

From Obscured to **Obvious**

There's a Smarter Approach to Seed Analysis,
With XSEED® X-ray Imaging



KUBTEC®
SCIENTIFIC

WHY XSEED?

XSEED® is a range of high-resolution X-ray imaging systems and software solutions that allow for accurate, non-destructive assessment of seed quality and viability, and can help predict germination potential.

Agricultural & Horticultural Needs

Crop Yield Improvement

Seed and Plant Research

Seed Quality and Agricultural Inspection

Seed Conservation

How XSEED Can Help Meet Them

Non-destructive imaging

Detailed visualization of internal morphology

Detect cracks and damage to seeds; image insect infestations in seeds and plant tissues

Better predict germination success and seedling performance

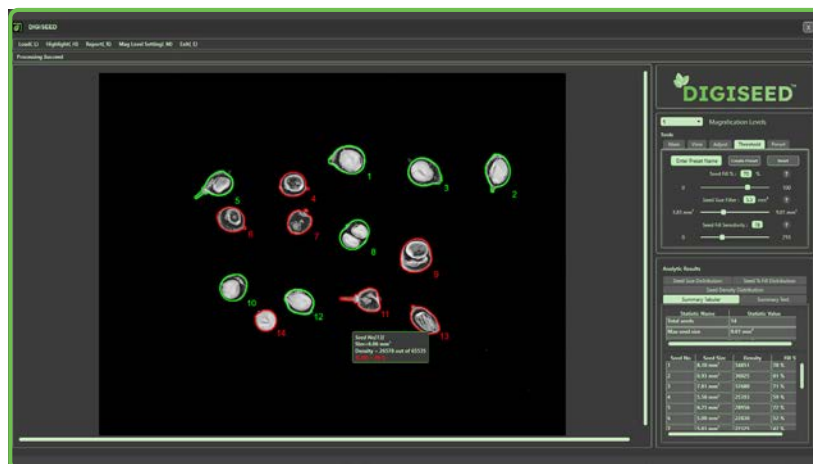
Signal-to-Noise Improvement



XSEED Systems improve the signal-to-noise ratio by >20-40%, as compared to the same system without XSEED system updates.

Quick, Customizable Analysis for Your Unique Imaging Needs with DIGISEED® Seed Analysis Software

DIGISEED® Seed Analysis Software, included on all XSEED Imaging Systems, provides researchers and seed specialists with the tools needed for precise, customizable, and repeatable seed analysis.

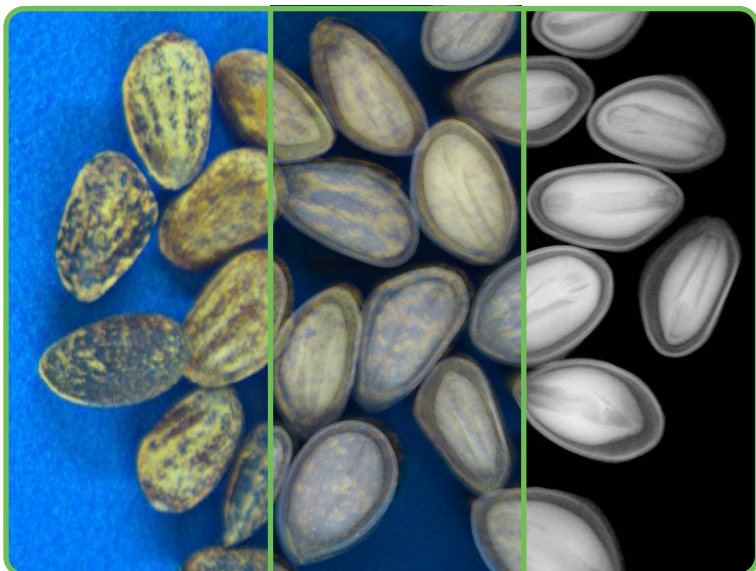


DIGISEED Seed density distribution analysis with histogram

DIGISEED Features:

- Simple and accurate batch analysis
- Presets for convenient repeat analysis
- Quantifies seed size, count, density, and fill percent in seconds
- Customizable to accommodate and quickly analyze a wide variety of seed species

Image Blender™: Convenience Made Simple



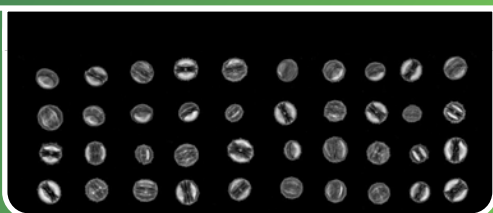
XSEED and XSEED Plus systems are equipped with Image Blender™, an innovative camera system that combines X-ray and optical images.

