

Flower Seed Starting Fundamentals



WELCOME

Chat questions will be collected for Q&A throughout the presentation.

Please submit questions before we begin the Q&A. Once Q&A begins, we may not see new questions.

All audience chat messages are private.

Direct Seeding

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.

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



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

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



A close-up photograph of a black plastic seedling tray filled with numerous young nasturtium plants. The plants have small, round, light green leaves and thin stems. The tray is filled with dark soil. The text "Seed Viability & Germination" is overlaid in white, serif font in the center of the image. In the bottom right corner, the word "NASTURTIUM" is visible on the edge of the tray.

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.
- Johnny's germ tests every lot of seeds and prints germination results on the seed packet.



Flower Crop Seed Storage Chart

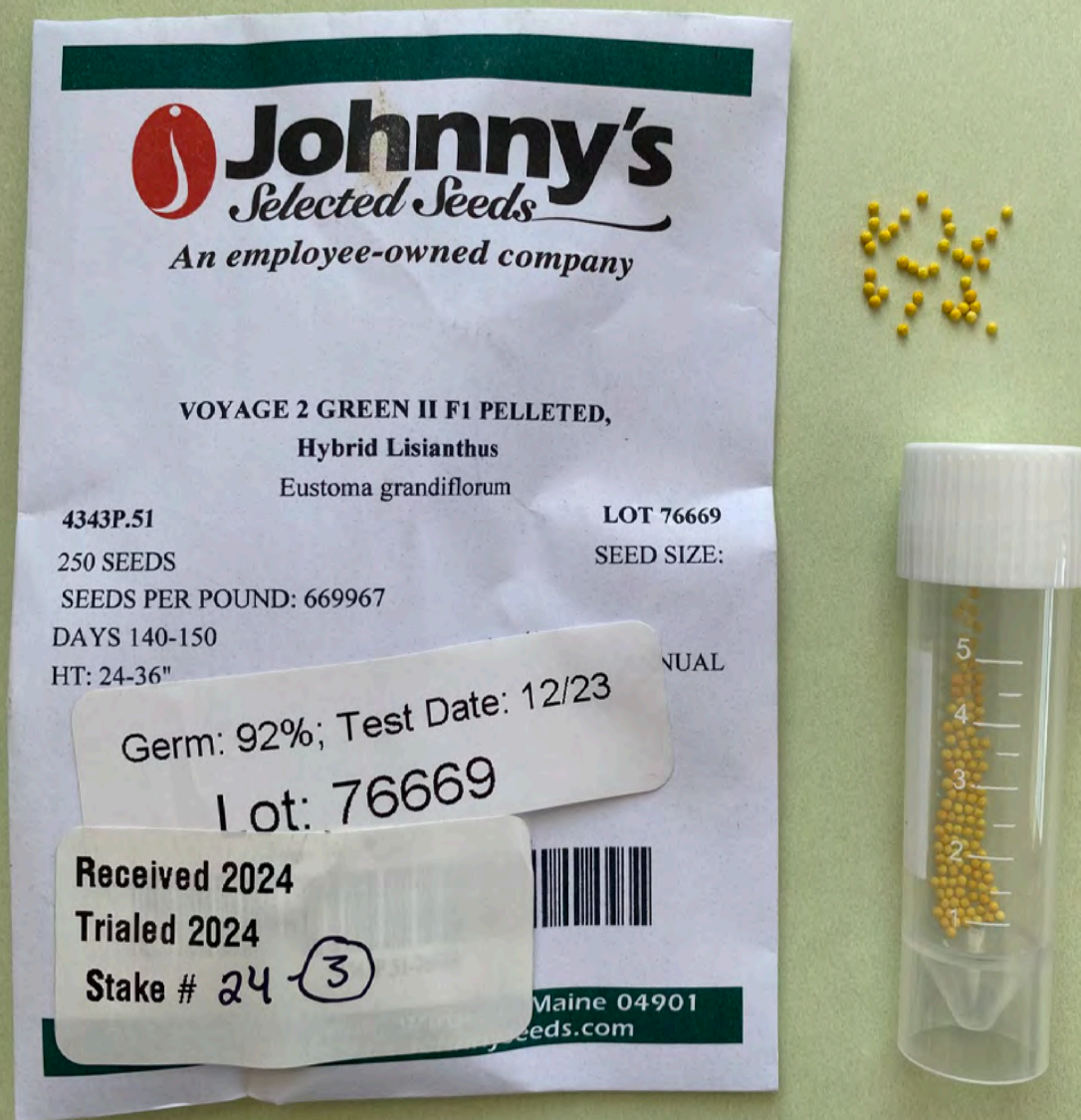
Type	Avg Storage Life (Yrs)	Type	Avg Storage Life (Yrs)
Ageratum	3-5	Gomphrena (Globe Amaranth)	3-5
Agrostemma	3	Gypsophila	2-4
Alyssum	3-5	Hyacinth Bean	3-5
Ammi	2	Impatiens	1-2
Amaranthus	4-5	Larkspur	1-3
Aquilegia (Columbine)	1-2	Lavender	1-3
Artemisia	1-5	Lisianthus	2-3
Asclepias	1	Lupine	3-5
Aster	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

