University of Idaho Extension

IDAHO master GARDENER
A UNIVERSITY OF IDAHO EXTENSION PROGRAM

Growing in Northern Idaho

SEED STARTING FOR THE HOME GARDENER: A DEEP DIVE

Presented by:
Candace Godwin
Certified Idaho Master Gardener
Owner, The Coeur d'Alene Coop

The Coeur d'Alene Coop

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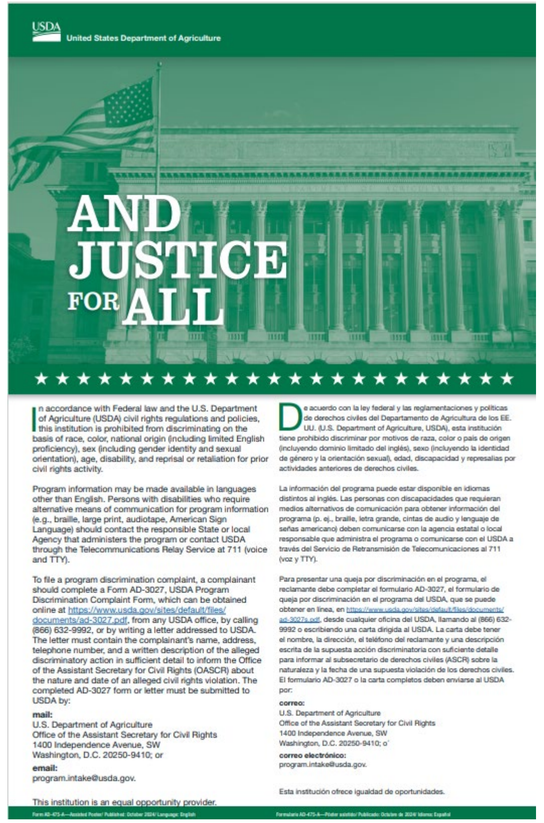

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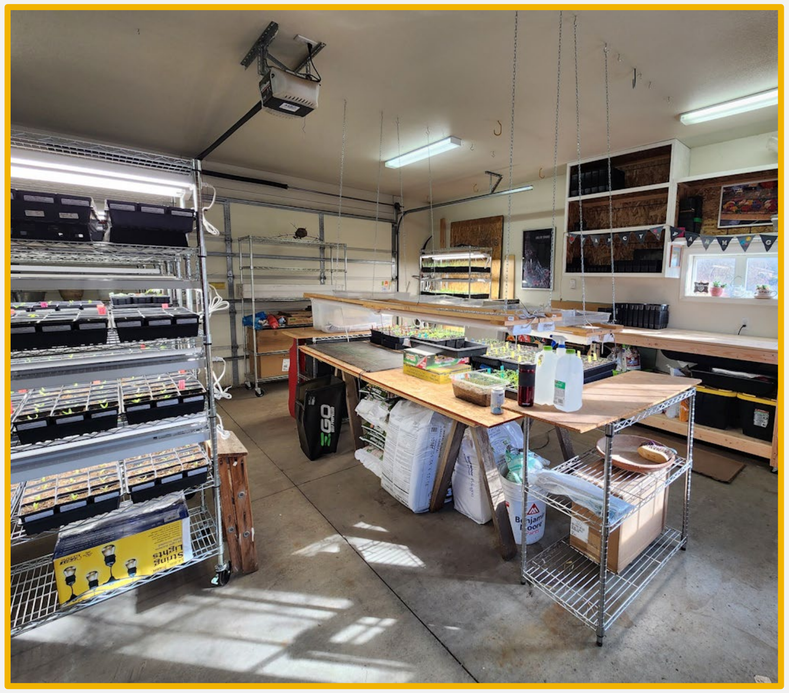
HUMBLE BEGINNINGS…

A packet of tomato seeds and a sunny, south-facing window…

TODAY…

Fifteen years later, a dedicated growing garage and a greenhouse.



LET'S START SEEDS!

WHAT COULD POSSIBLY GO WRONG?

1. Unknown squash seed: hybrid?
2. Starting squash too soon
3. Container is too small for the seed
4. Used soil from the garden
5. Seed was planted too shallow
6. Overwatered

WORDS TO GARDEN BY…

“There are no gardening mistakes, only experiments!”

— Janet K. Phillips

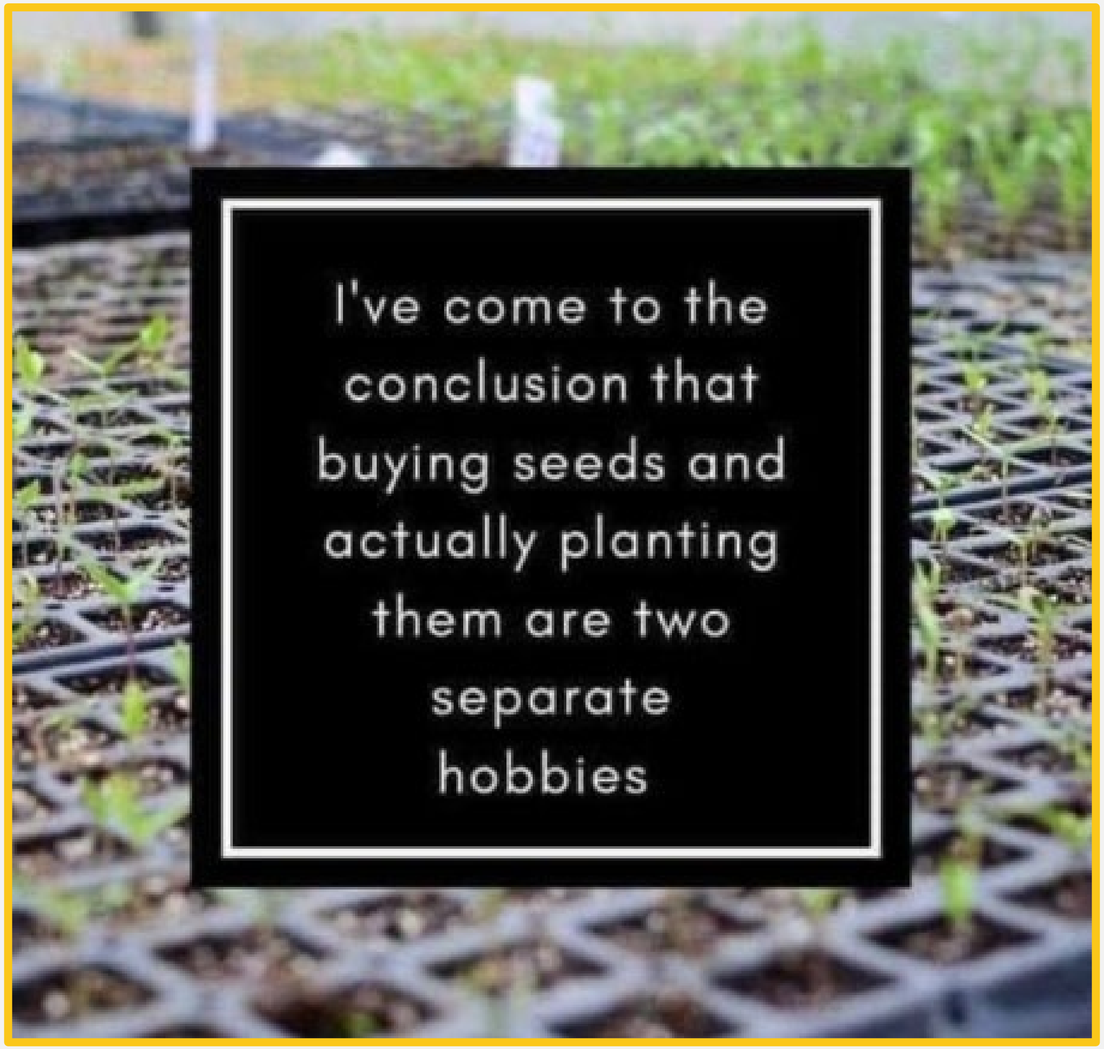
WHAT WE'LL COVER TODAY

- Why grow from seed?
- Seed terminology
- Exploring the seed packet
- Seed biology
- Germination how & why
- Why seeds fail
- Seed timing
- Supplies & equipment
- Potting up and hardening off

WHY GROW FROM SEED

& SEED TERMINOLOGY

IS THIS YOU?? LOL!!



WHY GROW FROM SEED?

