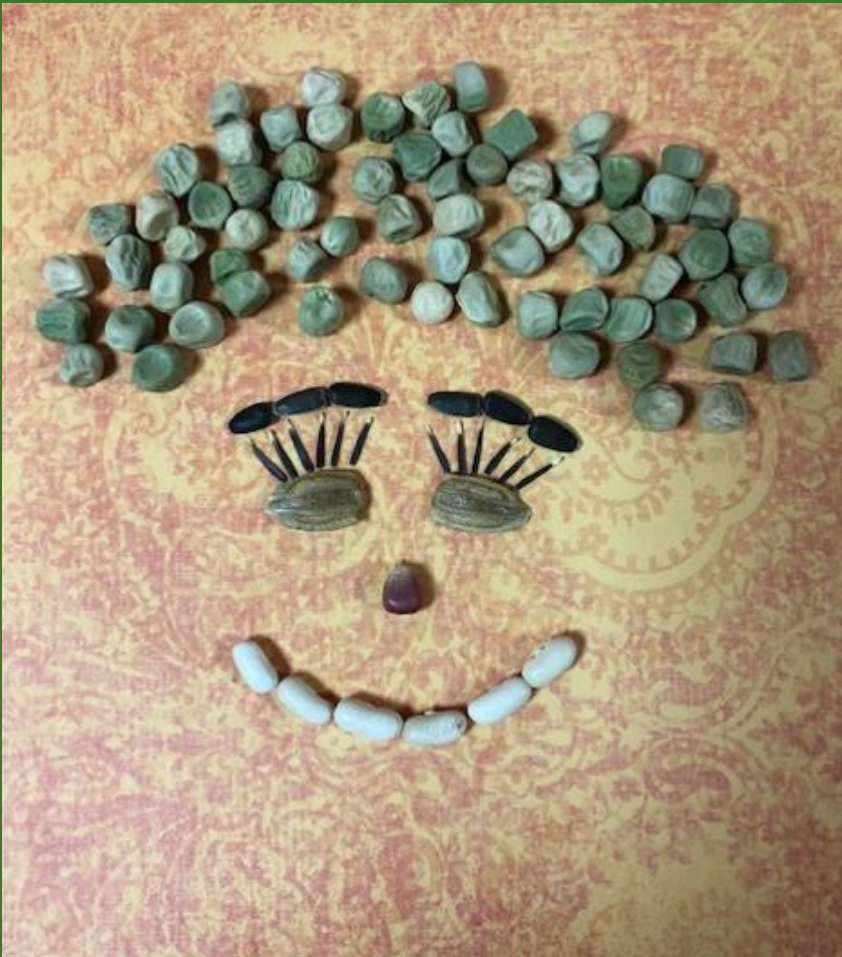


STARTING PLANTS FROM SEED



Sue Newman

WARNING

Seed-starting can become very addictive and habit forming in some individuals.

Signs of addiction include:

- Constant dirt under the fingernails
- Seedling trays covering any open counter space
- Feeling of euphoria when the first sliver of growth pops up from the soil
- Unaccounted hours of the day “lost” while you tend to your botanical babies

My Background

- Advanced Master Gardener; originally certified in 2001
- Spent most of my life in southeast Michigan
- Grew veggies from seed for 7 years downstate – had a room in the basement
- Moved to TC in 2015
- Successfully annexed a portion of my husband's workshop in the Great Seed Room Treaty of 2017



Why grow your own?

- LOTS more options with the varieties of plants that you can grow
- Stronger, healthier plants
- Control of what goes on/in your plants from day 1
- Cost savings (what you tell your significant other as needed)
 - 1 packet of Chef's Choice Pink tomato @\$3.25 (30 seeds per packet)
 - Assume 90% germination rate: $30 \times 0.9 = 27$ seeds become plants
 - \$3.25 divided by 27 plants = only 12 cents per plant!!!
 - Conveniently neglect to mention the additional cost of seedling trays, potting mix, grow lights, new tools, etc. etc.
- Gardener's Zen during winter: the sight, smell, and feel of moist soil, bright light, and tiny seeds transforming into little plants under your care

What to grow – browse catalogs



Catalog Key Example – Territorial Seed

Key for all plants located at the front of the catalog

Key to Symbols

	All-America Selections winner		Plant availability		Full Shade
	Cold-hardy variety		Taste-test favorites		Great for Cutting & Crafting
	Container-friendly variety		Territorial Select Maintenance Breeding Program		Culinary
	Dual-season variety	(A)	Annual		Tea
	Heirloom variety	(B)	Biennial		Has Extra Shipping Weight
	New to Territorial Seed	(P)	Perennial		
	Organic availability	(TP)	Tender Perennial		
	Organic/Biodynamic dual certified availability	(F1)	Hybrid variety		
	USDA Organic and Demeter Biodynamic®	(OP)	Open-pollinated variety		
	Pelleted availability		Full Sun		
			Partial Shade		

Safe Seed Pledge
As charter signers, we pledge that we do not knowingly buy or sell genetically engineered seeds or plants. We wish to support agricultural progress that leads to healthier soils, genetically diverse agricultural ecosystems, and ultimately people and communities. All of our seed is untreated.

