Flower Seed Starting Fundamentals

Hensley's SEED CO. DENVER · COLORADO

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Direct Seeding

A good option when:

- You have limited or no space for starting seed indoors.
- If you are growing:
  - Large-seeded crops that germinate fast and grow quickly
  - Fast-growing crops where you want to sow multiple successions (sunflowers, safflower)
  - Crops that do well germinating and growing on in cool soil conditions

TOP-5 PICKS for COOL-SOIL SOWING

5 Easy-to-grow, cool-season annuals that love cool soil for germination and should only be seeded in the early spring or in the fall (where overwintering is possible), for best results.



1 • BELLS OF IRELAND | 2 • BUPLEURUM | 3 • CENTAUREA | 4 • LARKSPUR | 5 • NIGELLA

TOP-5 PICKS for WARM-SOIL SOWING

5 easy-to-grow, warm-season annuals that can be succession-planted multiples times, a few weeks apart, providing lots of blooms to cut all season.



1 • SUNFLOWERS | 2 • ZINNIAS | 3 • COSMOS | 4 • AMMI/DAUCUS | 5 • AMARANTHUS

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Why Start Seeds Indoors?

- Access to wider variety selection
- Jumpstart a productive growing season
- Grow the exact number of plants you need
- A favorable option for flower crops with slow germination and longer seedling development



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Seed Viability & Germination



Seed Viability

- A viable seed is capable of germination under appropriate conditions.
- Seed viability declines over time, depending on the crop and storage conditions.
- Original-source germ tests every lot of seeds and prints germination results on the seed packet.



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Flower Crop Seed Storage Chart

Type	Avg Storage Life (Yrs)	Type	Avg Storage Life (Yrs)
Ageratum	3–5	Gomphrena (Globe Amaranth)	3–5
Agrostemma	3	Gypsophila	2–4
Alyssum	3–5	Hyacinth Bean	3–5
Ammi	2	Impatiens	1–2
Amaranthus	4–5	Larkspur	1–3
Aquilegia (Columbine)	1–2	Lavender	1–3
Artemisia	1–5	Lisianthus	2–3
Asclepias	1	Lupine	3–5
Aster	1–2	Marigold	2–5
Bachelor's Buttons	3–5	Matricaria	1–3
Bells of Ireland	2	Monarda	4
Calendula	4–6	Nasturtium	3–7
Carnation	3–5	Nigella	3–5

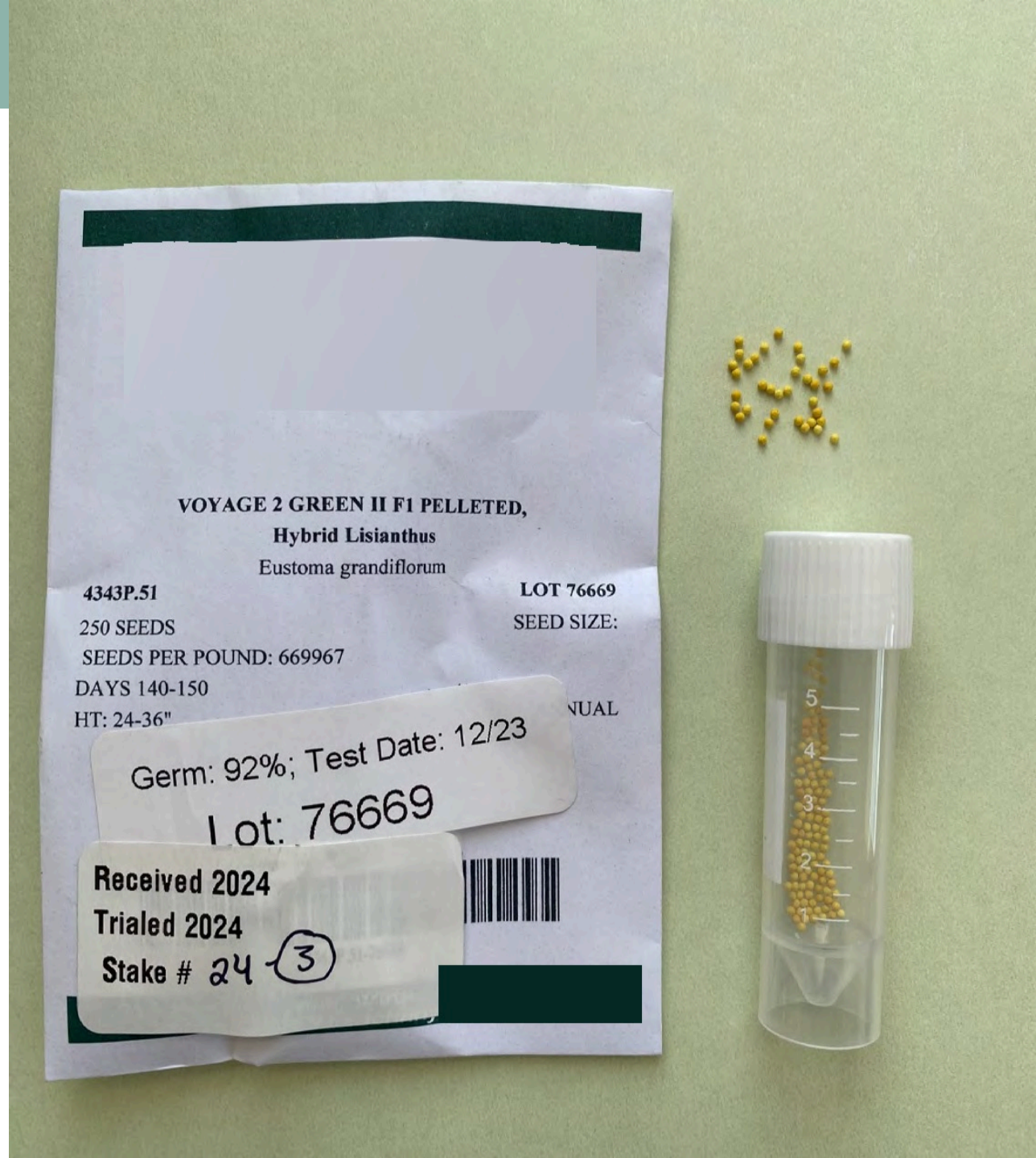
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Pelleted Seed

