

# Winter Gardening

In Central Arizona

*September 28, 2021*



# University of Arizona Master Gardener Association Yavapai County Cooperative Extension

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# Tonight's Three Main Topics

- Growing greens and vegetables during the cooler winter months.
- Methods for improving and protecting your soil and prepping for the next season.
- Growing microgreens indoors.



# Growing Greens and Vegetables in the Garden

- Choosing a location for your garden
- Caring for the soil
- Selecting plants/seeds
- Protection from the elements



# Choosing a location

- Look for an area that has southern exposure to mid-day sun (10am-3pm).
- Protectable from the elements and animals.
- Rotation of plants from previous season.
- Soil quality
- Access to water

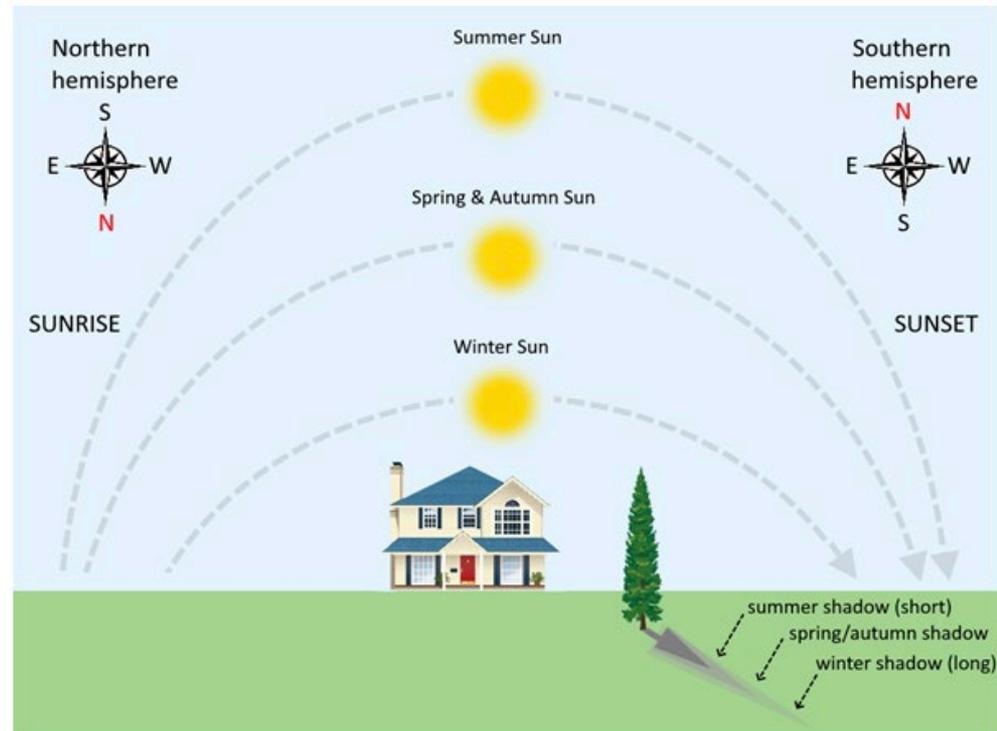


Image Credit: Deep Green Permaculture  
<https://deepgreenpermaculture.com/2020/03/24/emergency-survival-prepper-vegetable-gardening-part-1-selecting-a-location-for-a-food-garden/>



# Caring for the soil

- 
- Check the quality of your soil.
  - Has this space been grown in recently
  - Remove plants from previous season.
  - What is the soil texture like?
  - Make the necessary soil amendments.
    - Compost
    - Fertilizer
    - Organic Matter
    - Keep It Covered (mulch)

