Together we can solve hunger™
Largest organization in the region working to solve hunger and its companion problems: chronic undernutrition, heart disease, and obesity.

Partner with 444 community organizations in DC, MD, and VA, to help 540,000 people each year get access to good, healthy food.

46,000,000 pounds of food donated last year, of which 17,000,000 pounds was fresh produce!
URBAN DEMONSTRATION GARDEN

½ Acre Urban Farm on Puerto Rico Ave, NE

Organic, sustainable

Produce is used for nutrition education and given to people in need

Rely on volunteers to make our garden grow!
INTRODUCTION

Hillary Quarles
- Food Growing Education Specialist – “The CAFB Gardener”
- Masters Degree in Landscape Architecture and 20 years of hard earned experience in vegetable gardening

Katherine Donnelly
- Nutrition Education Coordinator
- Masters Degree in Nutrition and has travelled the world cooking and eating
- Formerly an urban farmer with Cultivate the City, growing at National’s Park, Barracks Grow, and Hayes Senior Center.
AGENDA

- Perils of Growing
- Why Rotate Crops?
- How to Plan for Crop Rotation over Time
- Crop Rotation in the Urban Garden
- Challenges of Small Spaces

- Activity: Let’s make a plan!

- Questions and Discussion
PERILS OF GROWING

- Soil Depletion: My plants are starving!
- Soil-borne Plant Disease: Spots, Wilts and Ick
- Soil-dwelling Pests: The Bad Bugs!
SOIL DEPLETION

- **Heavy Feeders:**
  - Brassicas
  - Nightshades
  - Tomatoes and Corn (use up nitrogen and phosphorus)
  - Lettuce and cabbage (use up nitrogen)

- **Light Feeders:**
  - Root Vegetables
  - Herbs

- **Nitrogen Fixers:**
  - Legumes (add nitrogen to the soil, but use a lot of phosphorus)
Soilborne pathogens reduce both yield and quality of vegetable crops.

- Symptoms include: root decay, discoloration, crown rot, wilting
- They are often fungus, occasionally bacteria and rarely a virus.
- Control usually requires 3 Years between plantings

Spot, Wilts and Ick at the Urban Demonstration Garden

- Root rot – kale
- Bacterial soft rot – carrots
- Anthracnose fungus – beans
- Verticillium wilt – tomatoes
- Leaf scorch – strawberries
Problem insects have low mobility and overwinter in the soil.

Challenging Insects in the Urban Demonstration Garden

- Wireworms – Root crops (1-6 year lifecycle!)
- Leaf Miners – Goosefoot family
- Aphids – Brassicas
- Squash Vine Borer – Summer squash and zucchini

Other common insect pests

- Colorado potato beetles
- Nematodes
WHY ROTATE CROPS?

- Feed the soil
- Isolate disease
- Break the bad bug lifecycle
HOW DOES CROP ROTATION WORK?

- By moving plantings throughout the garden over time!
  - Organize the planting plan by plant family – they tend to have similar pests and diseases
  - Assign each plant family to a zone in the garden
  - Shift the location of each plant family annually by one zone!
- Nitrogen users follow nitrogen fixers.
- Light feeding crops follow heavy feeding crops.
- Wait 3 years before planting a crop in the same place.
- Annual soil test by zone.
PLANT FAMILIES

- **Brassicas**
  - Cabbage, broccoli, mustard, turnips, radishes, kale, collards

- **Legumes**
  - Peas, beans, peanuts, edamame

- **Nightshades**
  - Tomatoes, potatoes, peppers, eggplants, tomatillos

- **Morning Glory**
  - Sweet potatoes

- **Onions**
  - Onions, garlic, leeks, chives

- **Parsley**
  - Parsley, carrots, fennel, cilantro, parsnips

- **Cucurbits**
  - Melons, squash, cucumbers

- **Goosefoot**
  - Beets, spinach, chard

- **Sunflower**
  - Sunflowers, lettuce

- **Grasses**
  - Corn, wheat, rye

- **Mallow**
  - Okra
6 PLANT GROUPS

- **Brassicas**
  - Cabbage, broccoli, mustard, turnips, radishes, kale, collards

- **Legumes**
  - Peas, beans, peanuts, edamame

- **Nightshades and Morning Glory**
  - Tomatoes, potatoes, peppers, eggplants, tomatillos, sweet potatoes

- **Root Vegetables - Onions, Parsley and Goosefoot**
  - Onions, garlic, leeks, chives, parsley, carrots, fennel, cilantro, parsnips, beets, spinach, chard