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.



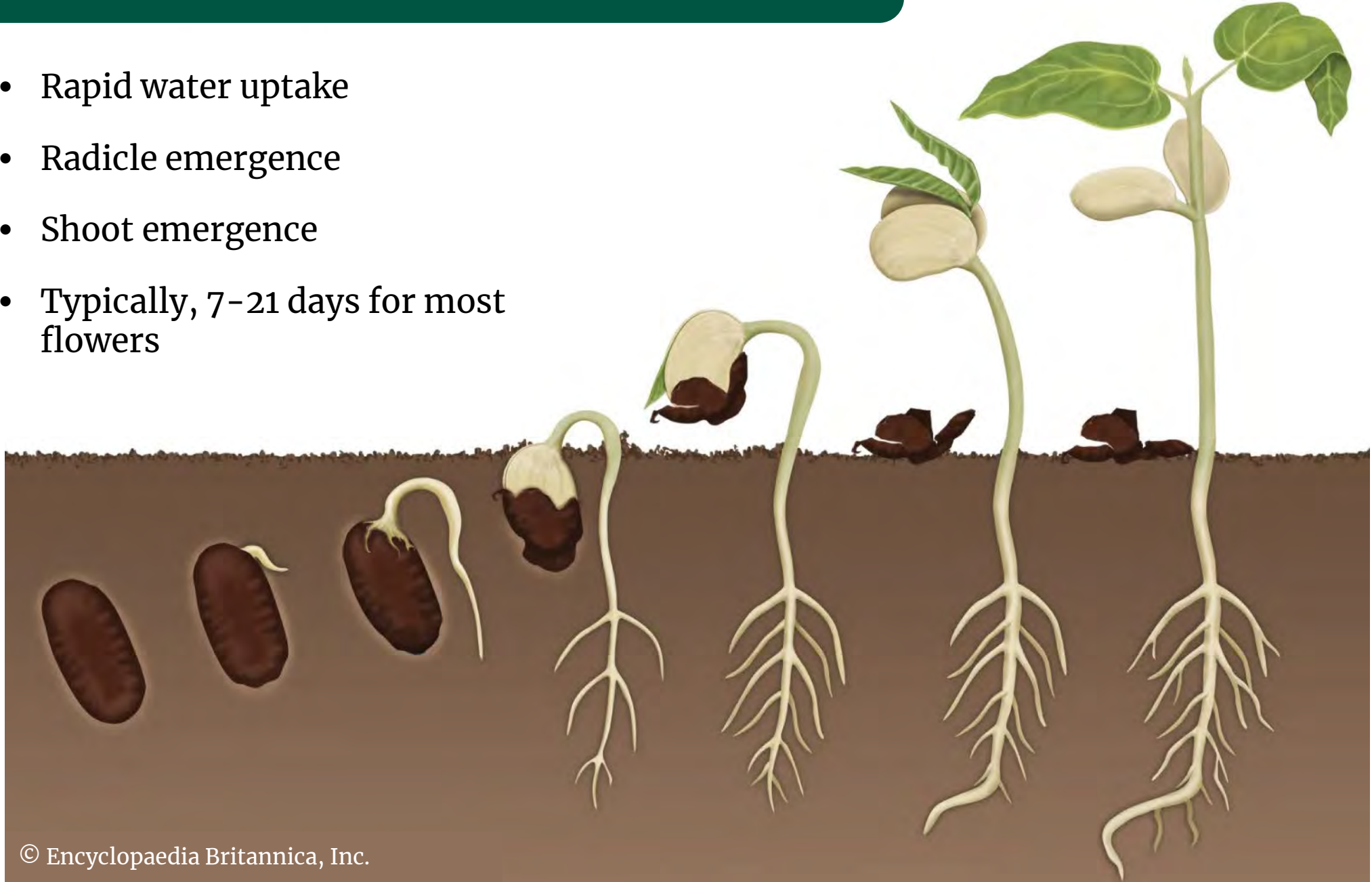
Factors Affecting Seed Germination

- Temperature
- Water
- Light



How a Plant Grows From a Seed

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



A close-up photograph of a seedling tray filled with numerous small, green, round-leaved plants. The plants are densely packed and appear to be in the early stages of growth. The background is a soft, out-of-focus green. The text "Reading Your Seed Packet" is centered over the image in a white, serif font.

Reading Your Seed Packet

NASTURTIUM



An employee-owned company

Certified Organic by MOFGA

VINTAGE WHITE OG,
Strawflower

Bracteantha bracteata

3330G.53

1M Seeds

SEEDS PER POUND: 765440

DAYS 75-85

HT: 36-40"

LOT 79816

SEED SIZE:

ANNUAL

Germ: 95%; Test Date: 12/23

Lot: 79816



3330G.53-79816

955 Benton Avenue, Winslow, Maine 04901
1-877-564-6697 • Johnnyseeds.com

Variety Name
Crop
Latin Name

Days to maturity
from seeding

Plant height

Germination test
results and date of
last germination
test

(Open carefully, resealable flap)

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

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.

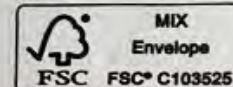
HARVEST: Harvesting increases yields. *Fresh* – Cut when 2–3 layers of petals have unfolded but before flowers fully open. *Dried* – Hang to dry.

FSTR

Estimated time in trays from
seeding to transplanting.

Expected days to
germination at listed
temperature.

Preferred environmental
conditions for developing
seedlings.



A close-up, slightly blurred photograph of a large tray filled with young green seedlings. The seedlings have small, round, light-green leaves and thin stems. They are growing in dark soil. The text "Starting Seeds: Best Practices" is overlaid in the center in a white, serif font. In the bottom right corner, the word "NASTURTIUM" is visible on the edge of the tray.

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.



