The
East New York
GARDENER Handbook
Edited by Deborah Greig 2015

Thank you to:
Daryl Marshal, East NY Farms!
David Vigil, East NY Farms!
Martin Lemos, Cypress Hills LDC
GreenThumb, NYC Parks + Recreation
Dr. Megan Gregory
Mohammad Faroze
NY State Dept. of Environmental Conservation via the Environmental Justice Community Impact Grant Program
Brooklyn Botanic Garden
Just Food
596 Acres

This project is funded by Northeast SARE
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As part of UCC + in partnership with local residents, the EAST NEW YORK FARMS! PROJECT improves access to fresh + healthy food, builds community + creates opportunities for youth to become leaders + form strong relationships with adults. We have been working with youth, gardeners, farmers, + entrepreneurs to build a more just + sustainable community since 1998.

Together, we are growing food, nurturing leaders, + cultivating community in East New York.

East New York Farms! primary programs include:

- **YOUTH LEADERSHIP** - We run a paid youth program from March-November for over 30 youth ages 13-18.

- **ACCESS TO HEALTHY FOOD** - We run a weekly farmers market + a market stand from July-November, educate community members + businesses about healthy, seasonal food + grow food in our own ½-acre youth-run farm.

- **GARDENERS GROWING MORE FOOD** - We run workshops, provide technical assistance + resources to over 100 individual gardeners in over 30 backyard + community gardens.
ENY FARMS! CAN HELP YOUR GARDEN GROW!

We provide a range of assistance to gardeners to increase production of fresh, healthy food for the neighborhood.

GARDEN ASSISTANCE

- **INDIVIDUAL ASSISTANCE:** Schedule a crop planning or garden support session with a staff member.

- **YOUTH PROGRAM:** Over 30 young people participate in our Internship Program from March-November. They work with gardeners to form positive, supportive relationships. Gardeners can schedule youth to work on general or specific garden tasks.*Gardeners MUST attend our annual Spring workshop to get youth help.*

- **VOLUNTEERS:** We can connect you with volunteer groups for big projects. These groups may be able to provide supplies. Talk to our Volunteer Coordinator for more details.

WORKSHOPS + EVENTS

- We provide WORKSHOPS around the neighborhood on everything from “Beginning Gardening Tips” to “Beekeeping” to “Selling at Market”.

- We can provide support (supplies, refreshments, cooking demos + fliers) to gardens interested in hosting EVENTS for the public.

SUPPLIES

- **FREE SUPPLIES** (like trellising, row cover, weed cloth/plastic, + seeds) are available for gardeners at workshops + giveaways.

- We have tools to borrow; if you need a lot, request them at least 1 week in advance (shovels, wheel barrows, etc...).

- **THE BACKYARD EXCHANGE** loans out power tools (circular saw, weed whacker, tiller + more). Call Dennis at 646.739.7118 for more info.

- **SEEDLINGS:** We grow high-quality, affordable + unique vegetable seedlings (transplants) so that you can get a head start on the season. Get your plants at our PLANT SALE in May!

- **COMPOST** is often available for gardeners in the Spring at our give-away. If you need a compost bin, let us know.
GARDEN MEMBERSHIP

- If you need space to grow, look at our list of “GARDENS THAT NEED MEMBERS”. With your energy, our gardens can thrive.
- If your garden needs MORE MEMBERS, talk to our Gardener Assistance Staff for help!

SELLING AT THE FARMERS MARKET  Growing for market can provide people in the community with healthy food for their families, + help earn money for you + your garden.
- THE SHARE TABLE is a collective way for gardeners sell their produce.

SMALL GRANTS

- Local residents, organizations, + businesses with projects that promote access to healthy food in our community, can talk to East New York Farms! for information about small grants + for help writing a strong application.

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East New York Farms! is a partnership between gardeners + UCC staff...

This is WHAT YOU CAN DO to help us to supporting gardens:

1. HELP DEVELOP YOUTH LEADERS. Take the time to speak directly with youth + help them learn.
2. MAKE YOUR COMMUNITY GARDEN WELCOMING. Host events + open hours, keep your gate open, + post clear information about how new members can join. Everyone will be more supportive of community gardens if we show that they are for the community!
3. SELL AT THE MARKET. Help thousands of market customers find healthy, fresh food. Most of our customers use EBT, WIC, + Senior coupons.

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For info about East NY Farms!, join our email list, check our Facebook, Events Calendar, www.eastnewyorkfarms.org, call “Gardener Assistance” at 718.649.7979
OR
Visit us at United Community Centers 613 New Lots Ave!
Chapter 1

PLANNING YOUR GARDEN
WHY CROP PLAN?

