

# 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

## Johnny's Research Farm:

- Zone 5a
- Average annual extreme minimum temps:  $-20^{\circ}\text{F}$  to  $-15^{\circ}\text{F}$  ( $-29^{\circ}\text{C}$  to  $-26^{\circ}\text{C}$ )
- First Frost - Oct. 1 – 10
- Last Frost – May 21 – May 31
- Daylength below 10 hours/day:  
November 6<sup>th</sup> – February 3<sup>rd</sup> (appx. 3 months)

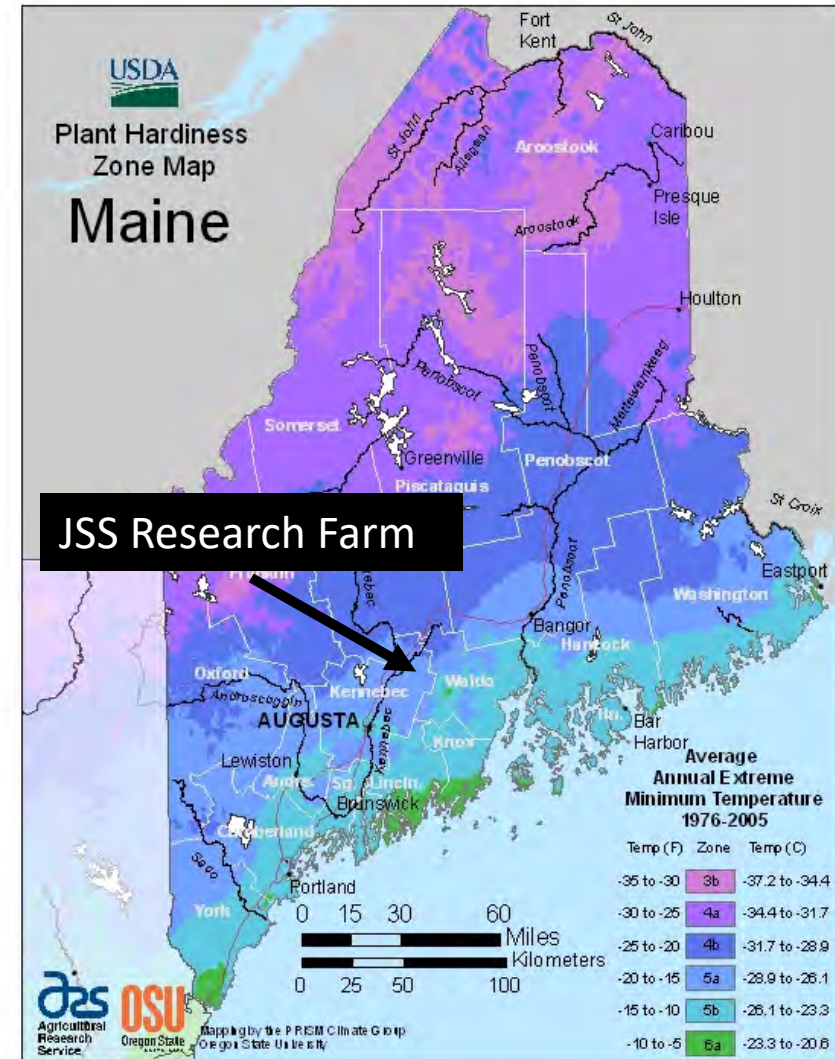


Image: extension.maine.edu

# Structures

## Johnny's 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°F (0°C)?
  - Fall bulb planting



# Setting a Transplant Date

## Johnny's Research Farm:

- First 10-hr. day – **November 6<sup>th</sup>**
- Count back 3-4 weeks: **October 7-15<sup>th</sup>**
- 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



