

# Virginia Hardiness Zone Map

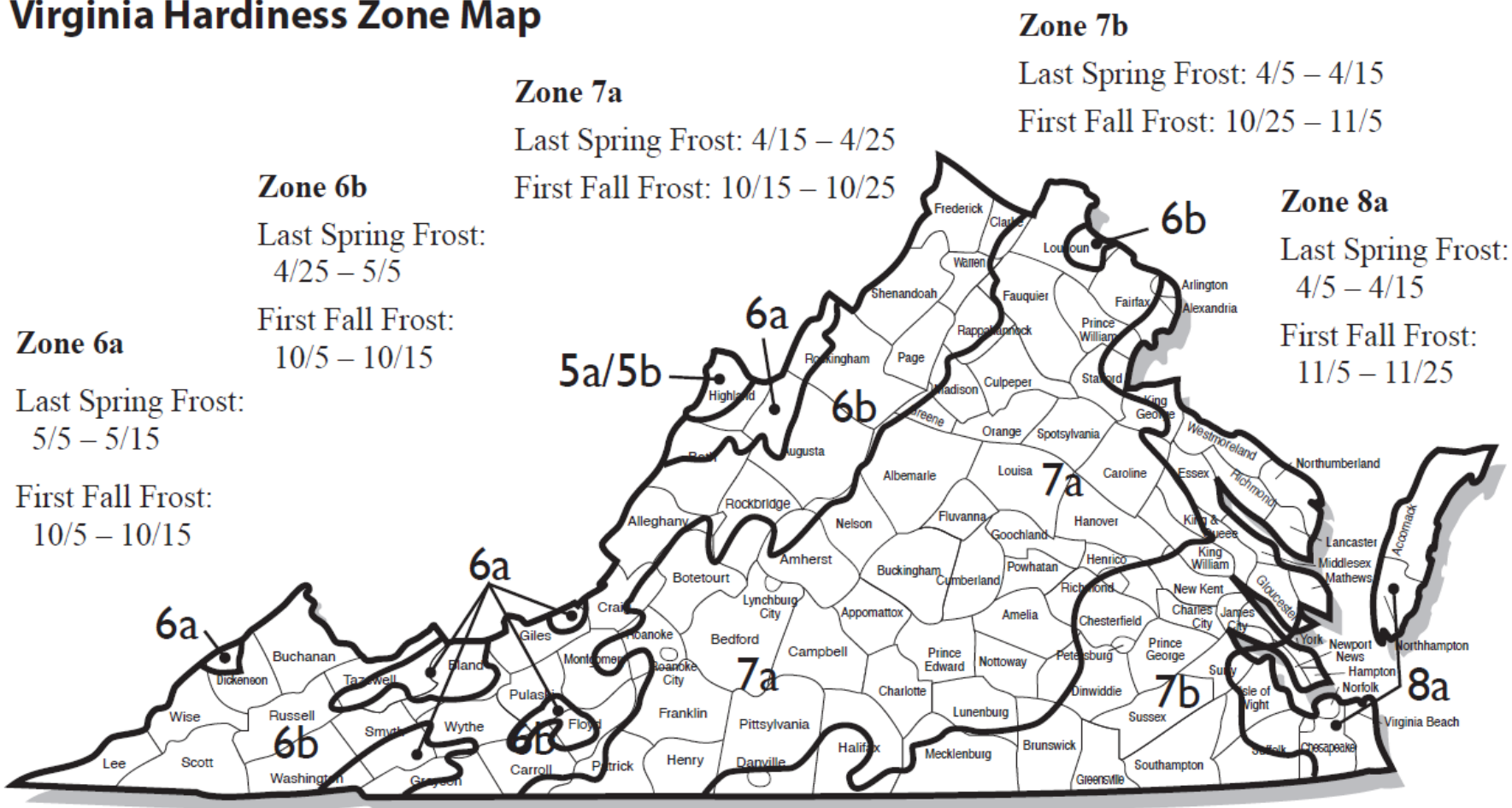


Photo Credit: Virginia Cooperative Extension, 426-331

# Crop Families and Seasonality

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# Today's Agenda

- Cool and warm season crops
- Hardy and tender crops
- Crop families & why it's important for crop rotation
- Season extension, cold weather protection







# Crop Families

## Cool Season

- Alliums
- Asters
- Brassica
- Carrot
- Goosefoot

## Warm Season

- Cucurbits
- Grasses
- Legumes
- Solanaceous



# Seasonality

## Cool Season

- Frost tolerant
  - Hardy 25-28°F
  - Semi-Hardy 29-32°F
- Optimal temperature
  - 60-80°F
- Heat causes bolting