The following pages will give you ideas for creating your own Crop Plan that can help you grow healthy food all season long.

A CROP PLAN CAN HELP YOU:

- Decide **WHAT + WHERE** to plant.
- Figure out **WHEN + how often** to plant by learning ways to keep your plot **PRODUCTIVE ALL SEASON LONG**.
- Prevent **DISEASES + PESTS**. Crops in the same plant family attract the same pests + diseases. Using a crop rotation-of leaf (e.g. kale), root (e.g. carrots), + fruit (e.g. tomato) - can help break the cycle.
- Each plant family takes up different **NUTRIENTS**. Crop rotation helps minimize nutrient depletion from the soil.
- A **GARDEN MAP** can help you figure out where you will rotate your crops each season. Look back at old maps to make sure you are moving your plants from year to year (we recommend a 3 year rotation).

“I made an appointment and (soon) realized that Crop Planning is the way of the future... Each plot will maximize its full potential to produce... (It) is essential in teaching growers how to continuously eat (and grow) a variety of fresh healthy vegetables throughout the growing season (for us and) our community.”

- Barbara, East NY Community Gardener
The **NYC URBAN PLANTING CALENDAR** lists planting dates for vegetables + fruit grown in the NYC area. These are recommended, based on the experience of gardeners, to get the best results no matter what the season is like.
NYC URBAN PLANTING CALENDAR
CONTINUED...

Source: Cornell Cooperative Extension, Gotham Gardener 1992 + the Just Food’s City Farms Toolkit
**SOIL** is made up of solids, liquids, gases, minerals, and organic material. It is usually teeming with microscopic organisms that help break down materials and feed your plants. Treat it as a living substance that needs to be fed and cared for. **START WITH THE SOIL;** if your soil life is healthy, your plants will grow healthy, strong, and full of flavor.

**IMPROVING YOUR SOIL**

**COMPOST** is like a multi-vitamin for your soil. It is a mixture of broken down green (nitrogen-based) and brown (carbon-based) materials. You can buy it, sometimes get it from the city, or make it yourself by combining things like vegetable + fruit scraps, dry leaves or torn up compost, water, air + time. When applied to your soil, it will look like rich, black earth that will give soil microbes + plants a chemical-free boost.

**COVER CROPS** are often called “green manure” because they offer many of the same benefits of chemical-free fertilizers like compost or manure. They also offer other perks that keep your soil healthy and productive all season.

**SOIL TESTING** is the most important indicator of what nutrients you need to add to your soil. It is also the only way to detect harmful contaminants that may have come from previous uses of your garden site. Soil tests cost around $10 for lead to $30 or more for nutrient + heavy metals tests.

**LEAD** is the most common contaminant found in urban soils. It can come from historical factors: past automobile exhaust or old paint chips. There is no clear standard for what is considered “safe” but normal soil levels are under 120ppm (300ppm is considered safe for adults).
If you are concerned about HEAVY METAL CONTAMINATION, there are many ways to keep gardening while addressing the issue:

PRECAUTIONS INCLUDE:

- WASH all crops well
- Avoid eating root crops.
- Add ORGANIC MATTER (like compost + woodchips) to bind up metals so that your crops do not absorb them as easily.

- Keep NEUTRAL SOIL PH levels (at or close to 7).
- MULCH + use COVER crops to keep the dust down, wear gloves + wash hands after gardening.
- Grow crops in RAISED BEDS or containers with clean soil.

Raised beds made from recycled scaffolding lumber from Build It Green

SOIL TESTING RESOURCES

- **Brooklyn College**: Environmental Sciences Analytical Center
  Phone: 718.951.5000x2647
  Website: www.brooklyn.cuny.edu/web/academics/centers/esac/services/soil.php

- **Cornell University**: Cornell Nutrient Analysis Lab (CNAL)
  Phone: 607.255.4540
  Email: soiltest@cornell.edu
  Website: cnal.cals.cornell.edu

- **Logan Labs**: *Micro-nutrients test only*
  Toll Free Phone: 888.494.SOIL
  Website: www.loganlabs.com

- **UMASS Amherst**: Soil Testing Lab
  Phone: 413.545.2311
  Email: soiltest@umass.edu
  Website: http://soiltest.umass.edu/ordering-information

Based on materials from GreenThumb, Bronx GreenUp/NYBG + Just Food’s City Farms Toolkit
**COVER CROPS** are often called “green manure” because they offer many of the same benefits of chemical-free fertilizers like compost or manure. They also offer many other perks that keep your soil healthy and productive all season.

