

Germination Testing

Why germination test?

Germination testing helps with garden planning by letting you know if old seeds will sprout before investing time and garden space. You can use germination rates to determine how many seeds to sow to achieve a desired population or to decide whether it is worth planting from an old packet. Luckily for home gardeners, germination testing is easy to do at home with common household supplies:

- Paper towels
- Clear plastic containers, glass jars, or plastic bags
- Pencil or waterproof marker
- Tweezers or bamboo skewers*
- Spray bottle*
- Nail clippers or razor*
- Thermometer*

*helpful, but not necessary

Setting up tests

Most seeds can be laid out on damp paper towels that are then folded and placed upright in a sealed container or bag to keep them from drying out. Smaller seeds do better on top of a flat paper towel as they often require higher light levels for germination and may get lost in the folds of a towel. The container should be clear to allow light in. Tweezers or damp bamboo skewers can help with placing seeds. Towels should be wet through but with any excess water wrung out. A spray bottle can help get the desired level of dampness. Be sure to label the test so you can match the germination rate to the correct seeds later on. Pencil or permanent marker written on the paper towel prior to dampening works well, but avoid placing seeds directly on the writing.

Timing and temperature

Most crop types will germinate in about 2 weeks. Members of the *Apiaceae* family require longer germination periods: up to 4 weeks. Some species, like corn, will germinate in a single week. For home germ testing purposes, the timing does not need to be exact. You can always extend the test if you think the seeds might still germinate. Check the test periodically to see if it is drying out. At the same time you can count and remove fully-developed seedlings or obviously dead and rotting seeds.

In a lab, germination tests are kept in incubators at standardized temperatures. This isn't necessary for home testing, but try to keep warm season crops slightly higher than room temperature if you can. Sunny windowsills, the top of your refrigerator, or near (but not too near) a heating vent or radiator can work well. Cool season crops should do well at room temperature. Giving your test conditions similar to where you will try to start your seedlings will mean that your test results accurately reflect the results you can anticipate when you start your plants.

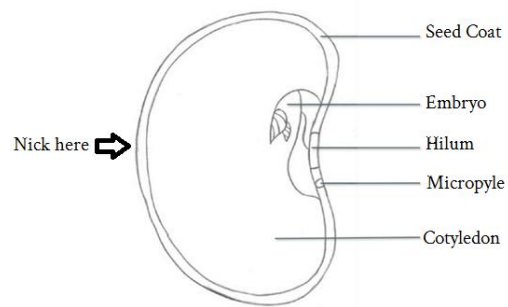
Reading your test

A germination rate should reflect the number of healthy seedlings, not every seed that sprouts. The Association Official of Seed Analysts standards use the concept of normalcy, where a normal seedling is defined as one that is likely to produce a healthy adult plant. Abnormal seedlings are those that are too unhealthy or damaged to mature. This includes plants where more than half of the cotyledon tissue is missing or decayed, those with large lesions on the stem that reach into the plant's connective tissue, those without a sufficient root system, and those that sprout but then die. Any seed that decays rather than sprouting is dead. Some seeds do not sprout but also do not decay. These seeds are assumed to be dormant or hard-seeded.

Seed Dormancy

Hard-seededness is a type of dormancy that occurs in legumes, okra and some sunflowers. If its seed coat is impermeable to water, a seed will not sprout.

Nicking the seed coat (or scarification) can increase germination in these crop types. Use nail clippers, a razor blade, or sandpaper to nick on the side of seed opposite the hilum to avoid damaging the plant embryo. To determine what percentage of your seeds are hard seeded, set up your test without nicking at first. After some seeds have sprouted, count and nick remaining hard seeds and allow them to sprout. If you find that your seeds have a high degree of hard-seededness, nick the seeds before planting them in your garden.



Cold stratification is another way of breaking seed dormancy. Some seeds need to experience a winter before they will sprout. This includes most of the *Poaceae* family (except corn) and some of the *Brassicaceae* and *Apiaceae* families. In nature this would keep them from sprouting at the end of the growing season and then failing to mature and make new seed before winter begins. Cold stratification is only helpful in crop types that germinate in cold conditions and will not help warm season crops. You can cold stratify by setting up a germ test and then placing the seeds and damp towels in your refrigerator for 1-4 weeks.

