

ENVIRONMENTAL EDUCATION IN THE COMMUNITY GARDEN

LESSON 10

MIX IT UP! CROP ROTATION, INTERCROPPING & SUCCESSION

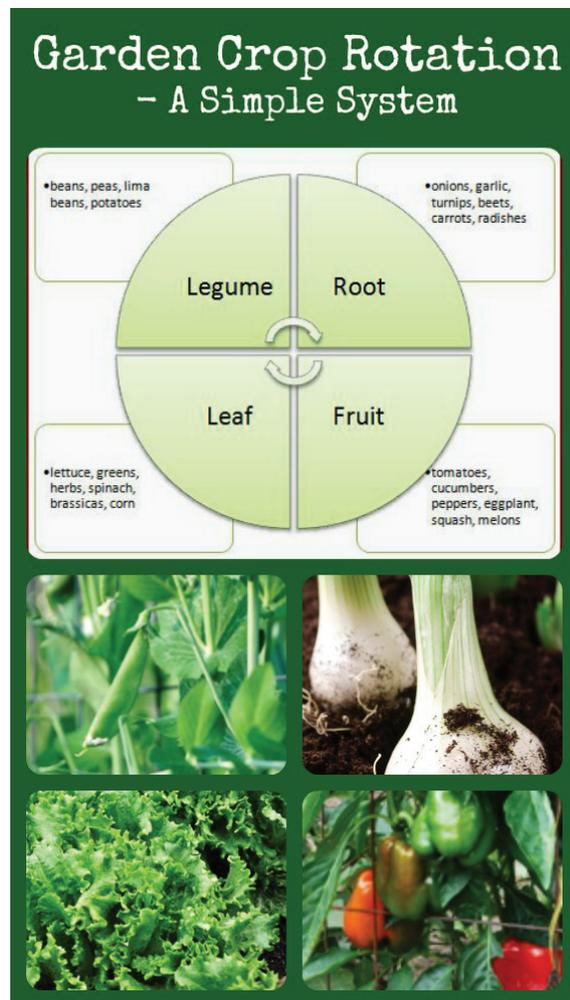
Just as we are healthiest when eating a widely varied diet, organisms in the soil also benefit from a diverse diet of organic material. Plant nutrients come from minerals made available by decaying plants and animals, but roots also exchange nutrients and electrical charges with microorganisms in the soil. Different roots provide different nutrients to the microorganisms, and vice versa. All vegetables have specific nutrient and soil requirements, so by grouping crops with similar needs together and rotating if possible every year, the soil maintains the ability to replenish lost minerals and efficiently support each crop.

Crop rotation (cycling different plants and plant families in the same area) introduces different plant exudates and biological relationships. Because some plants use more of certain nutrients and some plants leave nutrients in the soil after they die (such as nitrogen-fixing legumes), rotating crops and planting a variety of plant families in a bed helps support diverse forms of microbial life. The diverse microbial community nurtures balance in the food web so that one kind of organism or nutrient doesn't get too powerful and throw off the system.

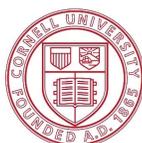
Crop rotation also supports plants' ability to fend off disease and pests by nurturing a more robust and well-nourished plant. Disease spores in the soil can easily be moved from a crop's previous location to the new location, however, the access to different microbial life and nutrients ideally contributes to the overall health and general immunity of the plant.

Succession planting is a practice of replacing short-season crops such as lettuce with new crops in the same location. Intercropping involves planting a short season crop at the same time as a long season crop, and harvesting the first crop before the long season crop (such as tomatoes) reach full size and require more space and nutrients.

Both succession planting and intercropping can provide multiple cycles of nutrient and microbe benefits similar to annual crop rotation during a single growing season. Combined with techniques that add organic matter to well-structured soil, succession planting and intercropping can help community gardeners increase productivity in their limited space while improving overall soil health.



Crop rotations based on parts of plant eaten.
Source: <http://www.betterhensandgardens.com/wp-content/uploads/Garden-Crop-Rotation-1.jpg>



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LESSON PLAN 10

PLAN FOR VARIETY

OBJECTIVE:

Teach gardeners how to adapt their garden plans to account for crop rotation, intercropping, and succession planting within the challenges of limited space in a plot.

Demonstrate several garden planning techniques from hand written plans to online square foot gardening planners, and options for determine season length and short/long season crops.

MATERIALS NEEDED:

- Garden planning materials for each individual gardener's spring planting plan including paper, pencils, seed packets (for planting and "days to maturity" instructions).
- Optional computer and wireless access for using online garden planning tools like the square foot garden planner at www.gardeners.com

ACTIVITIES:

1. Ask gardeners to bring their spring garden plan with them or begin the lesson by reviewing a list of vegetable and herb options for spring planting.
2. Suggest resources such as www.motherearthnews.com or www.farmersalmanac.com for determining average first and last frost dates. Review "cool season/warm season" and "days to maturity" information on seed packets. Explain how this information reveals length of growing season and days that gardeners can divide into mini-seasons for succession planting, intercropping and minimal crop rotation. Days to maturity will also be impacted by days getting longer or getting shorter as the sun moves in position in the sky over the summer. Lettuce planted in the spring may take 45 days while the same variety planted in fall may take 55.
3. Discuss how warm weather and long "days to maturity" length crops such as tomatoes, okra, cucumbers, peppers, and eggplant can be added later amid stands of cool weather, short "days to maturity" lettuce or spring peas with proper planning.
4. Review vegetable families and their feeding needs: root vegetables and phosphorous; the nightshade family's need for nitrogen and potassium; the nitrogen-fixing capacity of legumes (beans and peas); relationship between different brassicas and cucurbit plants. These feeding habits influence nutrients left in the soil as well as microbial life.
5. Ask gardeners to develop three years of garden plans or create separate plans for spring, mid-summer, and fall planting. Discuss the complications involved in making these planting decisions (such as the path of light in the garden, placement of trellises, space limitations).
6. Encourage gardeners to be open to experimenting with rotation as it is possible in the limited space of community gardens. Balancing the benefits of rotation and intercropping with the necessities of community gardens by emphasizing that other good gardening techniques also encourage diversity in the soil. While it would be best not to plant tomatoes in the same exact place each year, an awareness of the soil's needs will help gardeners make informed decisions and necessary amendments as they plan their gardens throughout the years.
7. Introduce gardeners to vegetable families as guides for crop rotation. Explain that rotating crops in larger groups based upon the part of a plant we eat provides an easy to remember alternative guide. Categories include: legumes (beans, peas); leaves (lettuce, greens, spinach, herbs); roots (onions, beets, carrots, turnips); and fruits (tomatoes, peppers, cucumbers). In a raised bed plot, crop rotation can be broken into general groups and areas in the garden annually, since traditional crop rotation and field change is not possible.



Screenshot from Gardener's Supply Company's free garden planning tool at www.gardeners.com