Vegetable Garden Planning

Charles County Maryland Master Gardeners

UNIVERSITY OF MARYLAND EXTENSION

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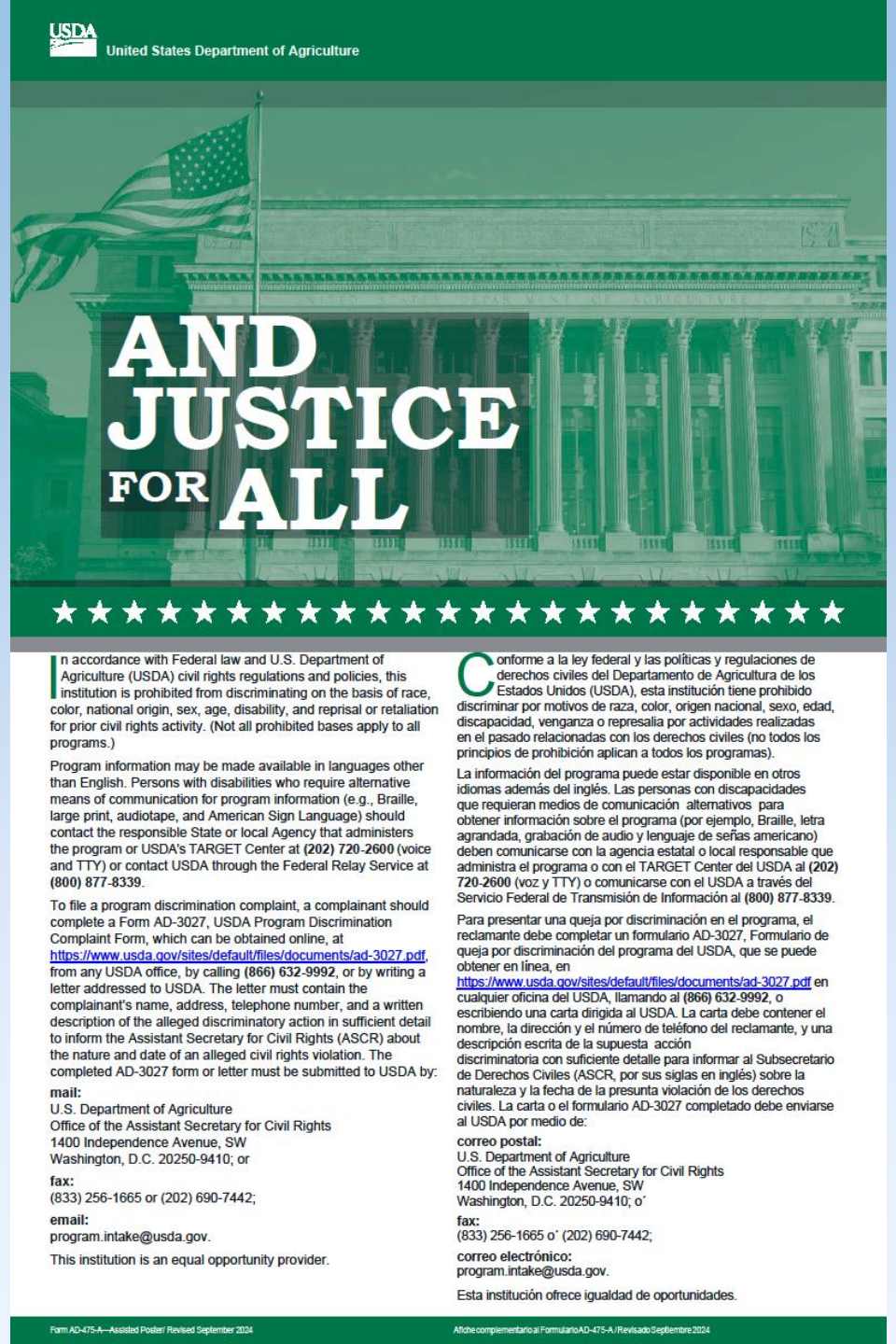
A MASTER GARDENER PROGRAM



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MASTER GARDENER

Charles County Master Gardeners
GROW IT EAT IT (GIEI) Education Project Team

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Welcome

- The mission of the University of Maryland is to connect Maryland residents to trusted, science-based resources to grow healthy gardens, landscapes, and communities.
- Master Gardeners teach classes and workshops, develop demonstration gardens, and educate the public about safe, effective and sustainable horticultural practices.

Garden Plot ‘Parking Lot’

