

Seed Testing: Ensuring It is What You Say It Is

SEED TESTING IS A VALUABLE TOOL FOR PROTECTING FARMERS' SEED INVESTMENTS AND IS RAPIDLY BECOMING ONE OF THE MOST IMPORTANT RESOURCES AVAILABLE TO GROWERS. SEED RETAILERS NEED TO ENSURE THEY'RE SPREADING THIS MESSAGE TO THEIR CUSTOMERS.

JUST ASK ANY seed technologist or seed lab worker and they will tell you why seed testing is one of the most important tools in a seed retailer's toolbox today.

WHY IS SEED TESTING IMPORTANT

"Seed testing is more important than ever before because the price of seed corn, as an example, is so high. Seed companies want accurate information on that seed bag so they can make sure the farmer they sell the seed to is getting what they paid for," says Neal Foster, president of the Society of Commercial Seed Technologists.

"For many years seed testing has been critical to customers—farmers, seed companies, greenhouses, etc.—to know what they are purchasing. It is important to seed companies to identify which seed lots are of high quality and hopefully of high vigor. I think seed testing is more important than ever before because even more is riding on the seed being high quality and being of the proper genetics," says Michael Stahr, manager of the Iowa State University Seed Laboratory. "In the case of corn, for instance, farmers pay a lot of money for the protection given by the several biotech traits of



An analyst evaluates a small seeded species on rolled paper towels.

SmartStax and also for the superior genetics that improves yield, protects against drought, prevents lodging and helps in a number of other ways. It is not just justifying the cost of these superior seed products, but also making best uses of other inputs such as fertilizer, fuel, seed treatments and herbicides."

"There is no question that seed testing is becoming more important," says Beni Kaufman, secretary general of the International Seed Testing Association. "We need to ensure the quality of the seeds farmers are putting in to the ground. Therefore seed testing is a critical part of the seed industry's challenge of feeding the world."



KNOW YOUR TESTS

Seed testing can answer a variety of questions and retailers need to know which tests are available depending on the growers' needs.

“SEED TESTING IS A CRITICAL PART OF THE SEED INDUSTRY’S CHALLENGE OF FEEDING THE WORLD.”

—BEN KAUFMAN

BACK TO THE BASICS

With the increased incidence of drought and flooding in recent years—environmental factors farmers can't control—seed testing gives farmers one aspect they can control. Although the seed testing methods used are continuously evolving, industry professionals agree the vigor test is still one of the most important tests farmers should consider.

According to a technical bulletin from the Oregon State University Seed Laboratory, vigor testing does not only measure the percentage of viable seed in a sample, it also reflects the ability of those seeds to produce normal seedlings under less than optimum or

QUESTION	RECOMMENDED TEST
Is the seed of the right variety?	Varietal ID tests
Is it genetically pure?	Genetic purity tests
Does it contain the right traits?	Trait purity tests
Is there adventitious presence of unintended GM seed?	AP/GMO tests
Is it physically pure (free from debris or inert matter)?	Purity tests
Is the seed free from disease and pathogens?	Seed health tests
Is the seed vigorous?	Cold test, accelerated aging test
How well will it germinate?	Warm test, tetrazolium test



Two vigor levels of corn in a tray cold test.

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,” states the bulletin. “Testing for vigor





A seed technologist plants corn on a tray for herbicide bioassay testing of corn that is supposed to be LibertyLink.

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 [an] indicator of the storage potential of a seed lot and in ranking various seed lots with different qualities.”

IMPACT ON FARMERS

The biggest beneficiary of seed testing is the farmer-customer. One of the best-selling features a seed retailer has is being able to say that the product they are selling is what they say it is, and that it’s going to perform the way they say it is.

“SEED TESTING VERIFIES THAT SEEDS ARE WHAT IS LISTED ON THE BAG, WHETHER A 50-POUND BAG OF SOYBEANS OR A SMALL PACKET OF VEGETABLE SEEDS.”

—MICHEAL STAHR

The recent development of high-speed seed counters, some of which also have imaging capabilities, is having a huge impact on growers today. The imaging capabilities have the potential for determining the breakdown of sizes of seeds electronically in addition to traditional methods and refuge-in-a-bag (RIB) products that may be used to determine the percentage of refuge product in a sample.

“For corn farmers, RIB corn has already impacted farmers. Seed companies have done a good job ensuring that the proper amount of refuge corn is present in each bag or bulk bin of RIB corn, but since this there is now RIB corn that is farmer-



returned or otherwise carried over, seed testing allows seed companies to ensure that both portions of RIB corn maintains high quality and vigor," says Stahr.

With the rapid release of new traits in the marketplace, seed testing is keeping up with the technology and adopting new methods that allow for more efficient and accurate testing. "The use of single nucleotide polymorphism, or SNP testing, and even newer high-tech methods, allows seed companies to detect even more aspects of seeds and in a more efficient manner which allows seed companies to provide farmers with even more traits, biotech and otherwise," says Stahr.

Another payoff for the farmer is that by knowing the quality of the seed they intend to put in the ground, they can determine the proper seeding rate to get the uniform plant stand that they desire. Uniform plant stand is beneficial for a number of reasons:

- It will result in an even, thick canopy which will compete with weeds, thereby helping with weed control.
- A heavier stand means decreased tillering which means crop flowers and heads out uniformly allowing for better management of herbicide and fungicide applications.
- Proper timing of these applications is critical to their success, most particularly with fungicides.

By encouraging farmers to spend a few dollars now, retailers can potentially help them save or gain thousands of

dollars in crop by reducing crop inputs or at least ensuring the best chance of success by applying at proper and even staging, and gain yield from a thick, even, healthy crop stand.

SHARING THE MESSAGE

What should seed retailers be telling their farmer customers about seed testing today? Stahr says it's a pretty simple message.

"Seed testing verifies that seeds are what is listed on the bag, whether a 50-pound bag of soybeans or a small packet of vegetable seeds," he says. "Before soybeans with biotech traits came along, my father-in-law used to test soybean seeds harvested the previous fall into a wet dish towel for a few days to see how well they sprouted. This met his needs back when seed beans were pretty inexpensive, but nowadays soybeans with tolerance to herbicides and with improvements such as higher linolenic acid are much more expensive. Therefore, the farmer and the seed company want more accurate information about the seed lot."

Stahr says testing has become extremely specialized and farmers need to know what their options are. "In the case of native species it takes a highly skilled purity analyst to know the difference between 400 or more species of seeds that might be in a seed sample. In addition to seed company seed labs, which generate accurate data, there are also private labs and official labs which are not affiliated with any seed company," he says.

DID YOU KNOW?

According to Stahr, a number of things about today's seed testing techniques would likely surprise farmers and should be better communicated to them.

"In addition to planting on paper towels—not kitchen paper towels—some species can be planted on crepe cellulose paper, which is pretty much large sheets of disposable baby diapers," he says. "It may sound strange, but this product allows for higher throughput and is friendlier to some species than other substrates."

Stahr says seed companies and seed labs are very concerned with seed lots being properly sampled. "Four hundred seeds planted in a warm germination test or 200 seeds planted in a cold test has been statistically determined to well represent thousands of pounds of seeds if the sample was properly obtained," he says. "Something else that farmers might not know is that a purity analyst typically handles 2,500 seeds for a purity test and 25,000 seeds for a noxious weed exam. Although examination of some grass species can be aided by using a seed blower, it takes a highly skilled purity analyst to correctly identify the thousands of seeds in a sample."