## Warm Season

- Frost is deadly
  - Tender, 55°F
  - Very Tender, 60°F
- Optimal temperature
  - 70-95°F
- Needs heat and sunlight



# Plant Hardiness

- Very Tender
- Tender
- Semi-Hardy
- Hardy

# Very Tender

- Summer weather
- Growth above 60°F
  - Optimal 70° to 95°F
- Frost kills



Credit: Gaylynn Johnson





# Very Tender Crops

- Lima Beans
- Cantaloupe
- Eggplant
- Peppers
- Pumpkin
- Winter squash
- Tomato
- Watermelon



# Tender

- Summer weather
- Growth above 55°F
  - Optimal 70° to 95°F
- Frost damages or kills



Credit: Gaylynn Johnson



# Tender Crops

- Beans
- Celery
- Corn
- Cucumbers
- Summer squash



# Semi-Hardy



- Spring, fall weather
- Growth above 40°F
  - Optimal 65° to 80°F
- Tolerates light frosts

Credit: Gaylynn Johnson



# Semi-Hardy Crops

- Beets
- Carrots
- Cauliflower
- Lettuce
- Parsley
- Parsnips
- Potatoes
- Swiss chard



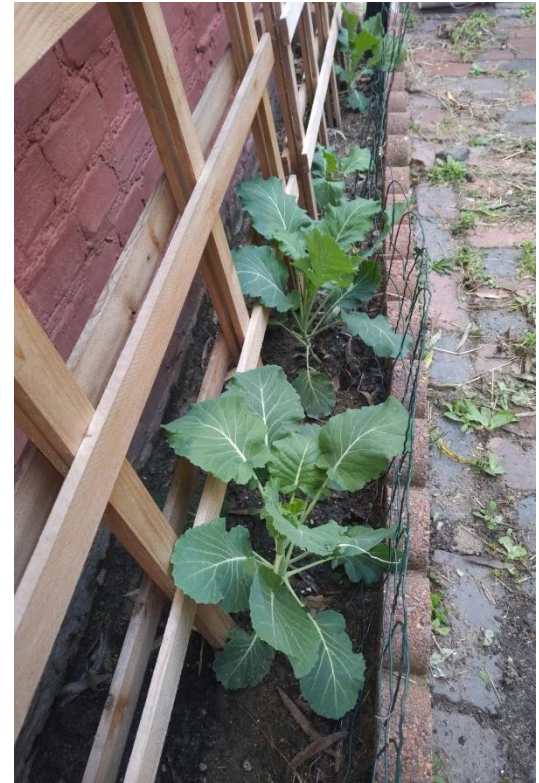


Credit: Gaylynn Johnson



# Hardy

- Spring, fall weather
- Growth above 40°F
  - Optimal 65° to 80°F
- Tolerates frosts



Credit: Gaylynn Johnson



# Hardy Crops

- Broccoli
- Brussels sprouts
- Cabbage
- Cooking greens
- Kohlrabi
- Onions
- Peas
- Radish
- Spinach
- Turnips





Credit: Gaylynn Johnson





# Cool Season Crops





# Alliums (Lily family)

- Onion family
  - Chives
  - Garlic
  - Leeks
  - Onions
  - Shallots



Credit: Gaylynn Johnson



# Alliums (Lily family)



- Sweet or pungent
- Well-drained soil rich in OM
- Established by seed, sets, or transplants
- Heavy weeding
- Cure after harvest

Credit: Gaylynn Johnson





# Alliums (Lily family)

- Bulb development
  - Short-day, 12-14 hour day length
  - Long-day, 14-16 hour day length



Credit: Gaylynn Johnson





# Asters

- Endive
- Escarole
- Lettuce
- Radicchio



Credit: Gaylynn Johnson



# Asters

- Head Firmness
  - Crisphead
  - Butterhead
  - Cos/Romaine
  - Loose/Bunching
- Requires well-drained, organic soils
- Direct seeding or transplants



Credit: Gaylynn Johnson





# Brassicas

- Broccoli
- Brussels sprouts
- Cabbage
- Cauliflower
- Cooking greens
- Kohlrabi
- Radish
- Rutabaga



