



## Conducting a Seed Germination Test: Why and How

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Conducting a seed germination test, also known as a seed viability test, can be a useful tool for farmers. Most commercial seed companies and suppliers have quality control programs for seeds. Usually, the results of their testing will be reported on the seed package. While quality is often managed by the companies that sell fruit and vegetable seeds, there are some situations in which a commercial grower may need to conduct their own seed germination test. Here are a few examples:

- Using older seed from storage
- Trouble with seedling germination
- Suspected plant pathogen on seeds



Reasons for conducting germination tests may differ with each farm's situation. For instance, a grower may want to revisit a vegetable variety they once grew using seeds that have been kept in storage (e.g. vacuum sealed for 20 years). In this case, the grower may want to conduct the test to see if the seed is still viable. The results of the test may affect the amount of seeds needed to account for any seed that does not germinate. Alternatively, if a grower observes poor germination in seedling trays or fields, it may indicate a problem with the seeds. In this situation, a seed germination test can



help determine what the issue could be— whether it is from the seed or another factor. If seeds germinate properly in the test but fail to emerge in the seedling tray, then it may indicate there is a disease or improper conditions inhibiting germination.



## How to Conduct a Seed Germination Test

### Considerations

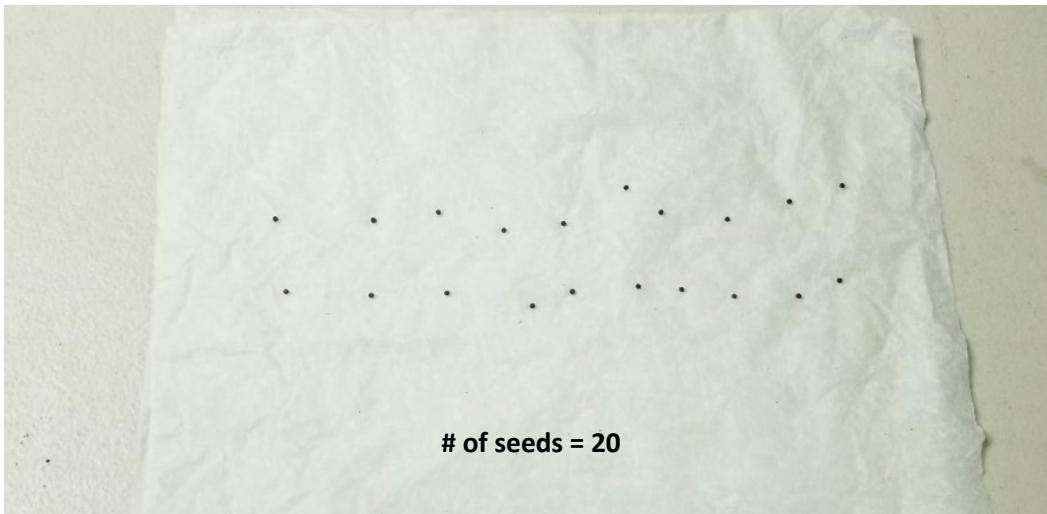
1. If you have a limited number of seeds, you may want to forego the test and plant what you have.
2. Temperature requirements for germination can vary by crop. Refer to your seed packet or package for specific temperature requirements or recommendations.

### Materials:

- At least 10-20 randomly selected seeds from the seed packet/batch
- Sealable plastic bag or a container with tight seals
- Paper towels or coffee filters
- Water
- Permanent marker
- Spray bottle (optional)

### Procedure

1. Under a faucet with clean water, or using a spray bottle, moisten the paper towel or coffee filter until it is uniformly damp, but not dripping wet. Too much moisture can promote bacterial and fungal growth which could negatively impact the germination test. Squeeze out any excess water. Depending on the number of seeds you are testing, you may need more than one paper towel or coffee filter.
2. Place the seeds in a row on the damp paper towel or coffee filter.

