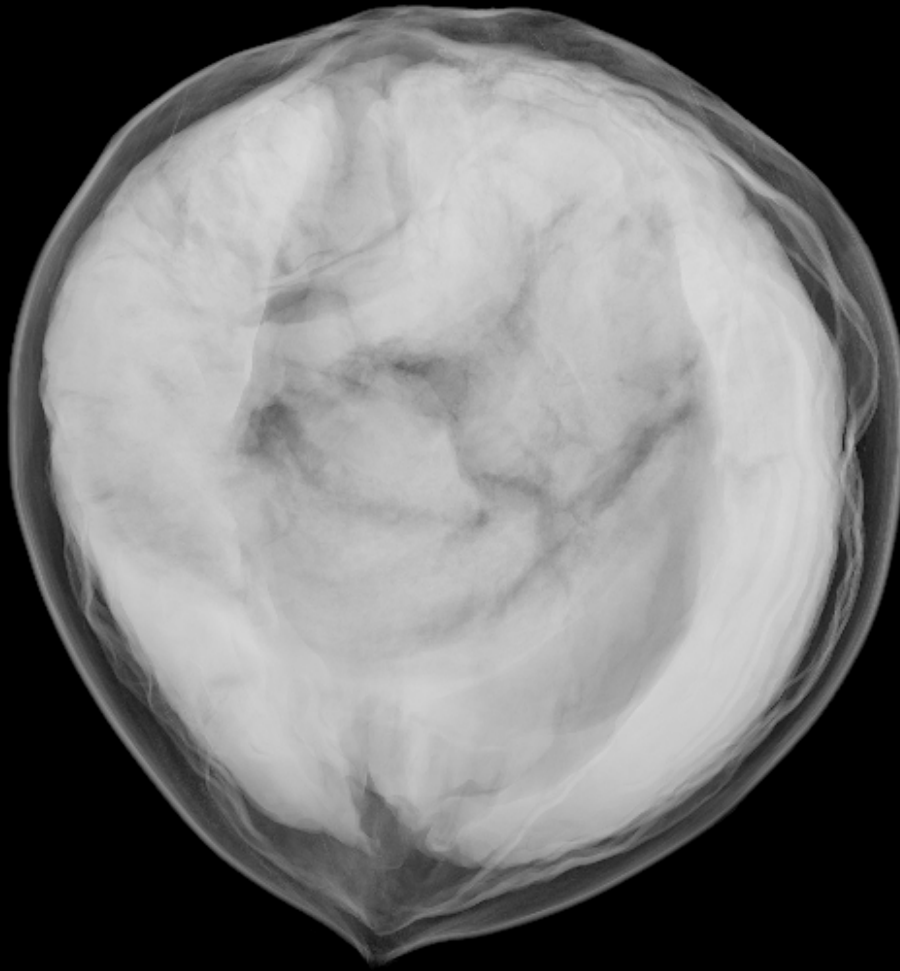# From Obscured to Obvious

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

The Next Benchmark Solution for Agriculture and Seed Analysis

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.

Applications of XSEED Systems

|	
Seed quality and agricultural Inspection	Detect cracks and damage to seeds; image insect infestations in seeds and plant tissues
Seed Conservation	Non-destructive imaging
Crop Yield Improvement	Better predict germination success and seedling performance
Seed and Plant Research	Detailed visualization of internal morphology
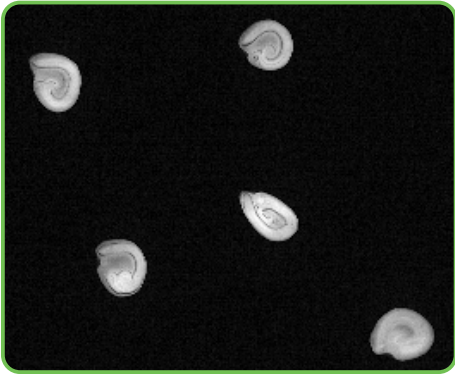
Signal to Noise Improvement

