

Managing Vegetable Transplants for Success

Julie Rubaud Red Wagon Plants

Quick Survey

• Are you currently a vegetable farmer?

• How many years have you been farming?

• Do you already have a heated and ventilated greenhouse?

A little about my experience





Growing in a controlled environment

Organic vs. Synthetic





A few rules.....

- Some things you can control, some things you cannot.
 Some things are too expensive to control and are not worth it for certain crops (artificial light, for example)
- Greenhouses are a place where everything is concentrated and intensified – population density, pests, air quality, water usage.
- Plants are valuable, representing the basis for much of your season's sales. It is worth taking the time to set up systems that will work well for the plants and will increase efficiency for you as the grower.

PART ONE CONSTRUCTION

Site Work

Heat

Ventilation

Plastic

Construction: The Base



Construction: Heat





Construction: Ventilation

Exhaust Fans and Louvers





Horizontal Air Flow Fans 2 per house, facing opposite directions.

Greenhouse Construction: Plastic



Any Questions?

PART TWO MANAGING THE VARIABLES Water Air Light Soil

Variables: Water



Morning is best

redwagonplant

Foliage and soil surface should be dry going into night.

Variable: Water

• Avoid spot watering if possible

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Even watering is the goal. Watch your edges, watch your micro-climates.



Variable: Watering TEMPER YOUR WATER IF POSSIBLE



Variable: Watering









Variable: Watering









Variable: Water

- Water in the morning
- Avoid spot watering and understand your microclimates
- Check the weather forecast
- Keep foliage dry, water beneath the canopy when possible.
- Allow plants to wither a bit every now and then. It strengthens them.

Variable: Soil



Variable: Soil

Organic Compost Based Living system





Synthetic Sterile Media Controlled System





Variable: Soil

Root Development should be evenly dispersed throughout the soil. This is achieved with good soil, good watering, and proper sizing of container.









Air quality is best when...

Greenhouse is dry, clean, well vented. The taller the house, the better the air. Control humidity with ventilation. Keep floors swept clean and use landscape fabric when possible.

Variable: Air



Set the vent to 85 to 95F

Vent once a day, even if it is cold out

Constant air circulation

Use HAF

fans

Variable: Light

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Variable: Light For most small scale vegetable growers, it is not cost efficient to use artificial light

light.



But there are a few things you can control...



Keep the construction material minimal. Don't hang plants above if you can avoid it. Change the glazing as needed.



Any Questions?

Part Three: Plant Production





Plug trays and larger pots

The smaller the number, the larger the cell. Lettuce, brassicas, etc do best in anything from a 100 to a 200. The smaller the cell, the more you will have to thing about fertility. Larger plants do better in 32 to 72's or 4" pots.

Part Three: Plant Production



Filling Pots



Part Three: Plant Production

Seeding

Keep things clean and organized.Seeding area should be separate from everything you do that is wet and dirty.Hands out of the seed packets!Wash hands often.Store seeds in dark, dry, even temps in rodent proof containers.

Part Three: Plant Production

Cotelydon Stage

This is the stage between germination and true leaf emergence. Some types of crops stay in a plug tray during their greenhouse life and some go from plug tray to larger pot. Plants that get potted up tend to be the fruiting, heat loving plants. Some plants are seeded directly into the larger pots.



Part Three: Plant Production

Germination

This is when watering is the trickiest. Pay special attention to edges of trays, micro-climates, temperature of the water, and size of seeds. Things that take a long time to germinate are the hardest to manage during this period. Heat mats, special misting nozzles, and tempered water can make a big difference.

Watering during germination phase

- Mist small seeds instead of using a regular nozzle
- Keep temperatures even by using a heat mat.
- Faster germination makes for a stronger cotyledon
- Do not over water
- Do not stress the mature plant will be weaker
- Make sure seeds that are just germinating are together in the greenhouse.
- Keep air flow steady. This is a stage when disease can set in easily.



True Leaf Stage



Potting up



Why Pot Up?



Fruiting plants like tomatoes, eggplants, peppers need a bigger pot when started earlier. For planting out by June 1, they can be potted around mid April (with seeding in early April or late March). Potting up gives them fresh soil (and food) and gives you a chance to bury the stem for better root growth. It also can save space in the greenhouse by starting seeds in small cells rather than starting them in their large pots right away.

Fertility for Growing Plants



- If your soil is good, you rarely will need to fertilize. If you do need to fertilize, use a liquid fertilizer as a soil drench and a foliar spray. Don't do it during a cloudy spell.
- You can also top dress larger containers by using a something like Compost Plus from VT Compost Company.



Insect Control

Biological Options

- Integrated Pest Management
- Sprays

Chemical solutions can be avoided with proper management

Insect Control

- Scouting make several copies of a map of your greenhouse.
- Have someone walk around once a week looking for insects.
- Take notes on the map.
- Check hot spots where you see insect activity
- Consult with an IPM technician you trust
- Release beneficials as recommended



Disease Control



- O Prevention is best strategy
- Look for signs early and treat on a regimen
- Mark everything you do in a calendar
- Remove affected plants

Identify disease and understand the cause







- Can it be prevented culturally?
- Is it in fact a disease?
- How is it spreading?
- Are there fungus gnats in the greenhouse?

Products for Disease Prevention

Root Shield (T-22)







Products for disease control



- Products are more effective in a rotation
- Following a regimen is key
- Observe carefully and monitor for side effects
- Most organic products are ineffective when there is a full blown outbreak

Hardening Off Your Plants

- Let them get a little abused
- Do it gradually
- They will be ugly, but that is okay
- They need to feel wind, sun, cold for a few days before the shock of transplant



Give them some shelter as they harden off

Only a few hours of direct sunlight on the first day
Increase it incrementally

over a few days

•Put the cover on if temperatures dip too low

•Plants that can take a frost should be allowed to freeze in the hardening off process





Any Questions?

Resources

SEED COMPANIES THAT ARE GREAT TO WORK WITH

High Mowing Seeds

Johnny's Selected Seeds

Fedco

Seeds Savers Exchange

Territorial Seeds



GREENHOUSE MANUFACTURERS Harnois, Quebec

Ledgewood Farms, New Hampshire

Rimol, New Hampshire

GREENHOUSE SUPPLIES

Griffins Greenhouse Supply

Resources

GROWING SUPPLIES AND TECHNICAL SUPPORT

Potting Soil - Vermont Compost Company, Montpelier, VT

Fertility / Inputs

- Biobest (informative website, can be ordered through Griffins)
- North Country Organics
- NOFA bulk order
- Griffins

Technical Support

- Griffins' Greenhouse Supply Support
- Vermont Vegetable and Berry Growers' website
- Vern Grubinger, UVM Extension

Thanks and feel free to contact me,





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