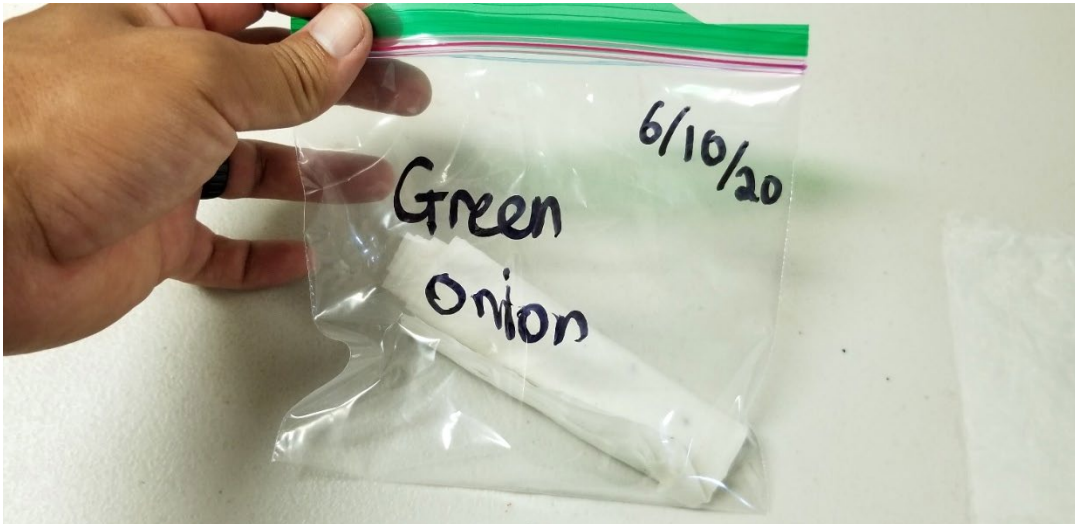




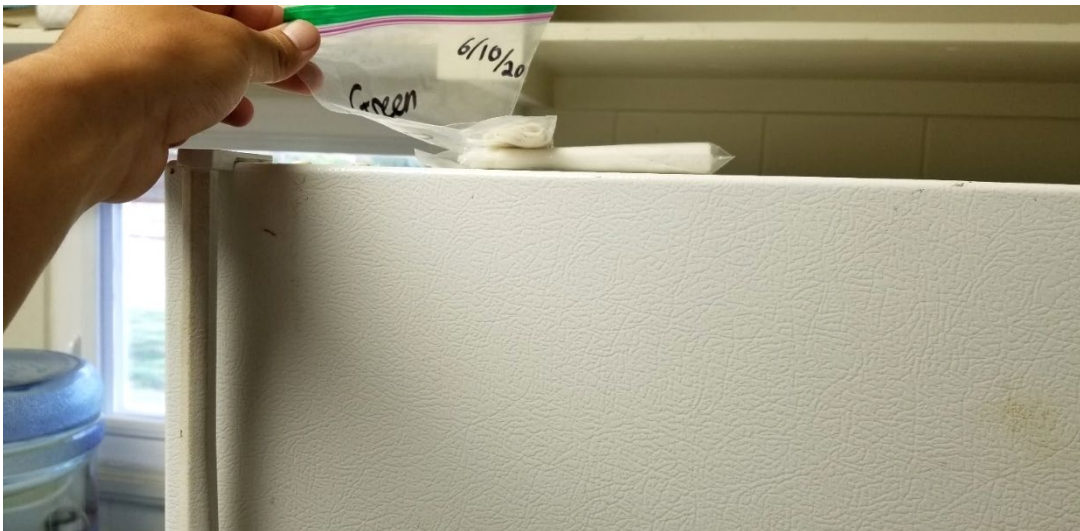
3. Roll or fold the paper towel or coffee filter around the seeds.