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

Seed Starting Tools

Mister for watering in small-seeded crops

Tray labels

Permanent markers for labeling black plastic trays



Soil thermometer

Hand seeder

Widgee

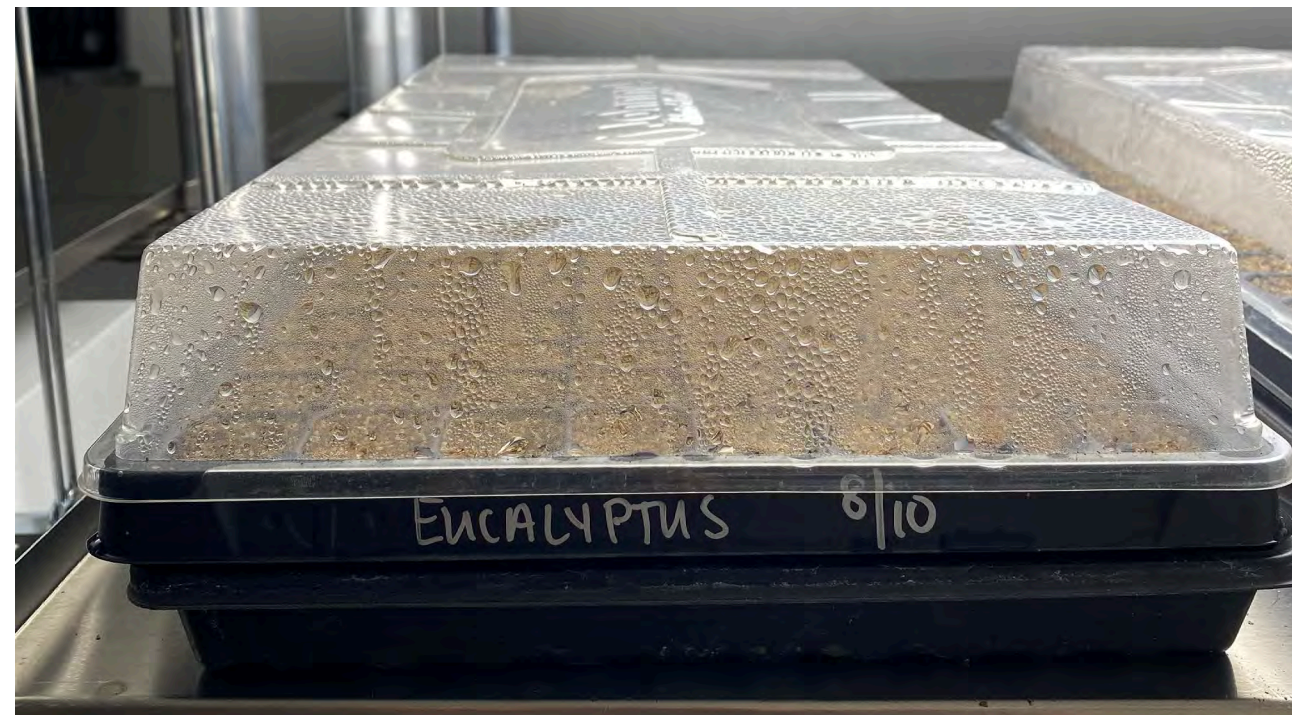
Seeding

- 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.



Seeding

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



Seedling Care

Provide appropriate water for germination and seedling growth.

Maintain optimal soil temperature for germination and development.

Provide supplemental lighting if growing indoors.