Growing a Food Garden - The Four P's

1. **Plan** the site
   - Location
   - Type of garden
   - Size

2. **Prepare** the soil
   - Prepare the area
   - Test
   - Improve

3. **Plant**
   - What
   - When
   - Seeds or transplants

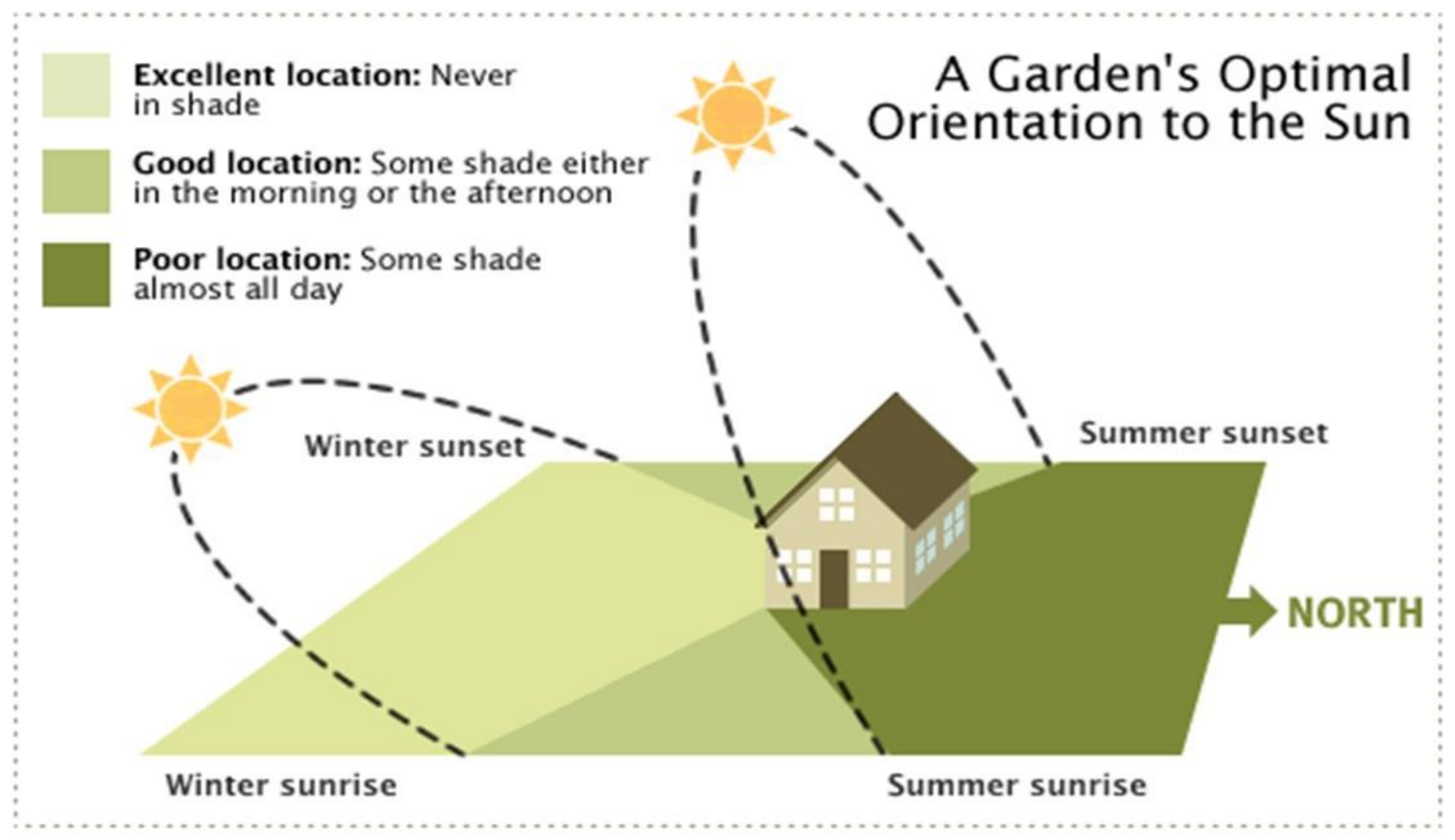
4. **Produce** and maintain
   - Food and water
   - Weeds
   - Pests

The 1st P – Plan the Site
(Location, location…)

LJEmerick

- Level ground
- 6-8 hours direct sun
- Close to water source
- Convenient to dwelling
- Southern exposure
- Protection from critters

Choose a Sunny Spot



Source: http://blog.smartgardener.com/in-the-garden/where-to-put-the-vegetable-garden

Types of Gardens

- In-Ground: Traditional
- In-Ground: Raised Beds
- Table-height beds
- Edible Landscapes
- Containers

Raised Beds

Edible Landscapes

Photo: Mother Earth News

Table Height Salad Table

Photo MS State University Extension

Containers

The In-Ground Garden

LJEmerick

Traditional Approach

Raised Beds

- 2-4 feet wide
- 6-12 inches high
- Space for access
- Above grade support
  - Mounded soil
  - Wood (use untreated and known sources)
  - Stone
  - Brick
  - Recycled building material

Raised Beds - Advantages

LJEmerick

- Sun warms soil quickly in spring.
- They drain well with less soil compaction, erosion.
- They increase rooting area for shallow-rooted plants and initial root growth for deep-rooted ones
- They can provide greater yields per square foot.
- They are tidy, easier to maintain.

Raised Beds - Disadvantages

- Initial cost may be high.
- Soil may dry out in hot or dry weather.
- It may be difficult to relocate beds once filled with soil.
- Wood can decompose over the years