Pelleted seeds are coated with inert substances to make the seeds uniform in size and shape.

Often applied to very small seeds (like Lisianthus) to make handling easier.

Pelleted seeds may have a shorter shelf-life than non-pelleted seed and should be used within a year of purchase.



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Factors Affecting Seed Germination

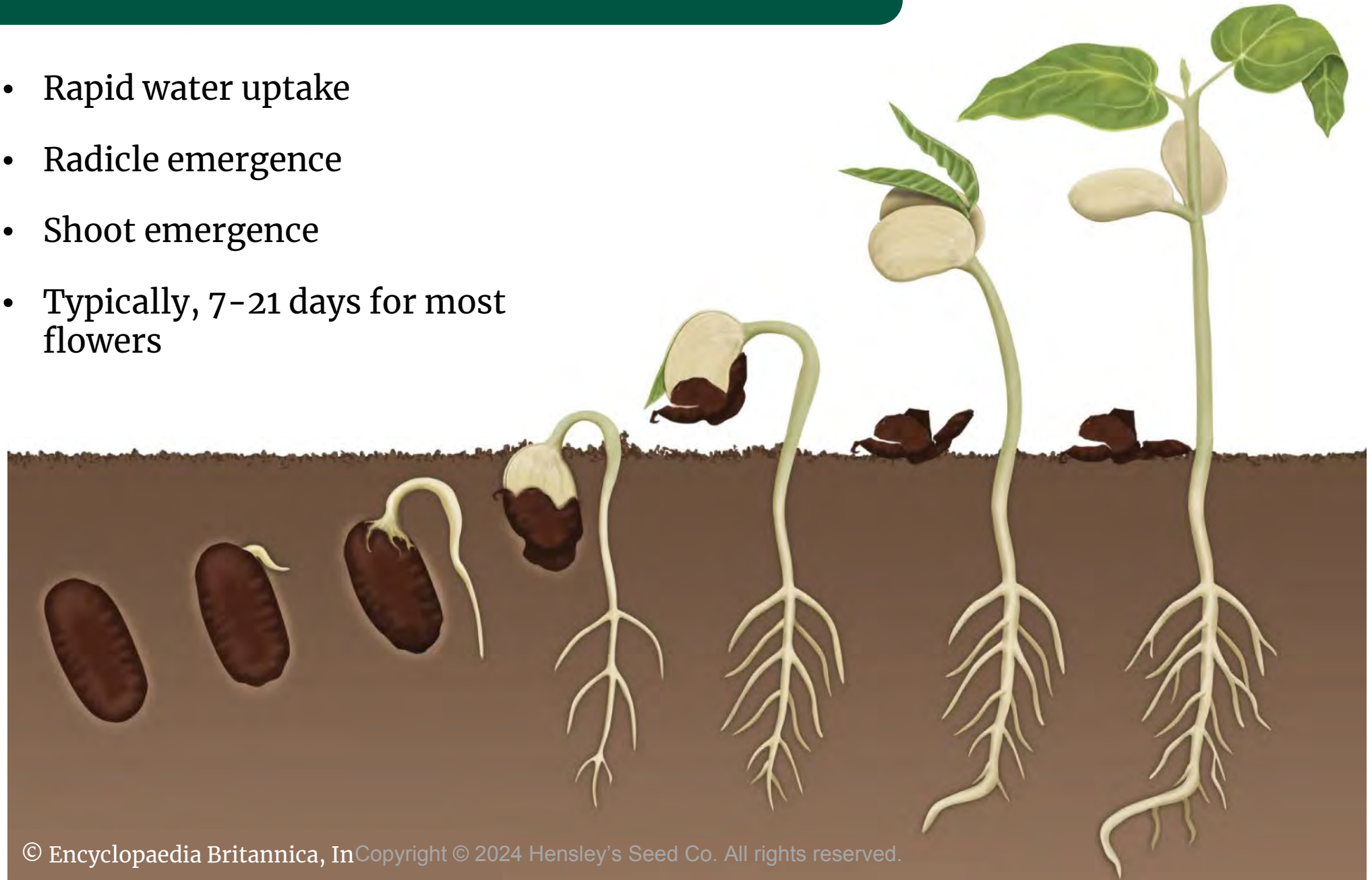
- Temperature
- Water
- Light



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How a Plant Grows From a Seed

- Rapid water uptake
- Radicle emergence
- Shoot emergence
- Typically, 7-21 days for most flowers



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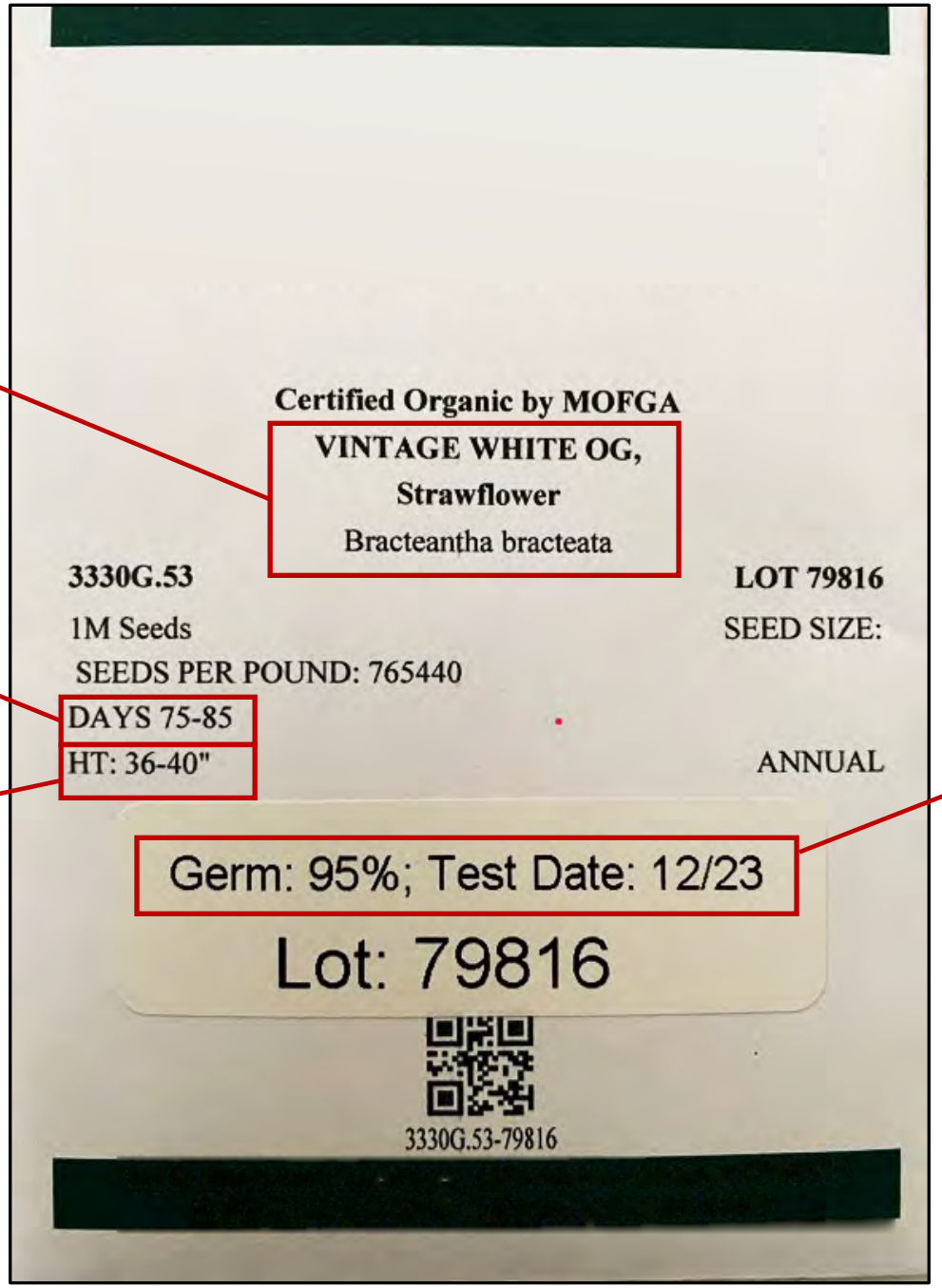
Reading Your Seed Packet