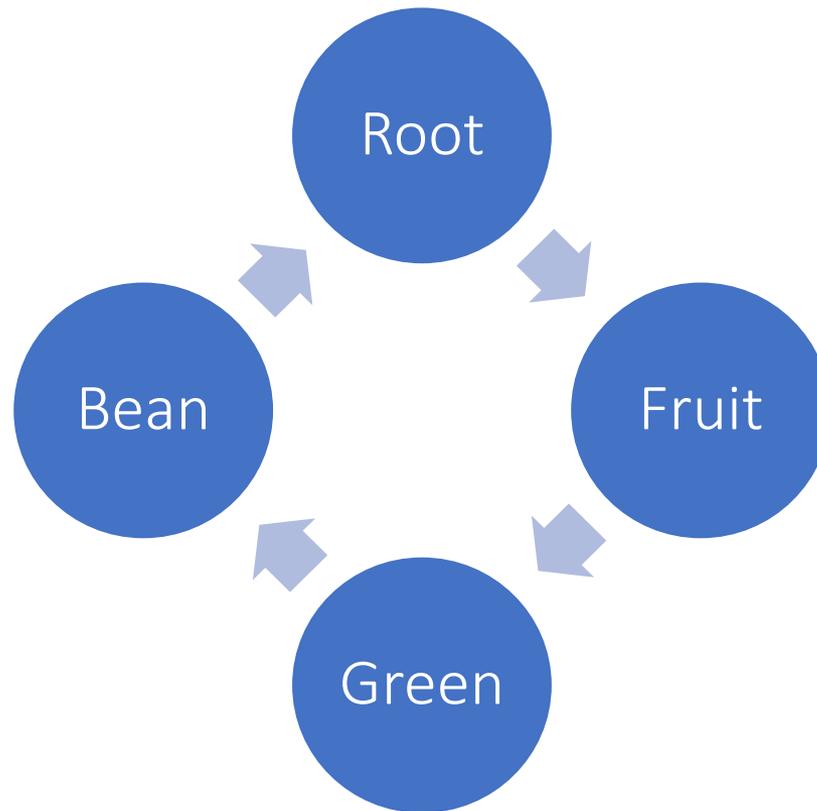


# Fertilizing

- Fall and Winter garden soils need to be enriched
- Best to use 2-3 pounds of a slow release fertilizer per 100 square feet of garden area
  - Both chemical and organic varieties are available
- You want a higher potassium count (the K in NPK). Potassium helps to protect from winter cold



# The Key to Healthy Plants: Rotation!



# Plant Choice Considerations



Time to  
germinate



Time to maturity



Height of plant



Seed versus  
plant

# Maturation Rate

## **Quick Maturation (30-60 days)**

Beets - 1.5'  
Leaf Lettuce - 1'  
Mustard - 1.5'  
Radishes - 1.5'  
Spinach - 1'  
Turnip Greens - 1.5'

## **Moderate Maturation (60-80 days)**

Broccoli - 3'  
Chinese Cabbage - 1.5'  
Carrots - 1'  
Green Onions - 1.5'  
Kohlrabi - 1.5'  
Parsley - 1.5'

## **Slow Maturation (80 days +)**

Brussels sprouts - 2'  
Bulb onions - 1.5'  
Cabbage - 1.5'  
Cauliflower - 3'  
Garlic - 1'  
Parsnips - 3'



# Selecting Seasonal Plants/Seeds

- Fall/Winter seeds can be directly sown into the soil.
- Plant starts are also an option
- Choose plants that are both cold hardy and appealing to you.
  - Possible winter garden seed choices:

## Leafy Greens

- Kale
- Lettuce
- Mustard
- Swiss Chard
- Spinach
- Collards
- Mache
- Claytonia

## Root Vegetables

- Carrots
- Turnips
- Radishes
- Beets
- Parsnips
- Rutabagas
- Potatoes

## Legumes

1. Peas
2. Sugar Snap Peas

## Onion Family

- Leeks
- Garlic
- Onions

## Brassica Family

- Brussel Sprouts
- Cabbage
- Broccoli



# Cold Hardy Vegetable Varieties

Leeks – darker, blue-green varieties – Bleu de Solaise, Bandit

Carrots - Scarlet Nantes, Autumn King

Spinach – savoy types – crinkled leaves – Winter Bloomsdale, Tye

Collards – Blue Max

Parsnips – Hollow Crown

Cabbage – savoy types – dark crinkled leaves – Marabel, January King

Tat Soi

Swiss Chard – green or white varieties – Fordhook Giant, Verde de Taglio

How to find seeds:

Search your favorite site for key words: cold tolerant

Always check recommended planting time – should include “Fall”

Check soil temperatures for planting

[www.sustainablemarketfarming.com](http://www.sustainablemarketfarming.com) – search cold hardy vegetables



# Putting it All Together

- Plant Slow Maturing Vegetables in mid-August
- Plant Moderate Maturing Vegetables in September
- Plant Quick Maturing Vegetables in October (early)

