Hydroponics: The Easy Ways for Year-Round Gardening

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Overview

• A method to grow plants in a water-based medium—no soil
• Two methods for starting seedlings
  – Peat and Perlite
  – Sterile Potting Soil
• Three set-ups for year-round growing
  – indoors, outdoors
• Grow and eat veggies and herbs all year
Perspective

• Hydroponic Systems
  – Commercial, expensive, elaborate, production

• SE Asia
  – Singapore schools, community gardens

• UMINN-MG field test, trial-evaluation

• Modified for school, home, office use
  – Minimal costs, easy, simple, expandable
  – No aeration needed
Singapore: Schoolyard Garden – Cherry Tomatoes
Aeration method (air pump)
Downsizing

• Commercial is dandy, but in-home is handy
• Simplified options for you ....
  – Lower costs
  – Lower maintenance
  – Smaller footprint
  – Flexibility to expand as you want, need
  – Portability: inside, outside
Hydroponic Advantages

– No soil preparation
– No soil diseases
– No worries about clay, sandy, poor soil
– No weeding
– No rabbits, woodchucks, chippies, deer
– No slugs, earwigs
– No extra fertilizing
– No (surface) watering
– Minimal maintenance
Basic Materials and Supplies

• Small drill and 2” Hole saw (or sharp knife)

• 10 gallon tubs (dark-23.9”L x15.9”W x8.7W”)
  – 2 tubs = 18 plants per lighting unit (18”x48”)
  – 4 tubs = 36 plants with two lights (30”x48”)

• 2” Net Pots – one for each hole/plant

• Growing Media: Water and fertilizer
Materials: Indoor Lighting

- Fluorescent Unit – 4’ (2-10 Gallon tubs)
- 1- Warm/Soft bulbs (3000K)
- 1- Cool bulbs (4100K)
- Or, 2 Gro-Lights
- Keep lights 2-3” above seedlings
Project: Build a Table?

• **Build it:** Woodworking Project
  – Tables: a 30” x 60” table (ID) allows for 2 sets of lights and 4 storage tubs
  – Materials: Wood, screws, drill, hammer, screwdriver, saw, ruler, T-Square, (option: attach wheels for mobility), liner to protect the wood
  – Storage tubs with lids to support net pots
  – **Or Not:** Use an existing table, counter
One idea for a Table
Project: Build a PVC Frame?

• **Build it: Portable PVC frame**
• Frame supports 1-4’ Fluorescent fixture and two 10-gallon tubs = 18 plants
• Materials: 3-10’ PVC pipe, tees, elbows, PVC glue, pipe cutter/hacksaw, storage tubs
• Hang the fixture on the top PVC pipe
  – See handout for design, instructions
Project: Don’t Build, Hang it

• Unfinished basement?
• Unfinished garage (heated)?
• Hang lights from ceiling rafters
• Materials: 2-sets of chains for each light, 4-6’, 2-hooks for each light, storage tubs
• Raise-lower lights by adjusting chains
Seed Starting: Option One

• Pre-mix Perlite and Peat Moss (moist)
  – Perlite – 80%
  – Peat Moss – 20%
• Add Perlite/Peat to each Net Pot
• Add 2-4 seeds directly into Net Pot
• Thin to best seedling
Direct Seeding into Perlite-Peat-Net Pot
Seed Starting: Option Two

• Fill tray with sterile potting soil
• Plant seeds in rows
• Label rows
• Transplant best seedlings to Perlite, Peat mix in Net Pots
Start Seeds in Sterile Potting Mix
Seedlings ready for Table or Tub
Root system, three weeks: Radicchio
Growing Media

• Water and fertilizer (powder)
• Supernatural Brand (Gro Aqua: 11-6-16)
  – @ $22 for a 14.1 ounces
• No other fertilizer needed
• Aquaponics (do you have fish?)
  – (Optional) Add waste water to tubs as needed
Mixing and Adding Media

• Mix fertilizer in 5 gal. bucket
• Ratio: 1.5 teaspoons/gallon
• Add solution to tubs
• Keep at least 1” of air between liquid and bottom of tub cover (aeration not needed)*
• Bottom of net pot should be in solution
• Can top water plants until roots reach solution
• Top off tubs 2-4 times/year

• * Aeration with small fish pump
Indoor-Outdoor Storage Tubs

10 Gallon plastic-resin tubs with net pots
Plants in net pots set in tub covers
Harvest micro-greens
Harvest when plants are larger
Harvest mature plant – 1-2” above net pot
And you can grow Outside

- Home in the summer? Not much?
- Think hydroponics
- Storage tubs on a table, saw horses
- Same materials, same growing media
- Sunlight vs. Fluorescent lighting
- Low maintenance, no weeding
- Top off tubs once during summer (2X?)
Plywood (or 2x4” boards), saw horses
Optional: Styrofoam over individual tubs
Styrofoam 4’x8’ sheet over multiple tubs
Label varieties so you don’t forget!!
Grow Turnips, Beets, Kohlrabi
Summary

• Hydroponic gardening is easy
  – No weeding, no critters, no soil diseases
• Indoors or Outdoors
• One-time costs (lights, tubs, table, etc.)
• On-going costs (growing medium)
• Fresh Veggies and Herbs all year long
• Great kiddie, mommy-daddy project
• Align food production with consumption
Thank you very much!

• Questions?

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