

STORING AVOCADO SEEDS AND HASTENING GERMINATION

F. F. HALMA and E. FROLICH

University of California, Los Angeles

In the past several years avocado trees have been propagated for rootstock trial purposes. This necessarily involved the collecting of seeds of many Mexican as well as Guatemalan varieties, which mature at different times of the year.

Until the method of storing seeds discussed below was used, the seeds of the different varieties were planted as they became available. This practice was unsatisfactory because it resulted in a nursery in which seedlings of the early varieties (Guatemalan) often reached budding size before seeds of the late varieties (Mexican) became available.

Another factor which contributed to seedling size variation in the nursery was delayed and/or uneven germination of some varieties, especially Guatemalan. In some cases the delay in germination amounted to several months, and usually this was associated with very irregular germination.

To record the progress made toward overcoming these storage and germination problems is the purpose of this report.

SEED STORAGE

The method which has been used successfully for the past two years consists of packing the washed and air-dried seeds in boxes containing dry peat moss, then storing them in a 150 cubic foot "Walk-In" refrigerator in which a temperature of about 42 degrees F. was maintained. The relative humidity, which could not be controlled, was over 90%. No other packing materials or temperatures were tested.

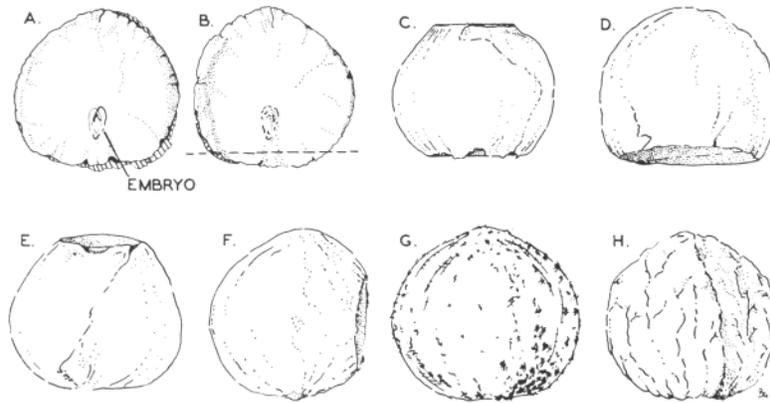


Fig. 1. *Various means of hastening germination: (A) one-half of a seed showing embryo; (B) location of the embryo in relation to the bottom cut (dotted line); (C) top and bottom cut which was found most satisfactory; (D) bottom cut; (E) top cut; (F) side cut; (G) scarified with wire brush; (H) seed coat removed. Drawing by Barbara Gillooly.*

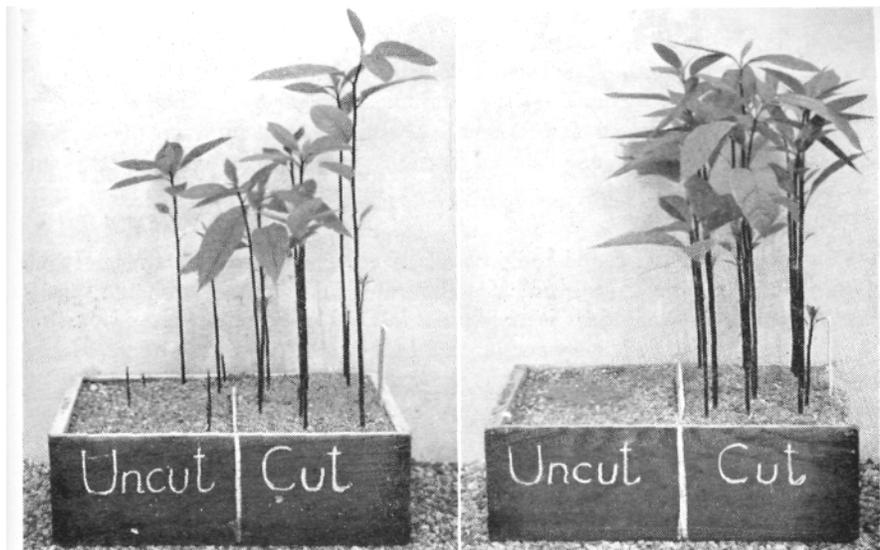


Fig. 2. *Effect of cutting off portions of bottom and top of the seeds 4 months after planting. (A) fresh seed; (B) seed stored for 11 months. Photograph by O. Hagaman.*

The results of several tests may be summarized by stating that none of the 12 Guatemalan and 8 Mexican varieties used showed any appreciable amount of decay up to eight months of storage. This was entirely satisfactory, since none of the seed lots needed to be held longer than six months. The effects of longer storage varied: In some lots a maximum of 12% of decay was found at nine months; in others practically none, even after 15 months. Generally seeds with partially separated or poorly sealed cotyledons did not keep as long as those with tight sutures. Storage did not affect the vitality of the embryo, but it caused delayed germination. This delay seemed to increase with length of storage period.

HASTENING GERMINATION

Various means of overcoming delayed and irregular germination were tried. As shown in figure 1, they included seed coat removal, already shown by Eggers* to be effective, scarification, and mutilation by cutting off portions of the cotyledons. All of these treatments were effective, but in varying degrees. Removing the seed coat seemed to be least effective with seeds with tightly sealed cotyledons. Moreover, the seed coat of some varieties adheres too tightly to make its removal practical.

The most satisfactory results were obtained when parts of the top and bottom of the seed were cut off (fig. 1C). Since it proved to be a practicable method, it was used for all varieties. It has also given the most uniform germination, even with varieties which ordinarily germinate easily without any treatment. The method has the additional advantage in that the cut at the basal end often reveals defects or decay which do not show on the surface of the uncut seed. Top and bottom portions removed amount to less than 5% of the weight of the seed and, as shown in figure 1B, there is no danger of injury to the embryo.

The treatment was found to be especially effective in overcoming delay in germination caused by storage. This is illustrated in figure 2. Fresh and stored (for 11 months) Nabal seeds were planted in sand and placed in a glasshouse. Half of the seeds in each lot were cut and half were left intact. Four months later there were no visible sprouts in the uncut, stored lot and only a few in the uncut, fresh lot. On the other hand, practically all cut seeds of both lots germinated within a month.

SUMMARY

Avocado seeds of 20 varieties, packed in dry peat moss and stored at 42 degrees F, kept well for at least 8 months.

Cutting off a small portion of both ends of the seeds promoted quicker and more even germination.

**Eggers, E. R. Effect of the Removal of Seed Coats on Avocado Seed Germination. Calif. Avocado Soc. Yearbook, 1942, pp. 41-43.*