Variety Name
Crop
Latin Name

Days to maturity from seeding

Plant height



Germination test results and date of last germination test

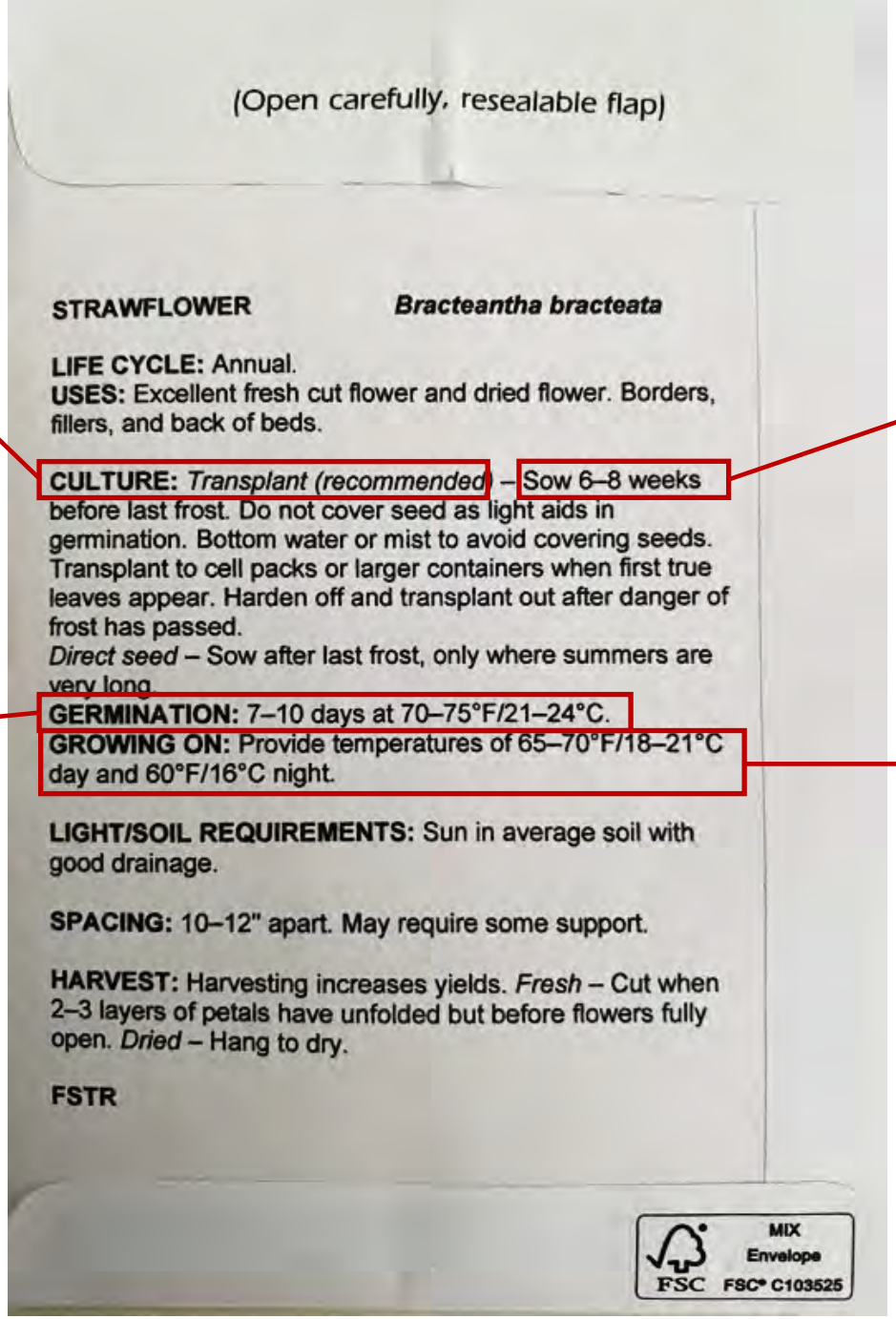
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Seed-starting information, for both transplanting and direct seeding.

Expected days to germination at listed temperature.

Estimated time in trays from seeding to transplanting.

Preferred environmental conditions for developing seedlings.


(Open carefully, resealable flap)

STRAWFLOWER ***Bracteantha bracteata***

LIFE CYCLE: Annual.
USES: Excellent fresh cut flower and dried flower. Borders, fillers, and back of beds.

CULTURE: *Transplant (recommended)* – Sow 6–8 weeks before last frost. Do not cover seed as light aids in germination. Bottom water or mist to avoid covering seeds. Transplant to cell packs or larger containers when first true leaves appear. Harden off and transplant out after danger of frost has passed.
Direct seed – Sow after last frost, only where summers are very long.
GERMINATION: 7–10 days at 70–75°F/21–24°C.
GROWING ON: Provide temperatures of 65–70°F/18–21°C day and 60°F/16°C night.