**HOW CAN COVER CROPS HELP YOUR GARDEN?**

- Protect the soil from **erosion** by wind, rain, + snow
- Improve **soil structure** by creating pores, which increase aeration + help the soil hold water
- Improve **soil quality** by feeding soil critters, like nitrogen fixing bacteria
- Add **nutrients** to the soil, especially after heavy feeding crops like tomatoes + cabbages
- Prevent **weeds** early in the season
- Attract **beneficial insects**
- Increase **crop yields**

**HOW TO PLANT COVER CROP**

**CHOOSE A COVER CROP:** Use the chart on the next page to find a cover crop that fits your needs.

**PLANT THE SEED:** It’s OK if you still have crops in your garden bed; you can “under-seed” the cover crop beneath them! Plant 6 weeks before the 1st frost (~October 15th).

- **Clean your plot.** Remove weeds, stake + prune crops that are still producing. This creates space + light for the cover crop to grow.
- **Rake the soil** to create a fine seedbed.
- **Spread the seed** evenly + gently rake in.

**TURN INTO THE SOIL IN THE SPRING:**

- **Cut down** cover crops right above the root as they begin to flower, in April-early May. Leave them as mulch, or dig them into the soil.
- **Wait 2-3 weeks before planting** to allow time for the plant material to break down.
**WINTER-KILL COVER CROPS:** Planted in late summer + 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 + survive the winter. Spring growth adds more organic matter + 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 + produces lots of material for soil quality, weed suppression, + 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, + mulch.

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

**Buckwheat or Buckwheat + Crimson Clover**
- Plant date: May - early August
- Buckwheat grows quickly, suppresses weeds, + attracts beneficial insects. Trim the buckwheat when it starts flowering to give the clover light to grow + fix nitrogen.
There are many ways to reduce **INSECT PESTS, DISEASES + WEEDS** in the garden.

One of the most helpful ways to deal with them is to **learn about them**: which ones are **beneficial** or harmful, their habitat, their life cycle, what they eat + their behavior.

**DEFINITIONS**

- **PESTS** are organisms that damage your crops.
- **DISEASES**, bacteria, fungi + parasites effect overall plant function.
- **WEEDS** are plants that are growing where they are not wanted. They can negatively impact the crop you are trying to grow. Ex. if a tomato plant is in a bed that has collards in it, it can cause spacing issues + could be seen as a weed.
- **INTEGRATED PEST MANAGEMENT (IPM)** uses different strategies to address pests in the garden. Instead of using chemical pesticides, there are many options that can minimize plant damage. IPM, is a process you can use to solve pest problems while minimizing risks to people + the environment. It works to develop **long term pest management strategies**. IPM can be used when dealing with weeds + disease as well.

**IPM STRATEGIES TO KEEP YOUR PLANTS HEALTHY**

1. **START WITH THE SOIL**: Soil fertility, moisture level + Ph can effect the health of your plants. Make sure you do regular soil tests + that your plants have the proper nutrients available to them. The easiest way to do this is to apply **COMPOST** every season.

2. **CHOOSE RESISTANT or TOLERANT VARIETIES** to pests + diseases. Ex. Wilt resistant cucumbers produce for longer.

3. **INSPECT PLANTS** before planting. It is important to start with healthy plants. Unhealthy plants may never yield as much as healthy ones or may die while young. If you save your own seed, harvest from healthy plants, dry it well + store in a cool, dry place to prevent disease from spreading.
4. SPACE PLANTS TO ALLOW AIR CIRCULATION: High humidity + moisture encourage the development of diseases + increase pest presence. Allowing enough room for plants to grow + space for air to circulate promotes rapid drying of leaves + fruit.

5. TIME OF PLANTING: Plant crops at times that avoid the most active feeding stage of an insect’s life or certain weed pressures. Ex. plant zucchini in early July to avoid squash vine borer damage.

6. WATER: Most plants require 1 inch of water per week. Water in the morning so they dry off quickly. Avoid using overhead sprinklers - they can spread infections. Drip irrigation puts water directly at the root zone + does not wet the plants. Plant in raised beds with good drainage, or mulch with straw to help retain moisture.

7. CLEAN UP: Remove weeds + plant debris, which can be ideal places for insects to overwinter + infect new plants the next season. Composting, unless the pile becomes very hot, does NOT eliminate pathogens from plant debris. Always remove plants that show signs of disease + put them in the trash.

8. PLANT PARTNERSHIPS:

   - Companion Planting - Some plants contain compounds that repel insects + can provide control for some pests, ex. garlic will deter aphids. Some plants attract beneficial insects that help pollenate or eat pests.

   - Diversified Planting - Plant different crops together to force pests to search for food + expose them to predators.

   - Trap Plants - Place plants that lure insects away from crops to isolate pests. Once the trap plants become infested remove the plant.