Seeds typically germinate at soil temperature of 40° or warmer



# Temperature is a Factor - Prescott

## Freeze Probabilities - Prescott

### Spring Freeze Probabilities (32.5 degrees F)

|          |      |     |     |      |      |      |      |      |     |        |
|----------|------|-----|-----|------|------|------|------|------|-----|--------|
| Earliest | 90%  | 80% | 70% | 60%  | 50%  | 40%  | 30%  | 20%  | 10% | Latest |
| 4/14     | 4/26 | 5/3 | 5/8 | 5/13 | 5/18 | 5/21 | 5/26 | 5/31 | 6/2 | 6/17   |

### Fall Freeze Probabilities (32.5 degrees F)

|          |      |      |      |      |       |       |       |       |       |        |
|----------|------|------|------|------|-------|-------|-------|-------|-------|--------|
| Earliest | 10%  | 20%  | 30%  | 40%  | 50%   | 60%   | 70%   | 80%   | 90%   | Latest |
| 8/23     | 9/20 | 9/25 | 10/1 | 10/5 | 10/11 | 10/14 | 10/16 | 10/21 | 10/27 | 11/5   |

Average Growing Season = 140 days



# Temperature is a Factor - Cottonwood

## Freeze Probabilities - Cottonwood

### Spring Freeze Probabilities (32.5 degrees F)

| Earliest | 90%  | 80%  | 70% | 60% | 50%  | 40%  | 30%  | 20%  | 10% | Latest |
|----------|------|------|-----|-----|------|------|------|------|-----|--------|
| 3/11     | 3/24 | 3/26 | 4/3 | 4/9 | 4/15 | 4/20 | 4/25 | 4/29 | 5/5 | 5/8    |

### Fall Freeze Probabilities (32.5 degrees F)

| Earliest | 10%   | 20%   | 30%   | 40%  | 50%  | 60%   | 70%   | 80%   | 90%   | Latest |
|----------|-------|-------|-------|------|------|-------|-------|-------|-------|--------|
| 10/18    | 10/24 | 10/25 | 10/29 | 11/4 | 11/7 | 11/10 | 11/12 | 11/14 | 11/18 | 11/25  |

Average Growing Season = 194 days



# Protection from the Elements

- Low Tunnels
- Row Covers and Floating Row Covers
- Cold Frames
- Cloches & Hot Caps
- Walls of Water
- Over-wintering Spring/Summer Veggies



# Low Tunnel

Always remove if the temps rise about 55 or it's raining. Vent if temps are above 40

- **Per each three to six feet of tunnel:**
  - 2 18" pieces of 1/2" rebar
  - 1 7-8 ft. length of 3/4" PVC
  - 2 3/4" PCV clamps
  - 1 piece of 3/4" PVC length of the bed
- **Cover :**
  - 83" wide Agribon floating row cover
  - the length of tunnel plus 8ft or
  - similar product



Tunnel integrated into a raised bed. Photo credit – Fran Scher



# Row Covers

- **Row cover** is any transparent or semi-transparent, flexible material, like fabric or plastic sheeting, used as a protective covering to shield plants, usually vegetables, primarily from the undesirable effects of cold and wind, and also from insect damage.
  - **Rated by**
    - **Light Transmission**
    - **Cold Protection**
- **Floating row cover** is extremely lightweight row cover fabric that can be placed directly over plants, without need for a supporting framework, instead being simply anchored to the ground against wind.



## Floating Row Covers

Photo Credit:

Wisconsin Horticulture

<https://hort.extension.wisc.edu/articles/floating-row-cover/>



# Cold Frames



<https://www.epicgardening.com/cold-frame-plans/>



# Cloches or Hot Caps

## Cloche

Photo Credit: Harvest to Table

<https://harvesttotable.com/cloches-hot-caps/>



## Hot Cap

Photo Credit Azure Standard

<https://www.azurestandard.com/shop/product/outdoor-garden/gardening-supplies/hot-caps/hot-caps-hotcaps/8570>



# Walls of Water

A wall of water is basically a heavy piece of plastic that is sectioned into cells that you fill with water. This creates the same effect as a greenhouse and gives off heat to protect from cool air and freezes.

