

Season Extension with Overwintered Flowers



Presentation Outline

- Background – Why Overwinter Flowers?
- Getting Started
- Top Five Crops for Overwintering
- Process and Timeline in Our Trials
- Current and Future Trials
- Resources

Background

- Goal - flowers for Mother's Day in Zone 5
- 4 years of trialing
- In unheated tunnels
- Results – Early blooms of high quality





Getting Started:

- Seasonal Cycle
- Structures
- Crop Selection
- Identifying Target Transplant Date
- Plant Establishment

Overwintering vs. Winter Growing

Overwintering – extending the season by supporting plant survival through the winter, with the goal of earlier spring harvests.

Winter growing – actively harvesting during the winter months

Goal: Set up plants for winter survival in order to achieve early spring harvests.



Overwinter Flower Growing Cycle

Summer	Seeding
Fall	Transplanting
Winter	Little/no plant growth
Early Spring	Plant Growth
Spring	Harvest!!

Growing Environment

the original research farm:

- Zone 5a
- Average annual extreme minimum temps: -20°F to -15°F (-29°C to -26°C)
- First Frost - Oct. 1 – 10
- Last Frost – May 21 – May 31
- Daylength below 10 hours/day: November 6th – February 3rd (appx. 3 months)

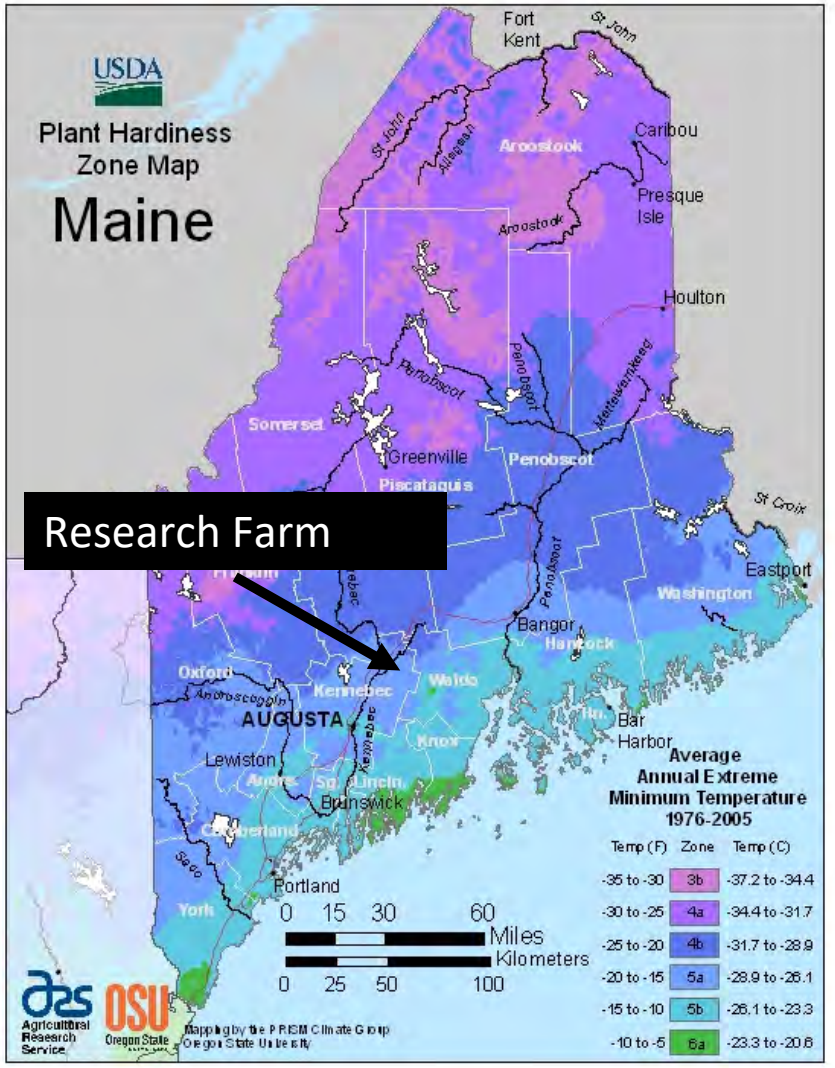


Image: extension.maine.edu

Structures

the original research farm:

- **Row Cover** – breathable fabric in varying weights.
  - We use AG-70, heaviest winter weight
- **Low Tunnels** – limited trialing of overwinter flowers
- **High Tunnels** – most overwinter flower trialing
  - Unheated
  - AG-70 row cover





Crop Selection

Crop Hardiness

- Hardy annuals or ‘cool flowers’
- Biennials
- Perennials

Markets

- What will be of most value to you in the early spring?



