

Greenhouse botanical seed germination

Specification of particular brand names below does not imply an endorsement by USDA that they are necessarily superior to other comparable products

1. Prepare seeds for planting. If planting in standard 3 inch (8 cm) clay pots, prepare about 50 seeds for sowing as below. Unless one needs maximum germination (e.g., you are performing a germination experiment), acceptable results are expected even if you do not treat the seedlots with strict uniformity or precise adherence to the recipe.

2. Place in vials to pretreat with GA₃ at 2,000 ppm for 24 hours at room temperature. Cover seeds with liquid and tap to make sure there are no air bubbles or floating seeds. For most seedlots, overnight soaking is sufficient, and soaking for up to three days is not detrimental. Some reports recommend higher or lower concentration of GA₃ but we have found 2000 ppm broadly effective, and avoids stretched-out seedlings or phytotoxicity. Personal communication from some colleagues say that re-drying *tuberosum* breeding seeds after pretreatment seriously harms germination, but our experimental results conclude that seeds can be re-dried and planted dry later without any loss of germination (*American Journal of Potato Research* 77:275-278).



3. Precautions against seedling disease are recommended, such as heat sterilizing pots. Fill pots with soilless potting mix. See fertigation tech sheet for the particular medium used at USPG. Push down medium flat ~ 2 cm below rim with fingers or if large number of seedlots are to be planted, it may be worthwhile to fab a custom tamping tool as shown.



4. Identify planting with plastic label stakes, written on with Sharpie® or similar waterproof marker. Since seedling pot plantings are temporary-- rarely last more than a month or so-- you may use cheaper biodegradable wooden tongue depressors (which eventually rot).



5. With a little practice, a common lab squirt bottle with tap water can be used to flush the seeds from the vial so they disperse evenly across the surface of the medium. It is not necessary to decant off the GA₃ solution.

6. Cover with about ½ cm fine horticultural expanded mica Vermiculite® to retain moisture. Water lightly...

7. Arrange pots contiguously on a uniform greenhouse benchtop. If very uniform results are sought (e.g., percent germination tests), border seedling pot arrays with blank pots to prevent “edge effect”. Cover with a double layer of newsprint or similar to keep in moisture. Stakes should keep the paper slightly above the pots to allow some air circulation. There is evidence that some seedlots’ germination is enhanced by



diurnal alternating temperature, but, in general, the same environment that is optimal for growing and crossing potatoes (low humidity, constant 20C, avoiding high temperature spikes, avoiding overwatering) gives good germination results. Check every day and very carefully and uniformly water as needed. Remove paper when first sprouts appear which may be as soon as four days.

8. There is significant variation in sprouting time and uniformity, but most seedlots will have maximum countable sprouts in about two weeks.



9. Seedlings sown in germination pots may be allowed to grow until they are several cm tall and the leaves are far enough from the medium to allow them to be cleanly cut off for a bulk tissue sample for DNA extraction.

If the intention is to grow seedling into mature plants, see Transplanting tech page.