The Edible Landscape

Kitchen Gardeners International

Mother Earth News

Photo: Rosalind Creasy

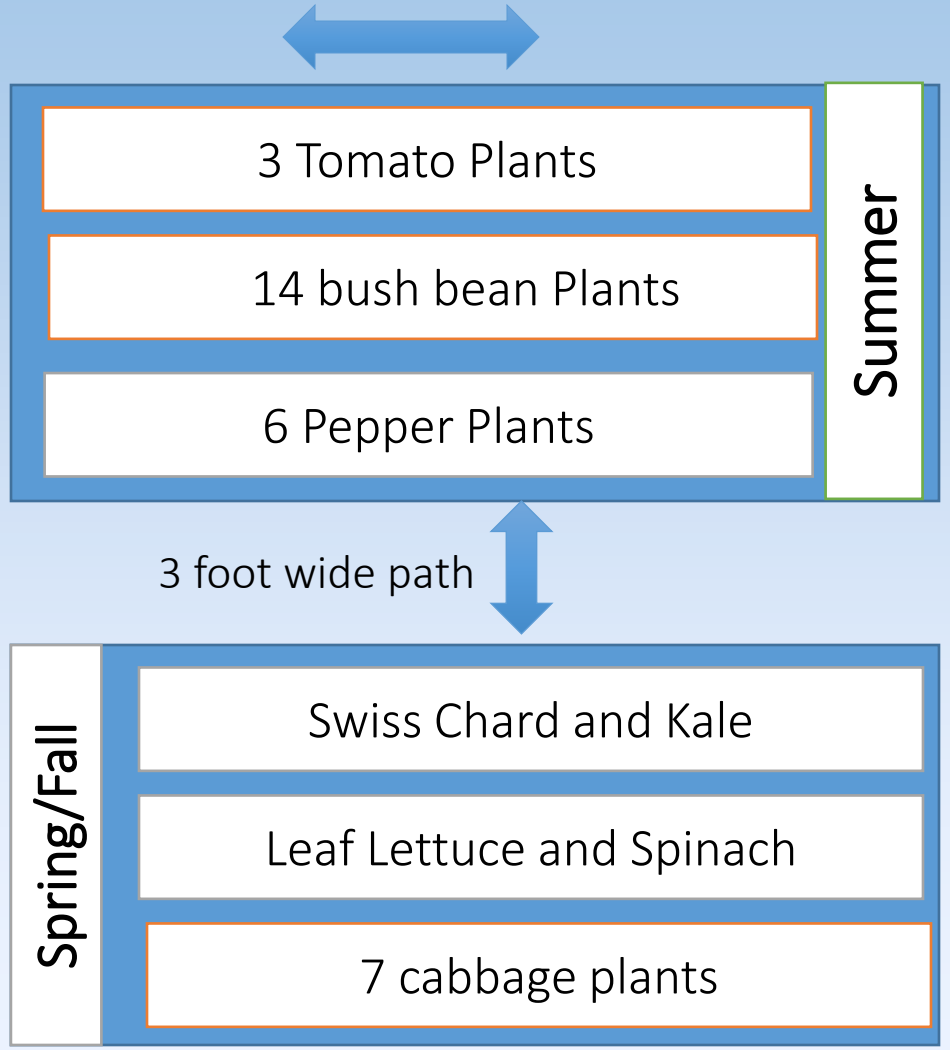
Vegetables can be planted in the ornamental landscape.

Garden Size

- Start small – only what you can eat
  - A good starter size is 50 – 75 sq ft
- Consider available space, time, effort.
- Pre-plan to save time and expense.

Sample 8 x 8 Foot Garden

8 feet x 4 feet raised beds



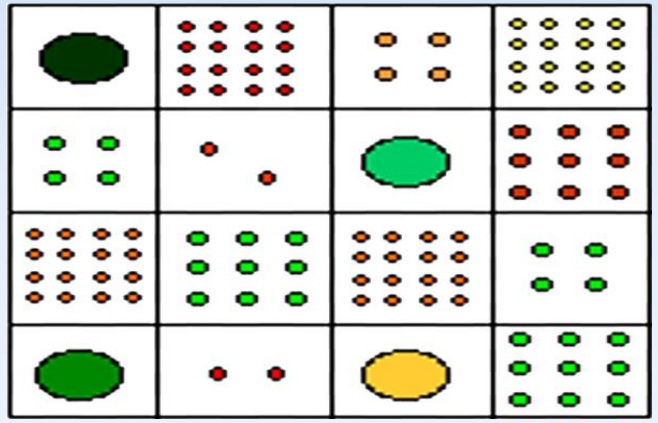
Early Spring garden can be replaced with summer crops (e.g., squash, pumpkins) once the weather is warm.

Be sure to add nutrients when succession planting.

Square Foot Gardening

- Square Foot Gardeners plant intensively in blocks rather than rows. Usually in 4′ X 4′ or 4′ X 8′ raised beds.
- Seeds are spaced within a square foot area depending on their mature size.
- Once one crop is harvested, another is planted.
- Good choice for small crops for those with limited space (lettuce, radish, beets, carrots, etc.)
- Not optimal for larger crops (tomatoes, squash, broccoli, etc.)

By Thomask0 - Own work, CC BY-SA 4.0,



By Trizek - Own work, CC BY-SA 3.0,

Growing Vegetables in Containers

What types of vegetables can I grow in containers?

- Almost any vegetable can be grown in a container, but it is important to pick the correct size!
- Lettuce, spinach, herbs need at least a 4" deep container.
- Tomatoes, peppers, eggplant, cucumbers need at least an 18" deep container.

What container should I use?

- 5-gallon plastic buckets.
- Plastic or terra cotta pots.
- Plastic storage containers.
- Grow bags.
- Self-watering containers.

Growing Vegetables in Containers

What sort of soil should I use?

- Don't use garden soil. It is too heavy and will compact in the container starving roots of oxygen.
- Do use commercial potting mix. It is light weight, high in organic matter and drains well.
- Add a slow-release fertilizer if none is included in the potting mix.

Growing Vegetables in Containers

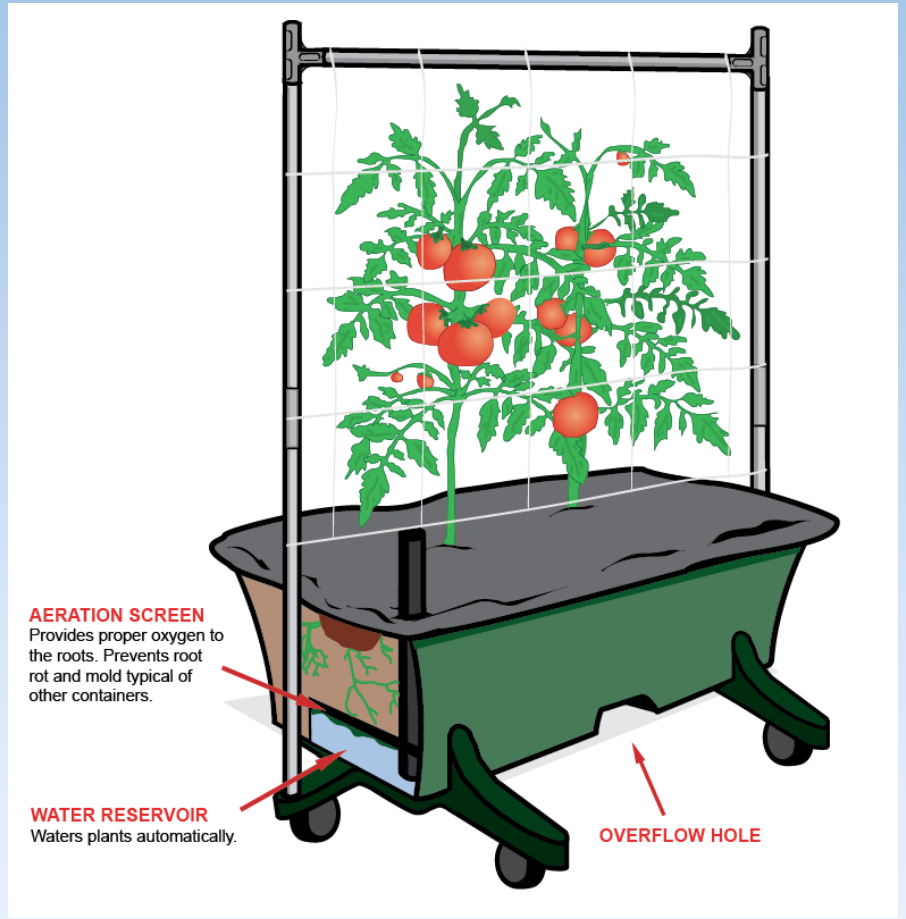
How do I care for my plants?

