

Cultivation & Regular Operations



Yields within a Growcer Farm

MIX*	TYPE OF PRODUCE	WEEKLY HARVEST
Mono Crop	Romaine Lettuce	656 mature heads
Dual Crop	Romaine Lettuce Spinach	328 mature heads 264 packages at 90g/package
Multi Crop	Romaine Lettuce Spinach Bok choy Fresh basil Mint	160 mature heads 129 packages at 90g/package 160 mature heads 105 packages at 28g/package 164 packages at 20g/package



Cultivation – Order of Operations

1. Harvests
2. Clean Rafts
3. Transplant
4. Clean Seedling Trays
5. Seed



Harvesting Prep

Plan to harvest the day of, or day before you plan to sell your produce for maximum freshness.

Materials needed:



Harvest totes



Pruning shears



Tote liners
(optional)



Harvest cart
(optional)

Types of Harvests

Type of harvest	Topping	Cut & Come Again Harvest	Complete Harvest
What is it	A type of partial harvest where you cut off the top of the plant under its newest growing node. This is done to promote lateral growth and create bushy plants. This way we can get wider plants given our height restrictions.	A type of partial harvest where the plants are developed enough (typically the older leaves) to produce a sizeable harvest and the rest (the younger leaves) are left to grow further.	The entirety of the plant is harvested at the same time.
What crops can you harvest this way	Basil	Leafy greens and herbs	Lettuces & asian greens. In some cases leafy greens.
Proportion of plant to be harvested	The top set of leaves	Typically $\frac{1}{3}$ of the plant, but with plants like mint, $\frac{2}{3}$	All

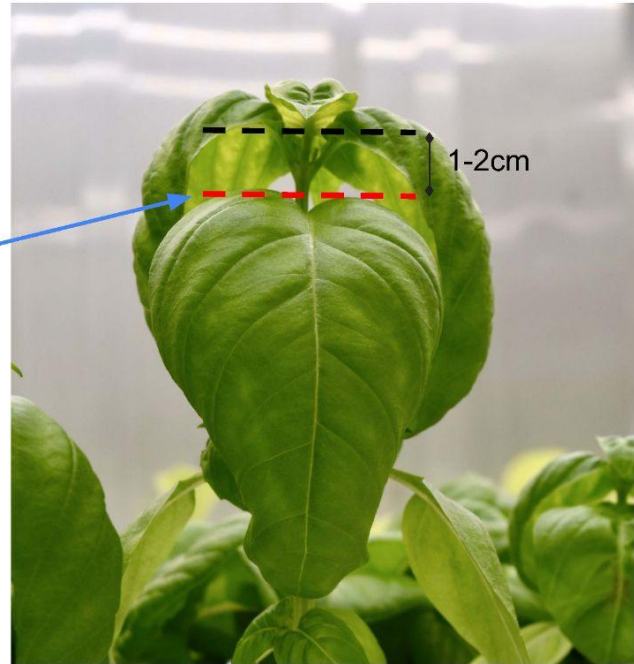


Topping Basil

Topping is a common cultivation technique to introduce enhanced branching of a plant, to increase leaf density and biomass per plant



On 5-6 week old plants, cut the main stem approximately 1-2 cm below the highest set of leaves to promote lateral growth.



Cut & Come Again – Basil

Cut off $\frac{1}{3}$ of the total leaves from the branching stems.

There is less of a notable pattern for harvesting basil, just stick to the biggest leaves, leaving the smaller ones behind to grow more.



Complete Harvest – Basil

For complete harvests, start by cutting the basil at the main stem close to the base of the rockwool and harvest all individual leaves.

Remove any dead or decaying leaves from the plant and dispose of them.

A complete harvest is the full removal of the plants from the rafts.

Place the basil loosely in a harvest tote to allow some air movement and avoid bruising, breaking leaves and stems and fill to the top.



Cut & Come Again - Kale (Spinach, Chard, Arugula...)

During a cut and come again (trim), harvest about $\frac{1}{3}$ of the plant - focus on taking only the **oldest, outermost** leaves, leaving the **younger ones** to **keep growing** for the next harvest.

The **younger leaves** emerge from the center of the plant.



Complete Harvest – Kale (Spinach, Chard, Arugula...)

For a complete harvest, bunch all leaves together and cut in one swift motion at the base of the stems.

Remove any dead and decaying leaves from the plant and dispose of them.

A complete harvest is the full removal of the plants from the rafts.

Place the delicious greens in a harvest tote. Fill to the top without packing too tight to allow for some air flow and avoid breaking stems and leaves.



