actively engaged in seed testing, seed testing research, and specialized testing to meet the needs of the seed industry.

"We share a wide range of seed testing knowledge and experience with others through individualized training programs, workshops, and publications depending on the interest of individuals," says Elias. "We offer specialized and general training to a wide variety of audiences including seed analysts, seed cleaners, growers, and others in the industry."



Digital image documents downy brome seeds (a noxious weed) found in a customer's sample of tall fescue seed. (OSU Seed Lab photo)

A recent unique seed evaluation procedure adopted at the OSU seed lab is a thermo-gradient germination test. A series of heating and cooling tubes under the table provide a temperature gradient that cools/heats the table from 5°C to 45°C (41°F to 113°F).

"The thermo-gradient table is a useful tool for growers or plant breeders to evaluate how well a new variety will respond to various soil temperatures. It can also screen varieties for cold and/or heat tolerance and determine a seed lot's optimal range of growing temperatures as well as determine the relative quality of different seed lots," Elias says. "This information can help a marketer more precisely match a seed product to a customer's field conditions."

Grass seed from Oregon growers and marketers accounts for a large portion of the lab's testing activity. Vegetable seed

production, and native species both are important segments of Oregon's agriculture. They provide a variety of seeds for evaluation.

### Custom Services

In addition to its full compliment of routine seed testing services, the OSU seed lab can design custom seed services to meet the needs of individual customers. The program is implemented in a hands-on manner. The duration is variable depending on need and the program.

- Custom digital imaging provides pictures of specific seeds or seed samples. This is especially important in small-seeded crops, such as grasses and clovers, and less familiar crops such as native species, where seeing unique and fine features is necessary to help customers understand test results.

- Micro-cleaning of small quantities of very high value seeds that have been naturally or accidentally contaminated with crop or weed seeds. The lot may be too small for mechanical separation, yet the customer needs pure and clean seeds.

- Blend and mixture verification analysis confirms the proportion of each seed component. This is especially useful to confirm the ratios of turf seeds in a professional blend or mixture.

- A soil seed-bank analysis can effectively identify noxious weed and any other seeds including invasive species in a soil sample and test their viability. The entire 500g sample is analyzed.

### Research Services

"Research in seed science and technologies has been one of the strengths of the OSU seed laboratory," says Seed Analyst Yea-ching Wu, Ph.D. "The research focuses on the needs of the seed industry, solving seed testing constraints, and developing new tests as needed."

Currently, researched efforts are focused on various areas:

- Improving current methods to respond to the needs of the seed industry, example is the feasibility of shortening the period of the grow-out test.

- Blackleg testing for Brassica species and mosaic virus for vegetables.

- Expand the use of flow cytometry to distinguish between seeds that are morphologically similar with distinct



The ergo-vision testing station uses a small vibratory to steadily move seeds into the analyst's field of vision.

ploidy level. An example is to differentiate between festulolium, ryegrass, and tall fescue.

- Imaging and information systems to more effectively bring digital information to customers.

- Needs-based research ordered by customers and research partners, such as testing a new seed coating product and its effect on seed and seedling performance.

"Our goal is to provide the seed industry with accurate, timely services to help our customers succeed in their business," Elias says.

Joe Funk, editor



The Emil Zivney Seed Collection on permanent display at the OSU Seed Lab includes seeds of more than 20,000 species plus more than 4,000 seed pods including the world's largest seed, a double coconut pod from the Republic of Seychelles in the Indian Ocean.