Virginia Hardiness Zone Map

Zone 7a
Last Spring Frost: 4/15 – 4/25
First Fall Frost: 10/15 – 10/25

Zone 6b
Last Spring Frost: 4/25 – 5/5
First Fall Frost: 10/15 – 10/25

Zone 6a
Last Spring Frost: 5/5 – 5/15
First Fall Frost: 10/5 – 10/15

Zone 7b
Last Spring Frost: 4/5 – 4/15
First Fall Frost: 10/25 – 11/5

Zone 8a
Last Spring Frost: 4/5 – 4/15
First Fall Frost: 11/5 – 11/25

Photo Credit: Virginia Cooperative Extension, 426-331
Crop Families and Seasonality

Gaylynn Johnson
Associate Horticulture Extension Agent, Hampton
Virginia Cooperative Extension
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
MOST COMMON GARDEN VEGETABLE FAMILIES

- Nightshade Solanaceae
- Mustard Brassicaceae
- Legume Fabaceae
- Squash Cucurbitaceae
- Onion Alliaceae
- Mint Lamiaceae
- Lettuce Lactuca sativa
- Spinach Amaranthaceae
- Parsley Apiaceae
- “All Others”
# 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°F to 95°F
- Frost kills
Very Tender Crops

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

- Summer weather
- Growth above 55°F
  - Optimal 70°F 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°F to 80°F
- Tolerates light frosts

Credit: Gaylynn Johnson
Semi-Hardy Crops

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

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

Credit: Gaylynn Johnson
Hardy Crops

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

- 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

Credit: Gaylynn Johnson
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 blocks 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*
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

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

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

Gaylynn Johnson
Associate Extension Agent
Virginia Cooperative Extension, Hampton

gaylynnj@vt.edu

https://hampton.ext.vt.edu/