My Top Reasons

1) **More Choices** for what to grow

2) **More Control** over how your plants are grown

3) **Money Saver!**

4) **Low Risk** way to experiment

SEEDY TERMINOLOGY

- Open-Pollinated
- Heirloom
- Hybrid
- GMO
- Organic

SEEDY TERMINOLOGY

Open-Pollinated

- Have stable parents
- Produces true-to-type seed
- Used for seed saving

SEEDY TERMINOLOGY

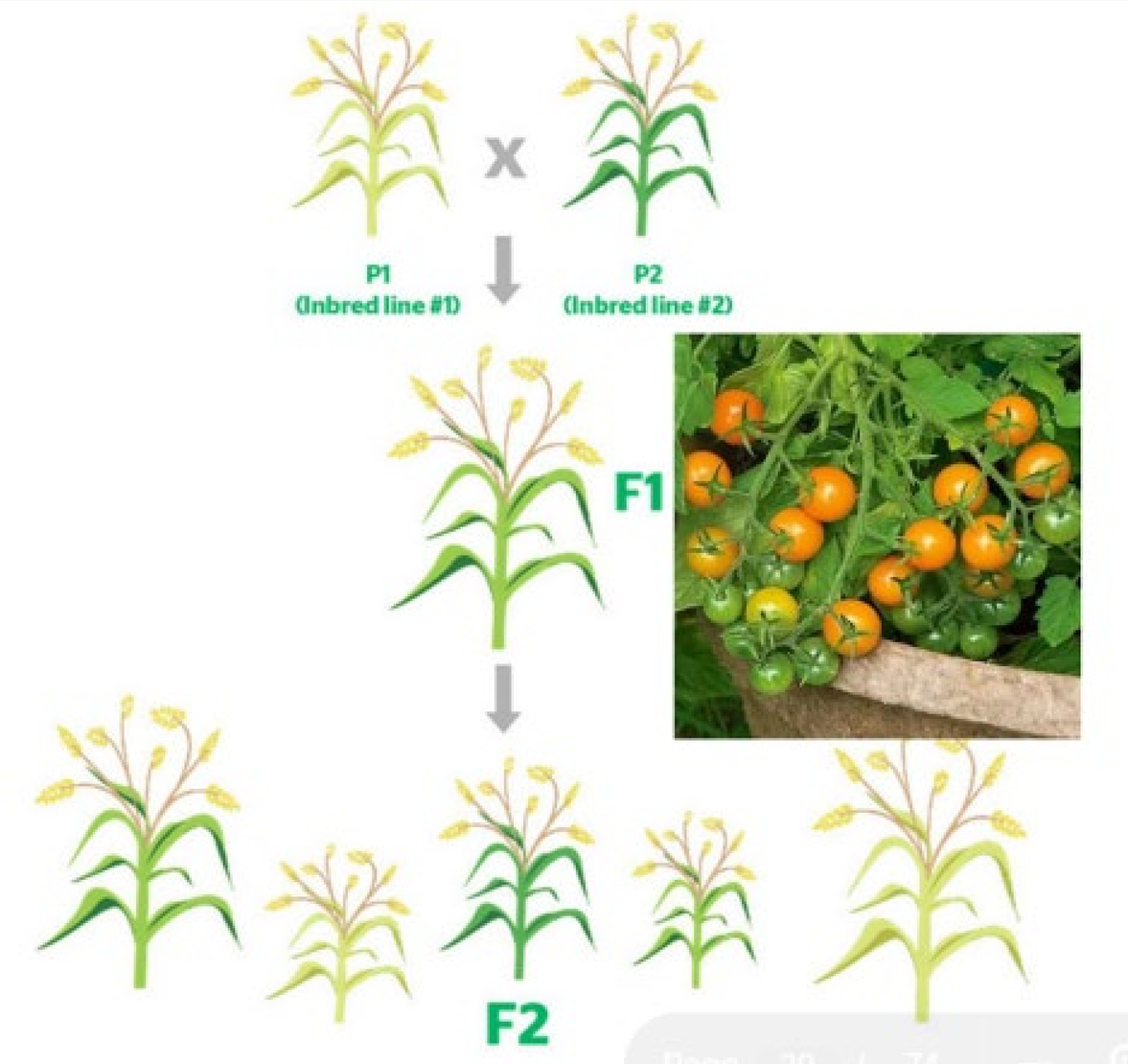
Heirloom (50+ years)

- Are open-pollinated & produce true seed
- Long history of being passed through generations or centuries

SEEDY TERMINOLOGY

Hybrid Seed

- Parents are two different inbred lines
- F1 or **First Filial =** offspring
- F2 – anything goes!



SEEDY TERMINOLOGY

Non-GMO seed varieties are either:

Open-pollinated

- Stabilized cross over many generations
- You can save true-to-type seeds
- Heirlooms: open-pollinated varieties with a history

Hybrid

- Deliberate cross between 2 inbred parent lines
- Uniform F-1 generation
- F-2 and beyond will be who knows!

Seedy Terminology

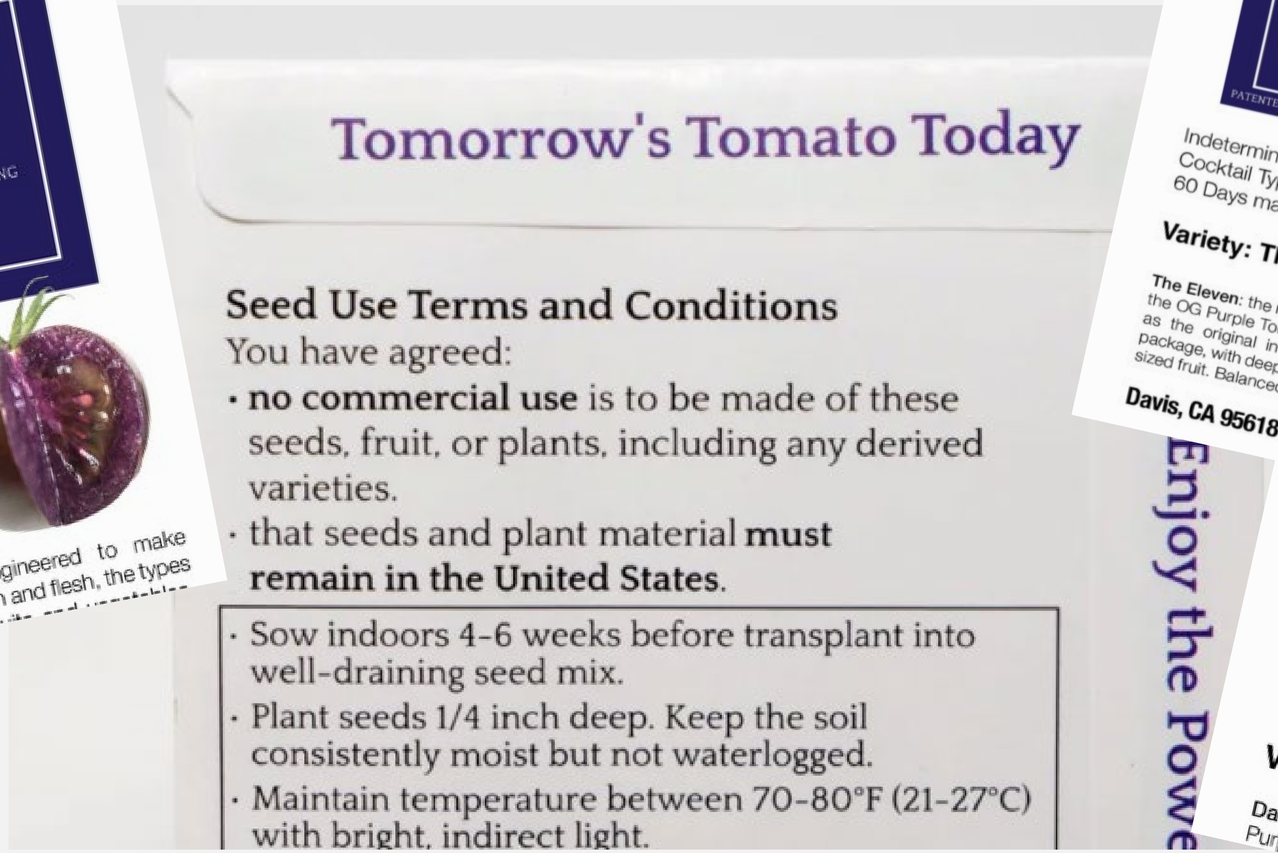
Genetically Modified Organism (GMO)

- Uses specific techniques in a lab to alter DNA or transfer DNA from one organism to another.
- DNA can be transferred from organisms across species or even kingdoms
- 13 highly regulated farm crops: corn, soybeans, sugarbeets
- Farm crops are not available to home gardeners, but…

GMO PURPLE TOMATO!!

- First GMO seed made available to the public.
- Genetically modified with snapdragon DNA for purple color– transgenic GMO
- High in anthocyanins.
- Attempt to make the public comfortable with GMOs.

SOME RESTRICTIONS APPLY…



Seedy Terminology

ORGANIC SEED: DOES IT MATTER?

If you are USDA Certified Organic, you must grow from organic seed.