LIGHT/SOIL REQUIREMENTS: Sun in average soil with good drainage.

SPACING: 10–12" apart. May require some support.

HARVEST: Harvesting increases yields. *Fresh* – Cut when 2–3 layers of petals have unfolded but before flowers fully open. *Dried* – Hang to dry.

FSTR

FSC MIX Envelope FSC® C103525

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Starting Seeds: Best Practices

Setup

✓ Practice good sanitation!

✓ Choose a growing medium formulated for starting plants from seed.

- Look for products labeled as germination or seed-starting mixes.
- Typically lighter with better aeration than potting soil or garden soil.

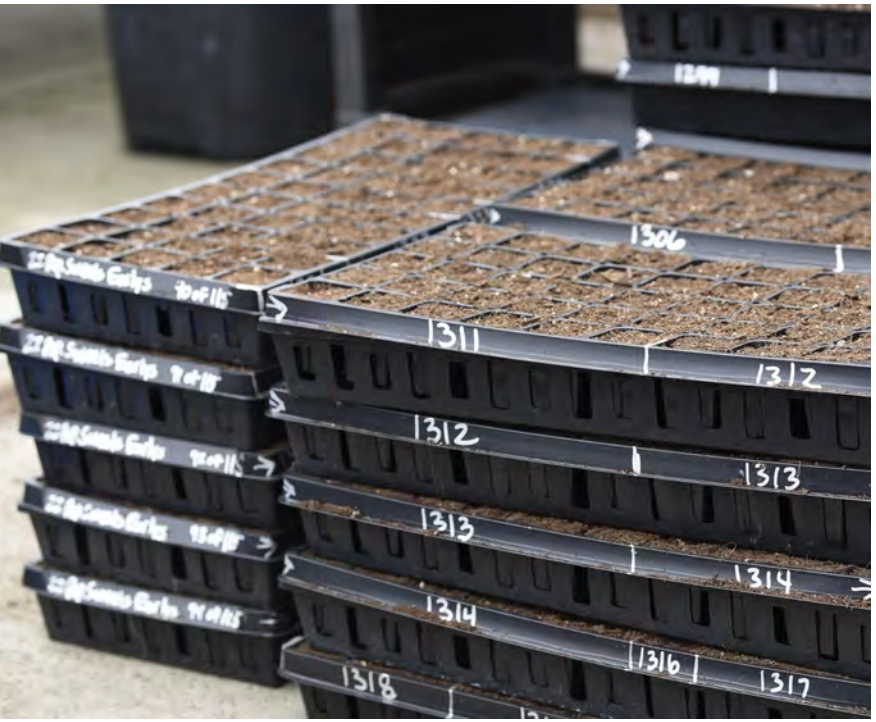


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Setup

✓ **Choose the appropriate container →**

- With drainage holes.
- A size large enough to accommodate plant until planting.
- Avoid deep pots, unless specifically required by crop.
- See Three Systems for Indoor Seed-Starting.



Plastic Trays



Biodegradable Pots



Soil Blocks

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Seed Starting Tools



Mister for watering in small-seeded crops

Soil thermometer

Hand seeder

Tray labels

Widger

Permanent markers for labeling black plastic trays

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Seeding

- Label trays or planting pots.
- Moisten medium before you seed.
- A hand seeder can be helpful for small-seeded crops.
- Press seed firmly into the growing medium, ensuring good seed-to-soil contact.

