

Hila of Full and Empty Longleaf Pine Seeds are Distinguishable

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Full and empty seeds of most longleaf pine trees (*Pinus palustris* Mill.) can be separated with a high degree of reliability by examining the hila. In this species the hilum, which marks the place where the seed was attached to the cone scale, is large enough to observe without a hand lens. It is located where the wing is joined to the seed. In all but a very few longleaf pine trees, seeds having a distinct hilum are full, while those with a faint scar are empty. Figure 1 shows the difference in prominence of the hilum on full and empty seeds from a single tree.

Longleaf seeds are too buoyant for sorting by water-alcohol flotation, while gravity tables, blowers, and other conventional equipment work well only with fairly large quantities. When cutting tests cannot be made and when time or equipment is lacking for determinations with X-rays or balances, the method described here may be useful for small lots, such as frequently result from tree-breeding experiments.

The effectiveness of the technique was verified by separating 1,993 seeds, representing 14 different trees, into 1,393 "full" seeds and 600 "empty," on the appearance of the hila alone. Cutting tests showed that 97 percent of the determinations had been correct. In one aberrant tree, determinations were 83 percent correct; in all others they were at least 95 percent correct and in 6 instances they were perfect.

Three precautions should be observed. First, only seeds with wings or wing stubs still attached should be examined, as the hilum is

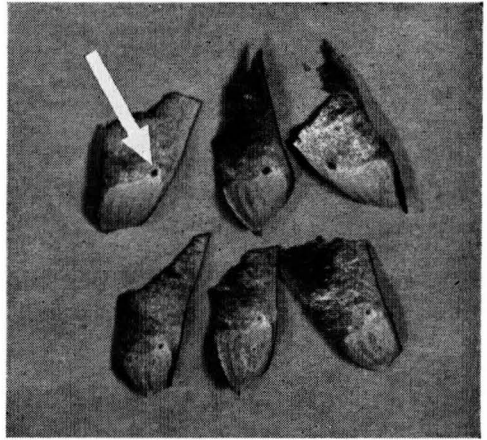


FIGURE 1. The three longleaf seeds at top have distinct hila and are full; those at bottom have indistinct hila and are empty (hilum of first seed is indicated by arrow).

obscured if the entire wing is removed. This requirement is no great drawback, because longleaf wing stubs almost never become detached. Second, seed from different trees should be kept separate; otherwise, tree-to-tree variations in color and size of seed and in character of the hilum reduce the reliability of the technique. Third, in an occasional longleaf pine ill-defined hila may reduce the accuracy of determinations. In such instances, errors will have to be accepted, or full and empty seeds will have to be separated by X-rays or by weighing.