Organic seed:

- Is grown with little or no chemical influence
- Is not weakened by constant chemical support
- Is naturally more resilient to pests and diseases
- Heirloom, OP & hybrid seed can all be organic

SEEDS & THE SEED PACKET

CHOOSING SEEDS

Think Regional First

- Where they are grown matters
  - Locally adapted
  - Supporting local farmers
- How they are grown matters
- Seed Swaps / other questionable sources

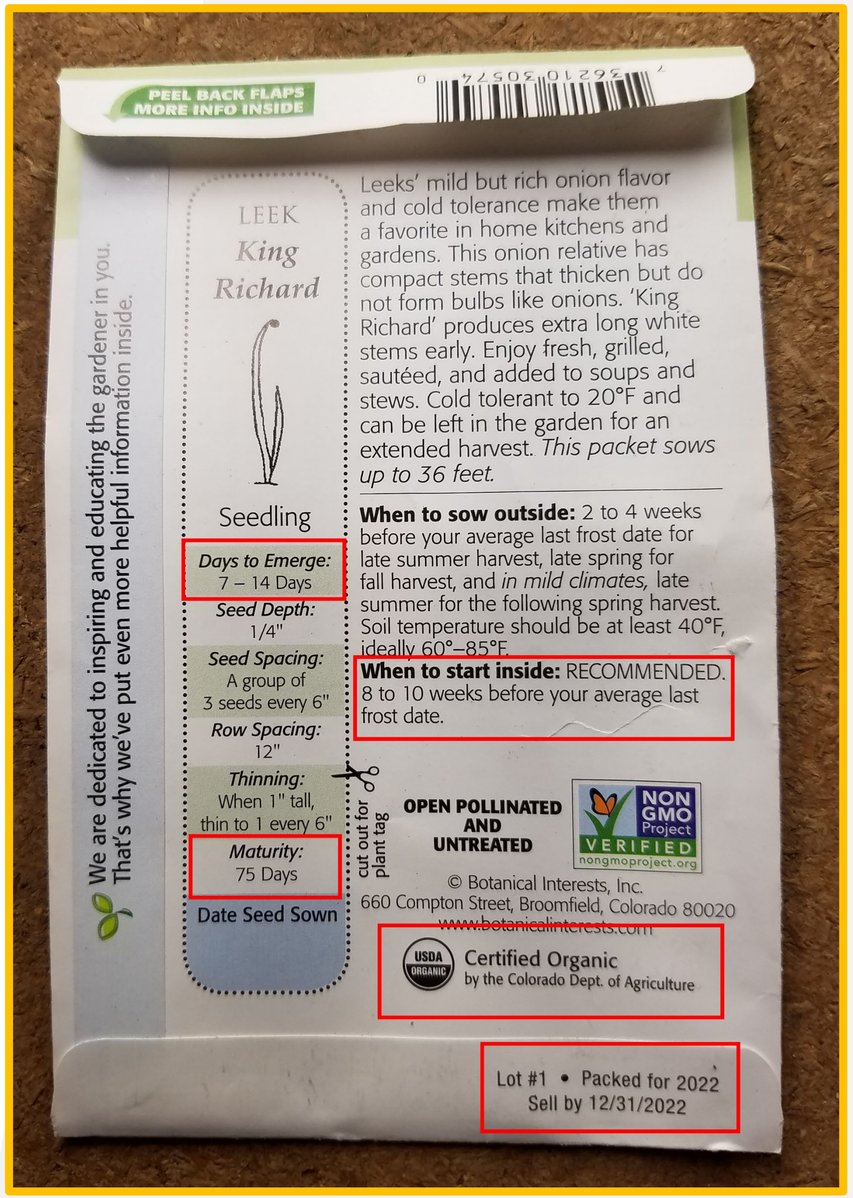
YOUR BEST FRIEND: THE SEED PACKET

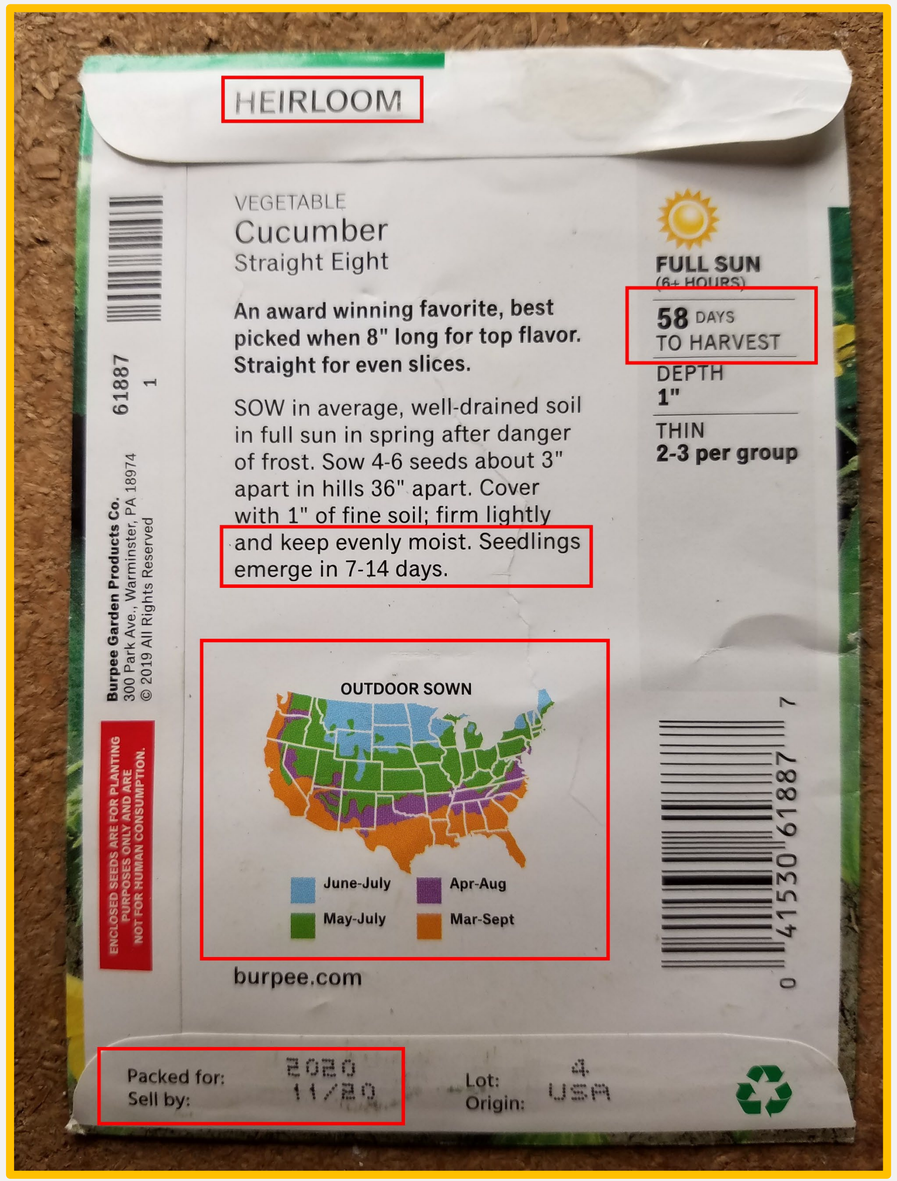
Can be a wealth of important information:

- Name: Common and Botanical
- Variety and Cultivar
- Organic or Conventional
- Open Pollinated, Heirloom, or Hybrid
- Days to Germination and Maturity
- Sowing Instructions: When/How
- Freshness Date

YOUR BEST FRIEND: THE SEED PACKET

YOUR BEST FRIEND: THE SEED PACKET





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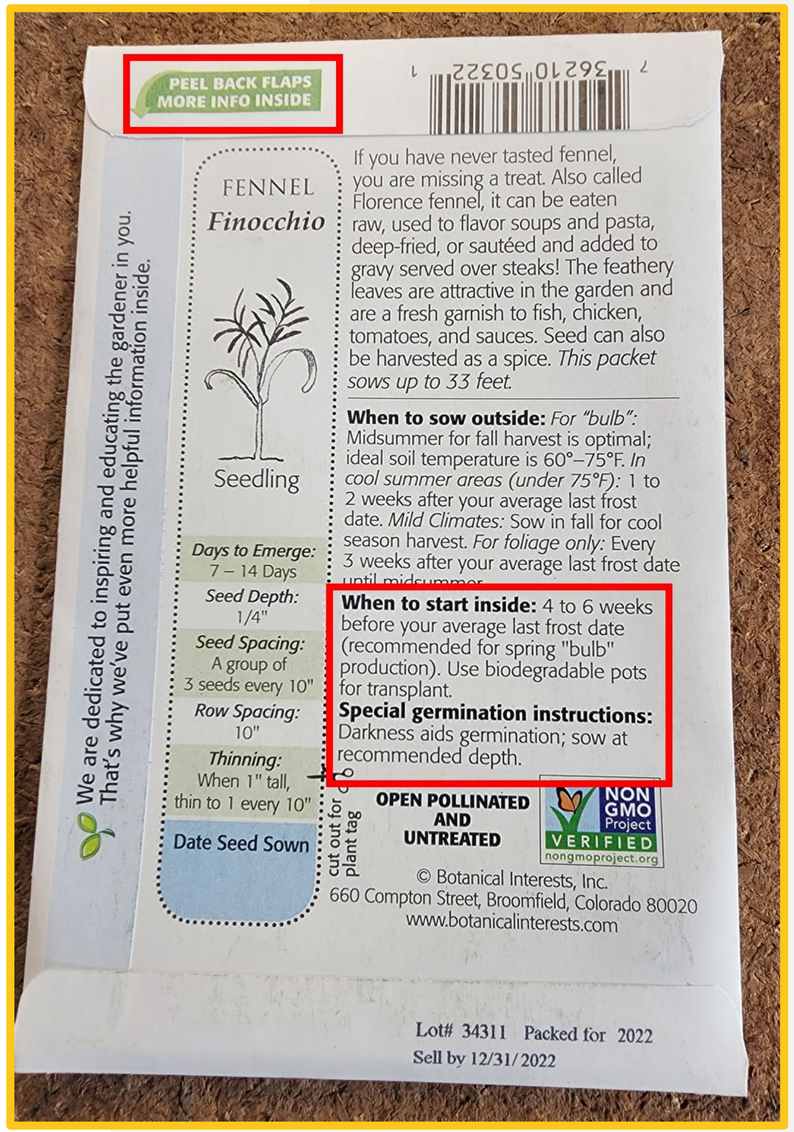

PEEL BACK FLAPS
MORE INFO INSIDE

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We are dedicated to inspiring and educating the gardener in you.
That's why we've put even more helpful information inside.