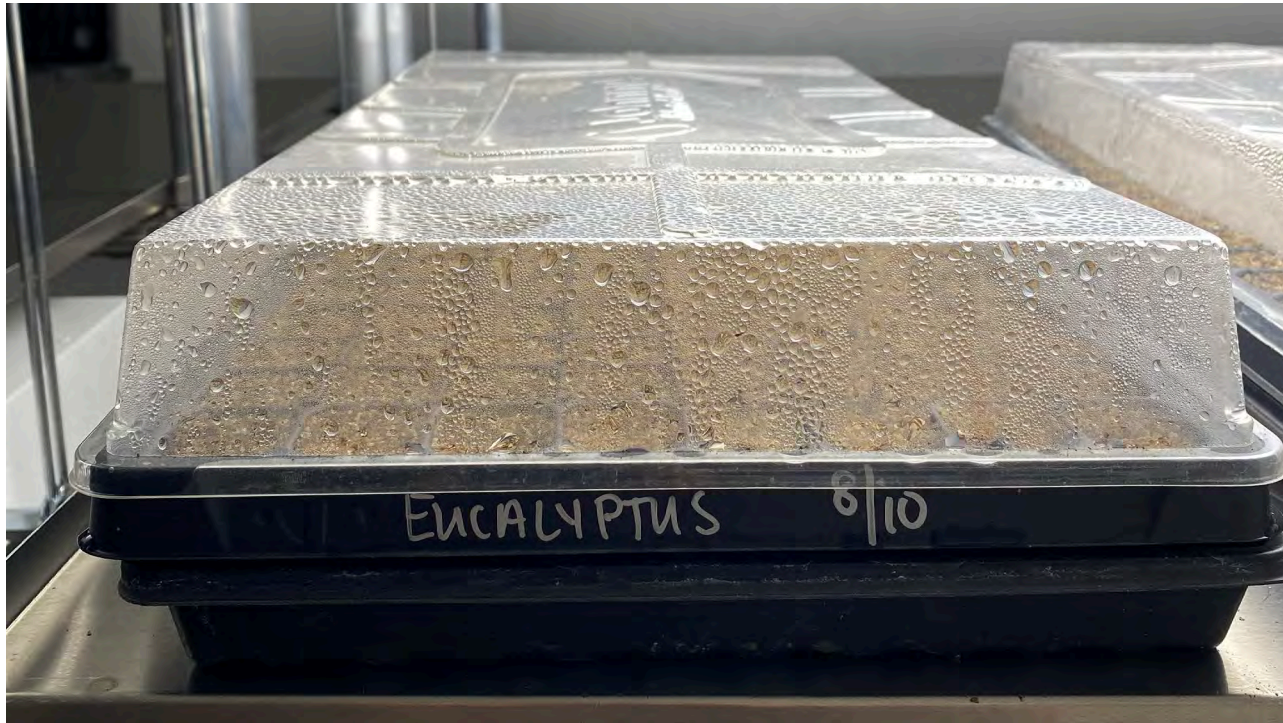


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Seeding

- Cover as directed on the packet
- Water in gently
- Cover the tray with a dome





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Seedling Care

Provide **appropriate water** for germination and seedling growth.

Maintain **optimal soil temperature** for germination and development.

Provide **supplemental lighting** if growing indoors.



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Water

- Necessary for germination.
- Important to not let seed dry out during germination.
- Make sure soil is well-watered but not completely saturated.



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Water

- Mist or water lightly especially for small seeds that may be easily dislodged
- **Pre-soaking seeds** is not necessary for most flower crops
- Use room-temperature water if possible
- During seedling growth – pay attention to tray edges and make sure water is also getting to the bottom of cells as roots develop.



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Temperature

- Temperature greatly affects rate of germination.
- Maintain temperatures within recommended range for the crop.
  - **If temps are too low:** Germination rate slows, and seed may rot.
  - **If temps are too high:** Seed may dry out; seedlings may scorch.
- **Vernalization or stratification** is not necessary for most flower crops.



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Tools for Managing Temperature



Heat Mats



Soil Thermometer



Humidity Domes

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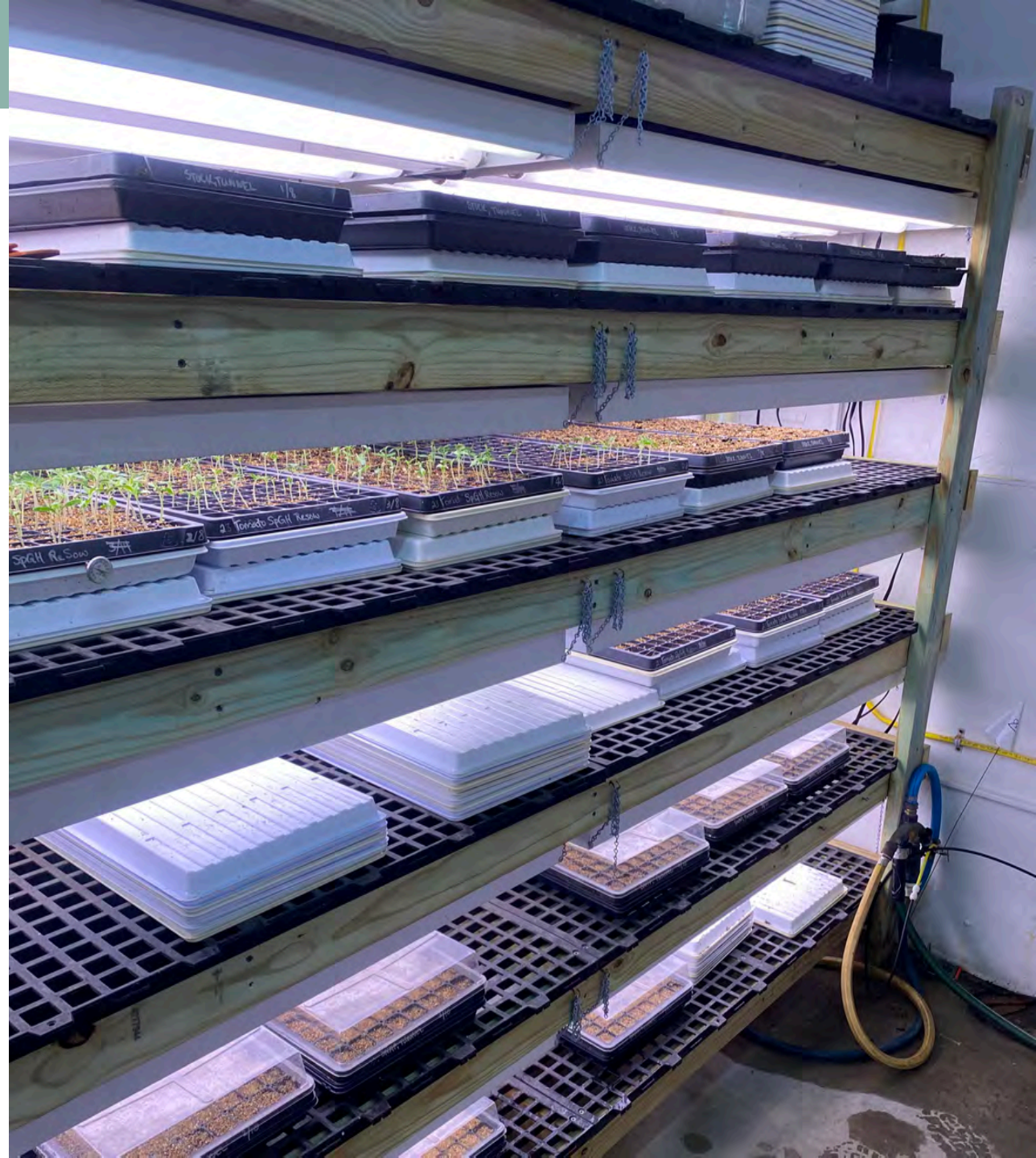
Light

