Testing Services

Purity Testing
- AOSA Purity & Noxious Exam
- Undesirable Grass Seeds (UGS)
- Oregon Sod Quality Exam
- Crop & Weed Exam
- ISTA Purity & OSD Exam
- Soil Exam
- Pest & Disease Exam

Viability Testing
- AOSA & ISTA Germination
- AOSA & ISTA Tetrazolium

Vigor Testing
- Cold Test
- Accelerated Aging
- Conductivity
- Seedling Growth Rate
- Speed of Germination
- Seedling Vigor Classification Test

Genetic Traits and Varietal Identification
- Ploidy by Cytometry
- Fluorescence for ryegrass and fine fescue
- Grow-outs of ryegrass and other species
- Varietal Fluorescence Level (VFL)
- Clearfield wheat bioassay
- Sodium Hydroxide for wheat
- Phenol Test

Pathological Tests
- Endophyte
- Pest & Disease
- Orobanche
- Ergot

Other Tests
- Seed Moisture Content
- NMR (oil and protein)
- X-ray
- Test weight (wt/bushel and seed count)
- Chemical tests to detect damage

In addition to standard testing services, we offer a wide range of customized testing and research services. Please contact us to discuss your testing and research needs.

Our Commitment

The OSU Seed Lab is the official seed testing laboratory of the State of Oregon, a member of AOSA and ISTA, and ISTA accredited. As part of a leading university in Agricultural Science, we focus on testing services, but also have a strong capacity to contribute in research and education in our field of expertise. Our customers range from local to national and international. As a customer focused lab, operating in a world of changing needs and opportunities, we innovate constantly to provide relevant and high quality services.

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OSU Seed Laboratory

Seed Vigor Testing

Taking care of people who care about seeds

The OSU Seed Lab is an AOSA and ISTA member laboratory and is ISTA Accredited Laboratory US07

Vigor Testing

Vigor testing provides information about the ability of seeds to produce normal seedlings under less than optimum or adverse growing conditions similar to those which may occur in the field. Seeds may be classified as viable in a germination test which provides optimum temperature, moisture and light conditions to the growing seedlings; however, they may not be capable of continuing growth and completing their life cycle under a wide range of field conditions. Generally, seeds start to lose vigor before they lose their ability to germinate; therefore vigor testing is an important practice in seed production programs.

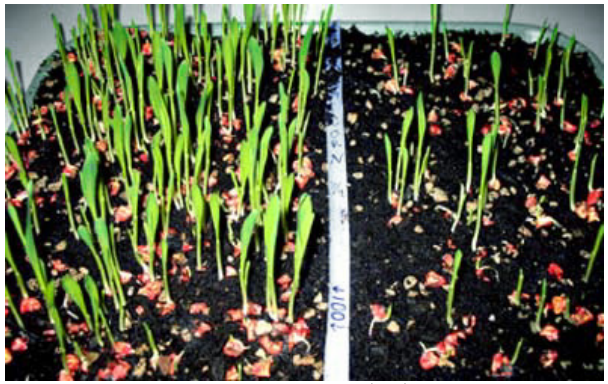
Testing for vigor becomes more important for carryover seeds, especially if seeds were stored under unknown conditions or under unfavorable storage conditions. Seed vigor testing is also used as indicator of the storage potential of a seed lot and in ranking various seed lots with different qualities.

It has been established that the conditions of seed development, maturation, storage and aging influence seed vigor. The general strategy of determining seed vigor is to measure some aspect of seed deterioration or weakness, which is inversely proportional to seed vigor. Below are brief descriptions for some of the most common seed vigor tests that are used.

Cold Test (CT)

The cold test simulates early spring field conditions by germinating the seeds in wet soils (≈70% water holding capacity) and incubating them at low temperatures (5-10°C/41-51°F) for a specified period. At the end of the cold period, the test is transferred to a favorable temperature for germination (e.g., 25°C/77°F in case of sweet corn). The percentage of normal seedlings is considered an indication of seed vigor. Vigorous seeds germinate better under cold environments.

- Used to select cultivars with the best ability to perform under cold wet soils for early spring planting.
- Provides basis for adjusting planting rates for individual seed lots.
- Evaluate the effects of adverse storage conditions, mechanical damage, drying injuries or other effects on seed germination in cold wet soils.



Cold Test in corn. High quality seeds (left) germinate better than low quality seeds (right) under cold stress conditions.

Accelerated Aging Test (AAT)

The principle of this test is to stress seeds with high temperatures (40-45°C/130-139°F) and near 100% relative humidity (RH) for varying lengths of time, depending on the kind of seeds, after which a germination test is made. High vigor seeds are expected to tolerate high temperatures and humidity and retain their capability to produce normal seedlings in the germination test.

- Used to determine the seed vigor of many crops.
- Useful in predicting the potential storability of a seed lot.

Speed of Germination (SG)

High quality seeds germinate faster than poor quality seeds. The number of normal seedlings recorded in the first count represents the population of fast germinating seeds and thus functions as a vigor measurement (AOSA Seed Vigor Testing Handbook).

Seedling Growth Rate (SGR)

At the end of the standard germination test, the dry matter of the seedlings is determined using the oven method. Seedling dry matter was found to correlate closely with vigor (AOSA Seed Vigor Testing Handbook).

Electric Conductivity Test (ECT)

This test measures the integrity of cell membranes, which is correlated with seed vigor. It is well established that this test is useful for garden beans and peas. It has been also reported that the conductivity test results are significantly correlated with field emergence for corn and soybean. As seeds lose vigor, nutrients exude from their membranes and so low quality seeds leak electrolytes such as amino acids while high quality seeds contain their nutrients within well-structured membranes. Therefore, higher conductivity is an indication of low quality seeds and vice versa.

Electric Conductivity Test in soybean. High quality seeds have lower electric conductivity readings than low quality seeds.

Seedling Vigor Classification Test (SVCT)

This vigor test is an expansion of the standard germination test (SGT). The normal seedlings obtained from the SGT results are further classified into 'strong' and 'weak' categories. This test has been used for corn, garden beans, soybean, cotton, peanuts and other crops. In this test, seedlings are classified as 'strong' if they are well developed and free from defects, which is indication of satisfactory performance over a wide range of field conditions. On the other hand, normal seedlings with some deficiencies such as missing part of the root, one cotyledon missing, hypocotyl with breaks, lesions, necrosis, twisting, or curling are classified as 'weak.'