Photo Credit: Gardener's Edge

[https://www.gardenersedge.com/gardeneer-season-starter-early-season-plant-protector-3-pack/p/WW3?gclid=Cj0KCQjwqKuKBhCxARIsACf4XuG7Et\\_9WufrEraQGjw910EshZu-pPOWqRDVXwgHKaX33esZo0WI-kaAt\\_NEALw\\_wcB](https://www.gardenersedge.com/gardeneer-season-starter-early-season-plant-protector-3-pack/p/WW3?gclid=Cj0KCQjwqKuKBhCxARIsACf4XuG7Et_9WufrEraQGjw910EshZu-pPOWqRDVXwgHKaX33esZo0WI-kaAt_NEALw_wcB)



# Over-wintering Peppers

Pepper plants being over-wintered next to a south-facing wall.

The wall acted as a heat sink to support warmer temperatures.



I've given my habanero a heavy pruning heading into its second winter. Photo by Clare Groom.  
<https://gardenerspath.com/plants/vegetables/overwinter-hot-peppers/>



# Over-wintering Strawberries

To protect strawberries from cold temperatures while they're dormant, they can be mulched over with a brown mulch. I used pine needles, but straw or leaves also work.



Instead of growing vegetables, you can give the garden a rest and improve the soil.



Photo Credit: Canva



# Methods for Improving Soil

- Remove the tops of old plants
  - Leaving in the root system
- Topping the soil with compost
  - Alfalfa pellets or cubes (Nitrogen)
- Keeping the soil damp
- Covering the soil
  - Brown Mulch
  - Green or Living Mulch



Photo Credit: The Spruce  
<https://www.thespruce.com/winter-mulching-in-cold-climate-gardens-1403588>



# Brown Mulch

Choose organic matter that breaks down and feeds the soil while providing a protective layer.



Shredded leaf mulch is efficient to apply and highly effective.

*Photo courtesy of Yaicha Cowell-Sarofeen*

<https://www.motherearthnews.com/organic-gardening/gardening-techniques/mulch-leaves-ze0z1601zbay>



Shredded cedar is one of the best mulches. (Howard Garrett/Special Contributor)

Photo Credit: <https://www.dallasnews.com/arts-entertainment/2017/10/05/the-top-three-mulch-materials-for-enriching-soil/>



# Green or Living Mulch

- Plant combination of hairy vetch (a legume) and cereal rye in the fall (October)
- Inoculate vetch seeds with appropriate inoculum (seed catalogs have it)
- Mow and turn into soil 3-4 weeks before planting



*Green Manure Mulch (Courtesy of Yoann Loyant)*



# Hairy Vetch



# Cereal Rye



# Cover Crop in April



Cereal rye and hairy vetch cover crop



Nodules  
formed by  
Rhizobium

# Working the Cover Crop



# Working the Cover Crop

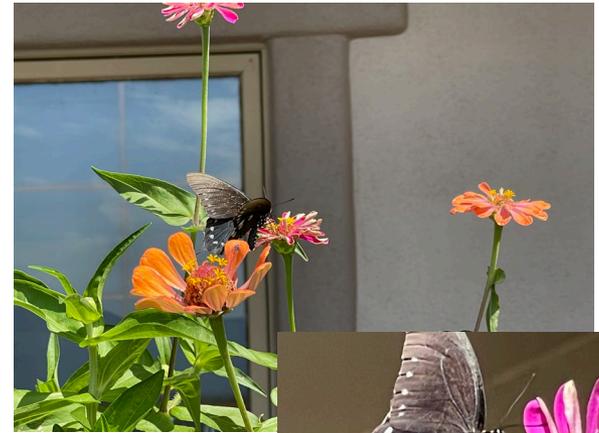


# Other Prep for the Next Season

- Saving seeds from Spring/Summer plants
  - Pollinator and Food Plants
- Clearing away dead plant matter
  - Prevents disease and discourages pests
- Pruning and Mulching Perennials
- Have plant covers on hand for extra cold weather
- Keep a garden journal