Digitalis – a biennial that flowers earlier and on longer stems tunnel plantings compared to field plantings. May 21, 2020.

Setting a Transplant Date

Goal: Plants in the ground 3-4 weeks before the daylength drops below 10 hrs/day.

- Identify first 10-hour day in the fall
- Count back 3-4 weeks to establish target transplant date
- Other seasonal markers:
  - Falling temperatures – are temperatures regularly dropping below 32^{o}F (0^{o}C)?
  - Fall bulb planting



Setting a Transplant Date

the original research farm:

- First 10-hr. day – **November 6th**
- Count back 3-4 weeks: **October 7-15th**
- Estimated first hard freeze – **Oct. 21-31**
- Fall Bulb Planting – **Oct. 15**



Hardening Off

- Similar process to hardening off seedlings in the spring.
- Allows plants to slowly adapt to cooler temperatures.
- In the overwinter cycle – hardening off occurs after transplanting.

Goal: Cold-acclimated plants that have experienced an extended hardening off period (3-4 weeks).



Root Establishment and Vegetative Growth

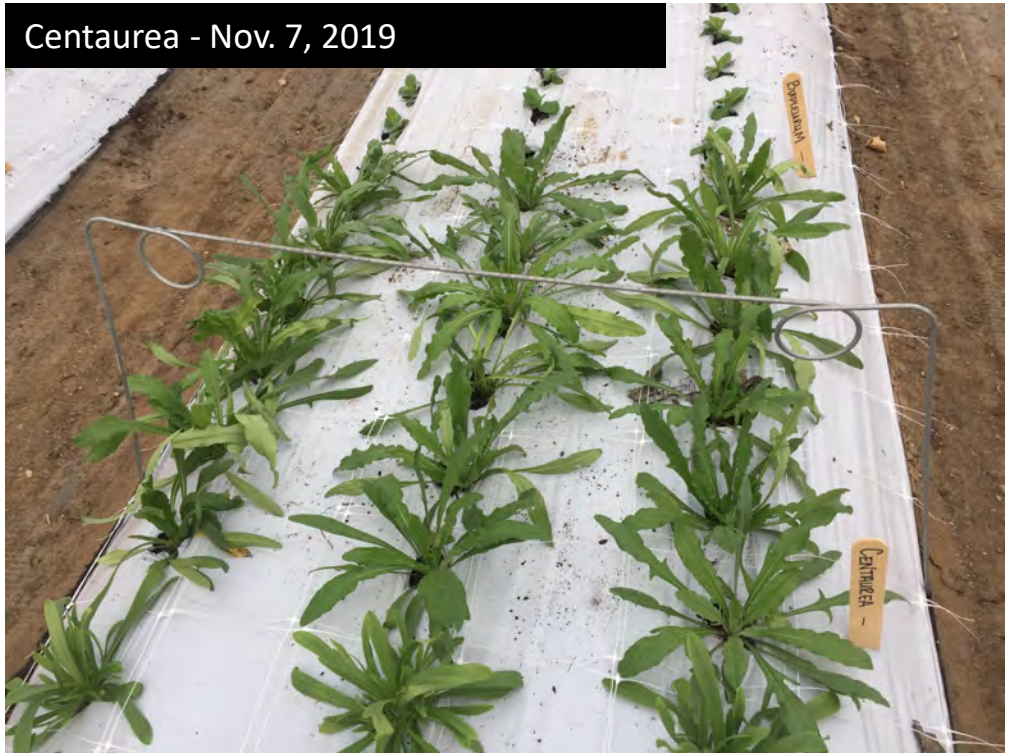
- Well-established root systems.
- Some vegetative growth, but not too much.
- Target transplant size: 3-4” tall, with 2-3 sets of true leaves

Goal: Well-rooted plants, without excessive vegetative growth.