Cut & Come Again – Mint

For cut and come again harvests, harvest $\frac{2}{3}$ (two thirds) of each plant at a time.

Cut the stems down so that they are approximately $\frac{1}{3}$ (one third) the height they started at.

Think of it like mowing the lawn

Harvest at weeks 8 and 10 and do a complete harvest at week 12 - in total mint is in the **seedling area for 3 weeks**, and in the **grow area for 9 weeks**.



Complete Harvest – Mint

For complete harvests, harvest all leaves by grouping together and cutting in one swift motion.

Cut approximately ½" above the rockwool cube.

A complete harvest is the full removal of the plants from the rafts.

Harvest at weeks 8 and 10 and do a complete harvest at week 12 - in total mint is in the **seedling area for 3 weeks** and in the **grow area for 9 weeks**.



Complete Harvest - Head Lettuce

Lettuce heads you can either harvest at the base of the main stem or keep as a living head by pulling out of the raft with the roots intact.

Living head can keep the lettuce fresher for longer and looks great on store shelves!



Post Harvest Considerations



- Always check cultivation tasks off on Luna and input yields.
- Produce should go in the fridge at a maximum of 30 minutes after harvest, using the table in the next slide as a guideline.
- Make sure to clean all harvesting materials, including the rafts from which crops have been fully harvested from.
- Packaging for produce is your decision but we can help you source and make your choice.



Cooling and Storage Chart for Produce

This chart shares the optimal temperature for storage and the conditions for each crop. Our R&D team have also validated the storage potential, the data is in number of days.



Crop	Optimal Temperature (°C)	Freezing/ Chilling Damage Temperature (°C)	Relative Humidity (%)	Storage Potential (# of days)
Arugula	0	-1.1	95-100	7-21
Asian Greens	0	-1.1	95-100	7-21
Basil	10	0	95	7-10
Chives	0	-0.9	95	10-14
Cilantro	0	-1.1	95	7-14
Collards	0	-1.1	95	7-14
Dill	0	-0.7	95	7-14
Kale	0	-1.1	95-100	14-21
Lettuce	0	-1.1	95-100	7-21
Mint	0	-1.1	95	7-10
Mustard Greens	0	-1.1	95-100	7-21
Parsley	0	-1.1	95	7-10
Pac Choi	0	-1.1	95-100	7-21
Spinach	0	-0.3	95-100	10-14
Swiss Chard	0	-6.7	95-98	7-14

Transplanting Prep

What are the materials required for transplanting?



1020 Tray without holes



Pruning shears

Safety Consideration for using Pruning Shears

- Keep them closed, leave them on the harvesting bench when not in use, rather than your pocket.
- Make sure to use proper ladder safety when harvesting in order to avoid incidents with pruning shears.

Transplanting

What does a healthy seedling look like?

1. The seedling should have cotyledons and a set of true leaves.
2. The roots should be beginning to emerge from the rockwool cube.



Transplanting

Selecting seedlings to transplant

We encourage you to overseed so that you can choose the best, most healthy seedlings for transplant.

When seeding leafy greens, lettuces and asian greens, we will seed 50 rockwool cubes in order to transplant one raft, or 36 seedlings.

When seeding herbs, we will seed 100 rockwool cubes in order to transplant one herb raft, or 72 seedlings.



Transplanting

Additional Transplanting Steps:

1. Place a raft on the runway. Remember:
 - a. 36 slot raft for leafy greens and lettuces
 - b. 72 slot raft for herbs
2. Carefully remove a plug from the 1020 tray and place it into a hole (planting slot) in the raft, ensuring that the rockwool cube is secure in the planting slot and that the bottom of the rockwool cube touches the surface of the water.
3. Dispose of any seedlings that are weak or didn't germinate and any other seedlings that you have in surplus.
4. Record in the production planner what crop was transplanted with the time, date, and quantities destroyed and/or moved.



Thinning & Seeding Rates

Although we try to limit how many seeds go in a rockwool cube, sometimes when the seeds are really small or when we put too many seeds in a single rockwool cube, we get more seeds per cube than expected.

So, we thin, or prune, the excess seedlings.

Crop	Varieties	Ideal # seedlings per cube
Lettuces	Monte Carlo Romaine, Dragoon, Red/Green-Incised, etc.	1
Lettuce or Greens Mixes	Wildfire Lettuce Mix, Encore Elegance Greens Mix, etc.	2-3
Spinach	Emperor, Seaside, Kookaburra, Space, Red Kitten, etc	1-2
Kale	Toscano, Winterbor, Redbor, Black Magic, etc	1-2
Arugula	Arugula, Standard, Astroc, etc	1-3
Asian Greens	Bok Choi, Win-Win Choi, Tatsoi, etc	1
Herbs	Basil, Mint, Cilantro, Parsley, Dill, etc	1

Thinning Seedlings



Thin out seedlings using thin tip pruning shears.