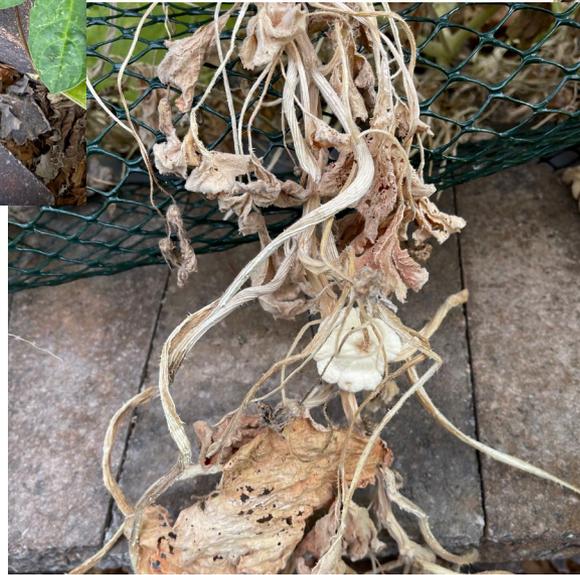
# Saving Seeds



Heirloom  
Tahitian Melon Squash



# Clearing Away Dead Plant Matter



# Pruning and Mulching Perennials



Iris are among a short list of perennials that are best cut back in fall, rather than spring.  
Michael Vosburg / Forum News Service

Photo Credit:  
<https://www.agweek.com/lifestyle/home-and-garden/4501611-should-perennials-be-cut-back-fall-it-depends>



# Plant/Tree Covers



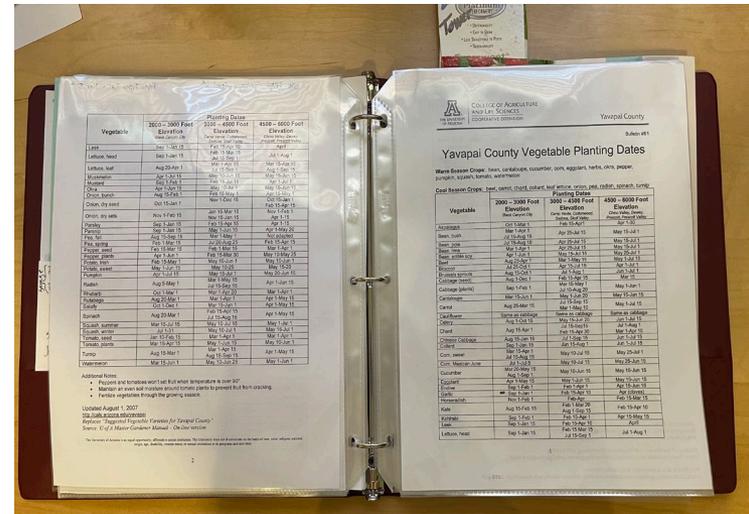
Photo Credit:  
Aliexpress  
<https://www.aliexpress.com>



Photo Credit:  
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<https://www.pinterest.com/pin/90916486197697138/visual-search/>



# Keep a Garden Journal



# Microgreens

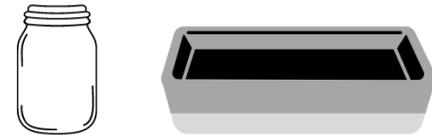


- Easy to grow inside
- Grows quickly
- Lot of flavor, lots of variety

# Supplies for Growing Microgreens

- Containers

- Trays
- Jars
- Empty plastic salad containers



- Grow Medium

- Coconut coir
- Peat moss
- Seed starting mix

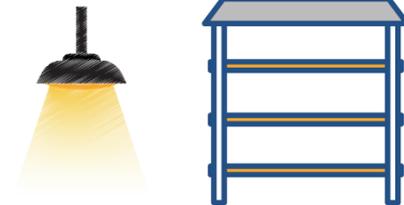


- Shelving and Lights

- Spray Bottle for Watering

- Seeds!

