

Physiological dormancy

Learning objectives: To observe the impact of chilling stratification on dormancy release in seeds with physiological dormancy.

Background: The most common form of seed dormancy is endogenous physiological dormancy. It is the type of dormancy that is relieved by periods of moist chilling stratification. In nature, seeds get their necessary moist chilling in the ground over the winter. This synchronizes germination in the spring. We can mimic this effect by placing seeds in a moist environment in the refrigerator.

Several seeds can be used for this demonstration. Tulip poplar, eastern hemlock, eastern white pine, and sweetgum have the advantage of being ready to use without removing a fleshy fruit. Eastern redbud can also be used but must be scarified first to allow seeds to imbibe. Those with fleshy fruits that can be used include black cherry and flowering dogwood as well as the edible persimmon and pawpaw. The nut species could also be used and include pecan, black walnut and Ohio buckeye.

Procedure:

1. Seeds should be cleaned of any fleshy fruit. It is often helpful to disinfest the seed surface with a 10% bleach solution for ten minutes before stratification.
2. Stratification is accomplished by placing the seeds in or on a moist substrate and placing them in the refrigerator. For smaller seeds, place them on the surface of moist sand in a closed container. Larger seeds can be handled the same way or they can be placed them in moist vermiculite in a sealed plastic bag.
3. Place the seeds in the refrigerator for the length of time recommended for each species (see the how to propagate section of the website). You may want to check on the seeds periodically and remove any moldy seeds.
4. Germinate seeds in containers or on sand.
5. For a more advanced experiment, you can stratify seeds for different lengths of time before you germinate them. Graph the results with time on the x-axis (in weeks) and germination percentage on the y-axis.