Transplanting vs. Direct-Seeding

- Many hardy annuals do well direct-seeded into cool spring soils,
  - Agrostemma, Larkspur, Nigella, Bachelor's Button, Bupleurum
- We have seen similar results with both direct-seeded and transplanted hardy annuals.
- We choose to transplant because:
  - More efficient use of high tunnel space with our cropping needs.





Sweet Pea


Scabiosa

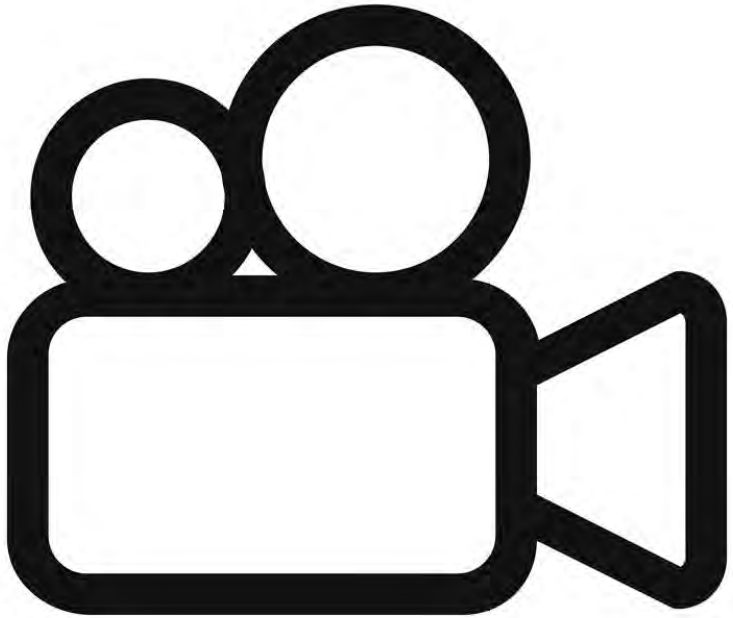


Snapdragon

Daylength: 10 Hours – Nov. 7th, 2019

Top 5 Crops – Video from Spring of 2020

- Snapdragons
- Sweet Pea
- Digitalis
- Dianthus
- Daucus, Dara
- Bonus - spring planted stock







Timeline and Process at the original source

- **Mid July to Early September – Seeding**
  - Considerations for summer seeding
- **September – Bed Prep**
  - Fertility
  - Irrigation
  - Mulch
- **Early- Mid October – Transplant**
  - Seedling target size
  - Pinching
- **November – February – Winter Maintenance**
  - Row Cover
  - Humidity Management
  - Rodents
- **Late February – Early April – Monitor new growth**
  - Monitor for irrigation needs
  - Remove row cover
  - Add crop supports
- **April – June – Harvest!!**

Mid July – Early September

Seed-Starting

- Easy to forget in this busy time of the year.
- Plan early if possible.
- Monitor seedling growth.



September

Bed Prep

- Fertility – add amendments as recommended by soil tests.
- Irrigation
- Mulch
- Crop supports



Early to Mid-October

Transplanting

- Target seedling size – 3-4” tall, with 2-3 sets of true leaves.
- Pinching
  - Treat the crop as you normally would.
  - We pinch as needed to keep plants short.
  - We find most crops branch abundantly.




October 16, 2019
Matricaria, Scabiosa, Agrostemma, Bachelor's Buttons →
Pansy and Viola
Tulips
Rudbeckia
Dianthus
Sweet Pea →
Ammi – White Dill
Ammi – Green Mist
Snapdragons
Carnation
Daucus

November to February

Winter Maintenance

- Light less than 10 hours/day: Nov. 6th – February 3rd
- Row Cover – goes on when outside temps are forecast below 32°F (0°C).
- Venting and moisture management
- Rodents




Snapdragon


January 2, 2020
Sweet Pea


Bells of Ireland


Cynoglossum


Centaurea

Winter (2019-2020)

- During the coldest periods, temperatures under AG-70 row covers were 7-14°F (12.6-25°C) warmer than ambient greenhouse temps. February was the coldest month

- 14.6°F (9.6°C) the lowest recorded temperature under the row cover

- -13.2°F (- 25°C) the lowest recorded outside temperature (on the same day)

