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!

- Root
- Fruit
- Green
- Bean
Plant Choice Considerations

- Time to germinate
- Height of plant
- Time to maturity
- 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:

<table>
<thead>
<tr>
<th>Leafy Greens</th>
<th>Root Vegetables</th>
<th>Onion Family</th>
<th>Brassica Family</th>
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<tbody>
<tr>
<td>Kale</td>
<td>Carrots</td>
<td>Leeks</td>
<td>Brussel Sprouts</td>
</tr>
<tr>
<td>Lettuce</td>
<td>Turnips</td>
<td>Garlic</td>
<td>Cabbage</td>
</tr>
<tr>
<td>Mustard</td>
<td>Radishes</td>
<td>Onions</td>
<td>Broccoli</td>
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<tr>
<td>Swiss Chard</td>
<td>Beets</td>
<td></td>
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<tr>
<td>Spinach</td>
<td>Parsnips</td>
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<tr>
<td>Collards</td>
<td>Rutabagas</td>
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<tr>
<td>Mache</td>
<td>Potatoes</td>
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<td>Claytonia</td>
<td>Peas</td>
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<tr>
<td></td>
<td>2. Sugar Snap Peas</td>
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</table>
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, Tyee
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 – 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

<table>
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<th>Spring Freeze Probabilities (32.5 degrees F)</th>
<th>90%</th>
<th>80%</th>
<th>70%</th>
<th>60%</th>
<th>50%</th>
<th>40%</th>
<th>30%</th>
<th>20%</th>
<th>10%</th>
<th>Latest</th>
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<td>Fall Freeze Probabilities (32.5 degrees F)</td>
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<td>30%</td>
<td>40%</td>
<td>50%</td>
<td>60%</td>
<td>70%</td>
<td>80%</td>
<td>90%</td>
<td>Latest</td>
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Average Growing Season = 140 days
Temperature is a Factor - Cottonwood

Freeze Probabilities - Cottonwood

<table>
<thead>
<tr>
<th>Spring Freeze Probabilities (32.5 degrees F)</th>
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<tr>
<td>Earliest</td>
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<table>
<thead>
<tr>
<th>Fall Freeze Probabilities (32.5 degrees F)</th>
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<tbody>
<tr>
<td>Earliest</td>
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</table>

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 ¾” PVC length of the bed

- **Cover:**
  - 83” wide Agribon floating row cover
  - the length of tunnel plus 8ft or similar product
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
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_9WufrEraQGjw910EsnhZu-pPD0wqRDVXtwgHKaX33esZo0WI-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.

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.
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
Brown Mulch

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

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

Shredded leaf mulch is efficient to apply and highly effective. (Photo courtesy of Yaisha Cowell-Sarofeen)

https://www.motherearthnews.com/organic-gardening/gardening-techniques/mulch-leaves-ze0z1601zbay
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
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:
Pinterest
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
Shelving and Lights
Seeds

Photo Credit: https://www.amazon.com/Microgreens-Seed-Heirloom-Rainbow-Co/dp/B07QZP5ZN4
<table>
<thead>
<tr>
<th>Variety</th>
<th>Avg. Seed/Tray (g)</th>
<th>Approx. flats/Oz. of seed</th>
<th>Avg. Yield/Tray (Oz.)</th>
<th>Avg. Days to Maturity</th>
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<tr>
<td>Beet, Bull’s Blood</td>
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<td>7.5</td>
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<td>Chard, Bright Lights</td>
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<td>Radish, Hong Vit</td>
<td>28.5</td>
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<tr>
<td>Radish, Red Arrow</td>
<td>24.5</td>
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<td>10</td>
<td>8</td>
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<tr>
<td>Radish, Daikon OG</td>
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<td>Tokyo Bekana</td>
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<td>Mild Micro Mix</td>
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<td>3</td>
<td>11</td>
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<td>Pac Choi, Red Pac</td>
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<td>13</td>
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<td>Sorrel, Red Veined</td>
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<td>6.5</td>
<td>24</td>
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</tbody>
</table>
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](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](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
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

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