>20%

>38%

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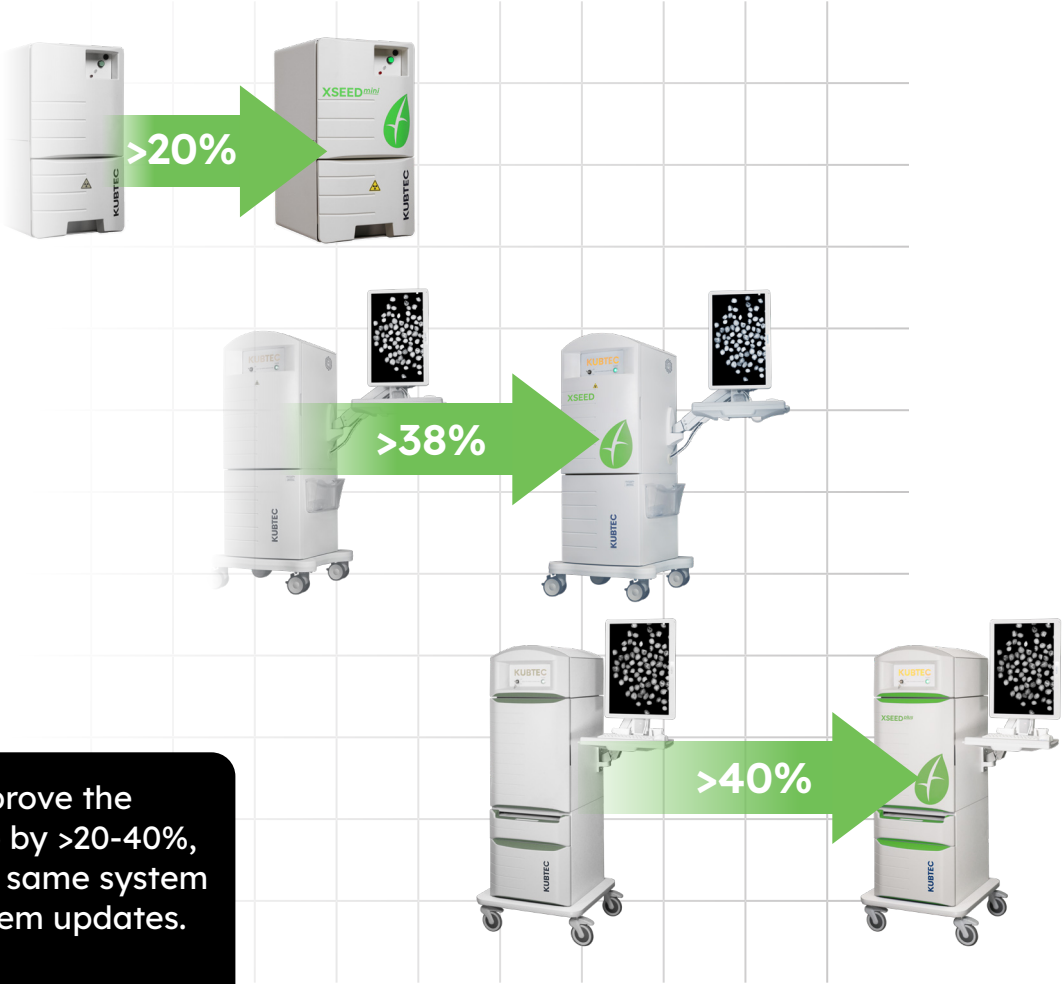
XSEED Systems improve the signal to noise ratio by >20-40%, as compared to the same system without XSEED system updates.

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.
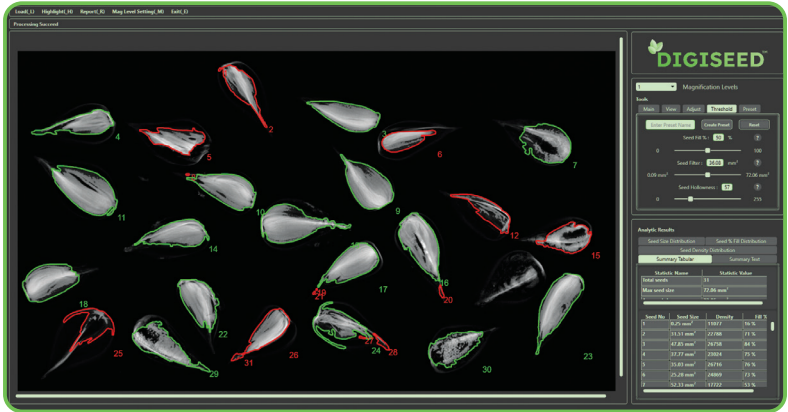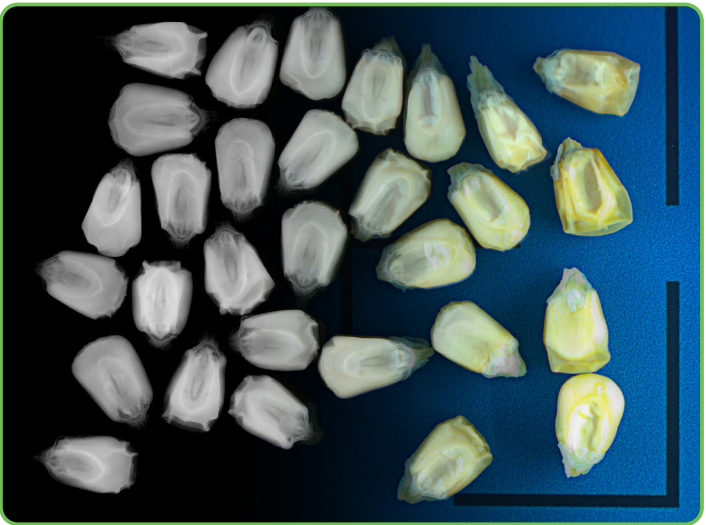
DIGISEED Seed density distribution analysis with histogram

DIGISEED Features:

• **Simple and accurate batch analysis**

• **Presets for convenient repeat analysis**

• **Provides seed size, count, density, and fill % in seconds**

• **Can be customized 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.