	Month	Coldest temp F	Coldest temp C	Cumulative hours below 32F
Under the row cover	Nov.	24	-4.4	40.5
	Dec.	19.8	-6.8	130.5
	Jan.	15.8	-9	237
	Feb	14.6	-9.7	249
	Mar	23.1	-5	84
Ambient greenhouse temp (uncovered)	Apr	26.8	-2.9	29
	May	29.1	-1.6	6.75

Late February – Early April

Spring Growth Begins

- Monitor for irrigation
- Remove row cover
- Consider crop supports



March 16, 2020


March 16, 2020
Pansy and Viola
← Agrostemma – taller than hoops
← Some Shirley Poppies that didn't survive
← Digitalis
Sweet Peas
Dianthus – Sweet White
Snapdragon

Late April - June

Harvest!!

- May need additional crop supports
- Plants may be taller and stems may be thicker than field-grown plants.



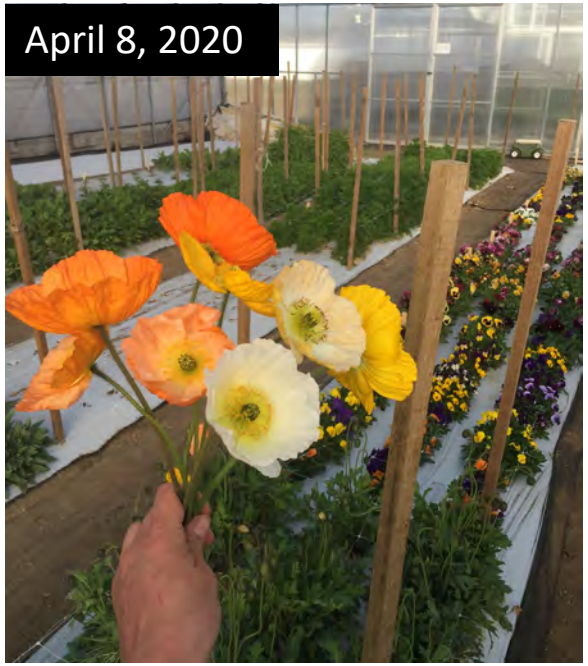
Harvesting: Early Spring

April 15 – April 30

- Pansies and violas
- Dianthus – Sweet series
- Poppies
- Tunnel Tulips
- Cress, Ornamental







Harvesting: Mid-Spring

May 1 - 15

- Pansies and Violas
- Icelandic Poppies
- Tulips
- Cress
- Sweet Peas
- Dianthus – Sweet Series
- First of the Snapdragons
- Cynoglossum – first cuts



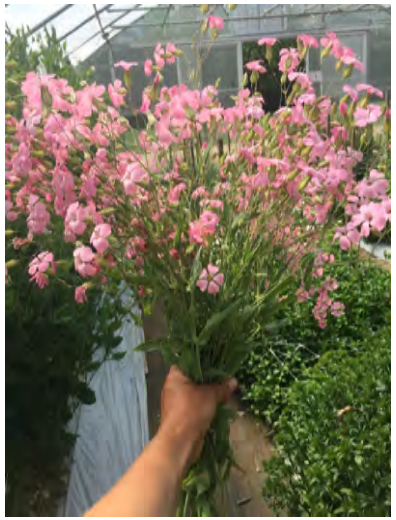


Harvesting: Late Spring

May 15 – May 31

In addition to crops on earlier slides:

- Sweet peas
- Snapdragons
- Digitalis
- Nigella
- Bells of Ireland
- Cynoglossum
- Stock