9. PHYSICAL BARRIERS around plants can control pests:

   - Cardboard collars or disposable cups 4 inches high + placed 2 inches deep in the soil around young plants can prevent cutworms, cabbage maggot fly + squash vine borers from depositing eggs on the plant.

   - Mulches- Back plastic, straw + other ground covers keep weeds down, heat up the soil + keep in moisture.
MANAGING PESTS

- **Row cover** is placed over plants until the pest is gone or the plants are large enough. All covers should be removed as temperatures become too hot. Be careful not to leave the cover on! Some plants need to be insect pollinated or they will not yield a crop (cucumbers, melons + squash.)

- **Traps**, like yellow sticky boards, can be used to track insect populations, but are seldom helpful with a major issue. They can help to manage whitefly populations as long as sticky material is replaced when insects cover the boards.

- **Spray soap or clay**- Soapy water sprayed on beetles will dehydrate them, killing them within a minute. Some growers coat their plants with kaolin clay. When some pests come in contact with the clay, they focus entirely on cleaning themselves, rather than destroying the plant.

10. **HAND-PICKING**: Remove pests by taking them off the plant + placing them in a bucket of soapy water.

11. **ROTATE CROPS**: Planting the same crop in the same place year after year may cause pest + disease buildup. Rotate plants of the same type to different areas to help break the cycle.

12. **PLANT FALL COVER CROPS**: After cleaning up the garden, plant a cover crop. This “green manure” will grow thickly + reduce weed pressure. In the Spring, turn it into the soil or add it to your compost. They can also reduce the populations of certain soil-borne disease agents. Ex. mustard greens release natural chemicals that can reduce the number of soil borne pathogens.

13. **ESTABLISH GOOD RECORD KEEPING**: As a gardener, detailed notes on pests, diseases + weeds can help in planning for the following season.

14. **BENEFICIAL INSECTS, BACTERIA+ FUNGHI** support pollination, nutrients absorption + pest control. Attract beneficial insects by growing flowering + native plants in the garden, which provide additional food + habitat for predators of insect pests.

*A tomato horn worm being parasitized by wasp eggs*
1. APHIDS

IDENTIFICATION: Aphids are small, pear-shaped bugs that live in groups on the underside of leaves. Some have wings, some don’t. Some are white, others grey, red, brown, or black. Adults suck sap out of the leaves of many vegetables, fruit, or trees, leaving them lifeless.

LIFE CYCLE: There are almost always aphids in a garden. Trouble comes when the population grows.

WHAT DO I DO?!
- Lacewings feed on aphids, so planting flowers that attract them is a great way to keep their numbers down.
- Spray soapy water.

2. FLEA BEETLES

IDENTIFICATION: Flea Beetles are small, oval-shaped beetles. They hop like fleas around the garden + eat various crops. Their favorites include bok choi, cucumbers + eggplants. Adult flea beetles make many tiny pin holes. Their larvae, meanwhile, feed on a plant’s roots + tubers.

LIFE CYCLE: Flea Beetles overwinter as adults + wake up in May.

WHAT DO I DO?!
- Use row cover to protect young plants.
- Keep weeds in check to reduce the beetle's habitat.

3. WHITEFLIES

IDENTIFICATION: Whiteflies are tiny, sap-sucking insects. They excrete sticky honeydew, so leaves may be sticky or covered with black mold, + cause yellowing or death of leaves. The honeydew attracts ants that interfere with the activities of natural enemies that may otherwise control the whitefly, causing to occur.

LIFE CYCLE: Whiteflies develop rapidly in warm weather. Most
have a wide host range that includes many weeds + crops. **WHAT DO I DO?!**: Whiteflies can’t be controlled with insecticides.

- **Hand-remove** heavily infested leaves or plants to reduce populations to levels that natural enemies can contain.
- **Water sprays** may also be useful in moving adults.
- Aluminum foil or **reflective mulches** can repel whiteflies. When it gets too hot, remove mulches to prevent burning plants.
- **Sticky traps** can be used to reduce numbers.
- **Soaps or oils**, such as neem oil, may reduce but not eliminate populations.

### 4. CUCUMBER BEETLES

#### IDENTIFICATION:
Cucumber Beetles are oval-shaped insects, yellow + black in color, striped or polka-dotted. They eat all cucurbits (melons, squashes, +, of course, cucumbers). Their impact comes from causing **plant disease**, including squash mosaic virus, powdery mildew, +, worst of all, **bacterial wilt**, which prevents nutrients from traveling through the plant, killing a healthy cucurbit in as little as 7 days.

#### LIFE CYCLE:
Beetles over-winter as adults in bordering vegetation + plant debris. They actively start feeding as days get warmer in the Spring + Summer.