- **Cucurbits**
  - Melons, squash, cucumbers

- **Sunflower, Grasses, Mallow**
  - Sunflowers, lettuce, corn, wheat, rye, okra
UDG PLANTING ZONES

- 65 Raised Beds
- 6 Planting Zones
- 7 Perennial Herb Beds
- 4 Staff Community Beds
- Pollinator Flower Beds
- Fruit Trees
- Container Plantings
<table>
<thead>
<tr>
<th>Zone</th>
<th>Bed</th>
<th>SPRING</th>
<th>SUMMER</th>
<th>FALL</th>
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<td>Carrots Amarillo, Atomic Red, White Belgian</td>
<td>Carrots Amarillo, Atomic Red, White Belgian, Hercules F1</td>
<td>Carrots Amarillo, Atomic Red, White Belgian, Hercules F1</td>
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<td>Parsnip, Root Parsley Half Long Guernsey, Gladiator 2F/</td>
<td>Parsnip, Root Parsley Half Long Guernsey, Gladiator 2F/</td>
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<td>3</td>
<td>Cilantro, Parsley, Chervil Celosia and Strawberries</td>
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<td>Radish French Breakfast</td>
<td>Tomato x8 Striped Roman, Green Zebra, White Wonder, White Tomatillo, Pineapple, Purple Cherokee, German Bicolor, Purple Calabash</td>
<td>Tomato Striped Roman, Green Zebra, White Wonder, White Tomatillo, Pineapple, Purple Cherokee, German Bicolor, Purple Calabash</td>
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<td>Sweet Potato x4 Cal Wonder Red, Cori di Toro, Long Pepper Blend, Shishito</td>
<td>Sweet Potato x4 Cal Wonder Red, Cori di Toro, Long Pepper Blend, Shishito</td>
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<td>Turnip x4 Black Beauty, Mamezane, Rosa Bianca, Thai Long green, Taipei Gai Hei, Pumkin, Giant, Ornamental Gai</td>
<td>Turnip x4 Black Beauty, Mamezane, Rosa Bianca, Thai Long green, Taipei Gai Hei, Pumkin, Giant, Ornamental Gai</td>
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<td>Tomato x8 Trisp VN, Sunchocola Cherry, Amy’s Apricot cherry, Ama Orange, Roma Pepper, Big Beef, San Marzano, Australian Heart</td>
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<td>Angelica</td>
<td>Potato x4 Yellow Monster, Yummy Belle Baby, Snack, Chocolate Mini Bells, ???</td>
<td>Potato x4 Yellow Monster, Yummy Belle Baby, Snack, Chocolate Mini Bells, ???</td>
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<td>Pole Beans - Fava Iantos Fava, McCallen</td>
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<td>Peas - Sugar Sugar Pod 2, Little Snappies White</td>
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<td>Squash, winter and summer Golden Glory, Calabash, White Bush Squash, Spaghetti, Honey Boat Delicate, Waltham Butternut, Tiptop Azum</td>
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<td>Cucumber Mexican Sour Gherkins, Dragon Egg, natau Fushigiri, H-10 Little Leaf, Poona Khware, TH4718S F1</td>
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<td>Radishes Red Meat, Minosu Rose, Minowase, Green Lusdo</td>
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</table>

**Zone Bed** refers to the planting zone and bed number. **Vegetable** lists the variety of vegetables planned for each zone and bed. **Date** indicates the planting or harvest date. **Plan** indicates the season (SPRING, SUMMER, FALL). **UDG PLANTING SCHEDULE** captures the variety, planting, and harvesting schedule for each vegetable.
CROP ROTATION WITH 6 RAISED BEDS

Nightshade → Legume

Root → Cucurbit

Sunflower ← Brassica

Year 1 → Year 2 → Year 3

Year 4 ← Year 5 ← Year 6
BUT MY GARDEN IS TOO SMALL!

- Container gardening
  - Replace the soil and sterilize the pot

- One raised bed
  - Replace the soil or rotate your planting over years

- Two or three raised beds
  - Flip crops annually and rest problematic crops in the 3rd year

- Four raised beds or more
  - Go for it!
  - Make each bed a zone or group beds into zones and rotate them each year.
BENEFITS

- Healthier plants
- Bigger harvests
- Happier gardeners
But I really want to grow more tomatoes and peppers than carrots and onions....
Hey, my okra doesn’t have a family – where do I plant it?
Last year my tomatoes grew everywhere – how do I start fresh?
LET’S MAKE A PLAN!

- Divide into groups by garden size – 2 beds, 3 beds, 4 beds, 6+ beds
- Determine what veggies to grow and list them by plant family
- Sketch your garden out and identify planting zones
- Assign each family to a zone