- Place your plants in full sun (minimum of 6 hours per day). Note: lettuce can take part shade.
- Carefully place containers - they will be heavy when full and hard to move. Some may stain deck/patio without a drip tray.
- Apply a second application of fertilizer for big, long growing plants.
- You may need to water daily as plants mature.
- Consider using a self-watering container to reduce the need to water daily.

Growing Vegetables in Containers

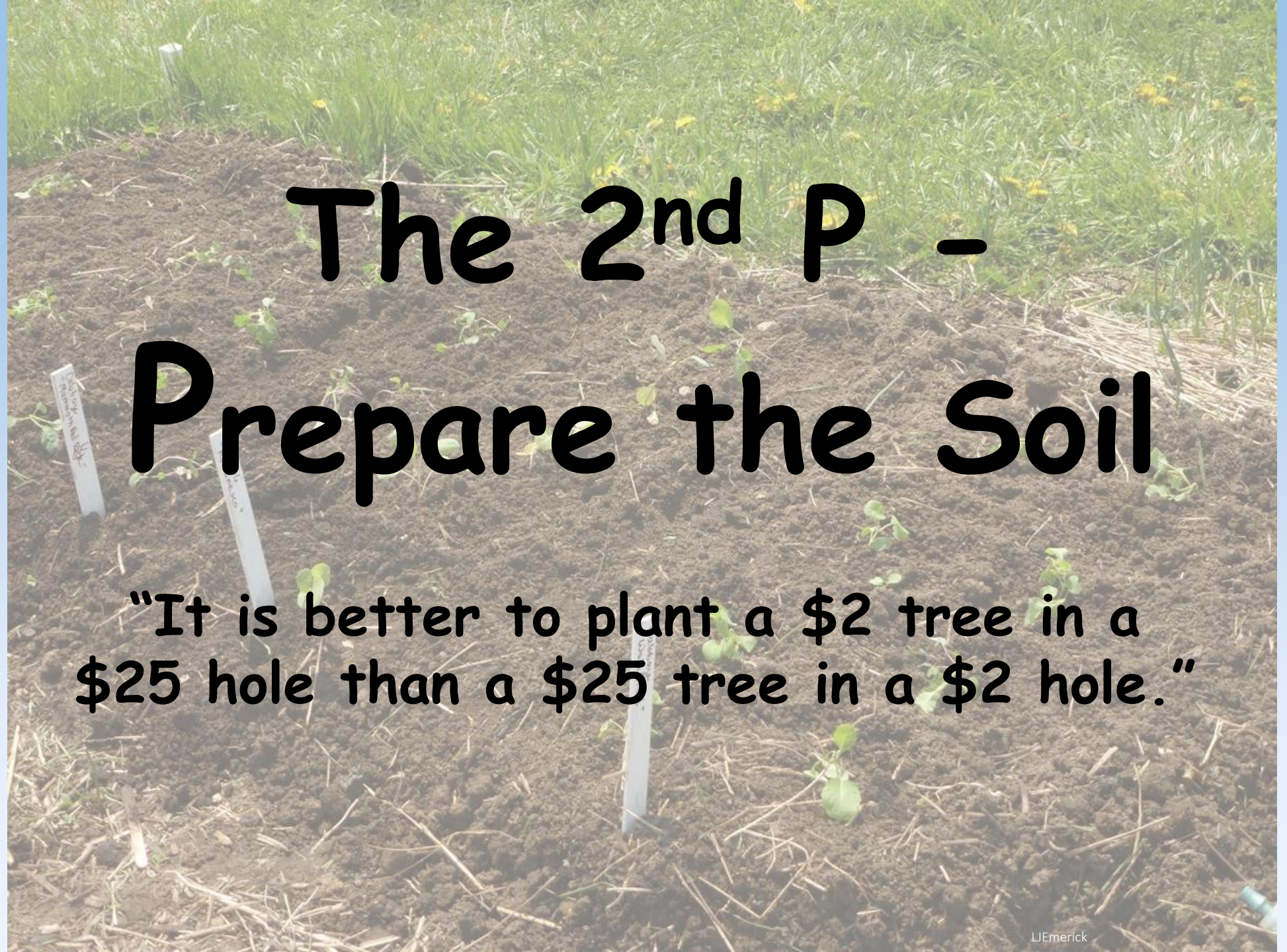
Self watering containers (SWC's)

- SWC is a plant pot or box that has a reservoir for water in the bottom.
- Water is wicked up into the potting mix either by a cloth wick or the potting mix itself.
- Reduces the need for daily watering.
- Bottom watering also helps to retain fertilizer and avoids overwatering.



Earthbox.com

https://youtu.be/OIKXcxzK93M



The 2nd P - Prepare the Soil

"It is better to plant a $2 tree in a $25 hole than a $25 tree in a $2 hole."