**WHAT DO I DO?!**: Control measures for Cucumber Beetles are the same as for Flea Beetles (physical barriers, hand picking, soapy water, keeping weeds down). If you already know that cucumber beetles frequent your garden, take proactive measures:

- **Trap crops**: A week or two before your cucurbit planting date, plant a border of decoy cucurbits around your planting area. The bugs will be attracted to this area, which will make the rest of your cucurbit beds less appetizing to them.
- **Plant Late**: Wait a few extra weeks until after the first cycle of cucumber beetles passes.
- **Cover** plants with row cover. Remove the cover once the plants start flowering to allow for pollination!
- **Hand Pick** by removing as many pests as you can then cover them to prevent more beetles from landing on them.
- **Sticky traps** can be effective; attach a little tea bag to the sticky paper with attractive floral scents, such as cinnamon, cloves or bay leaves.
- **Spray with soap or clay:** Soapy water sprayed on beetles dehydrates them, killing them within a minute. When the beetles come in contact with clay, they get dusty and focus on cleaning themselves vs. destroying the plant.
- **Clean Up** in the Fall makes it easier the next Spring. Cucumber beetles overwinter soil + leftover plant debris.

## 5. SQUASH VINE BORER:

**IDENTIFICATION:** Adult borers resemble a wasp. It is about 1/2 inch long with an orange abdomen with black dots. The larvae are white with brown heads, growing to almost an inch in length.

**LIFE CYCLE:** In late June/early July, adults emerge from cocoons in the ground. Soon after emerging, borers lay eggs at the base of susceptible plants (summer squash, winter squash + pumpkins). One week later, the eggs hatch + larvae bore into the stems causing the stem to wilt + blocking the flow of water to the rest of the plant. Close inspection reveals holes filled with moist orange sawdust-like material called *frass*. They feed for 4-6 to weeks, then burrow into the soil + stay there until the following Summer. There is one generation per year.

**WHAT DO I DO?!:**
- **Scout** for adult borers starting the last week of June.
- **Yellow trap pans** or container filled with water, can detect borer adults. Adults are attracted to yellow + get trapped when they fall into the water. Place traps by late June, + check least once a day. When you notice squash vine borer adults in your traps you know it is time to take action.
- **Plant crops** that are not attacked by squash vine borers, such as butternut squash, cucumbers + melons.
- **A 2nd planting** of squash in early July will mature after adult borers have finished laying eggs.
- **Pull + destroy** any plants killed by squash vine borers.
- **Remove larvae + bury the damaged stem.** It will grow new roots + recover.
- **Place row cover** over your crops. Be sure it is secure to prevent adults from moving underneath. **Caution:** Do not use row covers when crops are flowering, it prevents pollinating + vegetables production.
**SOME COMMON DISEASES FOUND IN EAST NY**

1. **BACTERIAL WILT ON CURCUBITS** (cucumbers, squash + melon):
   **IDENTIFICATION:** Cucumbers + melons are severely affected. Leaves wilt + die rapidly. It is most severe early in the season when plants are rapidly growing. Foliage appears yellow before entire plant dies.

   **LIFE CYCLE:** This disease is spread by the cucumber beetle. Beetles feed on leaves then bacteria multiply in wounds + spread, resulting in wilting of plants.

   **WHAT DO I DO?!:**
   - Crop rotation reduces beetle numbers.
   - Remove infected leaves or plants immediately.
   - Use Row cover to exclude beetles.

2. **DOWNEY MILDEW CURCUBITS**
   **IDENTIFICATION:** This is one of the most devastating foliar diseases of cucumber, melon, squash + pumpkin. It becomes prevalent under favorable temperature + humidity conditions.

   Only leaves are affected by the disease. Spots are pale green then turn yellow before the tissue dies. Several spots occur together in a group. Spores of the downey mildew are purplish grey + develop on the underside of leaves.

   **LIFE CYCLE:** This disease only infects the cucurbit family. Source of infection is wind blown spores spread within a garden through air currents, rain splash, workers + tools.

   **WHAT DO I DO?!:**
   - Scout crops weekly for symptoms.
   - Plant in areas with full sun.
   - Avoid overhead irrigation, use drip instead.
   - Use generous spacing to increase good air circulation.

3. **LATE BLIGHT ON TOMATOES**
   **IDENTIFICATION:** This disease mostly affects potatoes + tomatoes. It is a “community disease” + spreads easily through wind + rain. It can destroy an entire crop in a few days.

   Classic symptoms are large olive green to brown spots on leaves with white fungal growth on the underside when conditions are humid.
Sometimes the infected plants have a water soaked appearance. Leaf lesions begin as tiny, irregularly shaped brown spots. Also brown to blackish lesions may develop on upper stems. Firm brown spots may develop on tomato fruits.

