KUBTEC® SCIENTIFIC

Seed Size Imaging Guide

XSEED® X-ray Imaging & Analysis Systems

Though all XSEED® systems are equipped with cutting-edge technology for high-resolution imaging capabilities, each system is best suited to image certain seed characteristics and seeds within approximate size ranges.

For seeds 1-2 mm or smaller, we recommend that samples be sent to us for imaging to ensure the selected system will meet your needs.

XSEED Mini

Reliably resolves seeds approximately 3.0 mm and above.

Suitability:

Suitable when the primary need is to detect:

- Filled vs. empty seeds
- Insect infestation
- Large structural defects

The XSEED Mini can help identify physical damage in the seed, supporting quick and reliable seed quality assessment of small batches.

Recommendations:

For cases requiring detailed embryonic structure visualization in small and tiny seeds, fine internal tissue contrast below ~2 mm resolution for tiny seeds, or situations where the intent is to magnify extensively for micro-level analysis, we recommend the XSEED or the XSEED Plus, depending on the specific needs.

For very small or low-density seeds, we recommend the XSEED Plus, as finer internal particulars will be more clearly resolved.

XSEED

Reliably resolves seeds down to approximately 2.0 mm in size (in magnification).

Suitability:

Designed for users who need to analyze internal seed structure beyond fill–empty distinction, including:

- Embryo positioning
- Partial development
- Void fraction analysis

The XSEED offers a balanced performance between throughput and detail, making it suitable for medium-sized seeds and general viability assessments.

Recommendations:

In cases that demand ultra-fine embryonic structure visualization or for imaging very fine or less dense seeds, we recommend the XSEED Plus, as finer internal details will be more distinctly visible.

XSEED Plus

Reliably resolves seeds down to approximately 1 mm in size.

Suitability:

The XSEED Plus is equipped with a 23 x 29 cm direct-capture detector that minimizes light scatter, preserves high contrast and spatial fidelity, and offers up to 3x geometric magnification. These enhancements deliver exceptional image clarity and contrast, making the system ideally suited for detailed analysis of very small seeds and fine internal structures.

Engineered for customers who require the highest imaging capabilities, the XSEED Plus enables detailed visualization of internal seed anatomy, including embryo/endosperm differentiation, and micro-defects.

Ideal for research laboratories, gene banks, seed conservation authorities, and seed technologists working with small or complex seed types such as wildflowers.

The XSEED Plus has the highest resolution of the XSEED line of systems, enabling:

- More defined edges due to lower image noise
- Dynamic range and contrast so that small density differences become visible
- High contrast and spatial fidelity made possible by direct-capture technology