Harvesting: Late Spring, continued

May 15 – May 31

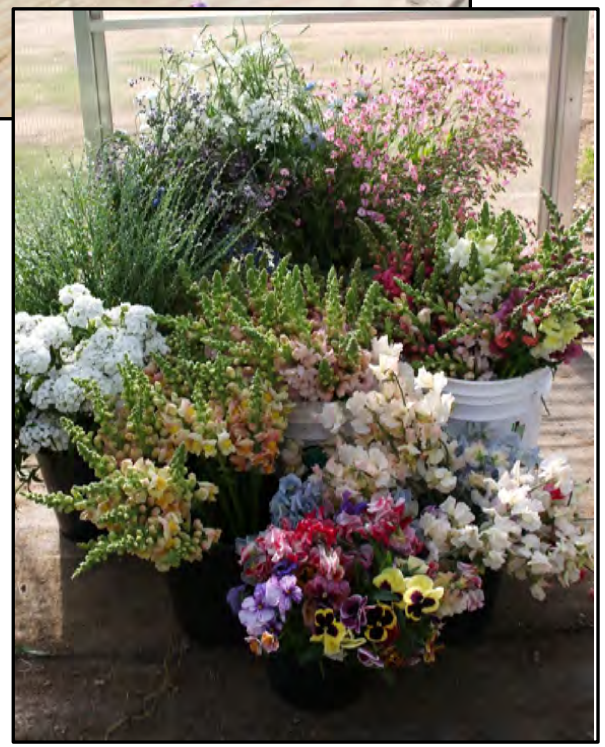
In addition to crops on earlier slides:

- Ammi
- Dianthus – Sweet Series
- Larkspur
- Saponaria
- Agrostemma
- Centaurea
- Orlaya





May 26, 2020



Harvesting: Early Summer

June 1 – June 30

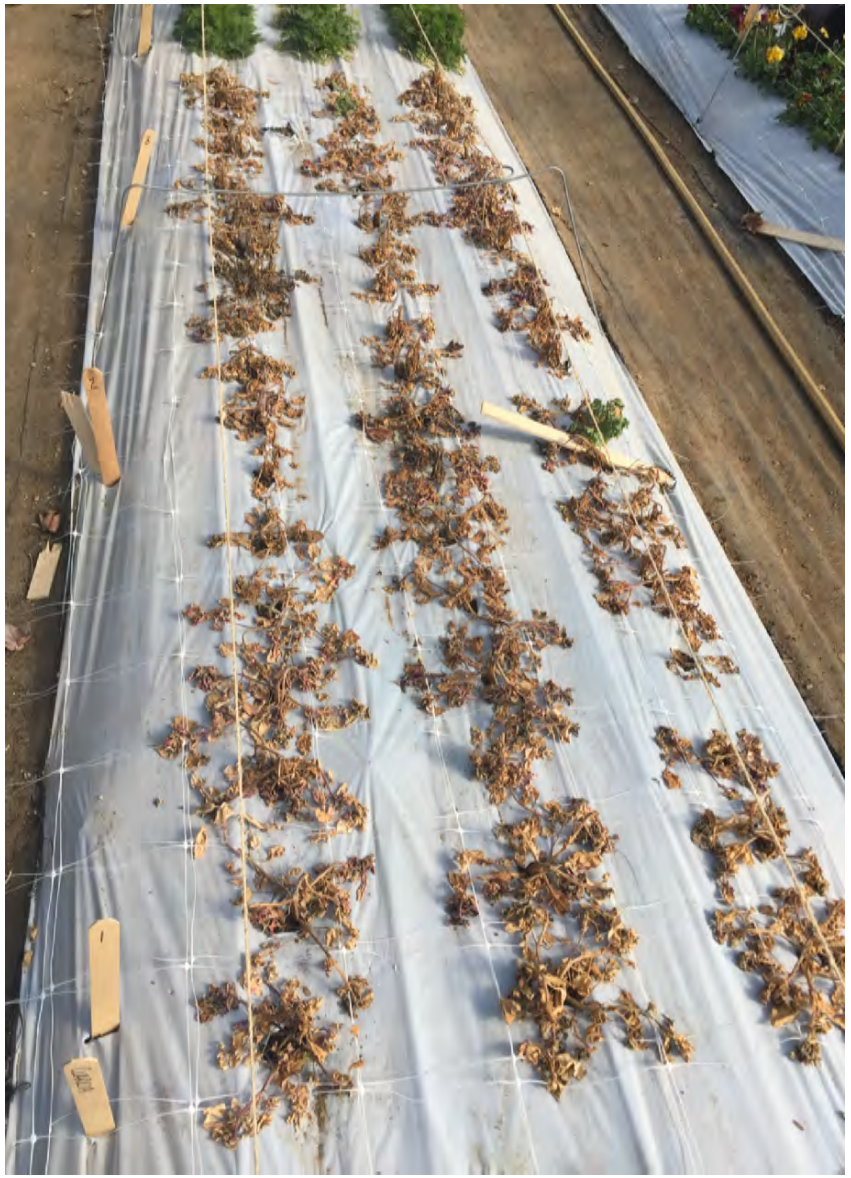
In addition to crops on earlier slides:

- Scabiosa
- Rudbeckia
- Matricaria
- Dusty Miller
- Daucus – ‘Dara’
- Dianthus – Amazon Series
- Dianthus – Chabaud Series
- Snapdragons – 2nd cut



Crops that did not work well for us:

- **Stock** – poor survival rate; low bloom quality. Much better for us in early spring plantings.
- **Columbine** – did not bloom.
- **Delphinium** – survived, but did not bloom significantly earlier than field-planted Delphinium.
- **Clarkia** – did not survive
- **Godetia** – spotty survival; not enough to make it worth the tunnel space for us.
- **Poppy –** Shirley and Breadseed poppies did not survive; Icelandic poppies were rock stars.



Overwinter Tunnel Favorites/Ongoing Trials

- **Icelandic Poppies** – excellent winter survival; long bloom window
- **Pansies and Violas** – edible flowers through the winter; stems are a nice addition with tulips in early May
- **Eucalyptus** – survived 2020-2021 winter.
- **Dusty Miller** – nice foliage in late spring
- **Larkspur** – 'Fancy Pink with White Bee'
- **Rudbeckia** – 'Sahara'



Larkspur – Fancy Pink White Bee
June 16, 2020

Resources

the original source:

- Online articles
- 2020 trial results
- Seeding date calculator
- New Video Library

Other:

- Cool Flowers, Lisa Ziegler
- Utah State extension
- ASCFG Association of Specialty Cut Flower Growers



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Web Article

Introduction to Overwintering Flowers

An overwinter trial tunnel. Photo taken late May.

Methods + Recommendations from the original source Multiyear Overwinter Flower Trials

Many types of flowers can be started in late summer or fall, for overwintering. Overwintered crops tend to bloom about a month earlier than spring-planted field crops (with some variation between varieties), providing an abundance of high-quality blooms long before any field crops are ready for harvest.

Growers in different locations will experience different results. Some crops will overwinter successfully in your area, while others will not. Results can also vary from year to year. And, even if a particular flower crop overwinters successfully it may not provide a financially viable opportunity, whereas others will excel.

For all these reasons, we encourage you to start by conducting your own small-scale trials before scaling up your production plans. Then continue to experiment each year, to see what is feasible and learn more about the limits and possibilities of four-season cut-flower production on your farm.

ON THIS PAGE

- Flower Crops to Overwinter — Results from Our Trials
- Crop Planning & Timing: Last 10-Hour Day + First Hard Freeze
- Overwinter Flowers Using High & Low Tunnels
- LEARN MORE

TOP ^

Flower Crops to Overwinter — Results from Our Trials

Top 5 Flowers for Overwintering in Tunnels

If you are new to overwintering, we recommend starting with one or more of our Top 5 Flowers for Overwintering in Tunnels:





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2019 -2020 Trial Report

Othe original source Overwinter Flower Trials • Results by Crop

Growing resources

…nter tunnel trials, as well as information gleaned from previous years of overwinter trials.

- These trials were conducted in unheated hoophouses in Central Maine, Zone 5a, Latitude 44.6°N.
- This information is intended for use as a reference. Your seeding, transplanting, and maturity dates, as well as yield numbers and harvest window, will vary according to

Key

Bloom Window

Late March - April 30 ..... Early Spring
May 1 - May 15 ..... Mid Spring
May 16 - May 31 ..... Late Spring
June 1 - June 30 ..... Early Summer