Credit: Gaylynn Johnson



# Carrot

- Carrots
- Celery
- Herbs\*
- Parsnips



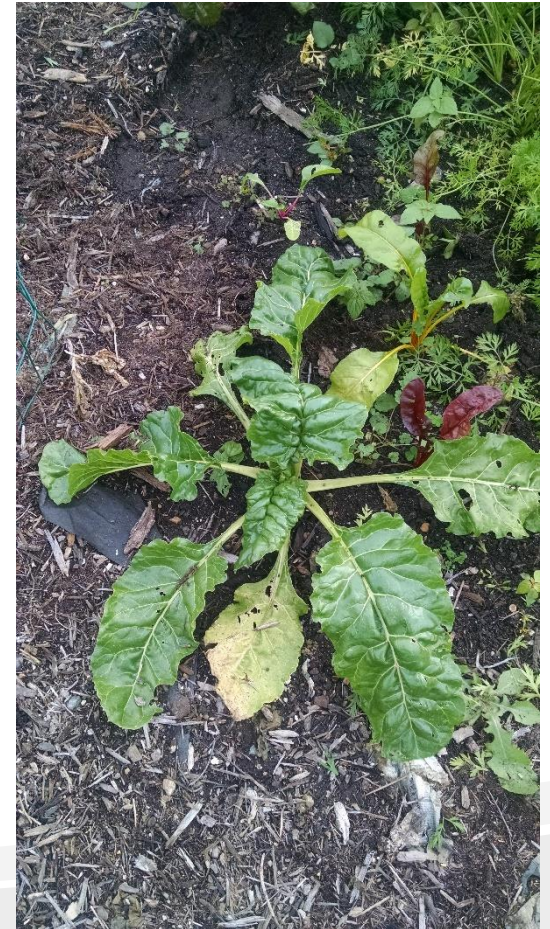
Credit: Gaylynn Johnson





# Goosefoot

- Beets
- Chard
- Spinach



Credit: Gaylynn Johnson



# Warm Season Crops





# Cucurbits

- Cucumbers
- Gourds
- Melons
- Squash
- Pumpkins
- Zucchini



Credit: Gaylynn Johnson





# Cucurbits



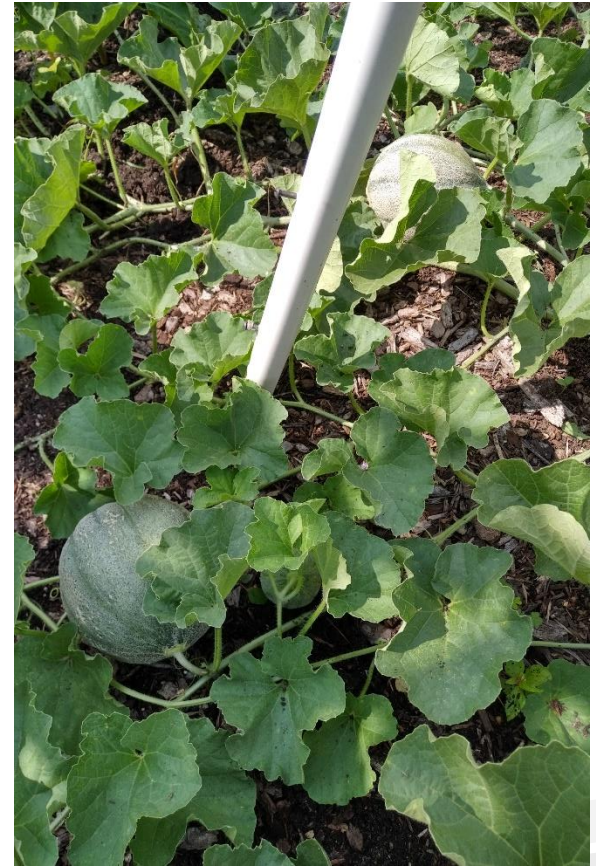
Credit: Gaylynn Johnson

- Requires pollination
  - Some cultivars are parthenocarpic
- Cucurbitacins
  - Causes the bitter taste of the fruit
- Large vegetative growth and fruit
  - Provide space or train on a trellis



# Cucurbits

- Long growing season
  - Except summer squash and zucchini (45-60 days)
- Cucumbers: slicing and pickling
  - Best to train on a trellis



Credit: Gaylynn Johnson



# Squash Types



- Summer squash
  - 45-60 days
  - Soft, shorter shelf-life
- Winter squash
  - 80-120 days
  - Hard, longer shelf-life

Credit: Gaylynn Johnson





# Grasses

- Popcorn
- Sweet corn







# Corn

- Sweet corn accumulates sugar instead of starch like field corn
  - Cultivars have been bred to increase sugar content
- Must be separated from field corn
  - Sweetness is suppressed when cross-pollinated



# Corn

- Grow in a blocks of with at least 8 plants for better pollination
- Harvest throughout the season
  - Early season, 65-74 days
  - Midseason, 80-90 days
  - Late season, 90+ days