GMO FREE

Catalog Key Example – Territorial Seed

SWEET-SLICE

Sweet-Slice

(F1) 62 days. This high-yielding slicer has tender skin, crisp, clean flesh, no bitterness and great disease resistance. One bite of Sweet-Slice and you'll be smitten by the refreshing flavor, and they're absolutely burpless. Glossy, dark green fruit grow 10-12 inches long with pure white interiors. MO. A, ALS, CCu, DM, PM.

CU312C SWEET-SLICE

1 gram	150 seeds	500 seeds
\$5.75	\$17.25	\$53.25

Key to Cucumber Flower and Fruit Set

GY | Gynoecious - Has nearly all female flowers.

HE | Hermaphrodite - Flowers contain both male and female reproductive parts.

MO | Monoecious - Has separate male and female flowers on the same plant.

PAT | Parthenocarpic - Has the ability to set fruit without pollination. Triggered by low temperatures, short day length, and plant age.

Additional keys with info for specific types of plants (if available) will be in the plant section

Key to Cucumber Disease Resistance/Tolerance

HR indicates high resistance.

IR indicates intermediate resistance.

A	Anthracnose
ACu	Alternaria Leaf Blight
ALS	Angular Leaf Spot
C	Cercospora
CCa	Corynespora Blight & Target Spot
CCu	Scab & Gummosis
CMV	Cucumber Mosaic Virus
CVYV	Cucumber Vein Yellowing Virus
CYSDV	Cucurbit Yellow Stunting Disorder Virus
DM	Downy Mildew
PM	Powdery Mildew
R	Common Rust
S	Scab
TSP	Target Spot

CUCUMBERS

Cucumis sativus

Soil Temp. for Germ.	65-90°F	Days to Emergence	4-13
Seed Depth	½"	Thin Plants To	1-2/hill
Seed Spacing	4-6/hill	Row Spacing	3-4'
Min. Germ.	80%	Seed Life	3 years
Seeds per gram	≈ 25-30	Fertilizer Needs	High

Days to maturity are calculated from date of direct seeding.

Culture

- Cucumbers perform best in fertile, well-drained soil with a pH 5.5-7.0
- Consistent, even watering is critical for best plant growth and fruit development
- Raised beds, plastic mulch, and trellising can improve yields, keep fruit straight and scab free
- Incorporate a shovelful of compost and ½ cup TSC's Complete fertilizer per hill

Direct Sowing

- For best germination, keep soil evenly moist but not too wet
- Cover hill with Kozy-Coats, Victorian Bell Cloches, or a row cover to speed up germination
- Thin to the strongest 1-2 plants when first true leaves emerge

Transplanting

- Start indoors in 4 inch pots, 3-4 weeks before anticipated transplant date
- Avoid letting starts get root bound; transplant carefully as to not disturb roots

What to grow – independent resources

- AAS – all-americaselections.org

All-America Selections (AAS) is an independent, non-profit organization that began in 1932 to conduct confidential and impartial trials of new, never-before-sold flower and vegetable varieties throughout North America.

Entries are trialed in many different geographic locations throughout the U.S. and Canada, grown side-by-side with currently available comparison varieties to evaluate garden performance, earliness, flower, or fruit size or any other characteristic important to the home gardener. The 80+ trial judges are horticulture professionals at universities, public gardens, extension offices, seed companies, breeding companies, retailers, and commercial growers. Only the best trial performers that show superiority to their comparisons are declared AAS Winners.