This combination provides the ability to map externally visible damage to internal seed structures, as well as conveniently identify labeled samples, as sample data can be embedded right in the image.

XSEED^{plus}

Highest Resolution for the
Finest Details

- Largest Imaging Area
- Image Blender
- Highest Signal-to-Noise Ratio
- Proprietary Imaging Algorithms
- 27" High-Resolution Monitor

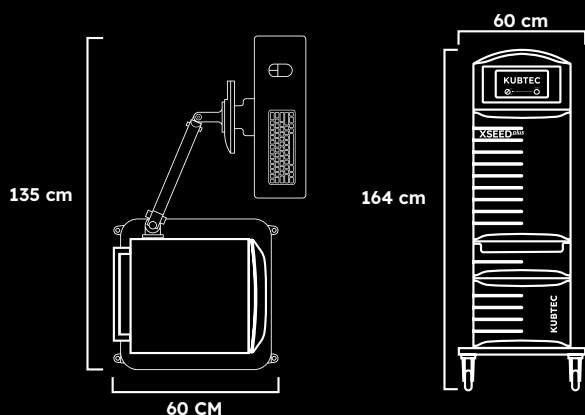


With The XSEED plus System's
24 x 31 cm imaging area, you
can easily see an entire well
plate in one view.



XSEED Plus Specifications

Imaging area	24 x 31 cm
Magnification	5 levels, up to 3x
External dimensions	60 x 60 x 164 cm
Internal dimensions	50.8 x 37.5 x 39.7 cm
Weight	310 lbs (140 kg)



XSEED

High-Resolution X-ray Imaging

- Large Imaging Area
- Image Blender
- High Signal-to-Noise Ratio
- Proprietary Imaging Algorithms
- 27" High Resolution Monitor



XSEED^{mini}

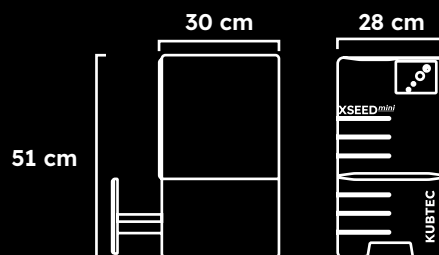
Compact, Benchtop System

- High Signal-to-Noise Ratio
- Proprietary Imaging Algorithms
- 22" High Resolution Monitor



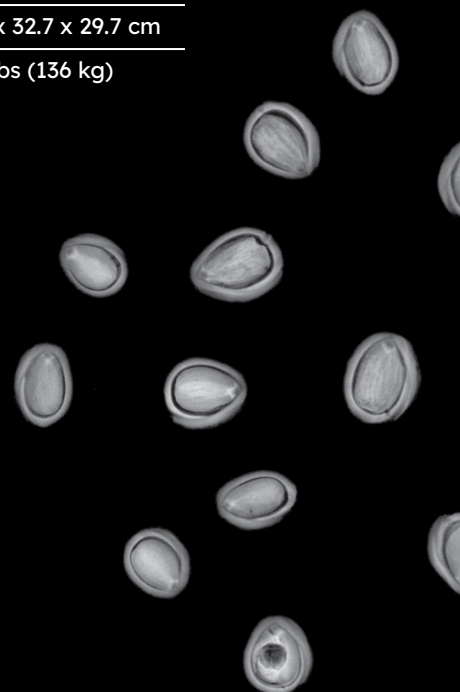
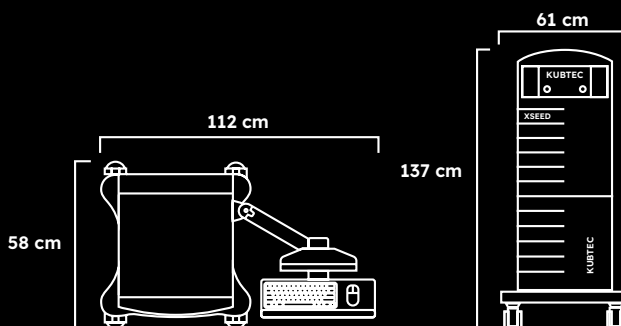
XSEED Mini Specifications