**LIFE CYCLE:** It can survive in potato tubers saved from the previous year + in infected crop debris. It also needs living tissue to survive. *It is different than Early Blight which can be controlled by pruning.

**WHAT DO I DO?!:**
- Regularly check with other community gardeners.
- Learn the symptoms.
- Start season with disease-free transplants.
- Plant resistant varieties.
- Regularly inspect plants for symptoms.
- Work in affected plots last + not when it is raining.
- Throw all tomato volunteer plants, infected tomato transplants + weeds, such as hairy nightshade, which are disease hosts, in the TRASH.

### 4. BLOSSOM END ROT ON TOMATO

**IDENTIFICATION:** This is common in plants that are exposed to a period of drought. When the roots fail to reach sufficient water + calcium the fruit tissues break down. They become rotted on the bottom. Initially a small, spot appears, which grows + darkens rapidly as the fruit develops. The spot can cover as much as 1/2 of the entire fruit surface. Large lesions soon dry out + become flattened + black.

**LIFE CYCLE:** Symptoms can occur at any stage of fruit development, but most commonly, are seen when fruit is 1/3rd to 1/2 full size.

**WHAT DO I DO?!:**
- Plant in well drained, aerated soils.
- Mulch plants to conserve moisture in times of stress.
- Avoid disturbing soil too near the plants so as not to damage feeder roots.
- Maintain an even supply of water + avoid extreme fluctuations.
- Use eggshells to build calcium in the soil.
WEEDS compete with crops for water, light + nutrients. They also interfere with harvesting, reduce yields, harbor insects + diseases. The most effective ways to control weeds are physical + cultural methods such as crop rotation + keeping nearby weeds from seeding.

PHYSICAL WEED MANAGEMENT OPTIONS

- **HAND WEEDING**: Remove weeds by the root.
- **CULTIVATION**: Remove weeds when they are as small as possible to minimize crop disturbance + before they go to seed.

CULTURAL WEED MANAGEMENT OPTIONS

- **COVER CROP**: Growing cover crops (as a “green manure”) has many benefits. They suppress weeds by blocking sun + water, compete for nutrients, releasing plant growth-inhibiting substances (allelopathy), + by altering soil microbes that put certain weeds at a disadvantage.
- **LIGHT TILLAGE**: Soil disturbance kills germinated weeds + moves seeds to the surface where they can germinate. Repeated tillage before planting will reduce weed seed accumulation if you knock them down a few times. No tillage reduces the stimulation of weed seeds as well.
- **Plant Competition**: Using transplants gives you a head start on weeds + can shade them out.
- **Mulches** can be organic (hay, straw, etc.) or inorganic (black plastic, etc.).
- **Time**: The older the seed, the less likely it is to germinate; If you have compost with weed seeds, waiting a few seasons to use it ensures that those seeds are too old to germinate.

Common Weeds in East New York: weedy callaloo, chickweed, dock, galinsoga, Japanese knot weed, morning glory, mugwort, sticky weed/carpet weed + more!
THINK ABOUT S.P.A.C.E:
Your seeds + seedlings are small now, but they grow into much larger plants. The way they are spaced in your bed effects their health + production.

SPACE: Some plants need more space; a tomato gets much bigger than a radish! Think about how big plants will get before planting them.

PRODUCTION:
If plants are too close, they won't have enough room or nutrition from the soil to grow + produce more for you. *It is important to “thin” (take out some baby plants or all of your plants will be stunted).

AIR: Air between plants helps reduce the spread of diseases and pests. If plants are too close, they will brush up against each other + quickly spread these problems.

YOUR SEED PACKET: Read your seed packet for spacing suggestions.

EFFICIENT TECHNIQUES Continued on the next page...
EFFICIENT TECHNIQUES:

- **Interplant**: Use your space efficiently by trellising plants that climb (cucumbers) or place plants that are smaller or quick to harvest next to ones that are slow to grow (e.g. basil along side your tomatoes.)

- Try to place tomatoes, cucumbers, + squash near the center of your bed. Then they wont spill into the pathways.

- **Trellis + prune** plants like cucumbers + tomatoes to promote air flow + enable inter-planting.

