

New Techniques For Reading Seed Radiographs Save Time

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When the purpose of X-ray examinations of seed lots is to select individual seeds for further study, some means of identifying particular seeds by position is necessary. This has often been done by arranging the seeds in a regular pattern for the making of the radiograph and subsequently picking out seeds which show the desired characteristics, using the X-ray image as a chart. Various devices consisting of rows and lines of cells have been used for this purpose.

Multiple cell devices have two shortcomings: (1) Arranging the seeds is somewhat time-consuming; (2) usually the number of seeds which can be regularly arranged over a given area of film is considerably fewer than the number which can "close-packed" in a single layer. The latter point particularly important when seeds are being examined for presence of insect larvae or pupae, for in such cases, inspection of total lots rather than of samples may be required.

The basic device used for the technique described in this note is a frame of the same size as the film to be used. This frame is provided with an adhesive surface and a small insert area for shadow labeling to identify the seed lot of sample. Seed is spread in a single layer, close packed on the adhesive surface, and the exposure made in the X-ray apparatus. After the negative or

print is processed, it is placed next to the adhesive frame and seeds on the frame are matched with their X-ray images by either of two devices:

The more convenient device is a magnifying mirror stereoscope of the type commonly used in viewing stereopairs of aerial photographs (cost approximately \$200). The X-ray negative over a light table, or more conveniently, a positive paper print (Polaroid or similar process) is placed under one mirror of the stereoscope, and the frame with seeds is placed under the other. The X-ray image and the direct image of the seeds are brought into coincidence, enabling the operator to "see through" each seed on the frame. Particular seeds may be picked off the frame with forceps, and the counterpart X-ray images marked with a wax pencil.

When a mirror stereoscope is not available, a drafting machine (costs range from \$15 to \$150) may be used. The procedure is to place the zero point of the horizontal scale arm of the protractor on the X-ray image, and to use a second point on this scale corresponding to the horizontal displacement between X-ray image and seed frame as the pointer to the corresponding seed. As with the stereoscope, the X-ray negative or print and the adhesive frame must be so arranged that their margins are parallel.

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