4. Place the paper towel in a plastic bag or container and seal it. Label the bag or container.

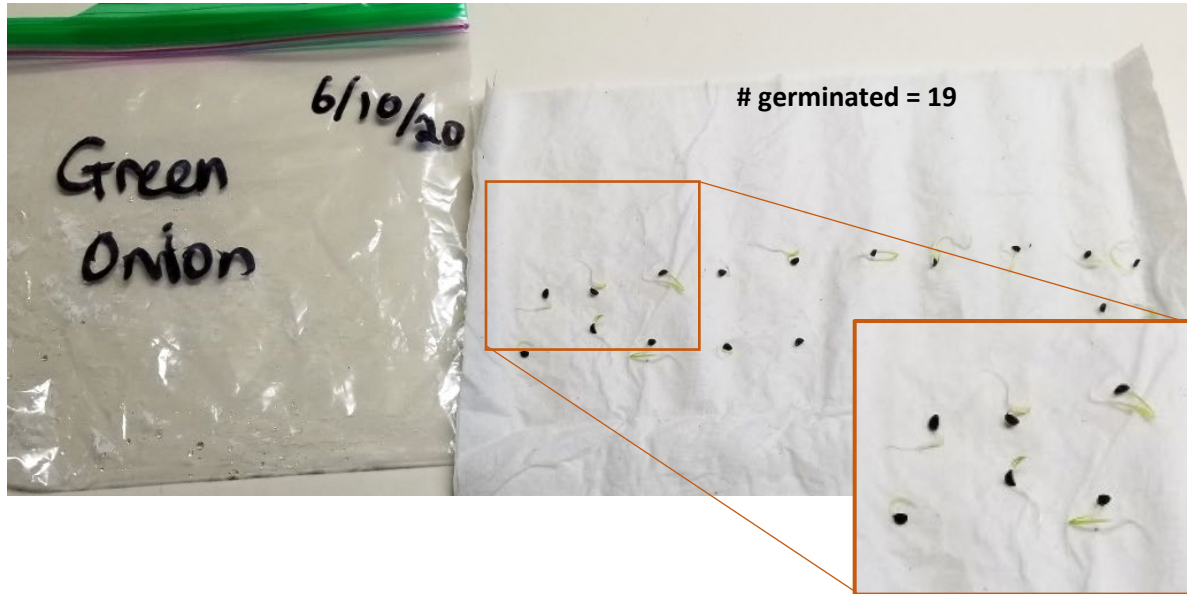


5. Place the plastic bag or container in a warm place (e.g., top of a refrigerator or a windowsill).





- 6. Check the seeds daily, making sure the paper towel remains moist. If it dries out, you may need to moisten the paper towel again.
- 7. Most seeds will germinate in 3-10 days. Check your seed packets for germination times. Usually 7-10 days will be enough time for the test. After 10 days, unroll the paper towel and count the number of seeds that have germinated.



- 8. Determine the germination rate

$$\left( \frac{\# \text{ of Germinated Seeds}}{\text{Total \# of Seeds}} \right) \times 100 = \% \text{ Germination}$$

From the example:

$$\left( \frac{19 \text{ Germinated Seeds}}{20 \text{ Total Seeds}} \right) \times 100 = 95\% \text{ Germination}$$

### Next Steps

The germination rate (% germination) determined from this test is the germination rate you can expect from the rest of your seeds. If the germination rate is lower than 70%, growers may consider purchasing new seed. This information is also useful as growers plan how many seeds to sow, including extras to account for potential unsuccessful germination.



## Average Germination Times of Common Fruit and Vegetable Seeds

<u>Crop</u>	<u>Average days to germination</u>
Lettuce	2 days
Tomato	5 days
Pepper	7 days
Papaya	14 days
Onion	4 days
Cucumber	4 days
Beans	5 days
Cabbage	4 Days

### For Information on Seed Storage and Storage Life

Motomura, S.A., T. Radovich, & R. Nagata. 2014. "Saving Seed". College of Tropical Agriculture and Human Resources, University of Hawai'i at Mānoa. *Soil and Crop Management* 32.

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### References

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Ngouajio, M. 2009. "A simple seed germination test may be a deal breaker". Department of Horticulture, Michigan State University Extension.

[https://www.canr.msu.edu/news/a\\_simple\\_seed\\_germination\\_test\\_may\\_be\\_a\\_deal\\_breaker](https://www.canr.msu.edu/news/a_simple_seed_germination_test_may_be_a_deal_breaker)