What to grow – ideas from magazines



Mother Earth News

- Compact Plants – Pint-sized Hybrids for Patio Gardeners
- 20 Tasty Tomatoes for Sauces and Canning
- Crop at a Glance: Okra



Fine Gardening articles

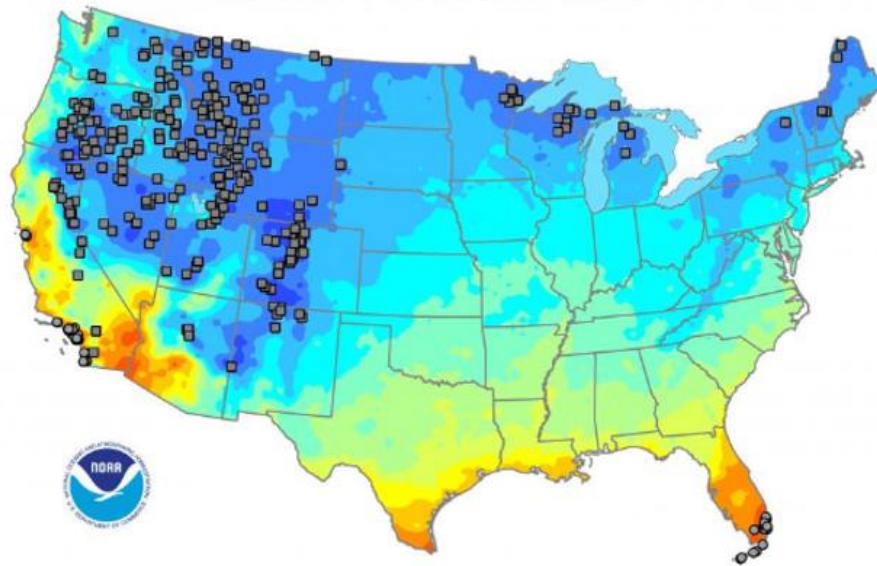
- Shake up your Veggie Options
- New Tomato Options to Try
- Spring Veggies to Plant Now
- Easier Ways to Start Seeds
- Seed Starting: Everything you need to know

When to start your seeds

- You need to know your last frost date – the average date of the last light freeze that occurs in spring
- With climate change this is becoming more variable, watch your local weather as the date becomes close to know when it's safe to plant outside

Day of the Last Spring Freeze

from the 1981–2010 U.S. Climate Normals



NOAA U.S. Frost Map

The format of the data is not very helpful...



When to start your seeds

Dave's Garden website <https://davesgarden.com/guides/freeze-frost-dates/>
First and last freeze/frost dates for Traverse City

Your results

Each winter, on average, your risk of frost is from **October 1 through May 29**.
Almost certainly, however, you **will** receive frost from October 16 through May 14.
You are almost guaranteed that you **will not** get frost from June 14 through September 16.
Your frost-free growing season is around 125 days.

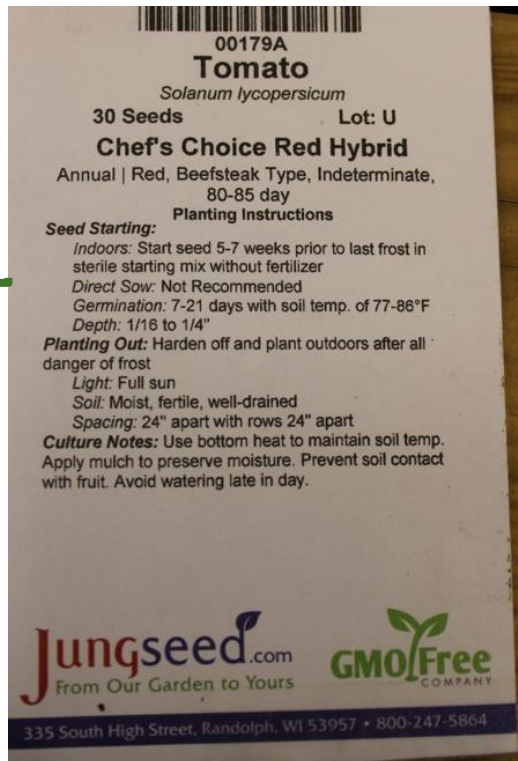
Detailed station data follows:*

Maple City, MI (Leelanau county):

Temperature	10%	20%	30%	40%	50%	60%	70%	80%	90%
Spring 32°	Jun 14	Jun 8	Jun 4	Jun 1	May 29	May 26	May 23	May 19	May 14
Spring 28°	May 25	May 21	May 17	May 15	May 12	May 9	May 6	May 3	Apr 28
Spring 24°	May 12	May 7	May 4	May 1	Apr 29	Apr 26	Apr 23	Apr 20	Apr 15
Fall 32°	Sep 16	Sep 21	Sep 25	Sep 28	Oct 1	Oct 4	Oct 7	Oct 11	Oct 16
Fall 28°	Oct 1	Oct 7	Oct 12	Oct 16	Oct 19	Oct 23	Oct 27	Oct 31	Nov 5

When / where to start – read the label!

