Tips for Early and Late Season Vegetable Gardening
Today’s Focus:

- Direct seeding or transplanting vegetables for spring and fall vegetable gardens
- Low input approach: raised beds and/or containers, organic methods and good soil stewardship (including cover crops and companion planting)
- Site selection (beds or containers)
- Succession planting/season extension
- Resources
Benefits of Spring Vegetable Gardening

- Pleasant weather = high enthusiasm
- Fewer weeds/insects/diseases (not animals!)
- More sunlight/less canopy
- Less watering
- Your own “spring” vegetables on demand including PEAS
Good Soils: The basis for healthy plants

- Soil Texture: Sand/Silt/Clay


- Soil Biology and Chemistry: Good soil management fosters diverse soil biology and active soil chemistry which increases resilience and nutrient availability
Soil Textural Triangle
Soil Aggregates
It’s Elemental! (and molecular)

<table>
<thead>
<tr>
<th>Chemistry terms</th>
<th>macronutrients: elements needed in large quantities by your body.</th>
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<td>trace elements: elements that are needed in very small quantities to maintain optimum health.</td>
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“The Basic Process of Life”
Plants feed themselves* and the soil

*carbohydrates only

\[ 6 \text{ CO}_2 + 6 \text{ H}_2 \text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2 \]

<table>
<thead>
<tr>
<th>Carbon dioxide from the atmosphere</th>
<th>Water</th>
<th>Organic matter</th>
<th>Oxygen</th>
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Diagram: Sunlight represents the energy source, CO₂ and H₂O react to form C₆H₁₂O₆ (sugar) and O₂ (oxygen).
The Soil Food Web

Figure 3.1 Soil organisms and their role in decomposing residues. Modified from D.L. Dindal, 1978.
Site Selection
Beds or Containers?

- Bright Sun
  Leaf Vegetables: 4 hours
  Root Vegetables: 6 hours
  Fruiting Vegetables: 8+ hours

- Good Drainage
Raised Rows, Beds, Boxes (No Till) (Rows = compaction)
Containers: Many Choices
Containers continued...
Make a Plan:
Think about general layout, succession and interplanting

- Formal or informal
Fill Boxes/Containers with quality soil/media
Soil Test

Soil Testing Laboratory
Rutgers, The State University
ASB II
57 US Highway 1 South
New Brunswick, NJ 08901-8864

Soil Test Report

Date Received: 2012-04-17
Date Reported: 2012-04-27
Serial #: "Rutgers Cooperative Ext. of Passaic County
Crop or Plant: Veggie Garden
Home: vegetable garden, annual

Sample ID: Veggie Garden

Results and Interpretations

pH: 6.50 (Slightly acidic; optimum pH range of many plants except acid-loving species)

Liming Requirement Index: 7.50

The Liming Requirement Index (LRI) is a measure of the buffering capacity of the soil, its resistance to pH change, and is used to determine the appropriate amount of limestone, when necessary. An LRI value near 8.0 indicates low buffering capacity of soil and a lower rate of limestone amendment compared to soil with high buffering capacity (LRI near 7.0).

Macronutrients (pounds per acre)

- Phosphorous: 67.2 (Above Optimum)
- Potassium: 2010 (Above Optimum)
- Magnesium: 749 (Above Optimum)
- Calcium: 4051 (Above Optimum)

by Mehlich 3 extraction

Micronutrients (parts per million)

- Zinc (Zn): 22.45 (Adequate)
- Copper (Cu): 1.16 (Adequate)
- Manganese (Mn): 73.62 (High)
- Boron (B): 2.40 (Adequate)
- Iron (Fe): 330.70 (+-High)

Special Tests Results
No special test data available
Soil pH and Nutrient Availability

How soil pH affects availability of plant nutrients

<table>
<thead>
<tr>
<th>Soil pH</th>
<th>Strongly Acid</th>
<th>Medium Acid</th>
<th>Slightly Acid</th>
<th>Very Slightly Acid</th>
<th>Very Slightly Alkaline</th>
<th>Slightly Alkaline</th>
<th>Medium Alkaline</th>
<th>Strongly Alkaline</th>
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Optimum soil pH range: 6.2 - 7.3
What will you grow?

- So many choices!
- Catalogs and seed packets are a great source of information.
- Choose what you like, and what is practical for your space and your needs
A note on organic seeds

- Why choose organic seeds?
  - Sustainability and non-GMO

- Some sources
  - High Mowing Seeds, Cook’s Garden, Seeds of Change
  - Many traditional seed companies now offer organic seeds (Park, Johnny’s, Burpees)
Start Planting
Starting Seeds Indoors/ Pre-germinating
Vegetables you can plant today and eat within 8 weeks

Arugula, Asian Greens, Carrots*, Chives, Collards, Kale, Lettuces, Mustard Greens, Peas, Radishes, Spinach, Chard

*Carrots take more like 10-12 weeks.

Google: Zone 7 Planting Guide
Companion Planting

- **Mechanisms:**
  - Impart desired characteristics (e.g. acidity, N fixation)
  - Repellants to insects and animals (fragrance)
  - Trap Plants (nasturtiums/aphids)
  - Attract beneficial insects (flowers)
  - Maximize season/root zone (interplant)
  - Provide structure or shade (corn)
  - Bring nutrients from soil depth (perennial grains)
Companion Planting

- [http://www.almanac.com/content/plant-companions-list-ten-common-vegetables](http://www.almanac.com/content/plant-companions-list-ten-common-vegetables)
Enjoy your spring, summer harvest and then...
Thinking Ahead: Intercropping & Succession Planting

- Take advantage of “spaces” in the garden, both physical and seasonal
- Maximize yield and interest
- Build soil health through plant variety/diversity
Thinking ahead: Season Extenders

- For production in early spring, late fall or even over winter
Thinking ahead:
Season Extenders (cont’d)
Cold Frames/Hot Beds
Thinking ahead: Cover Crops

- Bare soils are unproductive and release carbon into the atmosphere as CO₂, contributing to global warming.
- Cover crops keep carbon in the soil and also:
  - Retain soil and minimize erosion/water runoff
  - Legumes Fix N in the soil
  - Foster mycorrhizal fungi
  - Reduce compaction/increase aeration
  - Suppress weeds
  - Add soil organic matter
  - Attract beneficial insects/pollinators
Best Cover Crops for Northeast Gardens*

- Spring: Clovers, Buckwheat, Hairy Vetch
- Late Summer: Oats/Peas mixture, Buckwheat

*Note: Rye, though recommended, can be very invasive and hard to control, as well as allelopathic

*www.gardening.cornell.edu/factsheets/ecogardening/impsoil.html
Legumes “fix” Nitrogen

- Symbiotic relationship between bacteria and plant
- Nodules house bacteria that transform $\text{N}_2$ gas into plant available $\text{NO}_3^-$ and $\text{NH}_4^+$
Continuous Cover (cont’d)
Arbuscular Mycorrhizal Fungi

- A symbiosis between fungus and root (80% of all plants have it)
- AMF hyphae produces glomalin, a glycoprotein that helps create stable soil aggregates (structure)
If using fertilizer, choose the right one. (Nutrients only available in solution)
One last thing…
Consider necessary barriers
Plant something/anything today!
(You’ll be glad you did.)

- Seeds or seedlings out now in beds or containers
- Pre-germinate seeds indoors

Later...

- Interplant summer crops in May
- Sow/plant successively throughout summer
- Sow fall crops in late July
Happy Spring Gardening!

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