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 seeds[1].

The XSEED System can provide X-ray images of seeds showing insect or physical damage, and software that can determine Percent Fill of seeds.

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

XSEED *plus*

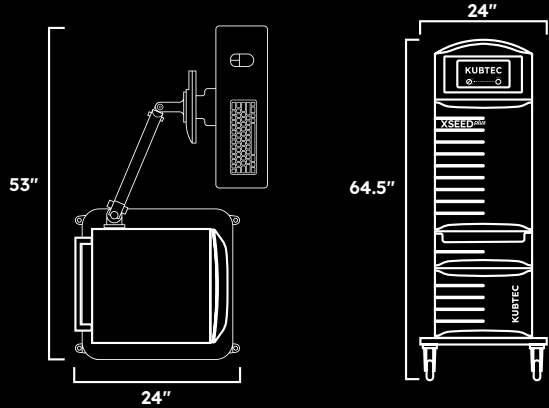## Highest Resolution for the Finest Details

- Largest Imaging Area
- Image Blender
- Highest Signal to Noise Ratio
- Proprietary Imaging Algorithms
- 27" High Resolution Monitor
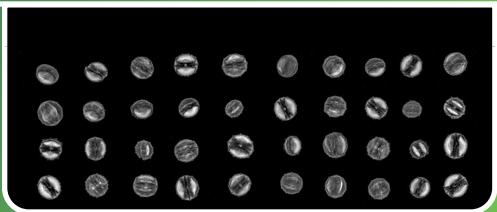
With The XSEED plus System's 24cm x 30cm imaging area, you can easily see an entire well plate in one view.
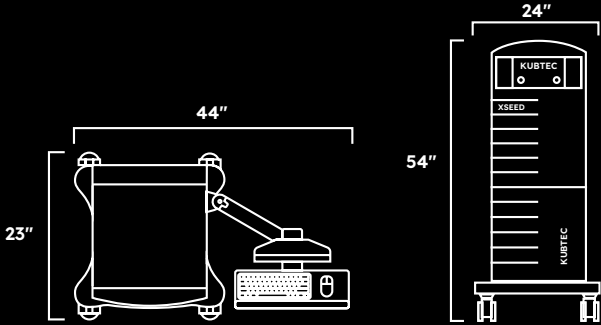
XSEED Plus Specifications	
Imaging area	24 x 30 cm
Magnification	5 levels, up to 3x
External dimensions	60 x 60 x 164 cm
Internal dimensions	50.8 x 37.5 x 39.7 cm
Weight	310 lbs (140 kg)

53"
24"
24"
64.5"

XSEED *mini*

Compact, Benchtop System

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

XSEED Mini Specifications	
Imaging area	Lower drawer: 6 x 11 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)

12"
11"
20"

XSEED

High Resolution X-ray Imaging

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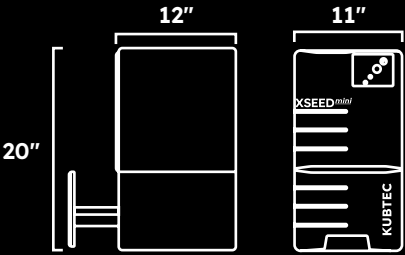- Proprietary Imaging Algorithms
- 27" High Resolution Monitor

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)

44"
24"
23"
54"

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

See which XSEED system is right for you:

Feature	XSEED Mini	XSEED	XSEED Plus
Dimensions	28 x 30 x 51 cm	60 x 60 x 164 cm	60 x 60 x 164 cm
Weight	70 lbs (32 kgs)	300 lbs (136 kgs)	310 lbs (140 kgs)
Image area	7 x 12 cm	12 x 15 cm	24 x 30 cm
Magnification	Up to 1.4x	Up to 2x	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%

Feature	Benefit	XSEED Mini	XSEED	XSEED Plus
Highest image quality	Detect cracks and damage to seeds; image insect infestations in seeds and plant tissues			X
Largest imaging area	Non-destructive imaging			X
HD optical camera	Better predict germination success and seedling performance		X	X
Image Blender	Detailed visualization of internal morphology		X	X
Benchtop system	Space-saving	X		
Multiple levels of magnification	More detailed seeds	X	X	X
DIGISEED software with adjustable image analysis filters	Parameters can be customized for different species to meet the needs of your unique seed analysis requirements	X	X	X
Image analysis presets	Quick and convenient	X	X	X
Density Profile	Can be used to analyze differing densities within a seed	X	X	X
Copy Path	Allows users to save images to two locations at the same time	X	X	X
Fast image acquisition	High throughput seed analysis	X	X	X
Self-contained cabinet systems	Safe to use - No chance of exposure to X-ray	X	X	X
Short calibration time	Less waiting	X	X	X
Simple operation	Get up-and-running quickly	X	X	X
Top-tier service and support	Less downtime	X	X	X

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 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 Image Blender, DIGISEED software for seed analysis, and DIGIMUS software for preclinical DXA analysis in small animals, are providing the tools researchers need to address the most demanding questions.

KUBTEC® SCIENTIFIC