FENNEL
Finocchio

Seedling

Days to Emerge:
7 – 14 Days

Seed Depth:
1/4"

Seed Spacing:
A group of
3 seeds every 10"

Row Spacing:
10"

Thinning:
When 1" tall,
thin to 1 every 10"

Date Seed Sown

If you have never tasted fennel, you are missing a treat. Also called Florence fennel, it can be eaten raw, used to flavor soups and pasta, deep-fried, or sautéed and added to gravy served over steaks! The feathery leaves are attractive in the garden and are a fresh garnish to fish, chicken, tomatoes, and sauces. Seed can also be harvested as a spice. *This packet sows up to 33 feet.*

When to sow outside: *For "bulb":* Midsummer for fall harvest is optimal; ideal soil temperature is 60°–75°F. *In cool summer areas (under 75°F):* 1 to 2 weeks after your average last frost date. *Mild Climates:* Sow in fall for cool season harvest. *For foliage only:* Every 3 weeks after your average last frost date until midsummer.

When to start inside: 4 to 6 weeks before your average last frost date (recommended for spring "bulb" production). Use biodegradable pots for transplant.

Special germination instructions: Darkness aids germination; sow at recommended depth.

cut out for plant tag

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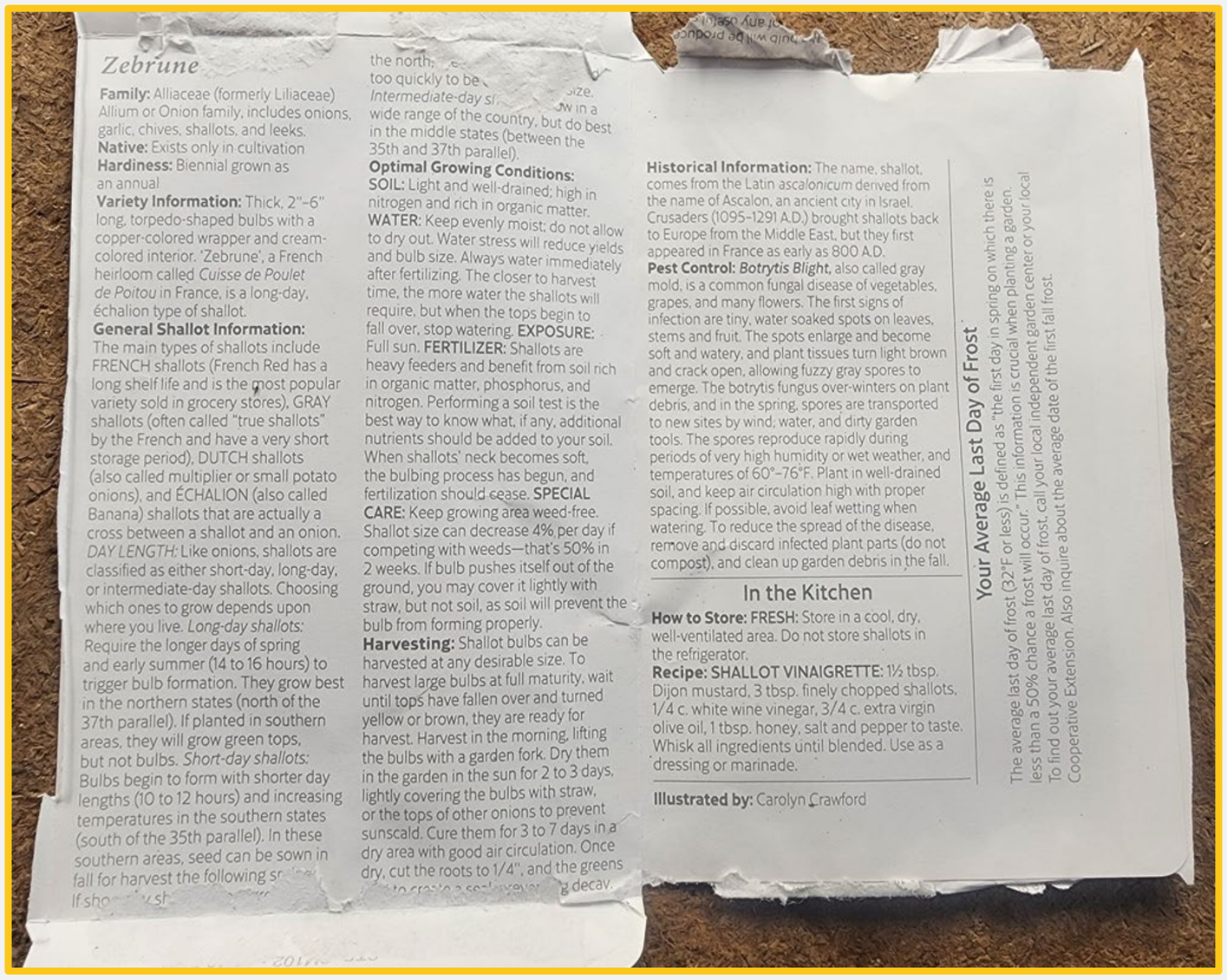
660 Compton Street, Broomfield, Colorado 80020
www.botanicalinterests.com

Lot# 34311 Packed for 2022
Sell by 12/31/2022



Zebrune

Family: Alliaceae (formerly Liliaceae) Allium or Onion family, includes onions, garlic, chives, shallots, and leeks.
Native: Exists only in cultivation
Hardiness: Biennial grown as an annual
Variety Information: Thick, 2"–6" long, torpedo-shaped bulbs with a copper-colored wrapper and cream-colored interior. 'Zebrune', a French heirloom called *Cuisse de Poulet de Poitou* in France, is a long-day, échalion type of shallot.
General Shallot Information: The main types of shallots include FRENCH shallots (French Red has a long shelf life and is the most popular variety sold in grocery stores), GRAY shallots (often called "true shallots" by the French and have a very short storage period), DUTCH shallots (also called multiplier or small potato onions), and ÉCHALION (also called Banana) shallots that are actually a cross between a shallot and an onion. *DAY LENGTH:* Like onions, shallots are classified as either short-day, long-day, or intermediate-day shallots. Choosing which ones to grow depends upon where you live. *Long-day shallots:* Require the longer days of spring and early summer (14 to 16 hours) to trigger bulb formation. They grow best in the northern states (north of the 37th parallel). If planted in southern areas, they will grow green tops, but not bulbs. *Short-day shallots:* Bulbs begin to form with shorter day lengths (10 to 12 hours) and increasing temperatures in the southern states (south of the 35th parallel). In these southern areas, seed can be sown in fall for harvest the following sp

the north;
too quickly to be
Intermediate-day sh
wide range of the country, but do best in the middle states (between the 35th and 37th parallel).
Optimal Growing Conditions:
SOIL: Light and well-drained; high in nitrogen and rich in organic matter.
WATER: Keep evenly moist; do not allow to dry out. Water stress will reduce yields and bulb size. Always water immediately after fertilizing. The closer to harvest time, the more water the shallots will require, but when the tops begin to fall over, stop watering. **EXPOSURE:** Full sun. **FERTILIZER:** Shallots are heavy feeders and benefit from soil rich in organic matter, phosphorus, and nitrogen. Performing a soil test is the best way to know what, if any, additional nutrients should be added to your soil. When shallots' neck becomes soft, the bulbing process has begun, and fertilization should cease. **SPECIAL CARE:** Keep growing area weed-free. Shallot size can decrease 4% per day if competing with weeds—that's 50% in 2 weeks. If bulb pushes itself out of the ground, you may cover it lightly with straw, but not soil, as soil will prevent the bulb from forming properly.
Harvesting: Shallot bulbs can be harvested at any desirable size. To harvest large bulbs at full maturity, wait until tops have fallen over and turned yellow or brown, they are ready for harvest. Harvest in the morning, lifting the bulbs with a garden fork. Dry them in the garden in the sun for 2 to 3 days, lightly covering the bulbs with straw, or the tops of other onions to prevent sunscald. Cure them for 3 to 7 days in a dry area with good air circulation. Once dry, cut the roots to 1/4", and the greens

Historical Information: The name, shallot, comes from the Latin *ascalonicum* derived from the name of Ascalon, an ancient city in Israel. Crusaders (1095–1291 A.D.) brought shallots back to Europe from the Middle East, but they first appeared in France as early as 800 A.D.
Pest Control: ***Botrytis Blight,*** also called gray mold, is a common fungal disease of vegetables, grapes, and many flowers. The first signs of infection are tiny, water soaked spots on leaves, stems and fruit. The spots enlarge and become soft and watery, and plant tissues turn light brown and crack open, allowing fuzzy gray spores to emerge. The botrytis fungus over-winters on plant debris, and in the spring, spores are transported to new sites by wind; water, and dirty garden tools. The spores reproduce rapidly during periods of very high humidity or wet weather, and temperatures of 60°–76°F. Plant in well-drained soil, and keep air circulation high with proper spacing. If possible, avoid leaf wetting when watering. To reduce the spread of the disease, remove and discard infected plant parts (do not compost), and clean up garden debris in the fall.

