

VEGETABLE SEED TREATMENTS
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Vegetable seeds are very often contaminated by disease-causing fungi, bacteria, and viruses. Seed treatments generally consist of hot water treatments in combination with fungicide protectants. Large-seeded vegetables (eg., vine crops) should not be hot water treated as this may denature the seed, however, protectant fungicides coupled with insecticides such as diazinon and lindane are recommended for these seeds.

Hot water treatment of seeds kills most disease-causing organisms in, and on the seed, but does not protect the seed from attack by fungi in the soil. Exact temperatures and timing are extremely important. Seeds may be killed if immersed for too long or if the water is too hot. On the other hand, the treatment may not be effective if the water temperature is not high enough for a sufficiently long time.

Pepper and Eggplant Seed

- 1) Hot water treat seed for 25 minutes at 50EC (122EF). Procedure outlined for cabbage. See below.
NOTE: Pepper seed may be more sensitive to hot water treatments than tomato seed, thus an alternative for peppers is a bleach treatment.
- 2) Pepper seed should be dipped into a 1:4 solution of Chlorox or Javex (6% NaClO) to water for 1 to 2 minutes. Use 1 gallon of solution for every 2 lbs of seed providing good agitation. Later, wash the seed in running water and dry thoroughly. This treatment should remove 80% or more of the bacteria present. Most of the bacteria responsible for bacterial leaf blight in peppers is found on the outside of the seed. Seed should also be dusted or slurried with fungicide.
- 3) Immediately after seeding, the flats can be sprayed or sprinkled with Captan or Thiram to prevent damping off.

Tomatoes

Most tomato seed is already treated with TSP (tri-sodium phosphate) for the control of viruses. However, it is also important that tomato seed be hot water treated for the control of other disease organisms such as fungi and bacteria. After the tomato seed has been defuzed it can be soaked in hot water at 50EC (122EF) for 25 minutes. This seed can also be treated with a chlorine solution as described for peppers. It may be found that 5% to 10% of the seed may be lost due to hot water treatment, however, this is likely the weaker seed which may in turn have resulted in less vigorous transplants.

For external virus control use 0.45 kg (1 lb) of TSP in 4.5L of water (1 gal.) and immerse seed for 30 minutes. This treatment, however, will not control internal residing viruses. Tomatoes

can also be acid treated for effective bacterial and fungal disease control. Treat seeds soon after extracting from fruit in a 1.8% HCl concentration for 1 minute. Using a 36% stock solution of HCl add 1 part acid to 19 parts water. If acid treating dry tomato seeds leave in prepared acid solution for 5 minutes. Allow seeds to dry then treat with Thiram.

Cabbage, Cauliflower, Brussels Sprouts, and Broccoli

Ideally, these crops should also be hot-water treated. The hot water treatment procedure is as follows:

- 1) Fill an insulated container with water (eg., water bath) at the required temperature, again 50EC or 122EF. It is imperative that the thermometer be accurate and calibrated by first immersing it in ice water to read 0EC.
- 2) Place the seed in a cheesecloth bag while not filling the bag more than half full.
- 3) Wet the seed and bag with warm water, then place them in the water bath.
- 4) Stir the water and bag of seed frequently to maintain a uniform temperature in the seed lot. Check the temperature frequently and, if needed, add sufficient hot water to maintain the correct temperature.

- 5) Spread the seed out to dry.

NOTE: Cabbage and Brussels sprouts should be soaked for 25 minutes while cauliflower, kale, collards, kohlrabi and summer turnip are soaked for 15 to 20 minutes. An alternative treatment involves a 24-hour soak in 0.2% thiram at 30EC (86EF) followed by drying. This controls the blackleg fungus, but does not kill the black rot bacteria. The seed should be further treated before planting for seed rot protection with captan or thiram.

Of course it is recognized that once the seed has been decontaminated it must be sown in steam-sterilized or fumigated seedbeds, or in soilless mixes that are essentially free from disease.