Water

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



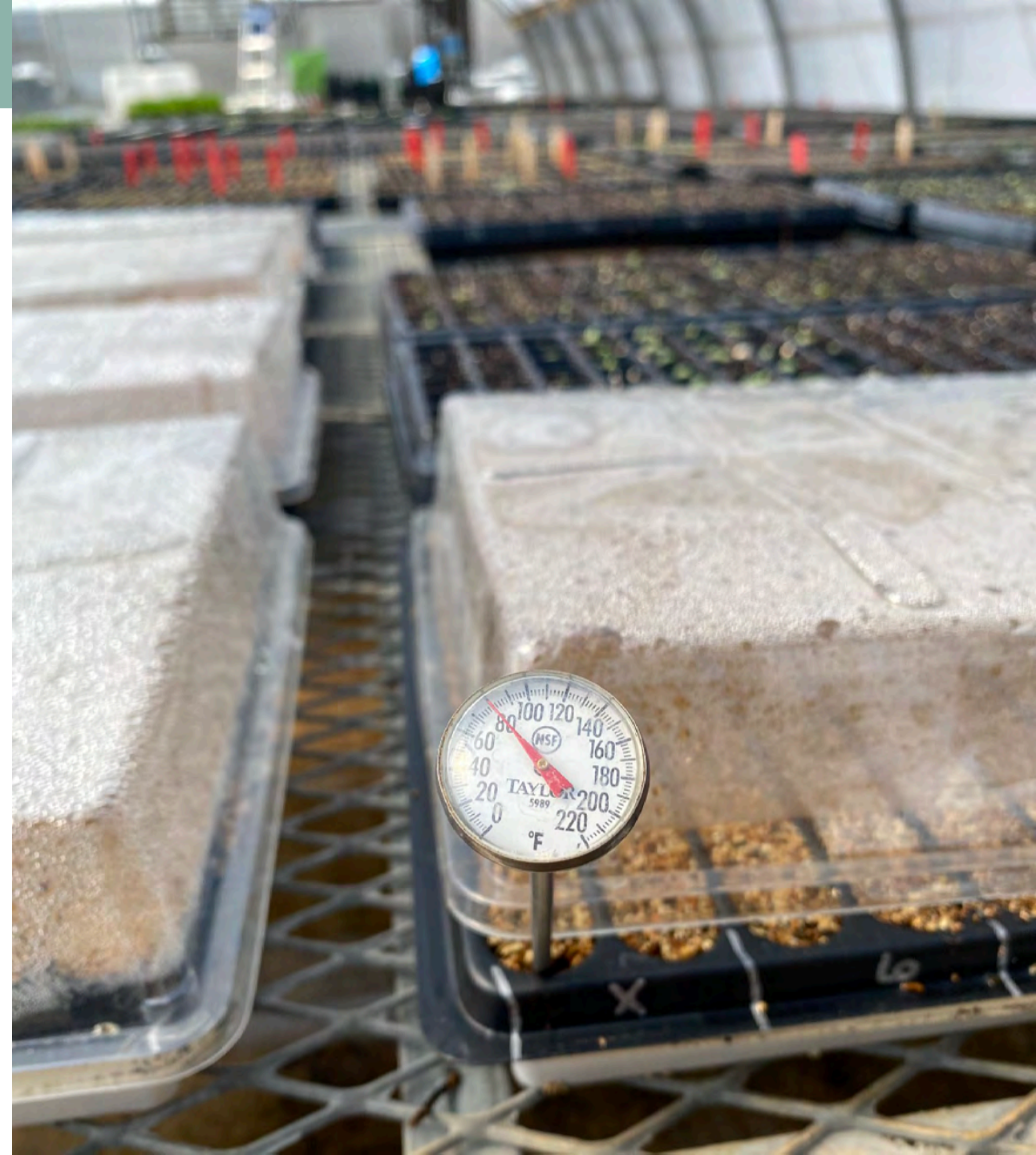
Water

- 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.



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.



Tools for Managing Temperature



Heat Mats



Soil Thermometer



Humidity Domes

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.



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



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.



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



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.



A close-up, slightly blurred photograph of a black plastic seedling tray filled with numerous young nasturtium plants. The plants have small, round, green leaves and thin stems. The text 'Tray Selection for Flower Crops' is overlaid in the center in a white, serif font. The tray's edge in the bottom right corner has the word 'NASTURTIUM' printed on it.

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.



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



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



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



Deep 50 Cell Trays

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



A close-up photograph of a large tray filled with numerous small, young green plants, likely Nasturtium, growing in dark soil. The plants have small, round, light green leaves. The text "Germination Tips for Flowers" is overlaid in the center in a white, serif font. In the bottom right corner, the word "NASTURTIUM" is visible on the edge of the tray.

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.



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.



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.



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.



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.



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



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.



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.



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.



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



A close-up photograph of a black plastic seedling tray filled with numerous small, green nasturtium seedlings. The seedlings have rounded, slightly lobed leaves and thin stems. The tray is filled with dark soil, and the seedlings are densely packed. The text "Troubleshooting Poor Seedling Health" is overlaid in white, serif font across the center of the image. In the bottom right corner, the word "NASTURTIUM" is visible on the edge of the tray.

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



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

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.



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.



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](#)
- [Selection for Double-Flowering Blooms in Stock - VIDEO](#)





Q&A

THANK YOU

We hope you enjoyed this presentation!

Johnnyseeds.com/webinars

