Site Assessment & Light:
Food Crops need sunlight!
Gardens need 10 hours (on 6/21)
April – September 8 hours of the 12 available needed for most food crops to grow
5-6 hours is not enough for all crops!

Crops for Shady Spots:
Salad Greens (especially in July & August)
Spinach
Arugula
Mustard Greens, Asian Greens
Broccoli
Peas
Beets
Radishes
Chard
Kale
Herbs
Scallions
Cucumbers
Squash

What to Grow?
Grow what you like
Grow varieties that are hard to find
Grow crops that are high value
Grow crops that are easy, especially if you’re a new gardener

Starting plants Transplants vs. Direct seeding

Direct Seeding
Pros
Less expensive
Seed available from multiple sources
Great varietal selection
Cons
Final # of healthy plants unknown
May not provide uniform stand

Transplants
Pros
Earlier, faster growth than seed
Improved final stand of plants
Cons
Costs more, Less varietal selection
May have to be grown by you
May have to be protected from early season frost
See Winter Sowing Handout

**Grid or Row Spacing**

**Hexagonal Spacing**

**Garden Bed Layouts**

Typical straight beds 2-6’ in diameter X ft long

**Pros:**
- Easy Bed Prep with Machinery
- Easy to harvest
- Organized appearance & Layout

**Cons:**
- Wastes space

**Other bed options:**
- Keyhole Beds
- Herb Spiral
- Leaf / Branches
- Nets / Grids
- Hexagons / Biointensive

**Companion Planting:** Two plants have can provide benefits to each other. Polycultures in Space.

**Roots of Companion Planting**
- Historical Observation
- Horticultural Science
- Sensitive Crystallization Tests

**Three sisters ~ Ancient Companions**

**Reasons for Companion Planting:**
- Flavor enhancement
- Security through Diversity
- Hedged investment
- Physical Spatial Interactions
- Utilizing multiple layers
- Nurse Cropping
- Trap cropping
- Nitrogen fixation & Fertility
- Pest Repelling
- Pest Suppression
- Beneficial Habitats
- Pollinator and predator recruitment
- Positive Hosting
- Pattern disruption

**Companion Planting Options**

Row intercropping: Growing two or more crops at the same time with at least one crop planted in rows

Strip intercropping: Growing two or more crops together in strips wide enough to permit separate crop production but close enough for the crops to interact

Mixed intercropping: Growing two or more crops together in no distinct row arrangement

Relay intercropping: Planting a second crop into a standing crop at a time when the standing crop is at its reproductive stage but before harvesting

**Spatial Interactions: Trellising & Teepees**

**Crop Rotations**

Ideally the 2 sequential crops are:
- Different botanically
- Do not make the same demands on the soil for nutrients
- Do not share the same diseases or insect pests

Cornercopia’s Current Crop Rotation Plan:

We will not plant the crops from the same family back to back in the same season or from year to year.

**Crop Families**

- Brassicas
- Cucurbits
- Allium
- Umbel
- Chenopods
- Legume
- Solanum
- Poesea (Grass)
- Aster

**Brassicas / Mustard**

- Broccoli
- Cabbage
- Kale

- Collards
- Mustard
- Cauliflower
- Brussel Sprouts
- Pok Choi
Garden Planning

Minnesota State Horticultural Society

Cucurbits

- Cucumber
- Summer Squash
- Winter Squash

Allium

- Onions
- Shallots

Chenopods / Goosefoots

- Chard

Solanums / Nightshades

- Tomatoes

Legume Family

- Legumes
- Beans
- Soy Beans

Grass Family

- Corn
- Popcorn

Umbel

- Carrots
- Parsnips

Simple Crop Rotation:
1. Brassicas
2. Roots
3. Legumes
4. Others
5. Cucurbits
Another Simple Crop Rotation

Simple Crop Rotation:

<table>
<thead>
<tr>
<th>Year</th>
<th>Group</th>
<th>Members</th>
<th>Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Legumes</td>
<td>Peas, Beans, Cover crops: Clovers, Vetch, Alfalfa</td>
<td>Fixes (adds) Nitrogen</td>
</tr>
<tr>
<td>2</td>
<td>Leaves</td>
<td>Lettuce, Spinach, Kale, Brassicas, Chard, Corn, Herbs</td>
<td>Nitrogen</td>
</tr>
<tr>
<td>3</td>
<td>Fruits</td>
<td>Tomatoes, Peppers, Eggplants, Squash, Cucumbers, Melons</td>
<td>Phosphorus</td>
</tr>
<tr>
<td>4</td>
<td>Roots</td>
<td>Onions, Garlic, Turnips, Beets, Carrots, Radishes</td>
<td>Potassium</td>
</tr>
</tbody>
</table>

Rotation based on Nitrogen Use

**Heavy Feeders:**
- Cucurbits
- Nightshades
- Pumpkins & Corn

**Light Feeders**
- Alliums
- Roots

**Medium Feeders**
- Greens
- Brassicas

**Heavy Givers**
- Legumes
### 2 Crop Rotations

<table>
<thead>
<tr>
<th>Year</th>
<th>Block</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Brassicas</td>
</tr>
<tr>
<td>2</td>
<td>Corn &amp; Pumpkins</td>
</tr>
<tr>
<td>3</td>
<td>Legumes &amp; Roots</td>
</tr>
<tr>
<td>4</td>
<td>Alliums</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Block</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Greens</td>
</tr>
<tr>
<td>2</td>
<td>Cucurbits</td>
</tr>
<tr>
<td>3</td>
<td>Fallow / Covercrop</td>
</tr>
<tr>
<td>4</td>
<td>Nightshades</td>
</tr>
</tbody>
</table>

Most important: Crop Rotations
- Keep records of what you plant where each year so that you can rotate families
- Can be as elaborate and complex or as simple as you want.
- Helps prevent pests, diseases, even nutrient uses
- Adding compost to you soil can help alleviate problems if you can’t rotate crops.

Successions: The sequential growing of different crops in a single space. Polycultures in Time.

Creating Successions or Relays
- Continuous harvest & growing of crops throughout the season
- Utilizing the same space for multiple crops
- Timing the planting of crops so that continuous harvest of that crop is possible

Succession Plantings
- the sequential growing of crops in a single bed during a single season (2-4 crops)
- Ex: Spinach – Lettuce – Radishes
- Ex. Peas – Parsnips
- Ex. Cilantro – Radishes – Lettuce
- Easiest to do with short season crops
Two-way Successions

- Early Peas followed by Carrots
- Spinach followed by Eggplants
- Bunching Onions followed by Chard
- Lettuce followed by Turnips

Three-way Successions:

- Peas- Broccoli- Spinach
- Bok Choy- Bush Beans – Lettuce
- Spinach- Cucumbers- Radishes
- Onions- Radishes- Lettuce
- Radishes- Carrots- Spinach

Four-way Succession plantings

- Peas- Bok Choy- Spinach- Garlic (for next year)
- Spinach- Radish- Pea Shoots – Arugula
- Scallions- Lettuce- Spinach- Radish
- Lettuce- Cilantro- Turnips- Spinach

Successions

Approximately 175 days between April 20th and October 15th in MN
- Beets 55 days
- Lettuce 45 days
- Scallions 65 days
- Spinach 40 days
- Radish 30 days
- Peas 60 days
- Broccoli Raab 42 days

How I plan:

- Make a list of the crops I want to grow
- Allocate Space / Crop
- Determine frequency of plantings, first planting dates for each crop, and subsequent planting dates for succession crops, map out space
- Follow the plan week by week
- Keep records so you know what worked and what didn’t.