# Legumes

- Beans
- Edamame
- Lentils
- Peanuts
- Peas\*



Credit: Gaylynn Johnson



# Legumes

- Nitrogen fixation
  - "Green Manure"
- Train beans and peas on trellis



Credit: Gaylynn Johnson





# Solanaceous

- Eggplant
- Peppers
- Potatoes
- Tomatoes



Credit: Gaylynn Johnson



# Solanaceous

- Staking recommended for peppers and tomatoes
- Tomato growing habit
  - Determinate = bush varieties with a single, big harvest
  - Indeterminate = vining varieties with continuous production



# Peppers

- Capsaicin and Scovill units
- Pungency (hotness, spiciness)
  - Non-pungent
  - Pungent



Credit: Gaylynn Johnson



# Scoville Heat Units

Scoville Rating	Pepper Type
15,000,000-16,000,000	Pure capasaicin
9,100,000	Nordihydrocapsaicin
2,000,000-5,300,000	<b>Standard US Grade Pepper Spray</b>
855,000-1,041,427	Naga Jolokia
876,000-970,000	Dorset Naga
350,000-577,000	Red Savina Habanero
100,000-350,000	Habanero Chile
100,000-350,000	Scotch Bonnet
100,000-200,000	Jamaican Hot Pepper
50,000-100,000	Thai Pepper, Malagueta Pepper, Chiltepin Pepper
30,000-50,000	Cayenne Pepper, Aji pepper, Tabasco pepper
10,000-23,000	Serrano Pepper
7,000-8,000	Tabasco Sauce Habanero
5,000-10,000	Wax Pepper
2,500-8,000	Jalapeño Pepper
2,500-5,000	Tabasco Sauce (Tabasco pepper)
1,500-2,500	Rocotillo Pepper
1,000-1,500	Poblano Pepper
600-800	Tabasco Sauce (Green Pepper)
500-1,000	Anaheim pepper
100-500	Pimento, Pepperoncini
0	No Heat, Bell Pepper