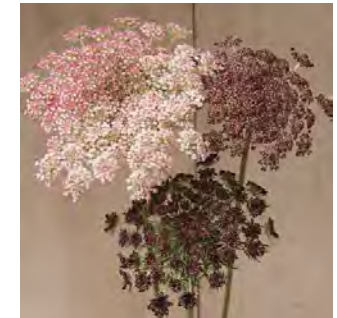
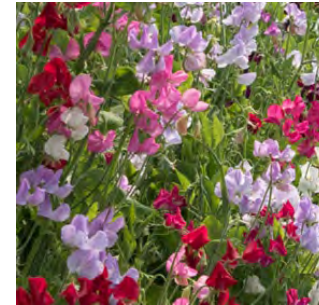
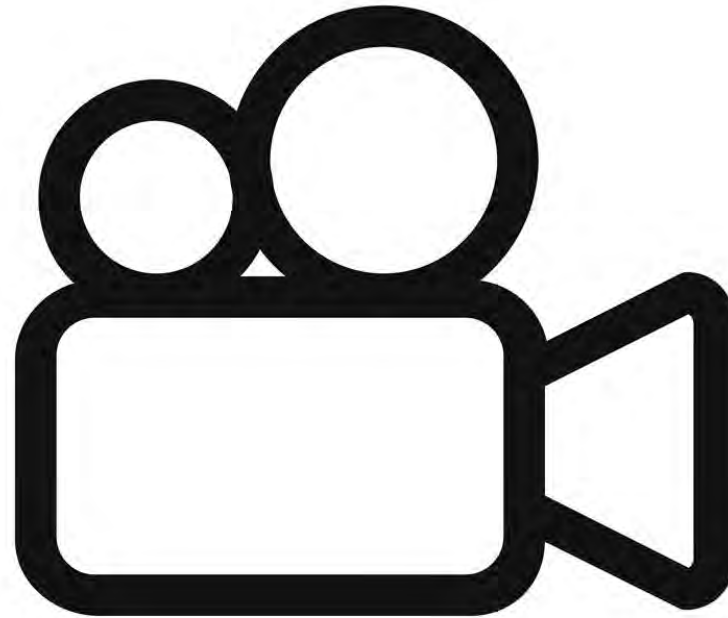
Snapdragon

Daylength: 10 Hours – Nov. 7<sup>th</sup>, 2019

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# Top 5 Crops – Video from Spring of 2020

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





# Timeline and Process at Johnny's

- **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

Tulips

Rudbeckia

Ammi – White Dill

Ammi – Green Mist

Daucus

Matricaria, Scabiosa,  
Agrostemma, Bachelor's  
Buttons →

Snapdragons

Pansy and Viola

Dianthus

Sweet  
Pea →

Carnation

# November to February

## Winter Maintenance

- Light less than 10 hours/day:  
Nov. 6<sup>th</sup> – February 3<sup>rd</sup>
- 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 in Maine (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

