Infested seed can be the source of the pathogen for important bacterial diseases occurring in the northeastern United States. These diseases include black rot affecting crucifer crops, bacterial spot affecting tomato and pepper, and bacterial speck and bacterial canker affecting tomato. They can cause substantial damage if not controlled.

The first strategy to use for controlling any disease is to eliminate or reduce the amount of the pathogen available to initiate disease. Therefore, the use of disease-free seed and transplants are some of the most important management practices for bacterial diseases. Some seed companies have the resources to produce seed in areas where these diseases do not occur and to test seed for the pathogens. First look at the seed package to determine if your seed has been tested for these pathogens and/or has been treated. Check with the seed company if the package does not contain this information. Hot water, hydrochloric acid, calcium hypochlorite, sodium hypochlorite, and peroxyacetic acid are treatments that seed companies use for bacterial pathogens. Infested crop debris, infested planting supplies (especially wooden stakes for trellising tomatoes) and infected weeds are additional sources of bacterial pathogens and must also be managed in an effective control program.

Seed can be treated by growers with hot water to kill the pathogen. Hot-water treatment affects bacteria inside the seed; however, high temperatures can adversely affect germination if proper precautions are not taken and bacteria deep inside seed may survive treatment. It is best to have seed custom treated, which some seed companies will do. Realize before you start that when you treat the seed, the seed company’s liability and guarantees are null and void. Do not treat old seed. Make sure seed has not already been hot-water treated as a second treatment can kill the seed. Treatment should be done within a few weeks of planting.

Precise control of conditions is essential for successfully hot-water treating seed yourself. Realize that there is a small margin between the temperature and length of exposure needed to kill pathogens and the treatment conditions that will kill seeds, and that the highest temperature seed can tolerate varies among crops. Use the following temperatures and times:

- Tomato seed treat at 50°C (122°F) for 25 minutes or 51.5°C (125°F) for 20 minutes.
- Pepper, cabbage and Brussels sprout seed treat at 50°C for 25 minutes.
- Cauliflower and broccoli seed treat at 50°C for 20 minutes.
- Carrot seed treat at 50°C for 20 minutes.
- Celery seed treat at 50°C for 30 minutes.
- Lettuce seed treat at 47.8°C (118°F) for 30 minutes. Some feel lettuce is too sensitive to treat.

Hot water treatment can be damaging or impractical for seed of other crops including pea, bean, cucumber, sweet corn, and beet. Water temperature needs to be carefully controlled during treatment. The best way to control temperature while treating seed is to use a stirring hot plate and a precision laboratory thermometer. Hot plates and thermometers can be purchased from a laboratory supply company such as Fischer Scientific (800-766-7000; www1.fishersci.com/index.jsp) or VWR International (www.vwrsp.com/). A recommended thermometer is Fischer catalogue # 15-114 (0 – 80 °C range), which sells for $35.43 (2005 price).
Fischer carries a 10' x 10' stirring hot plate that sells for $525 (Cat. No. 11-600-100SH) and a 7' x 7' stirring plate for $418 (Cat. No 11-600-49SH). A magnetic stir bar is also needed. A 3-in long bar sells for $13.20 (Cat. No 14-513-68). A large glass container will be needed because metal can crack the hot plate surface. The larger the container used, the easier it is to maintain water temperature and the less the impact on temperature of adding room-temperature seed. Hot-water treatment can be done successfully using a large pot on a stove top and a precision laboratory thermometer. With either equipment, expect to spend some time adjusting settings to achieve the desired temperature, especially with the stove top. A very low hot plate or stove setting will probably provide the desired temperature. Alternatively, Fischer sells a more sophisticated stirring hot plate for $995 that can be set to the desired temperature (Cat No.11-800-49SHP); this is accomplished with a probe placed in the water. With any set-up, wait to begin treatment until the water in the container is maintained at the desired temperature. Have containers of hot and cold water nearby in case the water does not stay at the desired temperature. Place seed in a tea infusion ball or in a piece of cotton cloth. Add a metal weight to keep the seed container submerged, but make sure it is not on the pot bottom. Agitate the water continuously. Stirring hot plates do this for you. A wooden spoon works well when using a stove top. Check the temperature constantly. Keep the thermometer off the hot bottom of the container; this can be accomplished by taping it to the inside of the wooden spoon used for stirring. Upon removing, cool the seed under tap water. Spread the seed out on paper towels to air dry at 70-75°F. It is advisable to conduct a preliminary germination test with a small quantity of treated and untreated seed from each variety and lot number before treating all the seed. Seed lots heavily infested with bacteria or produced from stressed plants may not stand up to hot water treatment and germination may be adversely affected. Old seeds can also be sensitive to treatment. Hot water treatment has been shown to mimic aging,