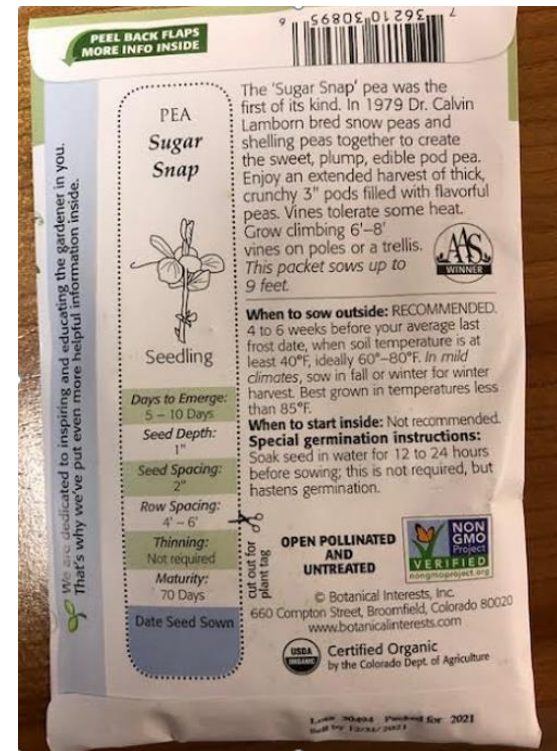
Tomato – Chef's Choice Red (Jung Seed)



Seed Starting:

Indoors: Start seed 5-7 weeks prior to last frost in sterile starting mix without fertilizer
Direct Sow: Not Recommended
Germination: 7-21 days with soil temp of 77-86° F
Depth: 1/16 to 1/4"

Peas – Sugar Snap (Botanical Interests)



When to sow outside: RECOMMENDED

4 to 6 weeks before your average last frost date, when soil temperature is at least 40°F, ideally 60° - 80°F.

When to start inside: Not recommended

How to Grow – Key Requirements

- Growing medium (and usually something to put it in)
- Light
- Water
- Air



Growing Medium Requirements

- Must be sterile to avoid damping off disease
- Must be able to absorb/hold water, but not so dense that tiny roots and shoots can't grow in it
- Free from other seeds
- Options
 - Packaged seed starting mix
 - Coir
 - Vermiculite, perlite, sphagnum moss



Enriched with
Miracle-Gro™ Plant Food



Containers

- For most seeds, depth of 2-3 inches is sufficient to get started.
- Use slightly larger containers for seeds that won't be moved to bigger pot before getting planted outside
- Must have drainage holes



Alternate Container Options



Soil blocks – roots from one block tend to grow into neighboring blocks

Peat pellets – netting can prevent root growth into surrounding soil



Peat pots – can pull water *away* from roots if they aren't kept well moistened; don't always break down well after planted in soil

CowPots – similar issues to peat pots but not quite as difficult to keep moist



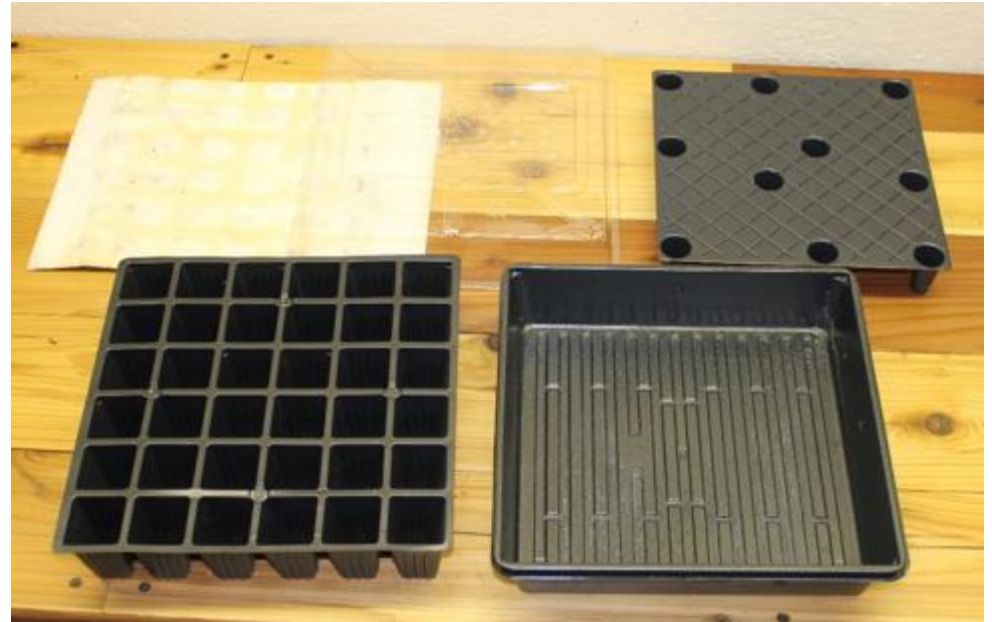
Seed Starting System Examples

System made from Styrofoam is well-constructed, but won't work with heat mats and is difficult to sterilize at the end of the season