In the Kitchen

How to Store: FRESH: Store in a cool, dry, well-ventilated area. Do not store shallots in the refrigerator.
Recipe: SHALLOT VINAIGRETTE: 1½ tbsp. Dijon mustard, 3 tbsp. finely chopped shallots, 1/4 c. white wine vinegar, 3/4 c. extra virgin olive oil, 1 tbsp. honey, salt and pepper to taste. Whisk all ingredients until blended. Use as a dressing or marinade.

Illustrated by: Carolyn Crawford

Your Average Last Day of Frost

The average last day of frost (32°F or less) is defined as "the first day in spring on which there is less than a 50% chance a frost will occur." This information is crucial when planting a garden. To find out your average last day of frost, call your local independent garden center or your local Cooperative Extension. Also inquire about the average date of the first fall frost.

SEED BIOLOGY & GERMINATION

SEED BIOLOGY

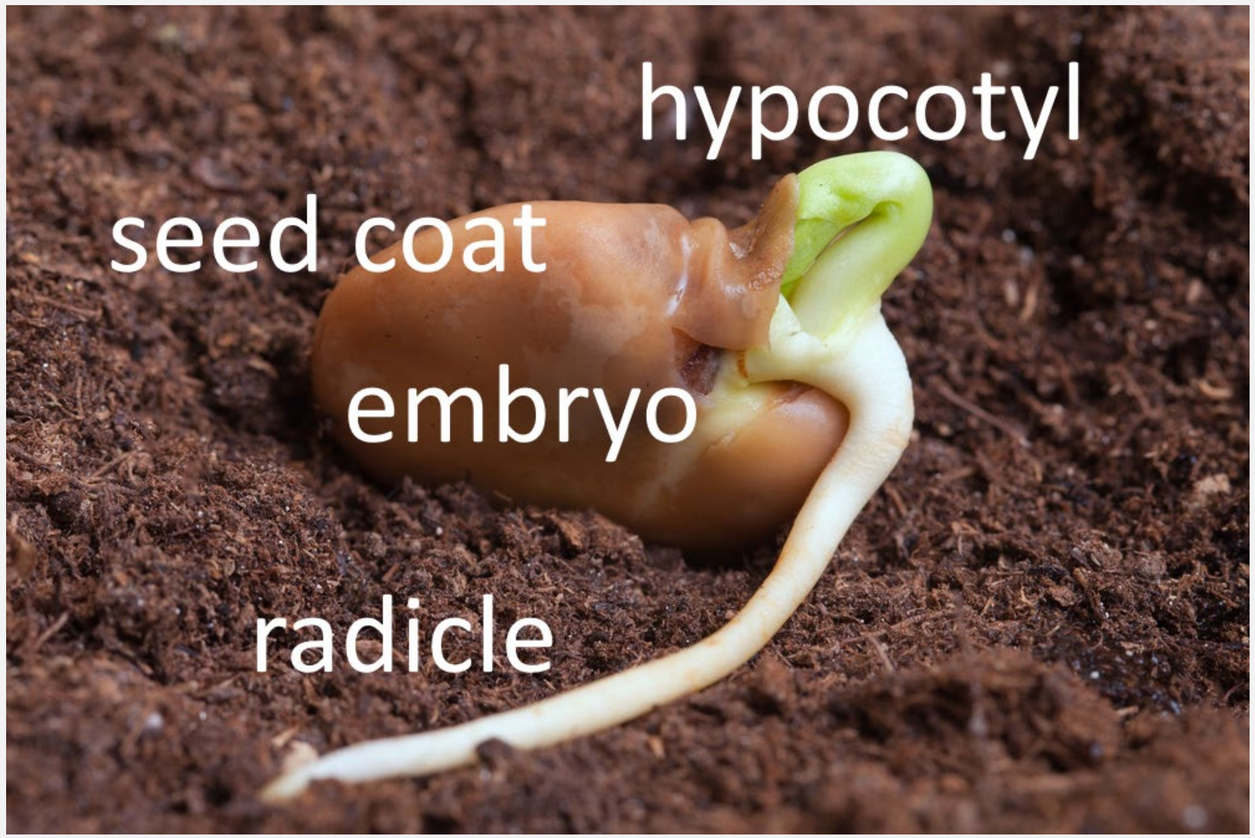
Seeds are alive!

Inside every fully developed seed is a seed embryo or endosperm, which is wrapped in a seed coat. Endosperm contains the nutrients needed to sustain the seedling until photosynthesis kicks in.

SEED BIOLOGY

The embryo comprises about 80% of the growing tissue: carbohydrates, fats, proteins, and 20% water.

It contains all the energy a seed needs for about the first 4 weeks of life.



SEED BIOLOGY

THE STAGES OF GERMINATION

Stage 1: Imbibition

- When conditions are right, a dry seed comes into contact with water to break dormancy.
- It takes up, or “imbibes,” water through the **hilum** in the seed coat.
- This causes the seed to soften and swell, breaking dormancy, and triggers the metabolic process to begin.
- Water wakes up the seed!

THE STAGES OF GERMINATION

Stage 2: Interim, Lag, or Waiting Game!

- The embryo makes proteins and metabolizes the stored energy in preparation for germination.
- This stage causes the most “nail-biting” and anxiety for home gardeners!

THE STAGES OF GERMINATION

Stage 3: Emergence

- The seed produces a radicle – the first root of the plant.
- Next the hypocotyl forms its backward hook and begins to rise up through the soil.
- The hypocotyl breaks the soil surface and the first leaves, the cotyledons, open.
- https://youtu.be/w77zPAtVTuI

THE STAGES OF GERMINATION

Stage 3: Emergence!

SEED GERMINATION REQUIREMENTS: WHAT IT TAKES TO GROW!

Five Elements Necessary for Germination

- Proper Soil Temperature
- Soil Moisture
- Oxygen
- Light
- Seed to Soil Contact (when growing in soil)

SEED GERMINATION REQUIREMENTS: WHAT IT TAKES TO GROW!

Proper Soil Temperature

- Every seed has a specific minimum, maximum, and optimal soil temperature for germination.
- Above or below, the seed will remain dormant – Thermo-dormancy.
- The optimal temperature produces the most rapid and uniform germination.

SEED GERMINATION REQUIREMENTS: WHAT IT TAKES TO GROW!

Germination Soil Temps for Lettuce

- Germination temperature range: 40 to 80 degrees F.
- Optimal soil temp: 65 degrees F.
- Above or below, the seed will remain dormant.
- Cool-season crop; not often planted in summer.

SEED GERMINATION REQUIREMENTS: WHAT IT TAKES TO GROW!

Germination Soil Temps for Tomatoes

- Germination temperature range: 50 to 95 degrees F.
- Optimal soil temp: 70 to 80 degrees F.
- Above or below, the seed will remain dormant.
- Warm-season crop; started indoors 6-8 weeks before planting out.

SEED GERMINATION REQUIREMENTS: WHAT IT TAKES TO GROW!

Soil Moisture

Seeds need water to break dormancy and to metabolize proteins for growth.

How Moist?

Like a damp sponge.

Field capacity is the amount of water held in soil after the excess water has drained away.

Soil moisture should be 50 to 75% of field capacity.

SEED GERMINATION REQUIREMENTS: WHAT IT TAKES TO GROW!

Oxygen

All living things require oxygen – including seeds!

Seeds need oxygen to begin metabolizing proteins.

Soil that is too saturated with water or too compacted will inhibit oxygen and germination.

SEED GERMINATION REQUIREMENTS: WHAT IT TAKES TO GROW!

Light

All seedlings need light to grow.

Most seeds germinate best in dark conditions.

There are a few exceptions…

SEED GERMINATION REQUIREMENTS: WHAT IT TAKES TO GROW!

