

Growing Watercress from Seed by a Non-Circulating Hydroponic Method

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Experiments are currently being conducted on growing direct-seeded watercress by a non-circulating hydroponic method at 3 locations in Hawaii. Watercress prefers cooler temperatures, and growing at lower elevations in summer will lead to variable results. The following discussion and suggestions are based upon our recent past experience and there will likely be improvements and changes in the future.

Rectangular tanks, at least 5.5 inches deep, (*deeper tanks are preferred*) were constructed on a level surface by draping 2 layers of 6 mil polyethylene over a lumber frame. The tank was nearly filled with water prior to seeding. (*Fill the tank before stapling the plastic to the tank.*) Another option is a plastic tank such as storage container. *A one-inch water depth on 1 square foot = 0.625 gal of water. Therefore, one inch of water in a 4 ft x 8 ft tank (32 sq. ft.) = 20 gallons. A 5.5 inch deep, 4 x 8 ft tank contains 110 gallons of liquid.*

Hydroponic fertilizer may be added to the tank by either *Method 1* or *Method 2*.

Method 1. Add 1 teaspoon of Chem-Gro 10-8-22 (Hydro-Gardens, Colorado) per gallon of water in the nutrient solution tank.

Method 2. Prepare Stock Solution **A** by adding 1 lb/gal Chem-Gro 8-15-36 hydroponic fertilizer plus 0.6 lb/gal of magnesium sulfate. Stock solution **B** consists of 1 lb/gal of soluble grade calcium nitrate. Add ½ ounce or 1 tablespoon of Stock Solution **A** and ½ ounce or 1 tablespoon of Stock Solution **B** to each gallon of water in the nutrient solution tank. *A tank with 100 gallons of water would require 50 ounces of stock solution **A** and 50 ounces of stock solution **B**.*

Other hydroponic fertilizers may also be used.

Advanced growers will test the nutrient solution with an EC meter to maintain a nutrient solution strength of 1.5 to 2.0 mS. pH of the nutrient solution may also be tested with either a pH meter or pH indicator solution. An acceptable pH range is 5.0 to 7.0.

Holes for 2-inch net pots are cut in ½ inch-thick Styrofoam extruded polystyrene boards (2 ft x 4 ft) with a staggered 8 x 12 inch spacing arrangement. *There are 1.5 plants per square ft.* Expanded polystyrene bead boards are not suitable for a float system, because they have occasional air pockets and may become waterlogged and covered with algae, but the Styrofoam extruded polystyrene boards have a consistent structure without any large air pockets and do not become waterlogged. The Styrofoam boards are placed in the tank and float on the nutrient solution.

The net pots are filled with a peat-perlite growing medium such as Sunshine #1 or Pro-Mix BX and they are supported by the floating Styrofoam boards. The lower 1.5 inch of the net pots are immersed in the nutrient solution. This moistens the growing medium in the containers by capillary action, thus automatically watering and fertilizing the plants.

Approximately 10-20 watercress seeds should be planted per 2-inch net pot. Seeds may be sown on the surface of the growing medium in the net pot and they are not covered. A shaker-type tube seeder may be used. It consists of a plastic tube with a 5/64-inch hole drilled in the cap. *There are 4631 watercress seeds/gram = 2,102,247 seeds/lb.*

Watercress seed (*Nasturtium officinale*) is available from Johnny's Seed Co. (1-877-564-6697) and Stokes Seed Co. ([www. Stokeseeds.com](http://www.Stokeseeds.com)).

Seeds usually germinate within 3 days. Watercress plants continue to grow for 4 to 6 weeks without any attention. The tank should be filled with water prior to harvesting, because the nutrient solution level drops during the growing period. Watercress is harvested by cutting with a scissors or similar tool - preferably in the morning or evening. Leave a 1.5-inch high stubble to encourage ratoon regrowth. After harvesting, fertilizer is added from stock solutions **A** and **B** based upon the number of gallons of water added to the tank. After 3 to 4 more weeks, a ratoon crop of watercress may be harvested. Then, the tank is drained, the net pots are emptied and cleaned, and the whole growing process is repeated.

Mosquitoes can breed and multiply in nutrient solution which is not circulated or aerated and become both a health menace as well as a nuisance to workers. Mosquito control methods include salt-tolerant fish in the tanks, specifically approved *Bacillus thuringiensis subspecies israelensis* toxins or by pesticides in the air or nutrient solution which are labeled for watercress. Cool air temperatures or dry, windy conditions discourage mosquito populations.

Good water quality is required for this method, because salts may concentrate as the nutrient solution is consumed and this could retard growth. The use of rainwater is recommended in locations with poor water quality. If this is not possible, then deeper tanks will cause less concentration of the salts, and the tanks must be emptied after each crop.

Insect problems should be similar to field-grown watercress. However, this hydroponic system allows a grower to completely shut down, thus, disrupting insect populations.