- Plant in a **TRIANGLE** (offset) pattern to give your plants more space:

![Diagram showing plant spacing and trellising techniques]

Plant slow growing scallions with quick lettuce.
<table>
<thead>
<tr>
<th>VEGETABLE</th>
<th>BETWEEN ROWS</th>
<th>IN ROW</th>
<th>HOW TO PLANT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radishes, Carrots, Beets, Turnips</td>
<td>8”</td>
<td>2”</td>
<td>Direct Seed, one seed every inch + then thin to correct spacing</td>
</tr>
<tr>
<td>Garlic</td>
<td>10”</td>
<td>6”</td>
<td>In November, plant 1 clove to get one head of garlic</td>
</tr>
<tr>
<td>Cilantro, Parsley</td>
<td>8”</td>
<td>4”</td>
<td>Direct Seed, one seed every inch + then thin to correct spacing</td>
</tr>
<tr>
<td>Celery</td>
<td>10”</td>
<td>10”</td>
<td>Transplant, very slow growing</td>
</tr>
<tr>
<td>Lettuce heads, Bok Choy, Mustard Greens</td>
<td>8-10”</td>
<td>10”</td>
<td>Transplant or Direct seed. For small leaves like salad mix, sow every inch in rows 5” apart.</td>
</tr>
<tr>
<td>Peppers</td>
<td>12”</td>
<td>18-24”</td>
<td>Transplant</td>
</tr>
<tr>
<td>Cucumbers</td>
<td>18”</td>
<td>12”</td>
<td>Direct seed or Transplant, can trellis</td>
</tr>
<tr>
<td>Summer/Winter Squash</td>
<td>24”</td>
<td>24”</td>
<td>Direct Seed or Transplant</td>
</tr>
<tr>
<td>Tomatoes, Okra</td>
<td>18”</td>
<td>24-30”</td>
<td>Transplant tomatoes; direct seed okra at the end of May when the ground is warm.</td>
</tr>
<tr>
<td>Eggplant</td>
<td>12”</td>
<td>18-24”</td>
<td>Transplant</td>
</tr>
<tr>
<td>Kale, Collards</td>
<td>12”</td>
<td>12-15”</td>
<td>Transplant or Direct seed</td>
</tr>
<tr>
<td>Swiss Chard</td>
<td>12”</td>
<td>12”</td>
<td>Every 2 or 3 weeks during the spring + late summer</td>
</tr>
<tr>
<td>Beans</td>
<td>12-18”</td>
<td>6”</td>
<td>Direct seed one seed every 3” + thin to correct spacing</td>
</tr>
<tr>
<td>Bitter Melon</td>
<td>18”</td>
<td>24-30”</td>
<td>Transplant + trellis</td>
</tr>
</tbody>
</table>
**TRELLISING**

Trellising certain crops is a great way to **save space in the garden, reduce disease, add support, increase production, make harvesting easier, and enhance the overall health of your plants!**

**WHAT CAN I TRELLIS?**

Trellising works best with **fruiting crops**. Many crops are naturally sprawling and can be grown vertically with a little support. **Trellis:**

- Bitter melon
- Cucumbers
- Eggplants
- Melons
- Malabar Spinach
- Peas
- Pole beans
- Peppers
- Tomatoes

**WHEN DO I TRELLIS?**

Put up your trellis **before** the plant needs support. It is really difficult to trellis once your plants are big. Use a correct spacing, pruning, and trellising from the start of the season.

**HOW DO I TRELLIS?**

There are many different trellising methods. You can use found or purchased materials, and existing fences. It is important to start off with a strong structure to support your plants. They seem small now, but they will get big! The metal tomato cages and other prefab trellis are often not strong enough and can make it difficult to harvest and prune.

**TYPES OF TRELLISING**

1. **THE FLORIDA WEAVE**

   for tomato, pepper + eggplants:

   This technique uses strong posts (6ft u-posts or 2x2’s pounded at least 1.5ft in the ground)
A. Pound in a U-Post at either end of the row at an angle. Posts can be placed every 2 to 4 plants in a row.

B+C. Add a level of string that can be tightened throughout the season to both sides of the plants.

D. Add a level of string every time the plants grow. During the height of the season, this can be every week!

E. For tomatoes you can prune the plants to promote tastier fruits + reduce diseases.
2. WIRE OR PLASTIC MESH + POSTS:
Vertical trellising works well for pole beans, bitter melon, + cucumbers.

1. Pound in a U-post at an angle at the each end of the bed.

2. Space tall posts about 8 feet apart (or less)

3. Weave the netting over the tall posts

4. Weave string through the top row of the trellis + wrap around the top of each post to keep the netting from slipping as crops

KNOTS
Learning a couple handy knots makes your trellis easy to tighten + take down.

THE TRUCKER’S HITCH is one of those knots that, once you learn it, you wonder how you got along without it! This combination of knots allows you to pull string as tight as a guitar string.
TRUCKER’S HITCH Continued...

1. Tie off one end of the rope.

2. Tie a slippery half hitch in the middle of the line to form a small loop.

3. With free end make a turn around a fitting + bring the free end back up to the loop in the line. Feed through + pull line very tight.