Darkness Required:

- Some crops require darkness for germination.
- These crops should either be covered completely with potting mix or if not covered completely, kept in dark conditions until germination occurs.

Light Required:

- Some crops require light for germination
- For these crops, make sure trays are under lights immediately upon sowing.
- Even for crops that require light to germinate, we still cover lightly with vermiculite.



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Light

Provide supplemental lighting if growing indoors.

- Window light is not enough
- See our Guide to Choosing a Grow Light

Lack of sufficient light will result in:

- Leggy seedlings
- Weak, spindly stems
- Chlorotic leaves



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Seedling Care

Fertilize lightly for crops that require longer time in trays.

“Bump up” according to specific crop needs.

Bumping up is the process of moving seedlings into larger containers prior to being planted in the ground.



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Seedling Care

Transplant when:

- Outdoor conditions are appropriate
- Seedlings have 2-3 sets of true leaves
- Seedlings have good root development
- Before plants are root-bound
- After seedlings are hardened off



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Seedling Care

Hardening off allows seedlings to gradually acclimate to outdoor temperatures before transplanting.

- Move seedlings outdoors to a semi-sheltered location about a week before transplanting.
- Exposure to outdoor conditions will help reduce risk of sunburn, windburn and transplant shock.



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Tray Selection for Flower Crops



20-Row Flats

Also called “strip trays”

Useful if:

- You have limited space
- Germination rate is unknown or suspected to be low
- Crops can handle bumping up – not recommended for anything with a taproot.



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20-Row Flats

- Shallow trays can dry out quickly and are not a good choice for crops that:
  - Have a taproot
  - Have large seed
- You must bump up before seedlings get root-bound.
- We use them for:
  - Lisianthus
  - Celosia
  - Snapdragon
  - Rudbeckia



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128-Cell Trays

- Useful for many flower crops
- Use for small to medium-sized seeds
- We use these trays for:
  - Snapdragon
  - Ammobium
  - Strawflower
  - Gomphrena,
  - Dianthus
  - Bupleurum
  - Nigella
  - Agrostemma
  - Eucalyptus
  - Pansies
  - Stock
  - Matricaria
  - Scabiosa



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72-Cell & 50-Cell Trays

These are good options for many medium to large-seeded flower crops

We use these for larger-seeded, faster-growing flower crops that will outgrow a 128-cell tray too quickly

Since the cell sizes are larger, these trays allow a little longer for seedling growth and some flexibility around transplant time.

We use these trays for:

- Zinnia
- Cosmos
- Marigold
- Aster
- Dahlia
- Calendula
- Sweet Pea
- Scabiosa
- Strawflower
- Echinacea
- Echinops
- Eryngium



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Deep 50 Cell Trays

- For crops with long taproots and a long development time.
- Can be more time-consuming to transplant.





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Germination Tips for Flowers

Lisianthus

DAYS TO GERMINATION: 10-15 days at 68-72°F (20-22°C).

SOW: 12-13 weeks before planting out.

- We sow into 20-row flats and bump up to 128s.
- Some growers sow into 288s or 200s.
- May benefit from bumping up just to refresh soil.



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Lisianthus

DAYS TO GERMINATION: 10-15 days at 68-72°F (20-22°C).

SOW: 12-13 weeks before planting out.

