BETTER SEEDS TO SOW

The crops we rely on for food, fiber, and biofuels start with high quality seeds. Healthy seeds are also necessary for animal feed, habitat restoration, and landscaping. Farmers, researchers, land managers, and others invest a lot of money in seeds with desirable characteristics or treatments like special coatings that protect them. When farmers and others pay more for seed, they expect better performance, but seeds face many issues. Seeds may sprout prematurely or go dormant unexpectedly. Seeds must be able to withstand shipment and storage and perform reliably under diverse field conditions.

Researchers from 16 land-grant universities are digging into seed development and finding ways to prevent seed issues. This work has led to higher quality seeds and more accurate predictions of seed performance, helping growers make cost-effective seed selection and ensuring hardy, beautiful plants for food, fiber, fuel, landscaping, habitat restoration, research, and other uses.

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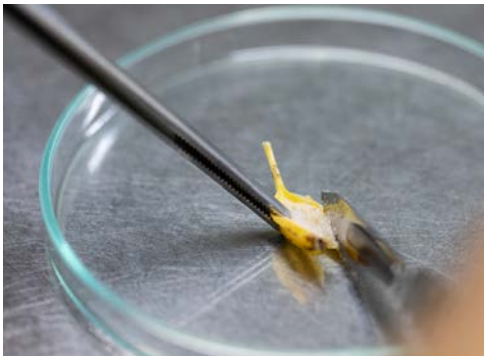
RESEARCH HIGHLIGHTS

Scientists studied the effects of the environment on seed quality (Iowa) and determined the temperature needed for germination of several seed species, showing which are best suited to certain growing conditions (Kentucky, Virginia).

Studies showed the best strategies for planting seeds and seedlings. For example, planting onion fields with container-grown transplants is an affordable way to produce earlier crops, reducing the time plants are exposed to stressors (Texas).

Scientists developed tools to assess seed quality and performance more accurately and affordably. Many of these tools require less time and labor and work on a commercial scale (California, Kentucky, Virginia). New techniques to stop seed dormancy and induce germination allow seed analysts to assess the germination percentages of a seed 2-8 weeks sooner (Kentucky).



Researchers screened genes for resistance to diseases that affect seed performance (Virginia, Iowa) and used gene editing to develop lettuce seed that is reliable in warm temperatures (California) and beet germplasm that performs well under high- or low-temperature conditions (Michigan).

Research has led to better strategies for collecting and preserving the seeds of native plants and strategies for seeding successful restoration efforts (Florida).

Researchers developed new seed treatments to enhance performance. For example, plant proteins applied in seed coatings may improve early vegetable crop growth and uniformity and hydro-priming can enhance germination, root length, and surface area. Researchers also made a device for coating of small seed lots, which are difficult to treat uniformly and calculated the seed treatment dosage needed to eradicate internal pathogens (New York, Iowa).

Scientists created drying systems and moisture-proof packaging to prevent the rapid loss of seed viability in warm, humid climates and mold and insect damage to stored grains (California).

A portable near-infrared device to determine optimal harvest timing for grass seed crops could result in yield and quality increases worth $29 million annually (Oregon).

Researchers are also making a difference by mentoring students and interns and preparing future generations of seed scientists (Florida, Oregon, others). Researchers and Extension educators held field days, trainings, and other outreach events that taught producers valuable techniques (Texas).