Snapdragon

Dianthus – Sweet White



# Late April - June

## Harvest!!

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

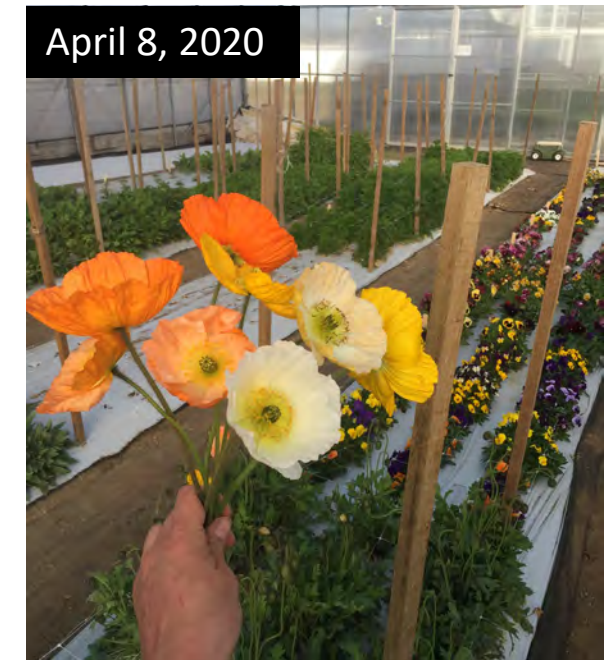


Extra support needed →

# 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

May 12, 2020



May 12, 2020



# 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

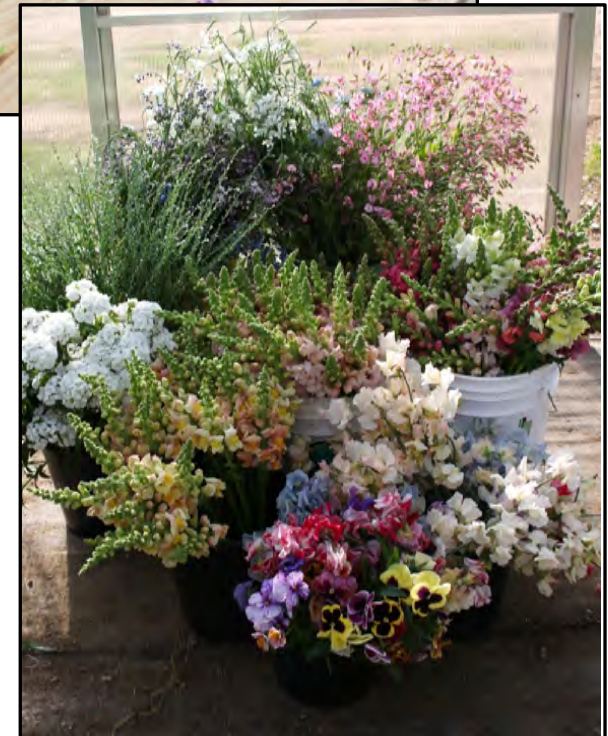
**May 15 – May 31**

In addition to crops on earlier slides:

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



**May 26, 2020**

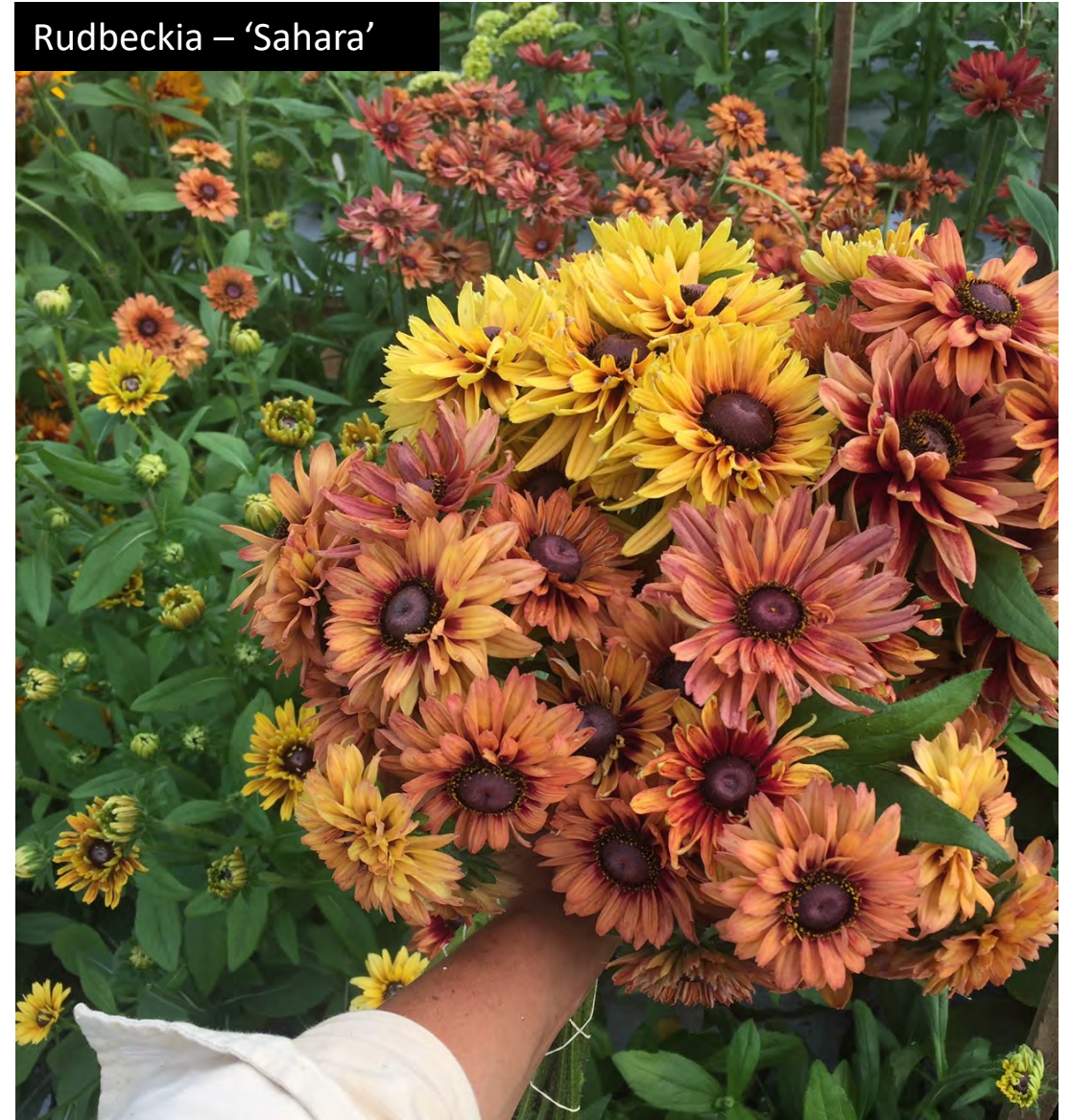


# Harvesting: Early Summer

**June 1 – June 30**

In addition to crops on earlier slides:

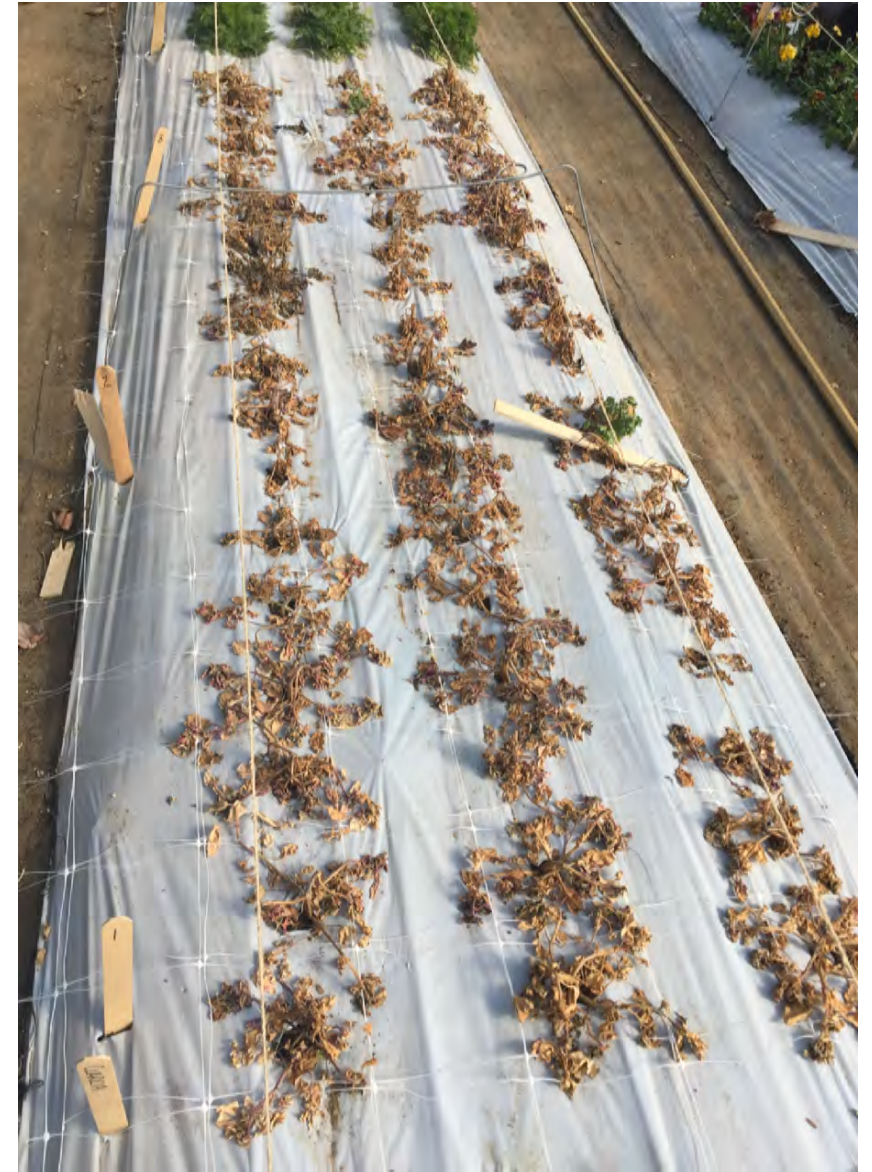
- Scabiosa
- Rudbeckia
- Matricaria
- Dusty Miller
- Daucus – ‘Dara’
- Dianthus – Amazon Series
- Dianthus – Chabaud Series
- Snapdragons – 2<sup>nd</sup> cut





# 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

## Johnny's:

- 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





# 2019 -2020 Trial Report



## Overwinter Flower Trials • Results by Crop

- The data in this chart reflect results of our 2018 and 2019 cut-flower overwinter 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, column 11, for details.

