


Vegetable Gardening

Advanced Gardening Techniques

This educational program is brought to you by an Extension Master Gardener Volunteer.





MASTER GARDENER VOLUNTEER PROGRAM

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Assumptions

By participating in this class, we assume you have knowledge of:

- Common garden tools
- Choosing vegetables
- Regular garden maintenance
- Pest management
- Local garden resources



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Class Topics

1. Improving Growing Conditions
2. Extending the Growing Season
3. Growing More in the Garden



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Primary Goals

- Improve soil structure
- Increase soil nutrition
- Limit water loss & erosion
- Reduce weeds & pests

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Improve Soil

- Easy to improve
 - Structure (compacted vs fluffy)
 - Nutrients (fertile vs nutrient-poor)
 - Incorporate organic matter
- Difficult to improve
 - Texture (sand vs clay)
 - pH (acidic vs alkaline)
 - Easier to replace the soil

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Add Amendments

- Benefits
 - Makes it easier for roots
 - Improves water retention, permeability & drainage
 - Increases aeration
 - Can alter pH temporarily
 - Adds nutrients
- Know your soil
 - Use Extension soil test
 - Work amendments into the soil 4-6 inches deep



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Prepare Garden Bed

- Tilling vs Cultivation
 - Tilling: 6-10 inches deep
 - Cultivation: 2 inches deep
- Benefits
 - Maintains channels for water & air
 - Reduces erosion
 - Limits weed seed exposure
 - Encourages microbial relationships
- Recommendations
 - Avoid working wet soil
 - Avoid walking on garden beds
 - Limit tilling to once yearly



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Use Compost

- Benefits
 - Improves soil structure
 - Adds nutrients
 - Holds moisture (sandy soil)
 - Improves drainage (clay soil)
- Compost at home
 - Use structure 3-5 feet wide
 - Choose a part-sun location
 - Water when very dry
 - Mix occasionally
 - Avoid animal matter, infected plants or weeds with seeds



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Grow Cover Crops (Green Manures)

- Benefits
 - Improves soil structure
 - Adds nutrients
 - Slows weeds
 - Reduces erosion
 - Works well with interplanting & succession planting
- Common cover crops
 - Legumes (*vetch, clover, beans & peas*)
 - Grasses (*annual ryegrass, oats, rapeseed, winter wheat & winter rye*)
 - Buckwheat



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Cover with Mulch

- Benefits
 - Holds moisture
 - Slows weeds & soil-borne diseases
 - Reduces erosion
- Recommendations
 - Apply after seeds sprout & transplants are planted
 - Use dried leaves, straw, shredded newspaper, cardboard or compost
 - Avoid hard mulch like wood chips or stone

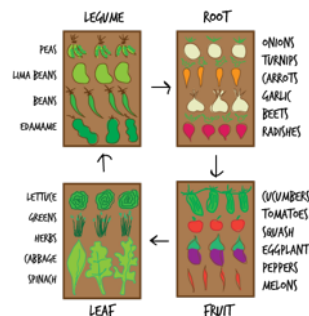


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Rotate Crops

- Benefits
 - Reduces insect damage
 - Limits soil-borne diseases
 - Manages soil fertility
- Recommended Order
 - Heavy feeders (fruiting)
 - Moderate/Light feeders (roots & leaves)
 - Nitrogen binders (legumes)



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Primary Goals

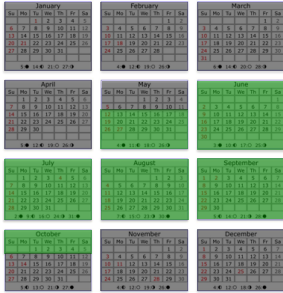

- Avoid plant damage due to weather
- Start gardening outside sooner
- Continue gardening outside longer




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Growing in Minnesota

- Ramsey County, MN
 - Zone 4b (-30°F)
 - 150 day growing season
 - Last Frost: mid-May
 - First Frost: early-Oct
- Plan ahead
 - Start from seed or purchase transplants
 - Check harvest times

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Temperature Risks

- 95° F and above
 - Plant growth slows
- 55° F and below
 - Plant growth slows
 - Few pollinators
- 36°-32° F
 - Frost Warning
 - Damages Warm-season vegetables
- 32°-28° F
 - Freeze Warning
 - Damages Tender vegetables
- 28° F and below
 - Hard Freeze Warning
 - Damages Cool-season vegetables