If there is more than one seedling that has germinated per rockwool cube, follow the thinning guide (ie. how to reduce the # of plants per rockwool cube) to the right.

Carefully cut out excess seedlings using thin pruning shears, leaving the strongest, most mature seedling(s) remaining.

Crop	Varieties	Ideal # seedlings per cube
Lettuces	Monte Carlo Romaine, Dragoon, Red/Green-Incised, etc.	1
Lettuce or Greens Mixes	Wildfire Lettuce Mix, Encore Elegance Greens Mix, etc.	2-3
Spinach	Emperor, Seaside, Kookaburra, Space, Red Kitten, etc	1-2
Kale	Toscano, Winterbor, Redbor, Black Magic, etc	1-2
Arugula	Arugula, Standard, Astroc, etc	1-3
Asian Greens	Bok Choi, Win-Win Choi, Tatsoi, etc	1
Herbs	Basil, Mint, Cilantro, Parsley, Dill, etc	1

Seeding Prep

Tip: Plan to seed the day of or the day after a transplant to ensure that there is space in the seedling area.

Materials needed:



Solid 1020 Tray



Mesh 1020 Tray



Seeds



Rockwool



Box Cutter



Large Jug



Humidity dome



Small plastic cups
(optional)



Stir sticks
(optional)

Seeding



Seeding Steps:

1. Sanitize all your required materials
 - 1020 Trays - one mesh and one with no holes
 - Humidity Dome
 - Box Cutter
2. Place all your required materials on the workbench
3. Put rockwool into the 1020 tray - mesh tray and tray without holes
4. Wet the rockwool with 2L of water per sheet, distributed evenly
5. Cut rockwool into individual cubes using a box cutter
 - **Note:** please use extra caution when using sharp tools, this is a cut hazard
6. Insert seeds into rockwool cubes
7. Take the mesh tray out of the tray with no holes before placing the seedlings into the seedling area tray
8. Place in seedling area with humidity dome
9. Remove humidity dome once seedlings have germinated

Seeding



Green Skills
Academy

Planting Tags



You can put as much info on the plant tags as you want but at the bare minimum we recommend:

- Date seeded
- Crop & cultivar

Example:

Date seeded - March 1st

Crop - Lettuce

Cultivar - Monte Carlo

Tag info:

Mar01-Mon-Car-Let

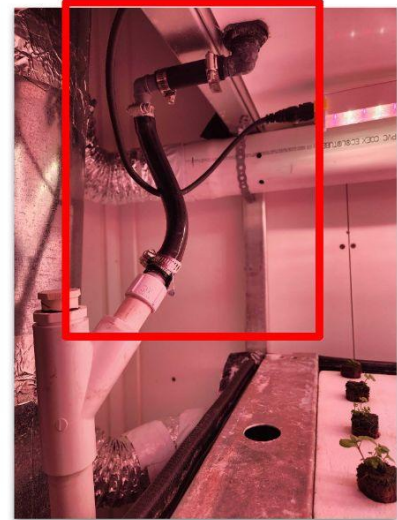
Main Maintenance Tasks

Maintenance Task	Frequency	Estimated Time Taken to Complete Task
1020 Trays/Flats	Weekly (before and after use)	2 min/tray
Harvest Tools	Weekly (before and after use)	1 min/tool
Harvest Containers/Totes	Weekly (before and after use)	2 min/tote
Rafts	Weekly (after harvest)	15 min/raft
Seedling Area - Tray	Weekly	15 min
Pump Bags	Weekly	45 min
Floors	Weekly (as needed and after harvests)	15 min
Work Bench	Weekly (before and after use)	5 min
Seedling Area - Tank	Monthly	45 min
Inputs and Drains	Monthly	20 min
BARD Air Filter Replacement	Quarterly (3 months)	1 hour
Runways	Quarterly (3 months)	2 hr/runway
Reservoirs	Quarterly (3 Months)	2 hr/reservoir
Clean Out - SOP to be provided, contact Help@thegrowcer.ca	Yearly	24 hours



A Breakdown of Monthly Tasks

Sanitize seedling area - tank



Clean input and drains

A Breakdown of Quarterly & Yearly Tasks



Sanitize/clean runways and reservoirs

Replace Bard HVAC air filter



Full system clean out