Soil Health: Compost and Cover Crops

Soil Health
Healthy soil is essential to happy, productive plants in an organically grown garden. To build and maintain healthy soil, we follow a few practices. We regularly add compost to our garden beds, we incorporate cover crops and crop rotation in our garden planning, and we use low-till practices where we try our best to avoid disturbing the soil. Together these practices help soil tilth/texture, maintain the soil biomass, and maintain nutrient levels in the soil.

Compost
Compost helps build good soil structure. This increases plants ability to access nutrients, increases soil’s ability to hold moisture and airspace, and encourages large populations of beneficial microorganisms in the soil. We add compost to our garden beds in early Spring when we build them up before the first planting, as well as side dressing every two weeks during the peak of the season on fast growing fruiting plants (tomatoes, peppers, eggplants, berries, zucchini, cucumbers, okra, fruit trees), and finally in the fall when sowing cover crops.

Additionally, we can make compost extract (non-aerated) or compost tea (aerated) to water new transplants to help minimize transplant shock.

If using a three-bin compost system:
When adding to the open bin, use a ratio of 2:1 carbon:nitrogen. High carbon items are ‘browns’ such as dried leaves, cardboard, dry hay, wood chips. High nitrogen items are ‘greens’ such as weeds (no seed heads!), flowers, freshly pruned branches, green leaves.

Why cover crops?
- Protects soil from erosion
- Return nitrogen to soil
- Dense plantings can suppress weeds
- Disrupts pest lifecycles
- Increase organic matter in soil
- Attractive to beneficial insects / pollinators

**Pairing grains with legumes**
- Most grains will find residual nitrogen (N) near roots, while legumes will fix N from the atmosphere and soil and store it on root nodules. If grains are present to store residual N in the soil, legumes work harder to fix atmospheric N.
- If allowed to decompose in the soil, should leave a favorable C:N ratio for most crops.

<table>
<thead>
<tr>
<th>Legumes</th>
<th>Non-legumes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field peas</td>
<td>Buckwheat</td>
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<tr>
<td>Shoots or tendrils can be harvested as soon as the stems 'snap' by hand – additional crop</td>
<td>Fast growing – establishes quickly for weed suppression</td>
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<tr>
<td>Blossoms are edible flowers</td>
<td>Attractive to bees / beneficial insects</td>
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<tr>
<td>Hairy Vetch</td>
<td>Oats</td>
</tr>
<tr>
<td>Excellent N fixer</td>
<td>Quick growing</td>
</tr>
<tr>
<td>Slow to establish, should be planted with rye or oats (70%)</td>
<td>Easier to incorporate than rye</td>
</tr>
<tr>
<td>Clover</td>
<td>Rye</td>
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<tr>
<td>Excellent N fixer</td>
<td>Cold-tolerant</td>
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<tr>
<td>Has tap roots; good for remediating compacted soils</td>
<td>Well-developed root system to reduce leaching of nutrients from soils</td>
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<td>Supports beneficial insects</td>
<td>Can be difficult to till in the spring, and can therefore suppress some early crops</td>
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The following is an easy to follow guide for selecting and sowing cover crops from the [East New York Farms Grower Handbook](available online)

**WINTER-KILL COVER CROPS:** Planted in late summer and killed by the winter cold. These don’t grow as much as over-wintering cover crops (see below), but you can plant early spring crops into the dead mulch next season.
- *Peas + Oats*
  - Plant date: mid-August
  - Oats grow quickly + suppress weeds
  - Pea is a legume (fixes N)
OVER-WINTERING COVER CROPS: These are planted in fall and survive the winter. Spring growth adds more organic matter and nitrogen (for legumes), but you need to wait until late April or early May to cut down the cover crop before you can plant vegetables.

- **Crimson Clover or Crimson Clover + Winter Rye**
  - Plant date: early September
  - Crimson clover is a legume (fixes N), + attracts beneficial insects. Somewhat shade-tolerant.
  - Rye grows quickly and produces lots of plant material for soil quality, weed suppression, and mulch.

- **Hairy Vetch or Hairy Vetch + Winter Rye**
  - Plant date: late September – early October
  - Hairy vetch is a legume (fixes N) + attracts beneficial insects.
  - Rye grows quickly and produces lots of plant material for soil quality, weed suppression, and mulch.

SUMMER COVER CROPS: These are planted in the window after early spring crops (like lettuce) and before crops for a fall harvest (like broccoli or kale). These cover crops can shade out weeds and add organic matter in the few months between spring and fall plantings.

- **Buckwheat or Buckwheat + Crimson Clover**
  - Plant date: May – early August
  - Buckwheat grows quickly, suppresses weeds, and attracts beneficial insects. Trim the buckwheat when it starts flowering to give the clover light to grow + fix nitrogen