4. Secure the knot with the tension in the line with one or two half hitches (over hand knots) tied to snug to the loop.

HALF HITCH Use this in combination with other knots. Use two stitches to tie a rope to any object.

SLIPPERY HALF HITCH Use this knot with the Truckers Hitch when tying trellis so that you can undo your knot to tighten the strings supporting your plants if they get loose.
PLANTING A CROP MULTIPLE TIMES
throughout the season lets you harvest, eat or sell from June to November.

<table>
<thead>
<tr>
<th>CROP</th>
<th>SCHEDULE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bush Beans</td>
<td>Every 2 or 3 weeks</td>
</tr>
<tr>
<td>Beets, Carrots, Turnips</td>
<td></td>
</tr>
<tr>
<td>Lettuce, salad + mustard greens</td>
<td></td>
</tr>
<tr>
<td>Cilantro</td>
<td></td>
</tr>
<tr>
<td>Bok Choi</td>
<td>Monthly</td>
</tr>
<tr>
<td>Cucumbers, summer squash</td>
<td>2\textsupscript{nd} + 3\textsupscript{rd} plantings at monthly intervals will keep quality high</td>
</tr>
<tr>
<td>Basil</td>
<td></td>
</tr>
<tr>
<td>Kale, Collards</td>
<td>Spring + mid-summer</td>
</tr>
<tr>
<td>Spinach, Chard</td>
<td>Every 3 weeks during the spring + late summer</td>
</tr>
</tbody>
</table>

TIPS:

- Experiment with different cold or heat-resistant varieties.
- Be aware of the frost dates (May 15\textsuperscript{th} + October 20\textsuperscript{th}); anything planted too close to the frost date will not get enough daylight + can freeze if not under cover.
- Try season extension methods like row cover + cold frames to extend your season at either end.
Plant vegetables for **FALL HARVEST** during the Summer months. We are lucky to have the longest growing season in NY State; the cool days + nights of Fall are ideal for growing Fall crops.

Planting times should correspond to harvesting vegetables around the time of the first frost in this area (~Oct 20th), even though harvest can extend well up through Thanksgiving.

<table>
<thead>
<tr>
<th>TYPE</th>
<th>CROP</th>
<th>DATE TO PLANT</th>
</tr>
</thead>
</table>
| Brassicas               | Broccoli, Cabbage, Cauliflower, Collards, Kale | **Seed:** July 15-30th  
Transplant: August 15-20th |
|                         | Kohlrabi, Mustard Greens      | **Seed:** August 1-20th      |
|                         |                               | **Seed:** July 1-10th  
Transplant: July 15-30th   |
|                         | Brussels Sprouts              | **Seed:** August 1-20th      |
| Leafy Greens + Herbs    | Bok Choi                      | **Seed:** August 1-20th      |
|                         | Lettuce, Arugula, Basil, Cilantro | **Seed:** August 15- 
September 1st  
Transplant: July 15-30th   |
| Roots                   | Beets, Carrots, Turnips, Radish | **Seed:** August 15- 
September 1st               |
|                         | Onions                        | **Sets/transplants:** August 15- |
| Bush Beans + Peas       |                               | **Seed:** August 10-20th    |

Based on materials by Cornell Cooperative Extension

Plant vegetables for FALL HARVEST during the Summer months. We are lucky to have the longest growing season in NY State; the cool days + nights of Fall are ideal for growing Fall crops.

Planting times should correspond to harvesting vegetables around the time of the first frost in this area (~Oct 20th), even though harvest can extend well up through Thanksgiving.

<table>
<thead>
<tr>
<th>Sept 1-Oct 20=50 Days</th>
<th>Aug 15-Oct 20=66 Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aug 1-Oct 20=81 Days</td>
<td>July 15-Oct 20=97 Days</td>
</tr>
<tr>
<td>CROP + VARIETY</td>
<td>Example: “Raven” Zucchini</td>
</tr>
<tr>
<td>----------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>PLANTING LOCATION</td>
<td>Bed #6</td>
</tr>
<tr>
<td>SEED OR TRANSPLANT</td>
<td>Transplant</td>
</tr>
<tr>
<td># OF PLANTS NEEDED</td>
<td>5</td>
</tr>
<tr>
<td>SPACING</td>
<td>1 row; 1 plant every 2 ft; 10ft total</td>
</tr>
<tr>
<td>PLANTING DATES</td>
<td>May 5th, July 10th</td>
</tr>
<tr>
<td># OF PLANTINGS PER</td>
<td>2</td>
</tr>
<tr>
<td>PLANTING LOG</td>
<td>PLANTING LOCATION</td>
</tr>
<tr>
<td>--------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Year:</td>
<td></td>
</tr>
</tbody>
</table>

Based on materials by JustFood