IMPORTANT PREP -- Test the Soil

What is a Soil Test?

Chemical analysis estimating a soil's ability to supply nutrients.

- Provides baseline data on and interpretations of soil pH, nutrient levels, and organic matter content
- Includes levels of soil's primary macronutrients, phosphorus (P) and potassium, (K) and trace elements such as calcium (Ca) and magnesium (Mg)
- Provides recommendations for adjusting soil pH and fertilizing including Nitrogen

NOTE: UMD recommends testing soil for Lead (Pb) contamination. Desired levels are less than 400ppm in bare soils. See Resources for more information.

Test the Soil cont'd

When should the soil be tested?

- If in-ground, at least every 3 years or new area.
- Purchased/bagged soils shouldn't need testing, if from reliable sources
- Bulk topsoil should be tested. Topsoil is unregulated in MD

Who should test the soil? (Which lab?)

- They vary! See list in resources from UMD Extension
- DIY test kits are not recommended- test interpretation can be complicated

➢ Prepare the Area

- **Fall is the optimum time to prepare the area to start** a vegetable garden: **prepare** the soil, **mulch** heavily, and let it **settle** over winter.

- Spring prep is possible. Be sure soil is not too wet. Dig up a **handful of soil** from below surface and squeeze it in your fist. Then **poke it with your finger**. **If it falls apart, it's dry enough to dig.** If it makes a wet muddy ball that sticks together, wait a few more days and try again. Working with very wet soil can damage its structure and result in heavy clods that are hard to break apart.

- Tilling, especially repeated tilling, while quicker and easier, is not a recommended method. It brings up weed seeds so they can germinate.

- Vegetable beds are optimally approximately 12-18 inches deep (with soil suitable for planting).

Prepare the soil – no till or minimum till methods recommended

- Wet thoroughly.
- Add a thick layer of organic matter.
- Avoid planting directly into wood or bark mulches, which take time to break down.

- Cut growing matter short.
- Remove large plants or deep rooted weeds.
- Lay out overlapping sheets of cardboard (best in Fall) or

  4-6 sheets of newspaper.

Questions?

BREAK

10 MIN.

The 3rd P – Plant Your Garden

(Or "What do you like to eat?")

Popular Crops for Beginners

Photo LJEmerick

- Herbs
- Lettuces
- Leafy greens
- Bush beans
- Peppers
- Tomatoes
- Cucumber
- Summer squash

2025 -Year of the HERBS

This year in the Master Gardener Grow It Eat It program, we are celebrating all things herbs!

Herbs are obtained from the leaves of herbaceous (non-woody) plants. They are used for savory purposes in cooking and some have medicinal value.

Spices are obtained from roots, flowers, fruits, seeds, or bark of woody or herbaceous plants. Spices often are more potent and stronger flavored than herbs

Some plants are both herbs and spices. The leaves of Coriandrum sativum are the source of cilantro (herb) while coriander (spice) is from the plant's seeds. Dill is another example. The seeds are a spice while dill weed is an herb derived from the plant's stems and leaves.

When to Plant

- Seed packet information
- Planting calendar
- Air/Soil Temperature
- Frost tolerance
- Soil moisture

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Vegetable Planting Calendar for Central Maryland

KEY

- Plant seeds in ground (direct sow)
- Plant seeds indoors to grow seedlings (transplants)
- Transplant seedlings outside
- Harvest

NOTES

This calendar is based on a last and first frost date around May 1 and October 31, respectively. Dates may be adjusted by finding the average frost dates in your area at https://garden.org/apps/frost-dates/. The range of dates given are the time periods during which you can plant each vegetable and expect success. For a sustained harvest, plant a little bit of that vegetable every two weeks (succession planting).

Directly sowing seeds in the ground is possible for many vegetables. This is the default method shown for each vegetable that produces well from direct sown plants. Plants marked with a * may also be planted as seedlings for an earlier harvest.

Plants that have a long period from seed to harvest compared to their preferred growing season must be started indoors and transplanted outside as seedlings. Growing seedlings indoors requires grow lights.

If you do not wish to grow your own seedlings, buy transplants to plant during the dates shown in purple.

Harvest dates are approximate based on planting on the earliest planting date and extending to latest possible date. Achieving a sustained harvest through this period may depend on planting several successions.

		February				March				April				May				June				July				August				September				October				November				December			
Week		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Crop																																												
Asparagus	plant																																											
	harvest																																											
Beans, Lima	plant																																											
	harvest																																											
Beans, Snap	plant																																											
	harvest																																											
Beets	plant																																											
	harvest																																											
Broccoli	plant																																											
	harvest																																											
Brussels sprouts	plant																																											
	harvest																																											
Cabbage	plant																																											
	harvest																																											
Cabbage, Chinese*	plant																																											
	harvest																																											
Cantaloupe/ Muskmelon*	plant																																											
	harvest																																											
Carrots	plant																																											
	harvest																																											

Use the UMD HGIC Planting Calendar to know when to start, plant, and harvest your vegetable crops

Cool Season, Warm Season

- **Cool season crops** (spinach, lettuce, broccoli) as soon as ground can be worked. These can be Fall crops too.
- Beets, carrots, chard, kale a little later - can handle light frost.
- **Warm season crops** (beans, tomato, melon, eggplant, pepper) need warm days and nights to thrive.
- Summer squash, beans, cucumber can be planted twice (succession planting).

Seed or Transplant…?