Seed Starting System Examples

This system is inexpensive and has worked well for me, will be re-using them for a third season this year



Light

- Read the label for how deep to plant your seeds. Some plants should not be covered at all, just pressed into planting medium.
- Full spectrum lights are best.
- Lights should be adjustable height to adapt to growing plants. If the lights can't move, raise/lower your seedlings as needed.
- Timers are the best way to provide consistent number of hours. I normally do 14 hours per day.



Water/Air

- Water
 - No chlorine or soft water. Used filtered water (get a water filter pitcher)
 - Tepid temperature
 - Water from bottom to avoid moving seeds. Or use spray bottle and mist from above
- Air
 - Seeds and seedlings need air – make sure all your containers have drainage holes.
 - Note: Germination rates are based on soil temperature, not air temperature. Heat pads can really speed up germination by raising the soil temperature 10-20 degrees above air temp.



Fertilize

- Wait until the first true leaves have appeared before fertilizer
- Options: Fish emulsion, seaweed fertilizer, pre-mixed solution



I prefer to manually fertilize instead of using a pre-fertilized soil mix



Transplanting to a larger container

- Yes for most seedlings – check the package instructions
 - Some plants like cucumbers and squash don't take well to transplanting – it's better to start those later and in a larger container
- Transplant when the seedlings are large enough to handle without damaging them; before they are root-bound or competing with their neighbors for the light
- I usually transplant into a 4" square pot. This size allows the plant to grow unimpeded, and the square shape is easier to arrange closely together under my grow lights.
- Tip: To avoid leggy tomato plants, I bury a portion of the stem when I transplant, usually up to the first set of true leaves. The buried stem sends out roots, which makes for a sturdier plant.

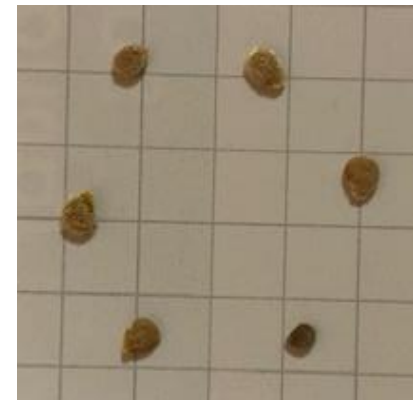


General Tips

- If your seed is older and/or has a low germination rate, plant more than one seed in a container. If more than one sprouts, then CUT off (don't pull) the smaller/weaker one at the soil line – avoids disturbing the other seedling's roots



- When planting different types of seeds in the same container, try to plant seeds with about the same germination length. Otherwise, the 'early bloomers' may be too tall for the container top (but not ready to transplant) before the other seeds sprout.
- Label your seeds *when* you plant them. No, seriously, label them.
- Only have one seed packet open at a time; don't hold the open packet over your soil (unless you can identify these 6 different varieties of tomato seed)



- Store your remaining seeds in the original package, out of direct light and protected from moisture (and critters, depending on where you store them)

My "Germination Station!"



Room for Improvement – My Goals

- Creating a planting plan by week
- Find a 'seed buddy' (or 2 or 3) to share seeds
- Plan for succession planting
- Document what I'm doing and when!!!!



Resources / Seeds / Growing Supplies

- Nancy Bubel, 'The New Seed-Starters Handbook'
- All-America Selections (AAS) – all-americaselections.org
- Burpee – burpee.com
- High Mowing Organic Seeds – highmowingseeds.com
- Johnny's Selected Seeds – johnnyseeds.com
- John Scheepers Kitchen Garden Seeds – kitchengardenseeds.com
- Jung Seeds and Plants – jungseed.com
- Park Seed – parkseed.com
- Territorial Seed Company – territorialseed.com
- Totally Tomatoes – totallytomato.com
- Lee Valley Tools – leevalley.com (make sure you're on the U.S site)
- Gardeners Supply – gardeners.com

Thank you!