*** Asterisks:** Refer to "Other Notes" in same row, colum… for details.

Crop	Function	Survival Rate	Bloom Window	Harvest Type	Harvest Window	Yield (range)	Recommended Varieties	Pros	Cons	Other Notes
Rudbeckia hirta	Focal flower; mixed bouquets or single-variety bunches	90-100%	Early Summer	Continuous harvest	2-4 weeks	18-25 stems/plant	Sahara, in particular, shines in tunnel. Stems are longer than those of field plantings, yet plants remain manageable and need less staking in the tunnel compared to others.	Taller stems, wider blooms; earlier than field plantings.	Stems can get too tall and bend if not supported well.	A late bloomer in the tunnel, not offering the customary early-summer palette, but colors are vibrant and rich and plants are productive.
Carnation	Accent flower; mixed bouquets or single-variety bunches; design/wholesale	100%	Early Summer	Continuous harvest	2-3 weeks	15-20 stems/plant	Chabuad Series: all varieties perform well, yielding fragrant, abundant blooms on tall stems.	High yields of uniform, fragrant blooms	May need additional support.	Plant varieties from each of the Sweet, Amazon, and Chabaud series for a succession of blooms from early spring to late summer.
Ammi: Green Mist	Accent flower; mixed bunches	75-90%	Mid Spring to Early Summer	Continuous harvest	2-4 weeks	10-15 stems/plant		More vigorous, productive plants and taller stems, compared to field plantings.		White Dill was slightly more productive, compared to Green Mist.

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Seeding Date Calculator

Overwinter Flower Trials • Seeding Date Calculator

To calculate your Earliest and Latest Seeding Dates:

1) Estimate your Target Transplant Date (column G) by counting back 4 weeks from:
   a) Last 10-Hour Day of the Year at your latitude; and/or
   b) Average Date of First Hard Freeze (below 28ºF / -2.2ºC), which generally correspond with temperatures regularly dipping below freezing in your area.
2) Enter your estimated Target Transplant Date into column G (yellow) of this calculator.
3) A range of Seeding Dates will display for each crop in Columns H and I (green).

NOTES

* We've found that starting seedlings in summer conditions, compared to spring conditions, can affect the standard amount of time needed to produce a transplant. The number of weeks listed below for plug/transplant production (Columns B-E, blue) may vary from our standard, spring-seeding recommendations, as a reflection of our experience with summer sowings of flower crops for overwintering.
* Our trial seeding dates reflect current targets for seeding in our zone 5b location. These dates were determined on the basis of

Flower Crop	Weeks Required, from Seeding to Transplanting	Plug Size	Enter Your Target Transplant Date	Earliest Seeding Date (calculated field)	Latest Seeding Date (calculated field)
Digitalis lanata (Wooly Foxglove)	11 - 12	72-cell	8-Oct	16-Jul	23-Jul
Digitalis purpurea (Common Foxglove)	10 - 11	72-cell	8-Oct	23-Jul	30-Jul
Dusty Miller	8 - 10	72-cell	8-Oct	30-Jul	13-Aug
Snapdragon	8 - 10	72-cell	8-Oct	30-Jul	13-Aug
Bupleurum	7 - 9	72-cell	8-Oct	6-Aug	20-Aug
Dianthus (including Carnation)	6 - 8	72-cell	8-Oct	13-Aug	27-Aug
Viola (including Pansy)	* 6 - 8	72-cell	8-Oct	13-Aug	27-Aug
Bells of Ireland	6 - 8	72-cell	8-Oct	13-Aug	27-Aug

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New Video Library

- Review of harvest period, all crops
- Irrigation
- Trellis, ground-cover and spacing
- Crop economics consideration
- Agrostemma
- Bells of Ireland
- Bupleurum
- Ammi
- Dianthus
- Digitalis
- Cynoglossum
- Cress
- Larkspur
- Matricaria/feverfew
- Nigella
- Orlaya
- Rudbeckia
- Saponaria
- Scabiosa
- Snapdragon
- Stock (spring planted)
- Sweet pea
- Viola



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More Resources

Lisa Ziegler Cool Flowers

https://www.thegardenersworkshop.com/the-cool-season-flower-chronicles-series/

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growing-overwintering.html



Dr. Melanie Stock, Utah State Extension

Instagram webinar for snapdragons: https://www.instagram.com/tv/CD39i9ZBDsf/

Ranunculus and Anemone trials:
https://diverseag.org/urbansmallfarmsconf2021/SmallFarmsConferenceRanunculusPresentation.pdf
Production guides:
High Tunnel Peony https://digitalcommons.usu.edu/cgi/viewcontent.cgi?article=2931&context=extension_curall
Sweet Pea http://digitalcommons.usu.edu/extension_curall/2063

Budgets for figuring out prices:
High Tunnel Snapdragons http://digitalcommons.usu.edu/extension_curall/2140
High Tunnel Peony http://digitalcommons.usu.edu/extension_curall/2165



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https://www.ascfg.org/


Thank You!!