- Arugula, Mustard, Kale, Multi-Blend



# Grow Medium

- Images:
- Coconut Coir
- Peat Moss
- Seed-Starting Mix



Coconut Coir

Photo Credit: Uncle Jim's Worm Farm

<https://unclejimswormfarm.com/product/supplies/1-4-pound-coconut-coir-brick/>





# Seeds



Photo Credit: <https://www.amazon.com/Microgreens-Seed-Heirloom-Rainbow-Co/dp/B07QZP5ZN4>



# Germination to Harvest - Timetable

| Variety                   | Avg. Seed/Tray (g) | Approx. Flats/Oz. of seed | Avg. Yield/Tray (Oz.) | Avg. Days to Maturity |
|---------------------------|--------------------|---------------------------|-----------------------|-----------------------|
| Beet, Bull's Blood        | 23                 | 1                         | 7.5                   | 17                    |
| Chard, Bright Lights      | 31.5               | 1                         | 9.5                   | 16.5                  |
| Cilantro                  | 26                 | 1                         | 6                     | 20                    |
| Radish, Hong Vit          | 28.5               | 1                         | 11.5                  | 9.5                   |
| Radish, Red Arrow         | 24.5               | 1                         | 10                    | 8                     |
| Radish, Daikon OG         | 22.5               | 1                         | 8                     | 8                     |
| Tokyo Bekana              | 14                 | 2                         | 15                    | 10                    |
| Broccoli OG               | 13                 | 2.5                       | 11.5                  | 12.5                  |
| Shiso, Britton            | 11.5               | 2.5                       | 6.5                   | 16                    |
| Mild Micro Mix            | 11                 | 2.5                       | 11.5                  | 13.5                  |
| Cabbage, Red              | 10.5               | 3                         | 8.5                   | 13.5                  |
| Rosie                     | 10.5               | 3                         | 11                    | 13                    |
| Pac Choi, Red Pac         | 10.5               | 3                         | 10                    | 13                    |
| Cress, Cressida OG        | 10.5               | 3                         | 8                     | 13                    |
| Arugula                   | 10                 | 3                         | 10                    | 14                    |
| Kale, Red Russian         | 10                 | 3                         | 11                    | 13.5                  |
| Ruby Streaks              | 9.5                | 3                         | 9                     | 14.5                  |
| Mizuna OG                 | 9.5                | 3                         | 10                    | 12                    |
| Kohlrabi, Purple          | 9.5                | 3                         | 11                    | 16                    |
| Mustard, Garnet Giant     | 8                  | 3.5                       | 9.5                   | 12.5                  |
| Spicy Micro Mix           | 7.5                | 3.5                       | 10                    | 13.5                  |
| Tatsoi OG                 | 7.5                | 3.5                       | 8.5                   | 13.5                  |
| Amaranth, Garnet Red OG   | 7.5                | 3.5                       | 6.5                   | 17                    |
| Basil, Italian Large Leaf | 6.5                | 5                         | 7.5                   | 19                    |
| Basil, Red Rubin OG       | 6                  | 5                         | 5.5                   | 25.5                  |
| Basil, Dark Opal          | 5                  | 5                         | 6                     | 25.5                  |
| Marigold, Gem             | 4                  | 7                         | 6                     | 18                    |
| Dandelion, Red            | 4                  | 7                         | 5.5                   | 18                    |
| Sorrel, Red Veined        | 3.5                | 8                         | 6.5                   | 24                    |



Table Credit: Johnny's Seeds <https://www.johnnyseeds.com/on/demandware.static/-/Library-Sites-JSSSharedLibrary/default/dw320cb0ff/assets/information/micro-greens-yield-trial-results-tech-sheet.pdf>



# Growing Microgreens

## Steps 1 & 2

Soak your seeds



Fill the growing container with  $\frac{3}{4}$ " of grow medium and dampen with a spray bottle.



Photo Credit: True Leaf Market <https://www.trueleafmarket.com/pages/microgreens-growing-instructions-soil>



# Growing Microgreens

## Steps 3 & 4

Sprinkle the growing medium with the soaked seed. Dampen soil again.



Cover with an inverted tray or plastic and a cloth to darken until they germinate.



Photo Credit: True Leaf Market <https://www.trueleafmarket.com/pages/microgreens-growing-instructions-soil>



# Growing Microgreens

Once they germinate and cotyledons appear (3-5 days), uncover and expose to light for at least 12 hrs daily. Keep moist.

Harvest when ready, 7-10 days on average depending on the variety.



Photo Credit: True Leaf Market <https://www.trueleafmarket.com/pages/microgreens-growing-instructions-soil>



# Harvesting Microgreens

Many growers use a sharp knife to harvest microgreens, taking care not to pick up the grow medium.

Scissors can also be used quite effectively.