Imaging area	Lower drawer: 7 x 12 cm Upper (mag) drawer: 4 x 8 cm
Magnification	2 Levels, up to 1.4x
External dimensions	28 x 30 x 51 cm
Internal dimensions	Lower drawer: 17.5 x 20.8 x 3.2 cm Upper (mag) drawer: 15.1 x 16.7 x 2.5 cm
Weight	70 lbs (32 kg)



XSEED Specifications

Imaging area	12 x 15 cm
Magnification	4 Levels, up to 2x
External dimensions	58 x 61 x 137 cm
Internal dimensions	36.2 x 32.7 x 29.7 cm
Weight	300 lbs (136 kg)



Designed to meet a range of budgets and imaging needs, XSEED has a system for your unique seed and plant analysis needs.

See which XSEED system is right for you:

System Specifications



Feature	XSEED Mini	XSEED	XSEED Plus
Dimensions	28 x 30 x 51 cm	58 x 61 x 137 cm	60 x 60 x 164 cm
Weight	70 lbs (32 kg)	300 lbs (136 kg)	310 lbs (140 kg)
Image area	7 x 12 cm	12 x 15 cm	24 x 31 cm
Magnification	Up to 1.4x	Up to 2x	Up to 3x
Magnification levels	2	4	5
Monitor	22"	27"	27"
Optical well plate holder insert	N/A	Yes at lowest magnification level	Yes, up to third level
Signal-to-noise ratio Improvement	>20%	>38%	>40%

X-ray Imaging: Confirmed by ISTA

X-ray imaging is confirmed by ISTA (International Seed Testing Association) as a method to quickly differentiate between empty and filled seeds, and to detect insect damage or physical damage in seeds¹.

