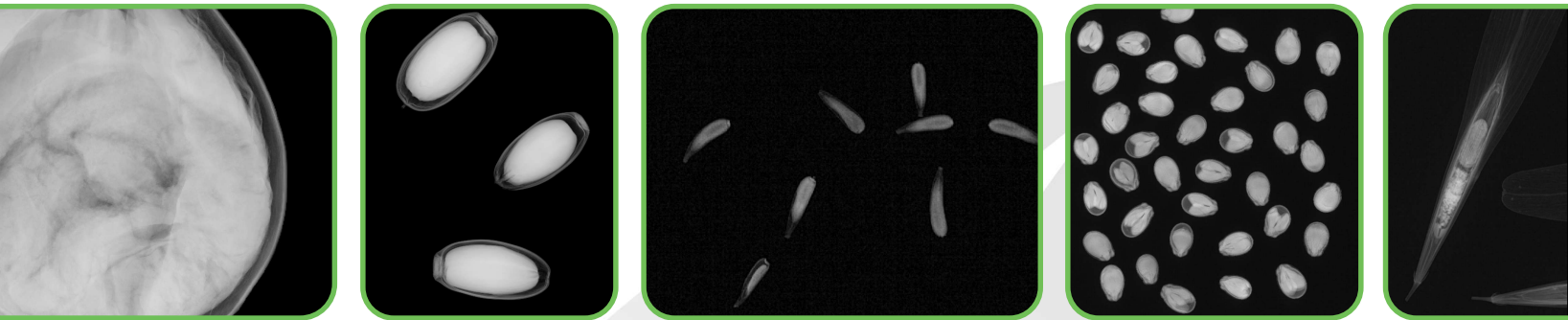


# From Obscured to Obvious

There’s A Smarter Approach to Seed Analysis,  
With XSEED® X-ray Imaging



X-ray offers a more efficient and insightful alternative to traditional seed testing methods - users can detect internal defects, reduce seed consumption, and optimize quality assessment without destructive testing.

Traditional Seed Testing Method	Drawbacks of Method
Tetrazolium Chloride (TZ)	Requires specialized training
	Tedious examination
	Time consuming per sample
	Potential discrepancies with germination
	Destructive
	Not a comprehensive test of seed quality
Germination	Time consuming
	Requires specific conditions
	May not predict field performance
	Costly; can require germination chambers and/or professional lab service
	Consumes seeds if the goal is seed banking
Excised embryo (cut test)	Destructive
	Can be labor intensive

Hidden in a protective coat, internal seed morphology can reveal valuable insight. Campos et al. found that the quality of a seed can be evaluated, and germination potential and seedling performance can be predicted – accurately, by X-ray imaging<sup>1</sup>.



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# XSEED®: A Rapid, Non-Destructive Way to Assess Quality

## Detect Internal Defects

- Insect infestations and cracks or voids in latent seed structures.
- Overlay X-ray images with optical images of external seed properties using Image Blender\*, to map externally visible damage to internal seed structures.

## Reduce Seed Consumption

- Save valuable, rare, or endangered seeds with non-destructive testing

## Minimize Risk

- Identify dead or abnormal seeds to reduce the risk of seeds that fail to germinate or that result in damaged, unhealthy, or unusable seedlings.

## Optimize Seed Quality Assessment

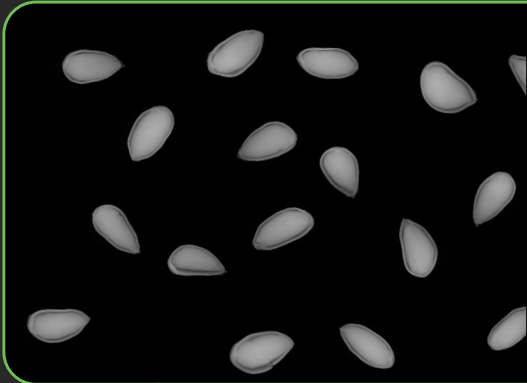
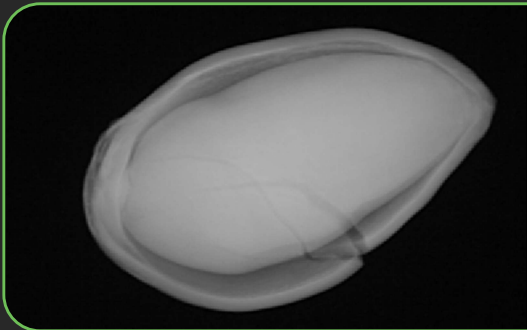
- Obtain detailed visualization of internal morphology in fully intact seeds
- Evaluate embryo development and endosperm completeness
- Determine seed quality and viability in seconds
- Gain valuable insight which can help predict germination success and seedling performance

## Customize Analysis

- Customizable image analysis parameters for different species
- Density Profiling capability for analyzing differing densities in seeds.

## Expand Capabilities

- Use X-ray imaging for agricultural or botanical applications like imaging insect infestations in plant tissues such as floral stems or maize plants2
- Designed to fit the needs of your unique seed and agricultural analysis



Experience the Next Benchmark Solution for Agriculture and Seed Analysis

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SCIENTIFIC

- 1. Campos, Thiago & Pereira, Vania & El merzougui, Soumaya & Beleski, David & Pérez, Héctor & Lopes, Pivetta & Vendrame, Wagner. (2024). Cryopreservation of Lavender Trumpet Tree (Handroanthus impetiginosus) Seeds. Horticulturae. 10. 1256. 10.3390/horticulturae10121256.
- 2. Keszthelyi, S., Pónya, Z., Csóka, Á. et al. Non-destructive imaging and spectroscopic techniques to investigate the hidden-lifestyle arthropod pests: a review. J Plant Dis Prot 127, 283–295 (2020).
- \* Available on XSEED and XSEED Plus