Seeds (Direct)

- Check the seed packet for directions.
- Look for time to germinate or harvest.
- Commonly direct seeded:
  - Leafy greens: lettuce, spinach, chard, Asian greens
  - Legumes: peas, beans
  - Root vegetables: beets, radish, turnips, carrots
  - Optional: Cucumbers, summer squash, okra

Transplants

- More costly but sometimes more convenient.
- Preferable for plants with a longer time to harvest.
- Commonly transplanted:
  - Fruiting vegetables: tomatoes, eggplant, peppers,
  - Brassicas: cabbage, broccoli, cauliflower, Brussel sprouts, collards

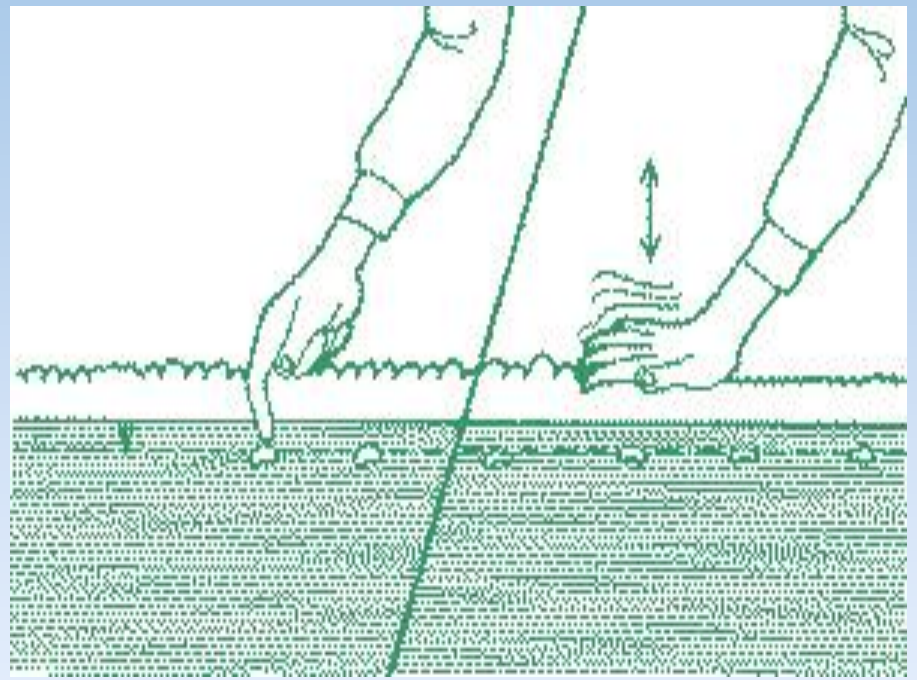
Spacing Seeds, Seedlings

- Check seed packet for spacing recommendations.
- Crowded plants compete for water, sun, and nutrients and won't grow to full potential.
- Small seeds are hard to plant at correct distance. Thin seedlings as they grow.
- Greens, lettuce seedlings are delicious in salads.

Correct spacing for large onions

Overcrowded okra

Planting Seeds



Cornell University

- Rake the soil smooth.
- Plant seeds at recommended depth, spacing (check seed packet or catalog).
- Lightly tamp down the soil for good seed-to-soil contact.
- Water in well, using gentle sprinkling nozzle or watering can. Too much force could wash the seeds away

Hardening Off your Transplants

- Hardening off is the process of exposing seedlings gradually to outdoor conditions
- Begin hardening transplants 1-2 weeks prior to setting out plants in your garden.
- An easy way to harden seedlings is to place them outside in a protected spot on warm days, bringing them in at night

Do not put tender seedlings outdoors on windy days or when temperatures are below 45° F

Planting Transplants

- Plant at recommended depth, spacing.
- Plant at same soil level as in pack or pot. (*Exception: Tomatoes should be planted deeper or horizontally!*)
- Water immediately, keep soil moist until new growth appears.
- Fertilize <u>after</u> new growth appears.

Plant Supports

- Tomatoes, peppers, eggplants need staking or cages for support.
- Use wire mesh for cucumbers, squashes.
- As plants grow, tie to supports, tuck in, or help them twine.

- Provide a string tower or bamboo "teepee" for snap peas and pole beans.

Place the supports before or soon after planting!

Companion Planting – Some Fact, Some folklore

- Companion planting is the practice of growing several types of crops near one another to enhance crop production

Companion Planting Can

<u>Enhance physical environment</u> -

- Provide support for vining crops
- Block wind, sun, weeds
- Enrich soil - natural mulch, nitrogen fixing

<u>Pest Control</u> –

- Attract Beneficials: Pollinators, Predators, and Parasitoids
- Trap Crops – draw pests away from main crop

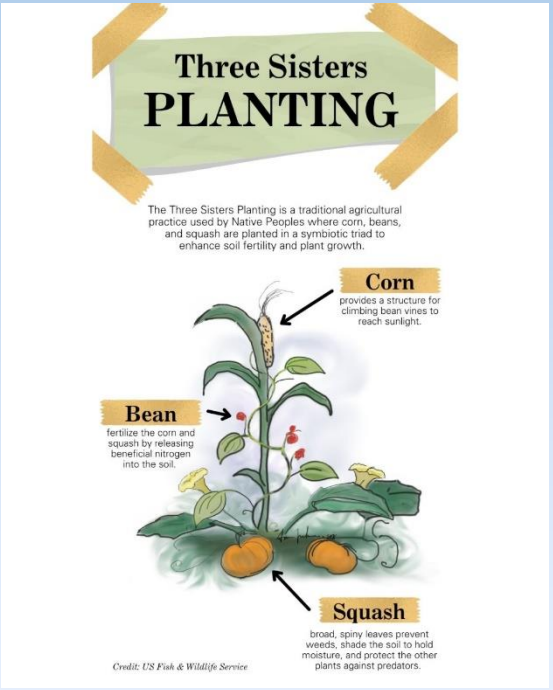


Photo USFWS

Remember to consider the timing and spacing of companion plants

Polyculture – planting diversity in the garden – is beneficial in multiple ways

Companion Planting – continued

Remember to consider the timing and spacing of companion plants

- Make sure the growth stage (e.g., blooming, fruiting) of the companion plant is timed to benefit your desired crop
- Make sure the companion plant is close enough – or far away enough – to achieve your goal

THINK OUTSIDE THE VEGETABLE BIN:

Flowers and herbs interplanted with vegetables attract beneficial insects
Can
Trees, shrubs, and native grasses can all be great companion plants

The 4th P – Produce and Maintain

Fertilizing Your Garden during the Growing Season

- Read and follow fertilizer labels.
- When appropriate, use slow-release fertilizers and substitute local organic fertilizers and soil amendments for synthetic fertilizers.
- The amount of fertilizer needed by plants decreases as the organic matter of the soil increases

Photo: Cornell.edu

Remember!

