

Hydroponic Lettuce Production Suggestions and Notes

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Seed and seeding

A good source of seeds is Johnnyseeds.com

Start with a leafy green lettuce like *Waldmans dark green* and a red lettuce like *Red Sails* and an oak leaf lettuce like *Royal Oak*. Later on, try semi-head and Romaine types.

Have seed sent air mail or priority mail. Heat and moisture causes lettuce seed to lose their viability, so the germination rate and the seedling vigor decrease.

When the seeds arrive, place them in a sealable plastic container in a refrigerator. This is the 'mother batch' which only comes out of the refrigerator when filling small film cannisters or similar small containers of 'working batch' seeds which go from the refrigerator to the planting area. When the seeds from the working batch go bad, then dump them and get more from the mother batch.

You may initially wish to purchase pelleted seeds for easier planting.

We frequently pregerminate the seeds in a tray as a speedling tray and then transplant the best seedlings into the net pots.

Fill seedling trays, net pots or containers with moist growing medium. A peat-perlite or peat-perlite-vermiculite medium works well. Make a small hole (1/4 to 1/2 inch deep) in the medium with a pencil or dibble.

Cut the top and right side from an ordinary envelope. Place seeds in the envelope. Notice that the bottom crease forces seeds to line up single file. Use a pencil or sharpened stick to guide the seeds into the containers. Plant 1 or 2 seeds/container.

Mist the seeds lightly with a spray mist bottle.

Lightly cover the seeds with additional fine growing medium or lightly close the planting holes.

Cover the seeded container(s) with a 1" thick sheet of expanded polystyrene or a plyboard for 24 hrs and keep in a cool place like a garage. This keeps the medium from drying out.

After 24 hrs, remove the cover from the sheet and place the containers on a bench and mist twice daily.

A good timetable is to seed at 5 PM, and uncover the containers at 5 PM the next day.

After 1-2 weeks, the seedlings may be transplanted.

Tank

A good growing table consists of a level 4 x 8 tank.

2 x 6 lumber is nailed to 4 x 8 plywood to make a box. It is lined with 2 layers of black polyethylene to make a tank.

The polyethylene is loosely laid and fitted to the tank – water is added and the polyethylene is final fitted to the tank (cool water causes polyethylene to shrink and pull away from the sides of the tank) and stapled with a staple gun to the outside of the tank.

Either a Styrofoam or plywood (1/4 inch) top is placed on the tank and is painted white and is supported by the sides of the tank plus some empty upside down pots in the middle of the tank help prevent sagging of the cover. Some growers use a 4 x 8 ft cover and other use 4 sheets of 2 ft x 4 ft to facilitate handling

A 2 inch hole saw is used to make 48 holes in the cover. We usually have 6 rows of 8 holes. The rows are 4, 12, 20, 28, 36 and 44 inches from the 8 ft side. The first row of holes is 4, 16, 28, 40, 52, 64, 76 and 88 inches from the 4 ft side and the second row is 8, 20, 32, 44, 56, 68, 80 and 92 inches from the 4 ft side. The third row is the same as the first row and the fourth row is the same as the second row. It is good to drill the hole about 3/4 deep, then complete the drilling from the other side. This gives a better cut and prevents the plugs from sticking in the hole saw.

The tank is filled with about 5 inches of water – preferably rainwater. This amounts to 20 gal/inch or 100 gal of water per tank.. The tank must be level. The water must not be salty. This may be checked with an EC meter. The EC of the water should be less than 0.2 mS.

Fertilizer

Fertilizer is added at the rate of ½ ounce of *stock solution 'A'* and ½ ounce of *stock solution 'B'* per gal of water and this calculates to 50 oz of A and 50 oz of B per tank with 100 gal water. This results in about a 1.5 mS reading from an EC meter and should be sufficient to grow lettuce. Too much fertilizer causes salt injury and too little fertilizer results in poor growth.

Stock solutions are made as follows :
Find 2 good quality plastic trash cans.
Make a 25 gal mark on the cans.

To *can 'A'*, add 25 lbs of Chem-Gro 8-15-36 plus 15 lbs of Magnesium sulfate. Fill with water to the 25 gal mark.

To *can 'B'*, add 25 lbs of soluble grade calcium nitrate and fill with water to the 25 gal mark.

Place a PVC or similar stirring stick in each can and stir well before using.
Place a plastic measuring cup in each stock solution. It should float.

The fertilizers in Stock solutions 'A' and 'B' react when mixed together in a concentrated form, but are ok when in the dilute growing solution. Therefore, keep the stirring sticks and measuring cups separate and carry the solutions separately to the growing tank. Some people place the 2 concentrates in a bucket and carry this to the growing tank, but some reaction takes place and this causes fertilizer imbalances.

One batch of stock solutions should be enough fertilizer for over 60 tanks of lettuce.

Growing

Two-inch net pots are filled with a peat-perlite growing medium and seedlings are transplanted .

The net pots with the transplanted 1 or 2 week-old seedlings are placed in the holes.

The bottom ½ to 1 inch of the net pots should be immersed in the nutrient solution so the plants are watered automatically by capillary action.. If the tank is badly off-level, some pots will not touch the liquid and those plants will die.

Do nothing for the next 5 weeks or so.

Do not lift the top cover or else you may tear the roots.

The plants may wilt down at mid-day. If they take too long a time to recover, you might consider shading the greenhouse with 30 or 40% shade screen.

If there are no side screens to the greenhouse, a type of butterfly may lay eggs and the lettuce will be attacked by the worm larvae.

If thrips attack the lettuce, spray some soapy water on the lettuce or use an insecticide for this. Check if the insecticide 'Success' is labeled for this.

If mosquitoes become a serious problem, place mosquito fish in the solution. The insecticide 'Pyronyl' is labeled for mosquitoes. A 1 ppm solution will kill the mosquito larvae. This only amounts to 38 ml of a 1% pyronyl solution per 100 gal water.

Harvesting.

Early morning is best for harvesting. Wash hands well before harvesting. Lettuce is eaten raw and the customer trusts that they are buying a clean product. Mist the lettuce with plain water before harvesting.

Use a good scissors or knife to cut the lettuce and place it in a plastic produce bag or a box if taken to a restaurant.

After harvesting, clean out the net pots. It may be easier to compost them for a week to cause easier depotting. Clean off the top of the tank. Siphon out the remaining nutrient solution and place it on some other plants because it still has nutrients remaining.

Some growers just add new solution after harvesting and change solution after every 3 crops or so.

Add new nutrient solution and start the cycle over again.