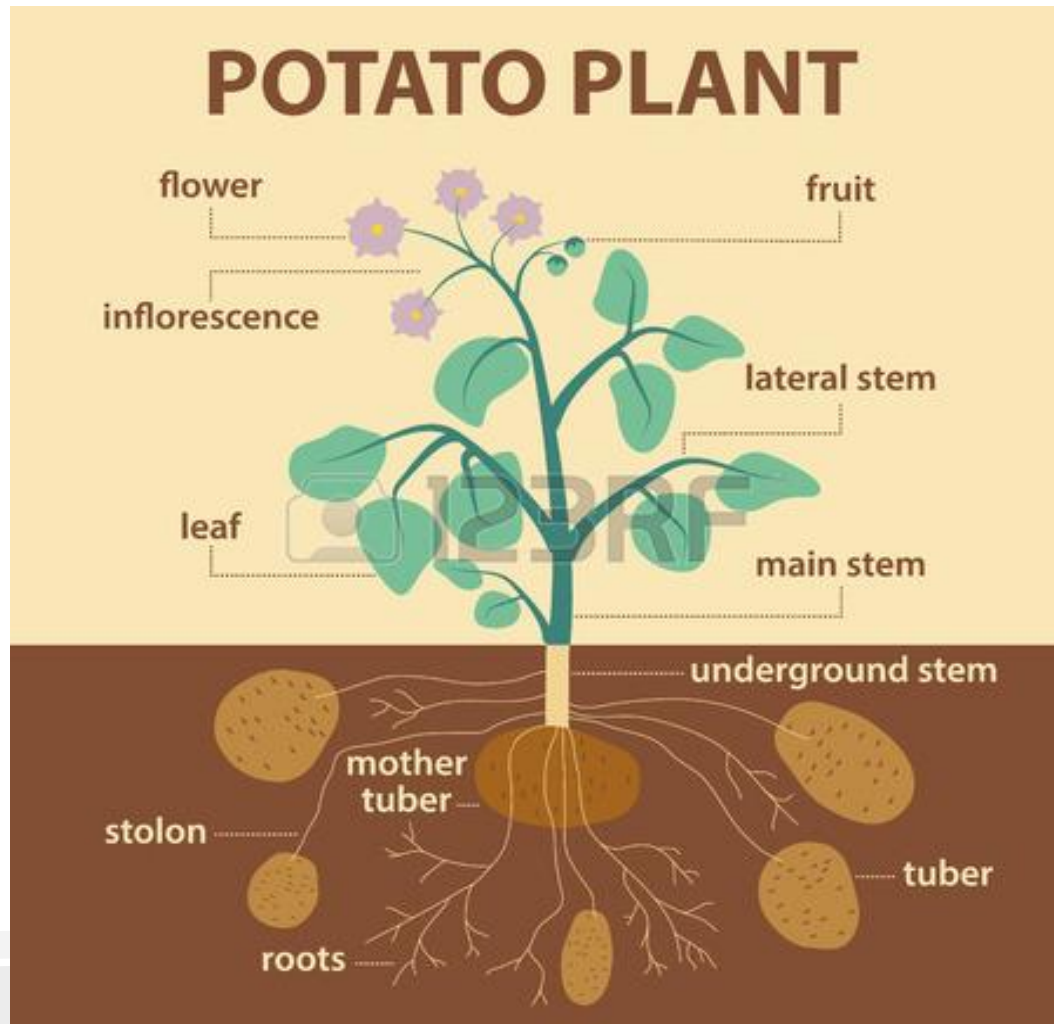
# Potatoes

- Distinguished by food use
  - High starch content: baking
  - Low starch content: boiling and processing (fries)
- Use certified seed potatoes, either whole or in pieces



Credit: Gaylynn Johnson

# Hilling Potatoes



Credit: Square Foot Gardening Forum





# Miscellaneous Warm Season Crops

- Okra (mallow)
- Sweet potatoes (morning glory)



Credit: Michigan State University Extension



Credit: Mississippi State University Extension Service



# Okra

- Mallow family
- Beautiful flower
- Pod harvest will catch you off guard
- Don't be a lazy harvester - get something sharp





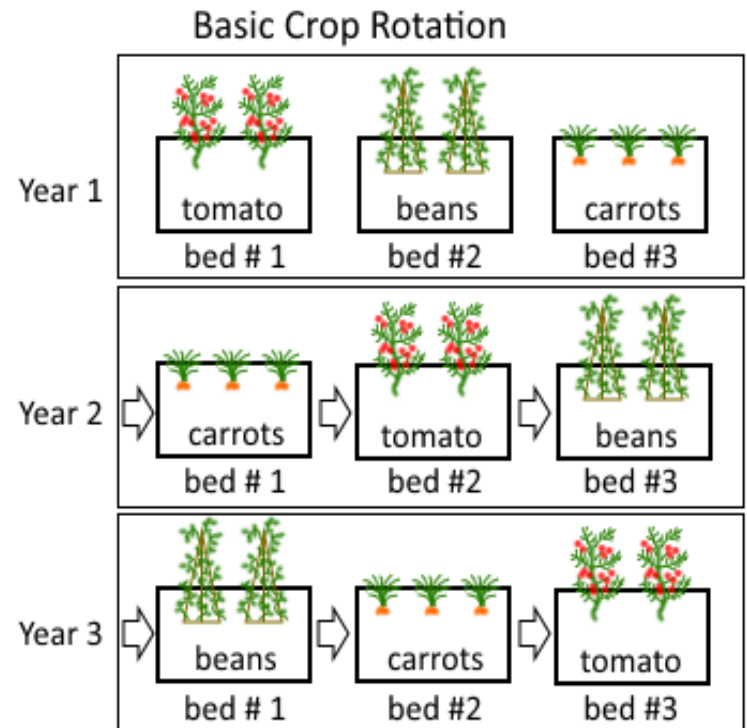
# Sweet Potatoes

- Bindweed/morning glory family
- High beta-carotene content
  - Limited in processing because of high sugar content
- Transplants are called slips



# Crop Rotation

- Shift crops from one location in the garden to another
- Helps control pests and diseases
- Maintains soil fertility





# Season Extension

- Cold frames
- Row covers
- High and low tunnels
- Greenhouses
- Mulch



Credit: Gaylynn Johnson











# Season Extension

- Increasing the earliness of a crop
  - Early maturing cultivars
  - Seed-starting indoors or transplants
  - Mulching
- Extend harvest by staggering crops and planting dates



# Resources

- Asparagus - VCE Publication 426-401
- Beans - VCE Pub. 426-402
- Cucumbers, Melons, and Squash - VCE Pub. 426-406
- Leafy Green Vegetables - VCE Pub. 426-408
- Onions, Garlic, Shallots - VCE Pub. 426-411
- Potatoes, Peppers, & Eggplant - VCE Pub. 426-413
- Root Crops - VCE Pub. 426-442
- Sweet Corn - VCE Pub. 426-405
- Tomatoes - VCE Pub. 426-418





# Questions?

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