Excess application of any fertilizers can burn plant leaves and roots, reduce fruiting, invite insect pests, and pollute waterways.

Watering -When to water

- Vegetable plants need, on average, 1 inch of water per week from rain or irrigation.
- Soil should be moist below the surface, "like a damp sponge."
- Monitor seeds and young seedlings daily. Monitor established plants every 2 days.
- Add mulch between the rows and you'll help stretch the time between waterings.
- Battery-operated hose timers are readily available and can be used to water the garden regularly or during periods of absence

Watering – Best practices

- Have an easily accessible water source
- <u>Water the roots, not the leaves</u>. Wet leaves foster disease
- Use drip irrigation or soaker hoses to save time and water.
- It is best to irrigate in the morning to limit water loss to evaporation

Weed Management

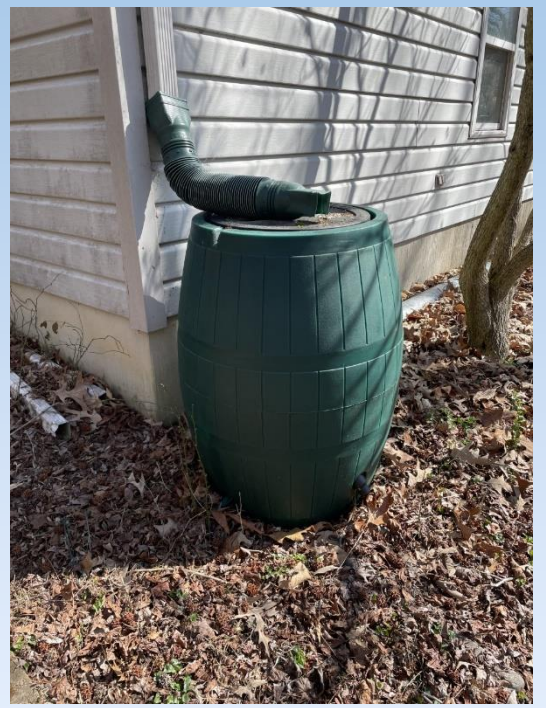
"Weeds" are defined as plants growing where they are not wanted.
Weeds attract pests and rob plants of moisture and nutrients.

Recommended control methods:

- Hand-pull when soil is moist.
- Use sharp hoe to chop off above ground portion.
- Lay organic mulch to prevent growth (avoid wood or bark).
- Use sturdy landscaping fabric to block weeds (can be reused)

What about Rain Barrels?

- Collecting water in rain barrels is a good way to reduce run-off into streets and waterways.
- BUT Water from rain barrels is not drinkable (non-potable) and generally should not be used to irrigate or wash edible plants.
- Rain barrels linked to roof downspouts may contain biological and chemical contaminants that can be dangerous to ingest.
- Use water from rain barrels for irrigating ornamental plants.



Source Rain barrels in the home landscape UMN Extension

Garden Pests

- Monitor your garden often.
- Identify the pest.
- Determine extent of damage.
- Hand-pick (caterpillars), wash off (aphids) if possible.
- Try to attract natural predators (wasps, lady bugs, toads, birds).
- Use barrier methods like insect netting or row cover to exclude pests

The use of chemicals should always be your last resort.
Try organic pesticides first.

Pest Management: Bugs and Birds

- Light weight, translucent row covers deter birds. Do NOT use netting, it kills snakes.
- PVC hoops and/or floating row covers exclude both insects and wildlife.
- Remove row covers for crops that require pollination (e.g. cucumbers, squash, melon) once the flowers bloom.
- Consider Parthenocarpic (Don't need pollination) varieties if insect pressure is severe

Fencing out wildlife

Woodchuck T Smith, UMass

James R. Holland, Bugwood.org

- Proper fencing provides the most reliable way to exclude the larger mammals from the garden.
- Choose the type of fencing most suitable for the animals that are known to be a nuisance in your area -- Deer, rabbits, woodchucks
- Move nearby resources that attract wildlife (garbage cans, compost bins) away from the garden

Source: https://ag.umass.edu/home-lawn-garden/fact-sheets/wildlife-excluding-repelling-problem-wildlife-from-garden

https://youtu.be/NAvRY-AQWOQ

Questions?

Bountiful Berries!

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Strawberries!

Quick Facts

- low-growing herbaceous perennials
- require full sun (6+ hr/day)
- can be grown in rows, beds, & containers
- pollinated by bees
- 1 berry has ~200 seeds
- is a member of the rose family