Some Seeds Are Photoblastic

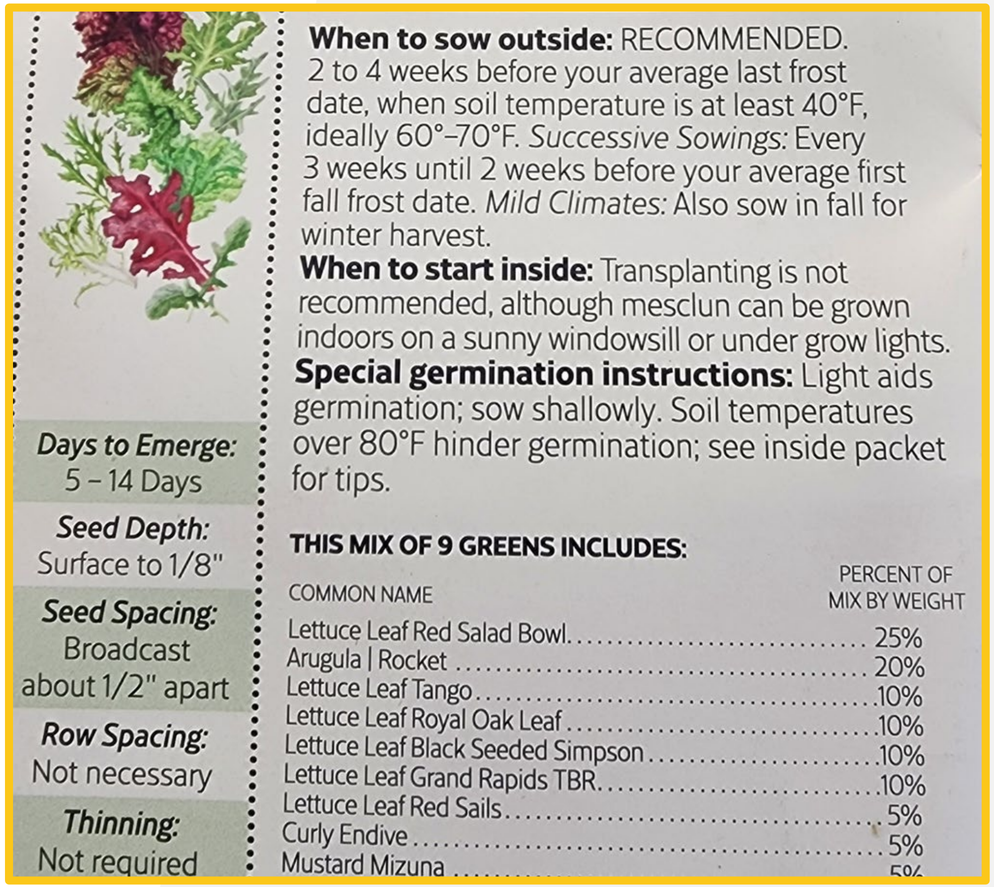
Photoblastic: Germination is influenced by light or the lack of it.

Seeds that need light to germinate are “positively photoblastic.” Lettuce, Chervil

Seeds whose germination is inhibited by light are “negatively photoblastic.” Chives, onions, fennel, parsley.

SEED GERMINATION REQUIREMENTS: WHAT IT TAKES TO GROW!

Check the Seed Packet!



When to sow outside: RECOMMENDED. 2 to 4 weeks before your average last frost date, when soil temperature is at least 40°F, ideally 60°–70°F. *Successive Sowings:* Every 3 weeks until 2 weeks before your average first fall frost date. *Mild Climates:* Also sow in fall for winter harvest.

When to start inside: Transplanting is not recommended, although mesclun can be grown indoors on a sunny windowsill or under grow lights.

Special germination instructions: Light aids germination; sow shallowly. Soil temperatures over 80°F hinder germination; see inside packet for tips.

Days to Emerge: 5 – 14 Days

Seed Depth: Surface to 1/8"

Seed Spacing: Broadcast about 1/2" apart

Row Spacing: Not necessary

Thinning: Not required

THIS MIX OF 9 GREENS INCLUDES:

COMMON NAME	PERCENT OF MIX BY WEIGHT
Lettuce Leaf Red Salad Bowl	25%
Arugula | Rocket	20%
Lettuce Leaf Tango	10%
Lettuce Leaf Royal Oak Leaf	10%
Lettuce Leaf Black Seeded Simpson	10%
Lettuce Leaf Grand Rapids TBR	10%
Lettuce Leaf Red Sails	5%
Curly Endive	5%
Mustard Mizuna	5%

sows up to 33 feet.

Seedling

Days to Emerge: 7 – 14 Days

Seed Depth: 1/4"

Seed Spacing: A group of 3 seeds every 10"

Row Spacing: 10"

Thinning: When 1" tall, thin to 1 every 10"

Date Seed Sown

cut out for plant tag

When to sow outside: *For "bulb":* Midsummer for fall harvest is optimal; ideal soil temperature is 60°–75°F. *In cool summer areas (under 75°F):* 1 to 2 weeks after your average last frost date. *Mild Climates:* Sow in fall for cool season harvest. *For foliage only:* Every 3 weeks after your average last frost date until midsummer.

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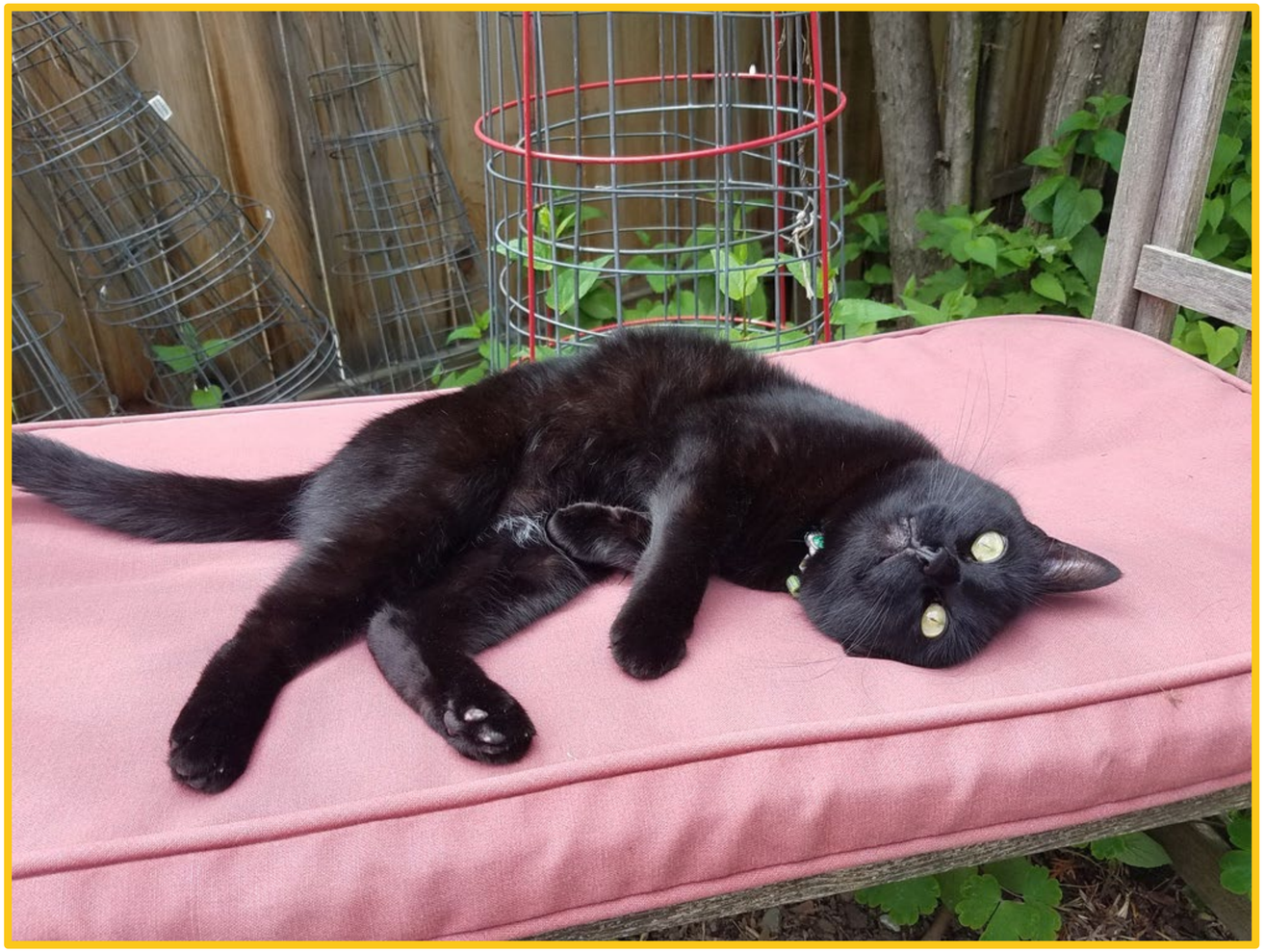
660 Compton Street, Broomfield, Colorado 80020

SEED GERMINATION REQUIREMENTS: WHAT IT TAKES TO GROW!

Seed to Soil Contact

- Seeds need good contact with the soil for germination.
- Seeds take up water from the soil to break dormancy
- The radicle (infant root) draws moisture from the soil and anchors the seedling.

LET'S TAKE A QUICK BREAK!



WHY SEEDS FAIL

WHY SEEDS FAIL TO GERMINATE

Number One Reason: The Soil Is Too Wet

- Overly wet soil forces oxygen out of the soil. Seeds need oxygen to germinate, and they will essentially drown and rot in wet soil.
- Remember the “damp sponge” for soil moisture!
- When starting seeds, always err on the “dry side. " It's better to be a little dry than wet.

WHY SEEDS FAIL TO GERMINATE

Soil is Too Wet

- Risk developing the fungal disease “dampening off.” Plant stem rots at the soil line.
- Mold can grow on the surface.

WHY SEEDS FAIL TO GERMINATE

Lack of Gas Exchange in the Soil

- Using incorrect soil for seed starting.
- Optimal: Soil-less germination mix; light/fluffy!
- Space for O2 and CO2 exchange between the embryo and the soil.
- Often sterile – disease-free.
- Avoid using coarse/heavy potting soils or garden soil for seed starting.

WHY SEEDS FAIL TO GERMINATE

Seed Was Planted Too Deep

- Find sowing information on the seed packet and follow it.
- The seed can use all its energy trying to reach the soil surface.
- Seed is positively photoblastic and requires light to germinate.