1. Chapter 14, ISTA Rules; Chapter 14, ISTA Tree and Shrub Seed Handbook

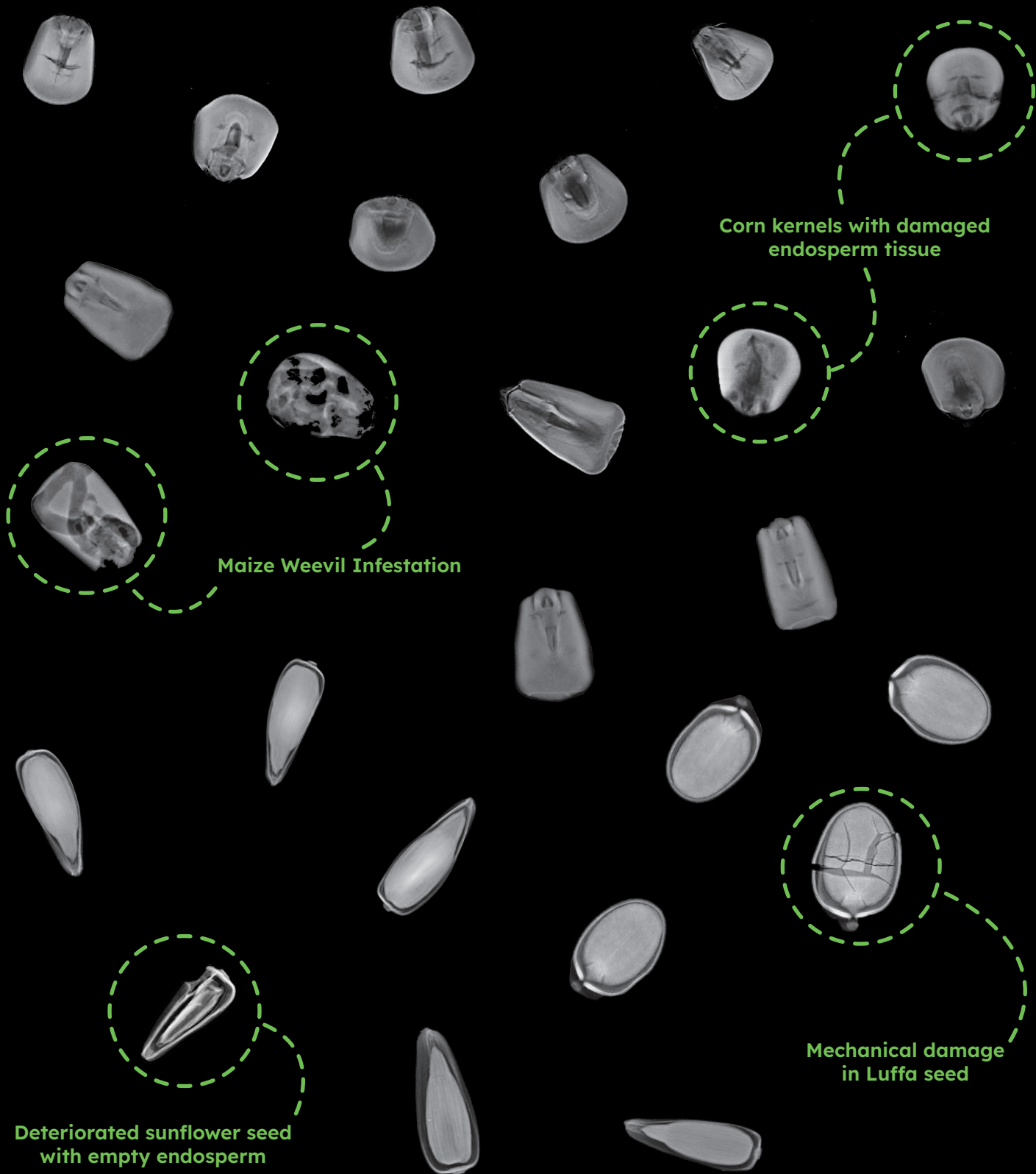
The XSEED System provides X-ray images allowing for fast visualization of insect or physical damage, and software that can determine Percent Fill of seeds.

System Features Comparison

Feature	Benefit	XSEED Mini	XSEED	XSEED Plus
Highest image quality	Image fine details and very small seeds			✓
Largest imaging area	Image more seeds or larger plant specimens in one view			✓
HD optical camera	Inspect exterior seed color and patterning in the same imaging session		✓	✓
Image Blender	Combine X-ray and optical for images that capture the best of both worlds.		✓	✓
Benchtop system	Space-saving	✓		
Multiple levels of magnification	More detailed seed imaging	✓	✓	✓
DIGISEED software with adjustable image analysis filters	Parameters can be customized for different species to meet the needs of your unique seed analysis requirements	✓	✓	✓
Image analysis presets	Quick and convenient analysis	✓	✓	✓
Density Profile	Analyze varying densities within a seed	✓	✓	✓
Copy Path	Save images to two locations simultaneously	✓	✓	✓
Fast image acquisition	High-throughput seed analysis	✓	✓	✓
Self-contained cabinet systems	Safe to use - No chance of exposure to X-ray	✓	✓	✓
Short calibration time	Less waiting	✓	✓	✓
Simple operation	Get up-and-running quickly	✓	✓	✓
Top-tier service and support	Less downtime	✓	✓	✓

Why KUBTEC® Scientific:

At KUBTEC Scientific, we are passionate about developing transformative technologies that enable advanced research and development in preclinical and agricultural applications. For over 20 years, we have been at the forefront of X-ray imaging and irradiation technology, offering the most comprehensive range of systems for studying disease and agriculture. Our innovative, proprietary technologies, such as DIGISEED software for seed analysis, Image Blender, and DIGIMUS software for preclinical DXA analysis in small animals, are providing the tools researchers need to address the most demanding questions.



Corn kernels with damaged endosperm tissue

Maize Weevil Infestation

Mechanical damage in Luffa seed

Deteriorated sunflower seed with empty endosperm