

DIY Hot water treatment for sanitization of vegetable seeds



Figure: Test hot water treatment at diagnostic laboratory

OBJECTIVE

Seed-borne pathogens are of special importance to horticultural practices especially for farmers and home gardeners as bacterial and fungal diseases such as bacterial blights or anthracnose, can cause low germination ability, slow growth of the plants or even total loss of the yield in the case of severe infections. Regular commercial coatings with chemicals, such as fungicides or disinfectants, are not an option for organic agriculture making the management of seed-borne pathogens especially challenging.

RECOMMENDATIONS

Hot water treatment is well suited to small seed batches, where the precise control of temperature and duration can be controlled more easily. However, the special attention has to be paid when heat-sensitive seeds are applied such as beans and peas, because due to the soaking in hot water the seed coat can be damaged easily which would lead to reduced germination rate. Therefore, seed-specific treatment protocols need to be followed.

Material:

- Seeds
- Stockings or fine mesh bags
- Paper clips or similar small fasteners to secure the mesh bags/stockings
- Thermometer (for monitoring water temperature)
- Glass beaker or pot for heating water
- Heating device (e.g., magnetic stirrer with a hot plate for controlled heating)
- Timer (to monitor treatment time)
- Cold water for cooling treated seeds
- Paper towels for drying seeds post-treatment

Procedure:

1. Prepare Seed Bags - Place seeds in mesh bag. Secure the open ends of the stockings with paper clips; use differently colored clips if different seed batches are treated at the same time
2. Heat Water to the Target Temperature - place glass beaker or pot with water on a heating device. Using a thermometer, heat the water to the desired temperature
3. Submerge Seeds - once the water reaches targeted temperature, carefully place the secured seed bags into the water. Make sure they are fully submerged but not overcrowded to allow even heating.
4. Monitor Treatment Time - Set a timer for 30 minutes (or the recommended time for the specific seed type). Stir occasionally or maintain water circulation to ensure even heat distribution.
5. Cool the Seeds - after the treatment time is completed, immediately remove the seed bags and submerge them in cold tap water for 1-2 minutes to stop the heating process.
6. Dry the Seeds - open the stockings and spread the seeds out on paper towels. Allow them to dry thoroughly before planting or storing.

RESULT

Hot water treatment is a cost-effective and environmentally sustainable technique that has been successfully used in sanitation of vegetable seeds by reduction or elimination of pathogens without affecting the seeds. The method has been effectively used to manage seed borne diseases without the use of synthetic pesticides which favors even small scale gardeners. The rationale is based on the principle of heat, wherein the right temperature and the right amount of time is given to deactivate the pathogens, with as little impact as possible on the seeds.

Recommendations:

Plant species	Option 1	Option 2
Corn Salad, Carrots, Celery	50 °C/30min	53 °C/10min
Brassicas, Onions, radishes	50 °C/20min	53 °C/10min
Lettuce	50 °C/5min	50 °C/10min
Beetroot	53 °C/30min	50 °C/10min

ADDITIONAL INFORMATION

More details, tips and tricks about HWT of vegetable seeds you can find here:
https://orgprints.org/id/eprint/53533/1/HotWaterTreatment_BSAG.pdf

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