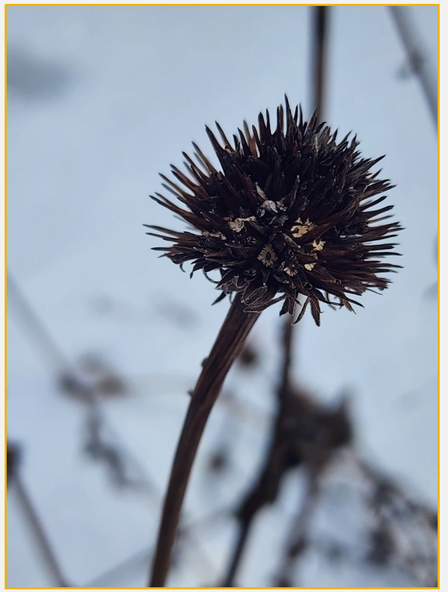
WHY SEEDS FAIL TO GERMINATE

The Seed is Chemically Dormant

Seeds need exposure to moisture and cooler temperatures to break dormancy.

Plant hormones inhibit germination and protect seeds from germinating too soon.

Plants include coneflowers, rosemary, milkweed, pansies/violas, and lupines.



WHY SEEDS FAIL TO GERMINATE

Overcoming Chemical Dormancy with Stratification

- Sow seeds that require cold stratification in the fall – nature's way.
- Winter sow seed from late December into early March – nature's way.
- Refrigerate seeds – mimics nature.
  - 10 days to 2+ months
  - Most need cold/moist
  - Check often

WHY SEEDS FAIL TO GERMINATE

The Seed is Physically Dormant

Some seeds have a hard, thick seed coat which needs to be breached in some way to let moisture in.

Common seeds include: spinach, nasturtiums, peas, beans

WHY SEEDS FAIL TO GERMINATE

Overcoming Physical Dormancy with Scarification

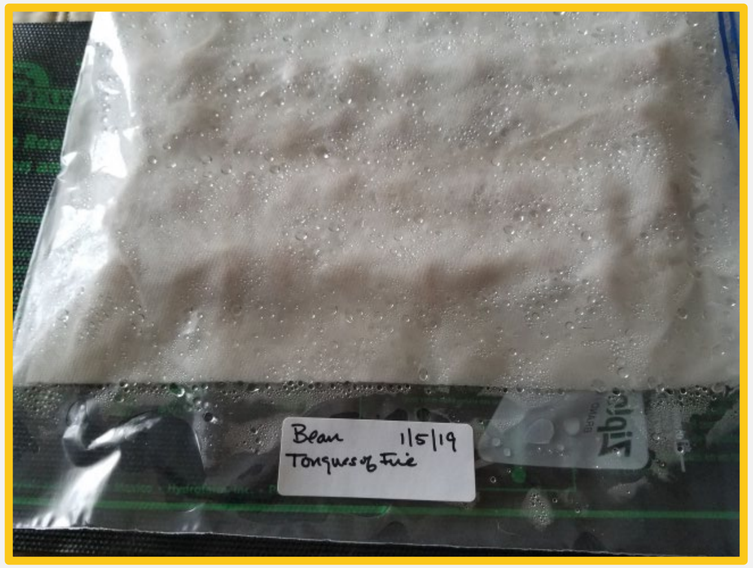
- Remove part of the hard seed coat to allow moisture in. Use a file or sandpaper.

- Soak seeds in warm water.

WHY SEEDS FAIL TO GERMINATE

The Seed Is Not Viable

- Old or poor-quality seed. Use your seeds before purchasing more!
- Unsure? Perform a germination test before planting.
- Store seeds properly in a dry, cool, dark place.
- Avoid hot/humid environments.
- Can be stored in the refrigerator or freezer.



TIMING IS EVERYTHING

WHEN TO START SEEDS -- TIMING IS EVERYTHING

WHEN TO START SEEDS -- TIMING IS EVERYTHING

- USDA Growing Zone 5b/6a, winter temps from -5 to -15.
- Our average growing season is 120 frost-free days from mid-May through September.
- Our region is prone to extreme temperature ranges.

WHEN TO START SEEDS -- TIMING IS EVERYTHING

Starting seeds indoors at the right time helps ensure your seedlings are at the ideal stage for transplanting outdoors.

WHEN TO START SEEDS -- TIMING IS EVERYTHING

The most important date to know…

YOUR LAST AVERAGE DAY OF FROST

Coeur d'Alene and vicinity: May 15

It can vary by WEEKS, both regionally and by microclimates

WHEN TO START SEEDS -- TIMING IS EVERYTHING

Percentage = Possibility of that temperature on that date									
Light frost 36° to 32° - Hard frost below 28°									
Coeur d'Alene, Hayden, Post Falls & Rathdrum									
In the Spring									
Temperature	10%	20%	30%	40%	50%	60%	70%	80%	90%
Last 20°	Mar 27	Mar 19	Mar 12	Mar 7	Mar 2	Feb 25	Feb 20	Feb 14	Feb 5
Last 24°	Apr 9	Apr 3	Mar 29	Mar 25	Mar 21	Mar 18	Mar 14	Mar 9	Mar 3
Last 28°	May 5	Apr 28	Apr 24	Apr 20	Apr 16	Apr 13	Apr 9	Apr 4	Mar 29
Last 32°	May 22	May 17	May 13	May 9	May 6	May 3	Apr 30	Apr 26	Apr 21
Last 36°	Jun 9	Jun 3	May 30	May 26	May 23	May 20	May 16	May 12	May 6
In the Fall									
Temperature	10%	20%	30%	40%	50%	60%	70%	80%	90%
First 20°	Oct 30	Nov 8	Nov 14	Nov 20	Nov 25	Nov 30	Dec 6	Dec 12	Dec 21
First 24°	Oct 16	Oct 24	Oct 30	Nov 5	Nov 10	Nov 14	Nov 20	Nov 26	Dec 4
First 28°	Sep 29	Oct 7	Oct 12	Oct 16	Oct 21	Oct 25	Oct 30	Nov 4	Nov 11
First 32°	Sep 23	Sep 27	Sep 30	Oct 3	Oct 5	Oct 8	Oct 10	Oct 13	Oct 18
First 36°	Sep 10	Sep 14	Sep 17	Sep 20	Sep 22	Sep 25	Sep 27	Sep 30	Oct 4

WHEN TO START SEEDS -- TIMING IS EVERYTHING

Use your **FROST** date and **seed packet** information to determine when to plant:

"Sow indoors 6 to 8 weeks before last average frost."

Count back 6 or 8 weeks from your last frost date.

That's **the optimal time to start** to ensure seedlings are ready to plant outdoors.

WHEN TO START SEEDS -- TIMING IS EVERYTHING

Is it truly harmful to start too early??

YES!

Sowing seeds indoors too early results in **stressed plants.**

- Timing is off. Plants will be ready for transplanting outdoors before conditions are optimal
- Stressed, leggy, and root-bound plants,
- Requiring more potting-up, more space, more care

Better to start a little late than early!

CONSEQUENCES OF STARTING TOO SOON

Leggy

Root-bound

Stressed bring pests

DAYS TO GERMINATION

Generally, 7 to 21 days
Refer to the seed packet

Dependent upon:

- Soil temperature
- Soil moisture
- Seed quality
- Depth sown
- Light

DAYS TO MATURITY

What does *Days to Maturity* Mean?

The number of days it will take for the plant to produce a harvest (fruit or flowers).

Knowing and understanding DTM will help you determine if a variety will produce a harvest within your growing season.

DAYS TO MATURITY

How to “Count” Days to Maturity

- Direct sown seed: DTM begins once the seedlings emerge and have true leaves. Beans = 60 days from when true leaves pop out.

- Seeds sown indoors or transplants: DTM begins once they are transplanted into the garden/container. Tomatoes = 70 days from transplanting.

- Based on “optimal growing conditions” – days may vary!!

SOWING INDOORS VS SOWING DIRECT

Typically Sown Indoors

- Warm-season crops – tomatoes, peppers, eggplant
- Crops that take longer to germinate or mature – onions, leeks, chives, thyme
- Teeny-tiny seeds – thyme, snapdragons, pansies.

Typically Direct Sown:

- Root crops – carrots, beets, parsnips, fennel
- Large seeds – squash, beans, and peas
- Seeds that need cold stratification

Timing Still Matters! Check the Seed Packet

Don’t Be Afraid to Experiment

SUPPLIES AND EQUIPMENT

SEED STARTING SUPPLIES & EQUIPMENT

- Quality seeds from reputable companies
- Quality seed-starting medium
- Clean growing containers or disinfect 10:1 water/bleach 5 min.
- Plant trays – for watering, protecting surfaces
- Clear covers for containers (lids or plastic wrap)
- Plant tags – so important!!
- Spray bottle / small watering can
- Heat Propagation mat
- LED shop or grow lights
- Garden Journal – keep track of what/when

CHECK OUT THE DOLLAR STORE FOR…

- Clear plastic food containers with lids that can be repurposed for seed starting.
- Plastic totes or cloches to cover tender seedlings
- Garden gloves
- Aluminum roasters for plant trays – for watering, protecting surfaces
- Craft sticks for plant tags
- Spray bottle / small watering can
- Garden snips
- **Avoid seeds, soil, and larger tools or pruners (or know they won’t last long)**

SEED STARTING SUPPLIES & EQUIPMENT

Let’s Be Clear…

Soil is what you plant in!