- Slow germination.
- Best results in consistent temperature environment.
- Pelleted seed.
- Long seedling time – algae can be a problem in trays.
- Sensitive to heat stress as seedlings.



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Snapdragon

DAYS TO GERMINATION: 7-14 days at 70-75°F (21-24°C).

SOW: 8-10 weeks before planting out.

- Tiny seeds – cover lightly with vermiculite.
- Mist lightly when watering to avoid dislodging seed.
- We sow into 128s but have also sown into 20-row flats and bumped up.



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Celosia

DAYS TO GERMINATION: 8-14 days at 70-80°F (21-27°C).

SOW: 6-8 weeks before planting out

- Bottom water or mist lightly to avoid displacing seeds and soil.
- Cover lightly with vermiculite.
- We sow into 20-row flats and bump up into 72-cell trays.
- Celosia are sensitive to environmental stress as seedlings.
    - Rootbound, heat, cold, soil too wet/dry – can all affect plant performance later in the season.



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Eucalyptus

DAYS TO GERMINATION: 7-10 days at 75-80°F (21-24°C).
14-21 days at 65-75°F (18-24°C) with high humidity.

SOW: 10-12 weeks before planting out

- A tree species and has a taproot – keep root disturbance minimal.
- We've had faster germination times, closer to 7-10 days, when germinating at slightly higher temperatures, closer to 80F.
- A tree species, so naturally slower-growing than most annual flowers.



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Delphinium

DAYS TO GERMINATION: 10-20 days at 65-70°F (18-21°C)

SOW: 10-16 weeks before planting out

- Germination rates can vary.
- Once germination occurs and seedlings have true leaves:
    - Grow on at cooler temperatures: 50-55F
    - Keep soil slightly drier



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Echinops

DAYS TO GERMINATION: 14-21 days at 65-75°F (18-24°C).

SOW: 6-8 weeks before planting out.

- Perennial crop.
- Large seed and relatively easy to start from seed.
- Recommend 72-cell or 50-cell trays.
- Will flower in the second year after sowing.



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Echinacea

DAYS TO GERMINATION: 10-15 days at 65-70°F (18-21°C).

SOW: 8-10 weeks before planting outside.

- Perennial crop.
- Large seed and relatively easy to start from seed.
- Recommend 72-cell or 50-cell trays.
- Can have variable germination rates.



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Sweet Pea

DAYS TO GERMINATION: 14-21 days at 55-65°F (13-18°C).

SOW: 4-6 weeks before planting.

- To aid germination, seeds can be presoaked for 24 hours in room temperature water prior to planting.
- We do not soak seeds but make sure to water in very heavily at seeding.
- Send out roots quickly and deep – may benefit from deeper cell trays, but 50s or 72s work as well.



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Stock

DAYS TO GERMINATION: 7-14 days at 65-75°F (18-24°C).

SOW: 5-6 weeks before planting outside.

- In the Brassica family – generally germinates quickly and uniformly.
- A cool-weather crop – grows best in spring and fall.
- Some seedlings may display lighter leaf color – not necessarily a sign of low fertility. In some series, lighter green leaves indicate a double-flowering plant.
    - Watch our Selecting for Double-Flowered Stock Blooms video



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Troubleshooting Poor Seedling Health

Damping Off

A general term used to describe sudden death of young seedlings caused by several different fungi and fungal-type organisms.

Symptoms:

- Sudden death of young seedlings
- Seedling chlorosis and decline
- Root rot and collapse of seedling at soil line.

Solutions:

- Manage humidity
- Adequate ventilation and moving air
- Remove domes as soon as seeds germinate
- Monitor for overwatering



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Stretching & Legginess

After germination, young plants need light for healthy growth.

Symptoms:

- Stretching or leaning towards the light
- Legginess: Long space between leaf pairs
- Small leaves and pale coloration
- Weak, spindly stems

Solutions for Indoor Growing:

- A full-spectrum light designed for growing plants
- Hang light 3-6” above the tops of plants
- See our Guide to Choosing a Grow Light



Photo courtesy of UMaine Extension Vegetable Program

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Rootbound Plants

When root growth exceeds available container space, roots will circle the base of the container.

Symptoms:

- Roots circling the base of the cell and forming a large mat.
- Rootbound plants may establish poorly in the field.

Solutions for Indoor Growing:

- Consider bumping up to a larger cell size if transplanting is greatly delayed.
- At transplanting, gently loosen roots to encourage normal root growth.



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Rootbound Plants

When root growth exceeds available container space, roots will circle the base of the container.

Pictured: Lupine – sown into a 72-cell tray.



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Resources

- Guidelines for Starting Seeds Indoors
- Three Systems for Indoor Seed-Starting
- Guide to Choosing a Grow Light
- Seed-Starting Date Calculator
- Seed Storage Guidelines
- Top Ten Flowers for Direct Seeding
- Growing resources
  Growing resources



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Q&A


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