Types of Strawberries

June Bearing

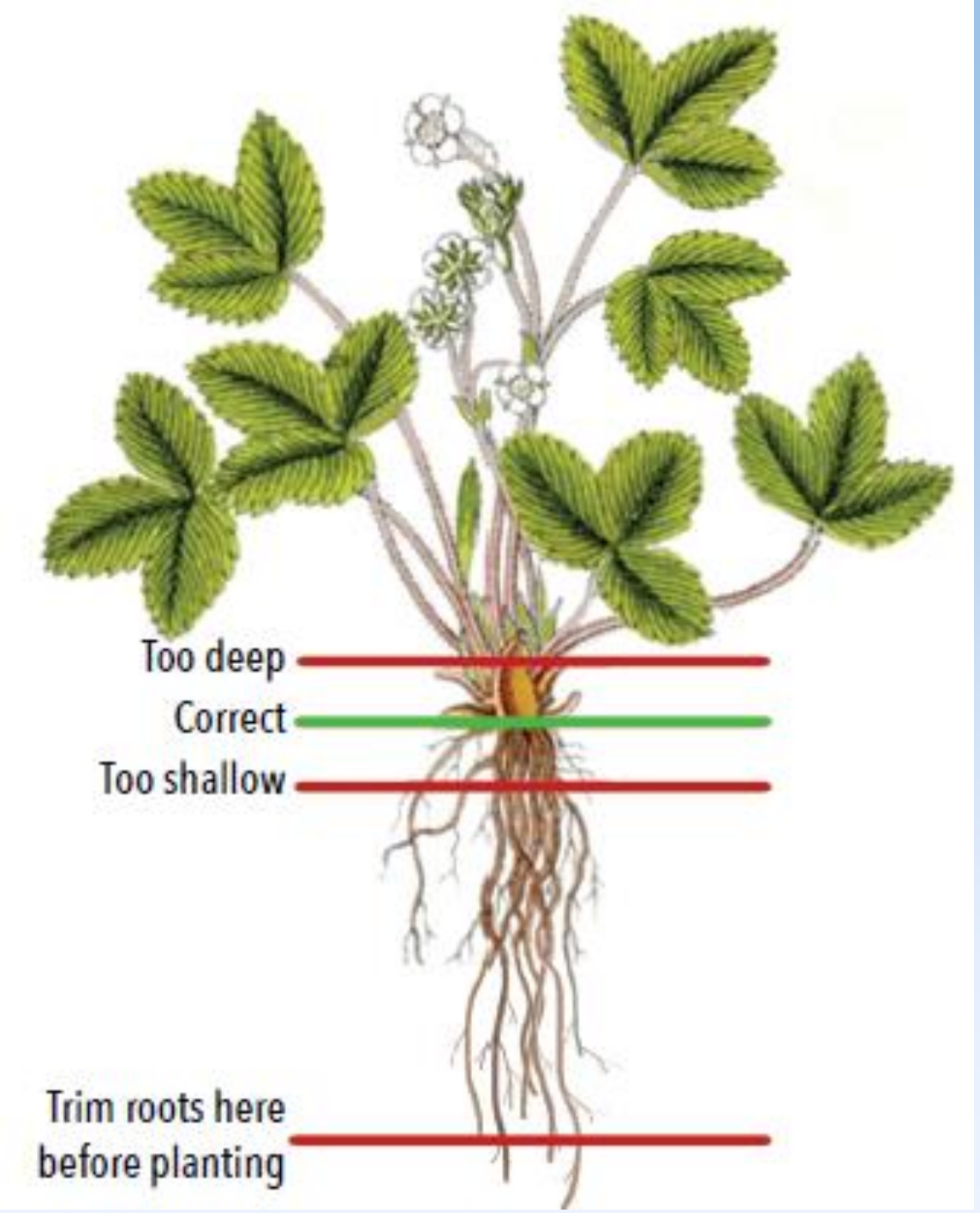
- produce 1 crop per year (late spring or early summer)
- fruiting lasts about 4 weeks
- produces many runners that make them most suited to rows covered in 'mats' of plants
- good choice if you want fruit all at once
- 'Annapolis', 'Allstar', 'Earliglow', 'Jewel'

Day-Neutral

- produce fruit throughout the growing season
- fruit from late June to October
- fruit the same year they are planted
- ideal for containers as they don't produce many runners
- 'Seascape', 'Tribute', 'Tristar'

How to Plant

- strawberries have shallow, fibrous root systems; therefore, they are vulnerable to very dry or wet soil conditions
- use mulch for weed suppression and to keep berries cleaner
- fertile, well-drained, loamy, and slightly acidic soil is optimal (5.8-6.2)
- avoid heavy clays, deep sands & excessively wet soil



Blueberries!

- can be grown in-ground as well as in containers
- types suited for southern Maryland: northern highbush, southern highbush and rabbiteye

The most important fact to know about growing blueberries is their specific soil requirement…MUST be planted in acidic soil!
(pH 4.5-5.5)

Resources

- Charles County Master Gardener's Grow It Eat It webpage
- Vegetable Planting Calendar | University of Maryland Extension (umd.edu)
- Soil to Fill Raised Beds | University of Maryland Extension (umd.edu)
- Types of Raised Beds
- Growing Vegetables in Containers | University of Maryland Extension
- Salad or table boxes
- How to Start a Vegetable Garden | University of Maryland Extension (umd.edu)
- Fertilizing Vegetables | University of Maryland Extension (umd.edu)
- 2023 Charles County Rain Barrel Workshops | University of Maryland Extension (umd.edu)
- The Safety of Materials Used for Building Raised Beds | University of Maryland Extension (umd.edu)

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Resources, continued

- https://extension.umd.edu/resource/soil-basics
- Soil, Compost, and Fertilizer for the Home Garden | University of Maryland Extension (umd.edu)
- https://hort.extension.wisc.edu/articles/safely-using-manure-garden/
- https://agsci.psu.edu/aasl/soil-testing/fertility
- Companion Planting | Extension | West Virginia University (wvu.edu)
- WSU Extension Publications|Gardening with Companion Plants (Home Garden Series
- Lead in Garden Soils | University of Maryland Extension (umd.edu)
- https://ag.umass.edu/home-lawn-garden/fact-sheets/wildlife-excluding-repelling-problem-wildlife-from-garden

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Resources

Strawberry Quick Facts
Types & Cultivars
Growing Strawberries in the Home Garden
Penn State Extension Growing Strawberries
Growing Blueberries in the Home Garden

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A big Thank-You to the Baltimore County Master Gardeners Grow It Eat It team!

This presentation is based in part on one developed by the Baltimore County Master Gardeners Grow It Eat It team and presented by Tom Potyraj. On YouTube see Starting a Vegetable Garden!

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