

Seed germination test

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What problem is being solved?

Growing healthy and good quality plants is only possible from good seeds. Germination is the process by which a dormant seed springs to life. Light is an important factor that regulates germination:

- **Photoblastic seeds** require light for germination.
Examples are lettuce, some grasses, parsley, and portulaca).
- **Negative photoblastic** seeds require dark for germination.
Examples: onion, Amaranthus, Nigella).
- Seeds that germinate in light as well as dark are called **non-photoblastic seeds** or light-indifferent seeds
Examples: rice, beans (*Phaseolus* spp.), corn (*Zea mays*), and peas (*Pisum sativum*).

As seeds age, they lose the ability to sprout. However, seed viability is not directly dependent on their age, very old seeds can also be viable if stored correctly. A germination (sprouting) test uses a small sample of seeds to check their viability.

Germination testing ensures seed viability, which refers to the potential of seeds to germinate and produce healthy plants. Thus, it is crucial in maximizing crop yields by allowing growers to identify low-viable seeds and remove them from circulation, preventing potential crop failures. Additionally, knowing the germination rate can optimize your process, as you can determine how many seeds are needed per specific amount of space available.

Seed selection for soilless plant cultivation

It is advisable to select seeds that can tolerate cultivation in water and have a relatively short cropping cycle. For example, lettuce (one month) or baby spinach (2 weeks for a leaf length of 8 cm / 3.2 inch).

Pelleted seeds are normal plant seeds that have been coated to give them a round, smooth, uniform shape and size. They are easier to handle than the "naked" version of tiny seeds like lettuce or tomatoes. They have the advantage of a shorter germination duration and higher germination rate, but the disadvantage is that pelleting shortens the lifespan of the seed, so pelleted seeds should not be relied upon to sprout the next year or two.

It is essential to use certified, i.e., healthy seed material so that no diseases are introduced into your production system. In general, a strict hygiene concept must be implemented in production systems to ensure that healthy crops can be grown over a long period of time.



Figure 1. The difference between pelleted (or pilled) and naked seeds of lettuce. The pelleted seed is easier to handle.

(Source: <https://www.hortmag.com/smart-gardening/pelleted-seeds-why-and-how-to-use-them>)



Figure 2. Seeding pelleted lettuce seeds into rockwool cubes (Photo: F. Gartmann)

1. Germination test

Count out a certain number of seeds (perhaps 20) and place them on absorbent paper (rough paper towel or toilet paper) on a petri dish spaced about a centimeter apart. You can also use an old plastic bottle, cover the bottom with absorbent paper, and place the seeds there. You need to make small holes in the bottle to allow air circulation.

Wet the paper lightly with a spray and keep it slightly moist until the seeds germinate. Check them daily and assess them. Make sure that the water you are using is not contaminated to prevent undesired fungi growth. Cover the petri dish or close the bottle to prevent evaporation. Open the petri dish or a bottle daily for air exchange.

DARK GERMINATORS: Put the seeds in a dark place if they do not require light for germination.

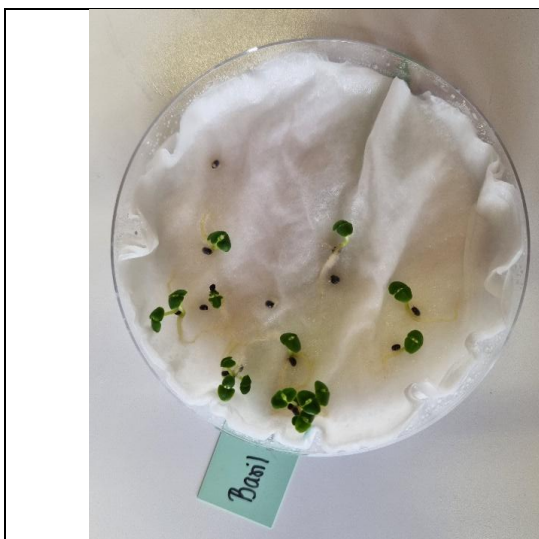


Figure 3. Germinated basil seeds
(Photo Z. Schmutz).

Figure 4. Germinated coriander seeds.
Note the lower germination rate!
(Photo Z. Schmutz).

Calculate the germination rate according to the following equation:

$$\text{Germination rate (\%)} = \frac{\text{Number of seeds sprouted} \times 100}{\text{Number of seeds tested}}$$

The advantage of this method is that you can easily see how many seeds have sprouted, how many are just beginning to sprout, and how many show no action at all.

You should adjust the number of seeds according to the germination rate. If the germination rate is 80%, be sure to plant at least 20% more seeds.

Happy growing!