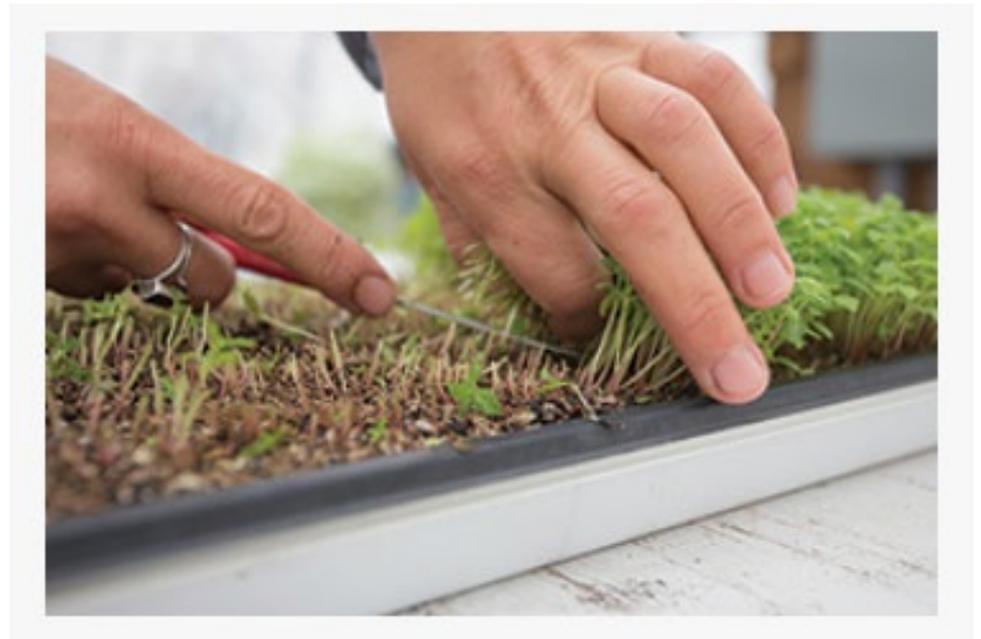


Photo Credit: Johnny's Seeds

<https://www.johnnyseeds.com/growers-library/vegetables/microgreens/micro-greens-yield-data-trial-summary-discussion.html>



# A Look Toward Spring

- Use your “winter growing knowledge” to get ready for your spring-summer garden
- Remember to plant long lead time veggies early
- Green manures add extra layer of protection
- Use season extenders for spring plants
- Get your starts growing inside and harden off
- Plant earlier than Mother’s Day – or according to your area's temperature chart.



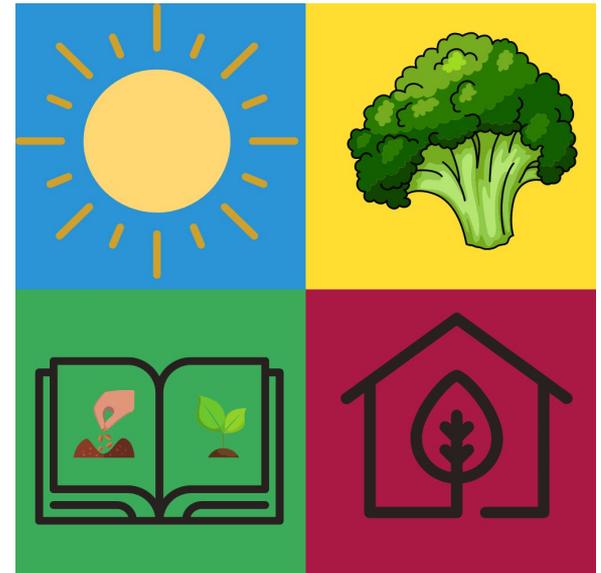
# Starting Plants for Spring

- Starting plants indoors
  - Using your microgreen area to get a head start on Spring
    - Cups
    - Trays
    - Seeds
      - Saved Seeds
      - Seed Catalogs – a healthy addiction!
  - When and what to start (insert link to [Yavapai County planting dates](#))



# Winter Gardening To Do List

- Find the best location
  - Select the seasonal vegetables
  - Source your seeds
  - Plan for protection
- 
- Use your winter gardening time to plan for spring!



# Questions?



For more information about our programs,  
visit our website at  
[extension.arizona.edu/yavapai](https://extension.arizona.edu/yavapai)

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Cooperative Extension

Yavapai County