

UNIVERSITY OF MINNESOTA  
EXTENSION  
MAKING A DIFFERENCE IN MINNESOTA

# Winter Sowing

## Smarter Growing for Cold-Tolerant Plants

MAKING A DIFFERENCE IN MINNESOTA: ENVIRONMENT • FOOD & AGRICULTURE • COMMUNITIES • FAMILIES • YOUTH

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### Class Goals

In this class you will learn

- How seeds grow
- How winter sowing works
- How to choose what to grow
- How to transplant healthy seedlings into your garden



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# Seed Biology

## How Seeds Grow

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### Seed Anatomy

- Seed coat ("Bran")
  - Protects against insects & disease
- Nutritive tissue ("Endosperm" or "Cotyledon")
  - Food for the embryo
- Embryo ("Germ")
  - Undeveloped plant
  - Waiting for ideal conditions



Learn more in our **All About Seeds** class

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### Germination Conditions

- Common needs
  - Available soil or growing medium
  - Right soil temperature
  - Adequate water
- Special needs
  - Specific temperatures (stratification)
  - Light exposure
  - Soaking (seed priming)
  - Scarifying (scratching the surface)



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### Seedling Development

- Imbibition
  - Seed coat absorbs water & comes off
- Radicle ("root")
- Hypocotyl ("stem")
- Cotyledons ("seed leaves")
  - Take 5-28 days
  - Looks different from the true leaves
- True leaves



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### Sources of Seeds

- Seed catalogs & garden stores
  - Risks: Higher prices
  - Benefits: Many varieties & good germination
- Seed libraries & seed swaps
  - Benefits: Low to no cost
  - Risks: Fewer or unreliable varieties & lower germination
- Save your own
  - Benefits: No cost
  - Risks: Fewer or unreliable varieties & lower germination



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See "Seed Shelf Life" Guide on class resource webpage

### Storing Seeds

- Portion & package seeds
  - Use paper envelopes
  - Label envelopes
- Choose an air-tight container
- Store in cool, dry & dark place
- Seed can be used for many years (1-5 years) though germination declines over time



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### Section Recap

- Seeds have everything they need to grow into a plant
- Germination happens when conditions are right
- Pick a reliable seed source
- Seeds can be stored for many seasons



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# Cold Growing

## Understanding the Technique



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### Growing In MN

- Short growing season
  - Zone 4
  - Averaging 150-200 days
  - May to October
  - Limited by sunlight & heat
- Outdoor plant types
  - Cold-tolerant plants
  - Tender plants
  - Warm-season plants




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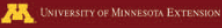
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### Temperature Requirements

- Cold-tolerant plants
  - Plant seeds directly outside
  - **Plant while soil is cool**
  - “As soon as the soil can be worked”
- Tender plants
  - Plant seeds directly outside
  - **Wait until the soil is warm**
- Warm-season plants
  - Transplant seedlings outside **once the soil is warm**

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### Tricks to Increase Soil Temperatures

- Containers
  - Smaller areas heat up faster
- Potting soil
  - Large pockets of air
  - Controlled amounts of water
  - Increases temperature 5° F
- Location
  - Protection from wind
  - Maximize sunlight exposure
- Covers (*cloche*; *greenhouse*)
  - Traps sun-warmed air
  - Increase temperature 5-10° F



Learn more in our  
Advanced Vegetable  
Gardening class

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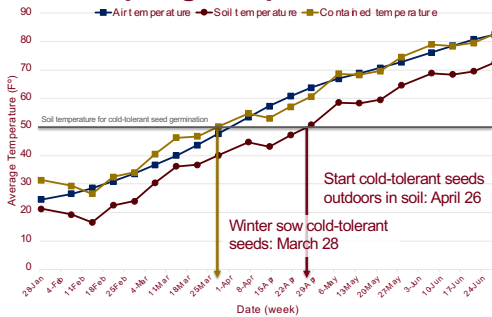
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### Spring Temperatures



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### Winter Sowing

- Small & easy to move
- Clear sides allow sunlight
- Potting soil holds moisture
- Drainage holes prevent flooding
- Open top prevents overheating
- Seedlings acclimates to outdoor conditions (*hardens-off automatically*)



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**Section Recap**

- Minnesota has a short growing season
- Only certain plants can grow under cool conditions
- Gardeners can create conditions that encourage cold-tolerant seeds to grow earlier
- Winter sowing is an easy at-home project to try



**Cold Growing**

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**Cool Plants**

Cold-Tolerant Plants for Winter Sowing

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**Winter Sowing Candidates**

- Keywords
  - Reseeds
  - Self-sows
  - Hardy seeds
  - Requires stratification
  - Seedlings can withstand frost
  - Sow outdoors in late autumn or early spring
  - Plant as soon as the soil can be worked



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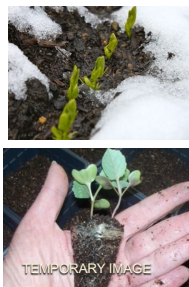
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**Recommended Characteristics**

- Cold-tolerant
  - Seeds germinate in cool soil
  - Seedlings survive cold temps
- Transplants well
  - Fibrous root structure  
*(not taproot)*
  - Hardy root ball



