A METHOD OF STIMULATING THE GERMINATION OF SUGAR MAPLE SEEDS

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When seeds were stratified in aluminum foil pockets, 95 percent germinated within 18 days after the onset of germination; with current methods, germination took 46 days to reach 95 percent.

Recommendations for laboratory germination of sugar maple (*Acer saccharum* Marsh.) seeds suggest that seeds are stratified on germination paper at 35° to 37° F for 90 days (Forest Service, U.S. Department of Agriculture, 1974).

Carl and Yawney (*3*) compared the effectiveness of sand, perlite, sphagnum moss, and germination paper as stratification and germination media for sugar maple seeds. They four that all four media were equally effective in providing both a suitable substratum and adequate moisture for afterripening. They suggested that the use of germination paper in a plastic box was especially convenient.

While working with these seeds when plastic boxes were not available, it was observed that sugar maple seed germination was completed more quickly when they were stratified within the folds of moistened paper towels that were wrapped with aluminum foil.

In the present study, the effectiveness of the germination paper—plastic box method was compared with stratifying seeds on a paper towel wrapped in aluminum foil.

Table 1.—*The effects of different methods of stratifying sugar maple seeds on the length of the required stratification period and on germination.*

Stratification method	Days stratified		Germination period (days)
	Time to beginning of germination	Time to 95 percent germination	
Plastic box	37	83	46
Foil	33	51	18

Materials and Methods

Five lots of sugar maple (*Acer saccharum* Marsh.) fruits with a germination potential of at least 95 percent were used in this study. They were air-dried to a moisture content of 10 percent; empty samaras were separated from filled ones in pentane (4), and the filled samaras were subsequently stored in sealed plastic bags at10° C prior to use. All references to seeds refer to those enclosed in the fruit.

One hundred seeds from each lot were soaked in tap water for 24 hours and then stratified at 3° to 4° C on germination paper inside plastic boxes. A second set of seeds was similarly treated, but each lot was placed within the folds of a paper towel, moistened with 10 ml of distilled water, and enfolded within aluminum foil. The aluminum foil packets were then stratified at 3° to 4° C.

Observations were made at weekly intervals at which time all germinated seeds were counted and discarded.

The emergence of the radicle through the pericarp was taken to indicate germination. At the end of the study, all ungerminated seeds were examined, empty samaras and insect-damaged seeds were eliminated, and germination rates were computed as percentages of the viable seeds that had germinated.

Results

The time required for total germination varied greatly (fig. 1). An analysis of variance showed the difference between treatments to be highly significant. The length of stratification required for germination to exceed 95 percent was greatly influenced by the method used.

Germination of seeds stratified within the aluminum foil packets was 95 percent complete on the 51st day of stratification (table 1). In this treatment germination began on the 33rd day of stratification. Thus germination of the seeds within the foil reached 95 percent within 18 days after it began as opposed to 46 days when seeds were stratified in the plastic boxes.

Discussion

Stratifying seeds within aluminum foil packets reduced the length of the required period of chilling and increased the rapidity

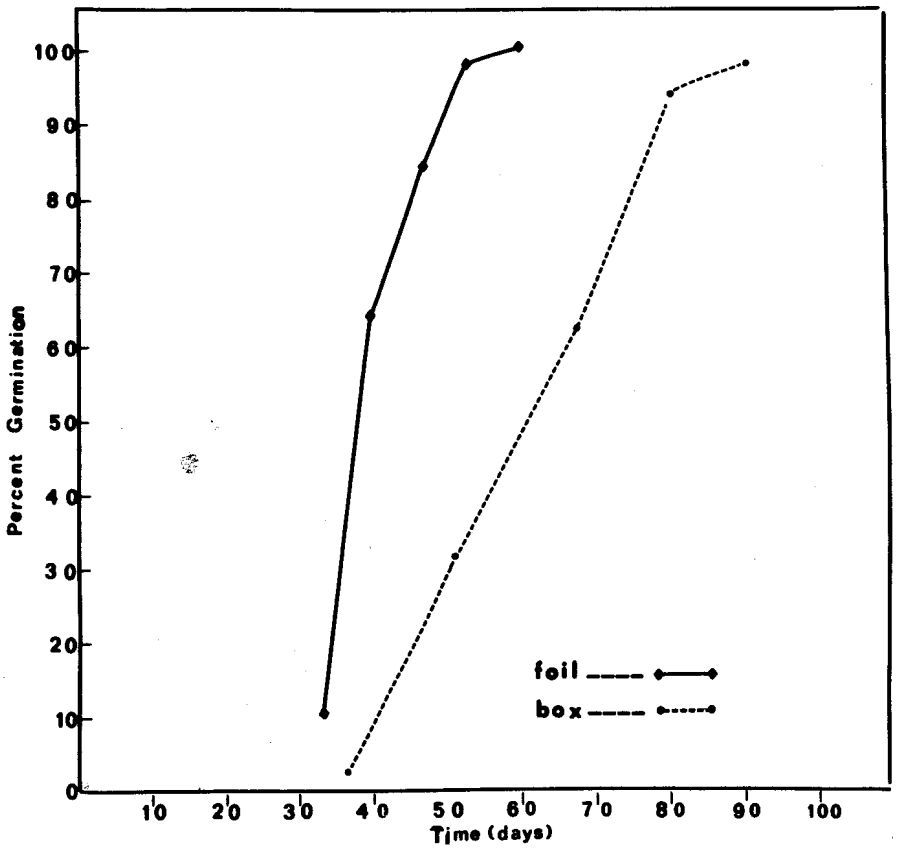

Figure 1.—*The germination profiles of sugar maple seeds stratified in aluminum foil packets or in plastic boxes.*

of germination once it began.

Janerette (*6*) demonstrated that lowered oxygen availability stimulated the germination of sugar maple seeds. It would appear that the stimulatory effect of the aluminum foil stratification method was due to lowered oxygen availability. Similar beneficial effects of low oxygen concentrations on germination have been observed by others (*2*), (*1*), (*5*).

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