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Plasticulture

- Benefits
 - Increases soil temperature **5°-10° F**
 - Improves early germination
 - Holds moisture & slows weeds
- Recommendations
 - Requires irrigation underneath
 - Soil may overheat in summer
 - Look for Infrared-Transmitting (IRT), black or clear colors



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Cloche & Hot Caps

- Benefits
 - Increases air temperature **2°-5° F**
 - Protects individual plants
 - Helps when hardening-off transplants
- Recommendations
 - Clear sides allow sunlight
 - Open top allows prevents overheating during the day
 - Open bottom prevents excessive water



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Cold Frames & Hotbeds

- Benefits
 - Increases air temperature **5°-10° F**
 - Protects large area
 - Use to start cool-season plants & hardening-off transplants
- Recommendations
 - Sloped top (facing sun)
 - Clear sides & top allow sunlight
 - Can use heating cables in soil
 - May overheat on warm days; must have ventilation option



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Low Tunnels & Hoop Houses

- Benefits
 - Increases air temperature **5°-10° F**
 - Covers large area
 - Protects plants against cold spring & fall temperatures & harden-off transplants
 - Blocks insects
- Recommendations
 - Bend PVC pipes or fencing
 - Use clear plastic for colder weather
 - Use row-cover/mesh fabric to block insects in warmer weather



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Primary Goals

- Increasing total harvest
- Reducing pest problems
- Minimizing exposed soil

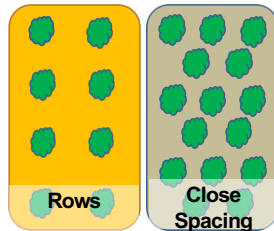


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Close Spacing

- Benefits
 - Increases overall harvest
(Note: individual plant yield may be lower)
 - Reduces exposed soil
 - Holds moisture
 - Slows weeds
- Considerations
 - Light, nutrient & moisture requirements
 - Mature growing habit
 - Disease risks

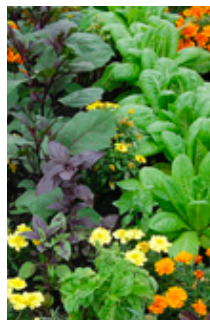


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Interplanting (Companion Planting)

- Benefits
 - Grow **many vegetables** in the **same space** at the **same time**
 - Helps alleviate pest problems
 - Increases overall harvest
 - Balances demands from the soil
- Considerations
 - Light, nutrient & moisture requirements
 - Growing habit of each plant
 - Interactions with other plants



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Succession planting

- Benefits
 - Grow **many vegetables** in the **same space** at **different times**
 - Minimizes exposed soil during growing season
 - Increases overall harvest
- Considerations
 - Growing behavior of each plant
 - Light, nutrient & moisture requirements
 - Possible interactions with other plants



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Relay Planting

- Benefits
 - Grow **same vegetable** in the **same space** at **different times**
 - Minimizes exposed soil during growing season
 - Increases overall harvest
- Considerations
 - Harvest times for each plant
 - Schedule multiple planting dates
 - Leave space for future plants

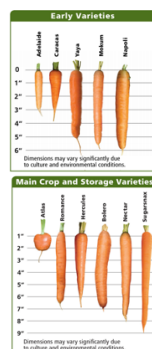


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Multiple Varieties

- Benefits
 - Grow **same vegetable** in the **same space** at **different times**
 - Multiple varieties tolerate different growing conditions
 - Creates continual harvest
- Considerations
 - Often Cool-season plants
 - Choose early-, mid-, and late-season varieties
 - Schedule multiple planting dates
 - Leave space for future plants




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Fall Crop

- Benefits
 - Grow **many vegetables** in the **same space** at **different times**
 - Minimizes exposed soil
 - Increases overall harvest
- Considerations
 - Use Cool-season plants
 - Schedule planting date backwards from frost date (*early-Oct*)
 - Choose fast-ripening plants
 - May need to start seeds indoors; outdoor soil may be too warm for



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Vertical Gardening

- Benefits
 - Open soil space for other plants
 - Increases airflow
 - Reduces risk of disease
 - Make harvest easier
- Considerations
 - Works best with vining plants
 - Requires support structures & vine training
 - May shade nearby plants
 - Plants may dry out faster



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Indoor Gardening

- Benefits
 - Grow vegetables indoors during cold season
 - Increases overall harvest
- Considerations
 - Not appropriate for all plants
 - Requires additional materials
 - Look for information on Microgreens, Sprouts & Hydroponics



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