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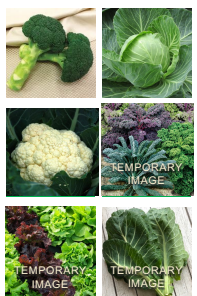
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**Cold-Tolerant Vegetables**

- Broccoli
- Brussel sprouts
- Cabbage
- Cauliflower
- Kale
- Lettuce
- Mustard greens
- Swiss chard



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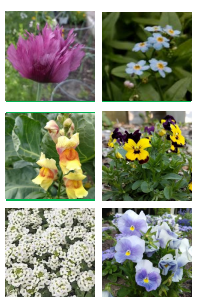
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**Cold-Tolerant Annual Flowers**

- Bachelor's button
- Breadseed Poppies
- Calendula
- Forget-me-not
- Pansy
- Snapdragon
- Stock
- Sweet Alyssum
- Viola



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### Cold-Tolerant Annual Foliage Plants

- Bells of Ireland
- Dusty Miller
- Flowering Kale
- Giant Mustard
- Ornamental Cress
- Swiss chard

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### Cold-Tolerant Perennial Plants

Requires stratification (8 weeks of 33-40° F) & may take multiple years to mature

- Baptisia
- Butterfly Weed
- Black-eyed Susan
- Delphinium
- Garden Phlox
- Gentian
- Helianthus
- Heliopsis
- Heuchera

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### Cold-Tolerant Native Plants

Requires stratification (4 weeks of 33-40° F) & may take multiple years to mature

- Anise Hyssop
- Blazing Star
- Blue Vervain
- Cardinal Flower
- Joe Pye Weed
- Milkweed
- Penstemon
- Prairie Clover
- Yellow Coneflower

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**Section Recap**

- There are lots of cold-tolerant plant options to try
- Look for keywords like
  - Self-sows
  - Sow outdoors in early spring
  - Plant as soon as the soil can be worked
- Avoid plants that have taproots or are not recommended for transplant



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**Step-by-Step**

Winter Sowing Instructions

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**Equipment**

- Plastic container
  - Measuring tape
  - Scissors/box-cutter
  - Hammer & nail
  - Weather-resilient tape
- Potting Soil (hydrated)
- Seeds



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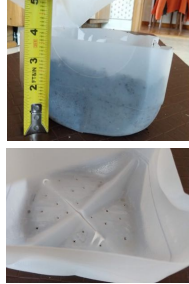
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### Preparation

1. Clean & sterilize container
2. Cut container 4-6 inches from bottom; only go around  $\frac{3}{4}$
3. Create drainage holes in the bottom
4. Fill with potting soil 1-2 inches below rim



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### Planting

1. Plant seeds
  - Read the label for depth
  - Use grid pattern (larger plants)
  - Scatter liberally (smaller plants)
2. Cover & pat gently to increase soil contact
3. Close container & tape shut
4. Label container
5. Remove cap/lid



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### Growing Location

1. Put containers outside
  - Full-to-Part Sun
  - Protected from wind
  - Anchor
2. Monitor containers
  - Keep upright
  - Surface condensation
  - Plant growth



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### Seedling Care

- Vent container (*lid off*)
- Keep closed until daytime temps are above 55°F
- To prevent overheating
  - Remove tape to crack open
  - Bend back lid as plants grow
- Water gently (*if necessary*)



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### Transplanting Seedlings

- Transplant when seedlings are 4-6 inches tall (2x sets of true leaves)
- Steps for transplanting
  1. Choose a cloudy day
  2. Prepare hole in garden\*
  3. Remove the root-ball from container\*\*
  4. Divide plants
  5. Sink seedlings into holes to soil line
  6. Fill with soil & water gently



Learn more in our Introduction to Vegetable Gardening class

\*Read the label for recommended growing conditions  
\*\*Grip plant by a leaf if needed; NEVER by the stem

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### Dividing Seedlings



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### Proper Spacing

- Plants get big quickly during the short growing season
- Leave room between transplants when planting\*
- Plan your garden spacing
  - Increase airflow
  - Maximize soil coverage

\*Read the plant label



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### Plant Labels

- Label plants when transplanting
  - Differentiate between varieties of same type of plant
  - Easy to identify vegetables from weeds
- Look for the following features
  - Easy to read
  - Includes name & mature-by date
  - Weather-resilient materials
  - Anchored (won't blow away)



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### Section Recap

- Clean any clear plastic containers before use
- Hydrate potting soil before planting
- Open container as outdoor temperatures increase
- Transplant when seedlings are 4-6 inches tall



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# Winter Sowing Recap

## Parting Thoughts



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# Class Recap

- Seed germination happens only when conditions are right
- Certain plants can grow in cool soil
- Winter sowing creates conditions to start cool-season seeds earlier
- Look for keywords like
  - Self-sows
  - Plant as soon as the soil can be worked

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# Learn More on Our Website

[www.ramseymastergardeners.org/sb-winter-sowing](http://www.ramseymastergardeners.org/sb-winter-sowing)



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**Thank you**

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Ramsey County Master Gardener Volunteer Program  
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