Crop	Function	Survival Rate	Bloom Window	Harvest Type	Harvest Window	Yield (range)	Recommended Varieties	Pros	Cons	Other Notes
<a href="#">Rudbeckia hirta</a>	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.
<a href="#">Carnation</a>	Accent flower; mixed bouquets or single-variety bunches; design/wholesale	100%	Early Summer	Continuous harvest	2-3 weeks	15-20 stems/plant	Chabaud 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.
<a href="#">Ammi: Green Mist</a>	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.

# 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 28°F / -2.2°C), 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 Albion, Maine 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)
<u><a href="#">Digitalis lanata (Woolly Foxglove)</a></u>	11 - 12	72-cell	8-Oct	16-Jul	23-Jul
<u><a href="#">Digitalis purpurea (Common Foxglove)</a></u>	10 - 11	72-cell	8-Oct	23-Jul	30-Jul
<u><a href="#">Dusty Miller</a></u>	8 - 10	72-cell	8-Oct	30-Jul	13-Aug
<u><a href="#">Snapdragon</a></u>	8 - 10	72-cell	8-Oct	30-Jul	13-Aug
<u><a href="#">Bupleurum</a></u>	7 - 9	72-cell	8-Oct	6-Aug	20-Aug
<u><a href="#">Dianthus (including Carnation)</a></u>	6 - 8	72-cell	8-Oct	13-Aug	27-Aug
<u><a href="#">Viola (including Pansy)</a></u>	* 6 - 8	72-cell	8-Oct	13-Aug	27-Aug
<u><a href="#">Bells of Ireland</a></u>	6 - 8	72-cell	8-Oct	13-Aug	27-Aug

# 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



<https://www.johnnyseeds.com/growers-library/webinar/webinar-series-overwintering-flowers.html>

# More Resources

## Lisa Ziegler Cool Flowers

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

<https://www.johnnyseeds.com/growers-library/flowers/cool-flowers-lisa-ziegler-winter-growing-overwintering.html>



5 Cool Flowers to Plant Now (or very early next spring)

Learn Lisa Mason Ziegler's secrets for growing hardy, cool-season annuals

*Interview by Debra Prinzing, Founder of SlowFlowers.com*

What is the definition of cool flowers?

Cool flowers, known as hardy annuals, live for one year and survive cold temperatures. Many are planted in the fall, to winter-over and produce blooms the following spring and summer. These flowers prefer becoming established and growing in cool conditions. Alternately, tender annuals live for one year and do not survive cold temperatures — they prefer to grow in the heat of summer. Both categories are annuals, but they are planted at very different times.

## Dr. Melanie Stock, Utah State Extension

[Instagram webinar for snapdragons:](https://www.instagram.com/tv/CD39i9ZBDsf/) <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](https://digitalcommons.usu.edu/cgi/viewcontent.cgi?article=2931&context=extension_curall)

**Sweet Pea** [http://digitalcommons.usu.edu/extension\\_curall/2063](http://digitalcommons.usu.edu/extension_curall/2063)

[Budgets for figuring out prices:](#)

**High Tunnel Snapdragons** [http://digitalcommons.usu.edu/extension\\_curall/2140](http://digitalcommons.usu.edu/extension_curall/2140)

**High Tunnel Peony** [http://digitalcommons.usu.edu/extension\\_curall/2165](http://digitalcommons.usu.edu/extension_curall/2165)



## HIGH TUNNEL & FIELD SYSTEMS FOR PRODUCING SNAPDRAGON CUT FLOWERS IN NORTHERN UTAH

MAEGEN LEWIS – graduate research assistant

DR. MELANIE STOCK – assistant professor, extension urban & small farms specialist

November 17, 2020



## ASCFG

<https://www.ascfg.org/>





**Thank You!!**