SEED STARTING SUPPLIES & EQUIPMENT

Soil Matters!

- Use a mix specifically for seed-starting.
- “Soil-less” -- usually finely screened peat or coir, with perlite or vermiculite.
- Naturally disease free.
- May contain some nutrients – worm castings or very fine compost.

SEED STARTING SUPPLIES & EQUIPMENT

Soil Matters!

- Potting soils may be too coarse for small seeds and may contain ingredients not needed – including fertilizers
- Garden soil is too heavy and too compact to provide sufficient air circulation within the space of a small growing container. And it carries the potential for disease pathogens.

SEED STARTING SUPPLIES & EQUIPMENT

Containers

- Just about anything can be used!
  - Food containers, yogurt cups, paper cups, toilet rolls, peat pots, plug trays, Solo cups.
  - Needs good drainage.
  - Needs to be seed-size appropriate. No tiny seeds in huge pots or giant seeds in tiny pots!

SEED STARTING SUPPLIES & EQUIPMENT

LED Shop Lights or Grow Lights

- Seedlings need at least 14 to 16 hours of light per day.
- Set lights on a timer
- Position lights about 3 to 4 inches over newly emerging seedlings. Move up as the seedlings grow.
- Be cautious with “hot” grow lights – LEDs are cooler and save energy.
- Terrific results with LED shop lights
- 2900 Lumens minimum

SEED STARTING SUPPLIES & EQUIPMENT

Turn on the Heat for Greater Success

Germination Mat

- Greatly improves germination
- Remove once the seedlings emerge (or raise off the heat)

SEED STARTING SUPPLIES & EQUIPMENT

SEED STARTING SUPPLIES & EQUIPMENT

A Few “Extras” Make a Difference!

Shelving Unit

- Great space saver!
- Fits up to 20 growing trays.
- Lights easily attach/raise up
- Drape with emergency heat blanket (silver foil) for added warmth.
- Storage for the off-season!

PRO TIPS

HERE'S HOW I START SEEDS...

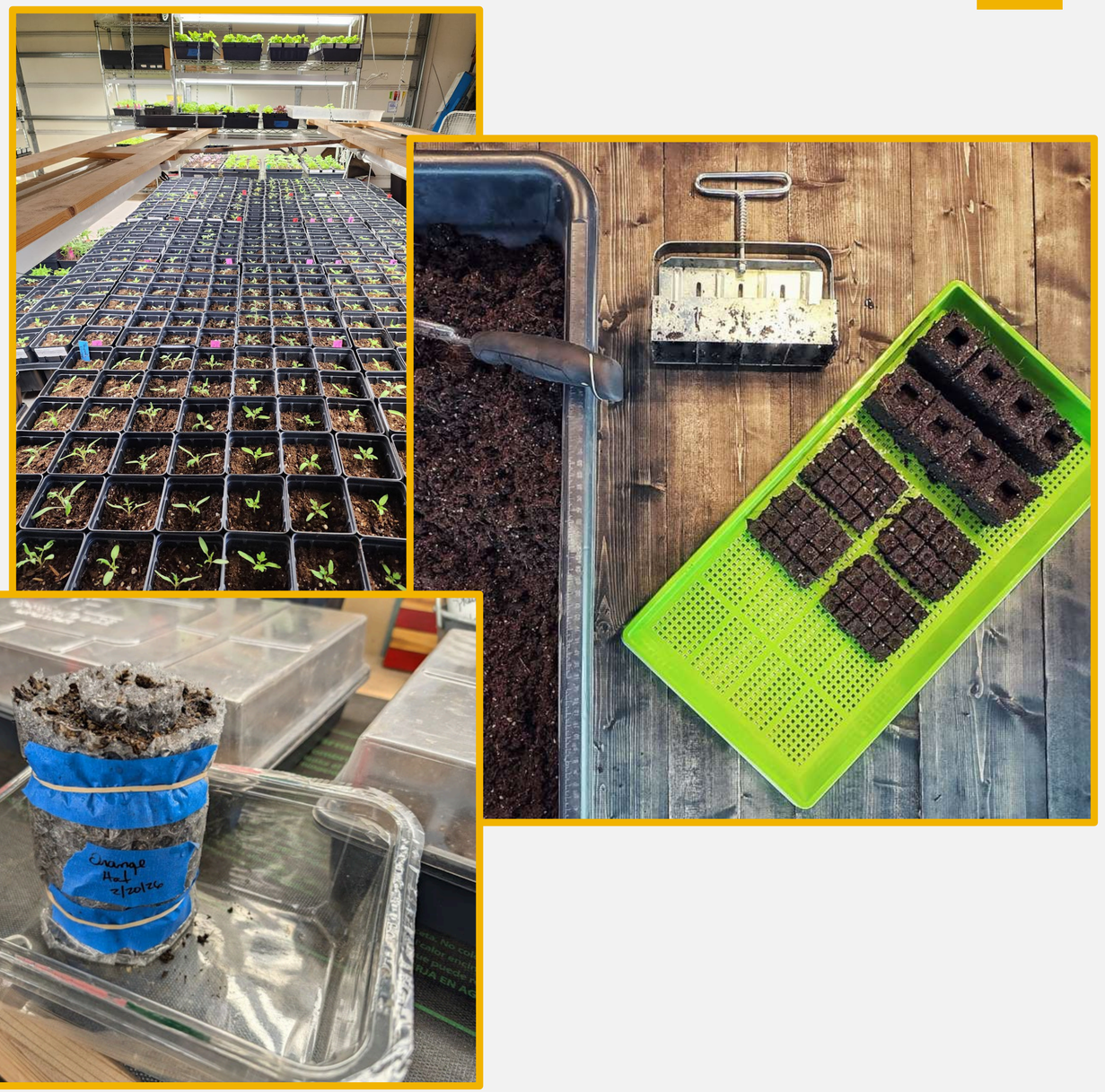
Tell that little voice in your head to be quiet. You should definitely sow the extra 246 tomato seedlings you won't have room for.

Avellinofarms

PRO TIPS

Ways to Start Seeds

- Soil & containers: traditional
- Soil blocking: air-pruned roots, no plastic
- Seed snail: effective for transplanting



PRO TIPS

Soil Blocking

- Soil blocks are stamped out
- Air-pruned roots, no girdling
- Reduces plastic use
- Can be fragile

PRO TIPS

Seed Snail

- Space & soil saver
- Promotes deep roots
- Easy transplanting
- Uses recycled materials

PRO TIPS

Starting plants from seed takes time and dedication.

Seeds should be monitored daily!

PRO TIPS

- Warm and lightly moisten your seed-starting mix BEFORE planting.
- Pre-soak peat pots (warm water)
- Fill the container with soil and lightly compress. Leave enough space to plant the seeds on top, then cover with soil.

PRO TIPS

- Spray the soil, plant the seed, spray the seed, cover the seed with soil to the appropriate depth, and spray the soil.
- Cover the container/tray
- Once germinated, remove the cover, heat, and ensure the lights are on!

POTTING UP

Pricking Out & Potting Up

- Pot up once the “true leaves” form.
- By 4-weeks of growth
- See roots emerging from the bottom of the cell.
- Transplant to 3.5 or 4-inch pots. One seedling per pot!
- Soil medium should be rich in organic compost, worm castings.

POTTING UP

How To Prick Out

- Use a spoon, or pop the plug from the bottom.
- Select the best/strongest seedlings
- Handle by the leaves – not the stem.
- Use a chopstick, dibbler, or your finger to create a hole and pop the seedling in.

POTTING UP

Watering Seedlings

- Once transplanted, bottom water
- Fill the tray with about an inch of water
- Slow uptake of water
- Ensures even watering (water on a flat surface)
- Keeps foliage dry & prevents disease
- Time saver.

HARDENING OFF

Ready for the Real World!

- Getting seedlings/young plants acclimated to outdoors.
- About 7 to 10 days before planting out.
- Strive for a warm, calm, overcast day.
- Shady area. Protect from wind and direct sun.

HARDENING OFF

- Start with 30 minutes, gradually increase time and exposure.
- Plastic bins, cold frame, low tunnel, or greenhouse are great options.

TIME TO PLANT OUTSIDE!

- Plant cool-season crops once the soil is workable.
- Keep frost protection handy!
- Do NOT plant warm-season crops until soil & air is at least 50 degrees.
- Most veggies need at least 6 hours of sunlight.
- Feed your soil with quality compost (1 to 2 inches) to reduce the need for fertilizers.

KEY POINTS…

- Know your frost date
- Read the seed packet
- Don’t start too soon
- Start small
- Water with care
- Experiment
- Don’t be afraid to fail – you’ll learn more!
- HAVE FUN!!

THANK YOU!

For Seed Charts & A Special Discount:

TheCoeurdAleneCoop.com/Seed-Class

CANDACE GODWIN

CERTIFIED IDAHO MASTER GARDENER

OWNER, COEUR D'ALENE COOP NURSERY,

GARDEN WRITER, CONSULTING SERVICES

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