CULTURAL PRACTICES AND GARDEN MAINTENANCE

Planting healthy seeds/transplants in healthy soil is just the start. Throughout the season, your garden must be watered, weeded, and kept free of pests and disease. There are important, labor saving steps to take to make sure your garden remains healthy and productive throughout the growing season.

Watering/Irrigation

Ways to Water your Garden

- By hand with a watering can, bucket or any other container
  - -This method is labor intensive and inefficient and should not be the primary way your garden is irrigated.
- With a garden hose
  - -While more efficient than watering by hand, it can still take a lot of time to give. Your entire garden enough water to thrive using this method, unless only managing a few beds.
  - -Watering with a hose allows moisture to get on the leaves of your plants; this may cause increased disease problems.
- With a sprinkler System
  - -Sprinklers free up time and reduce labor; the user can turn them on and leave, or work on other projects.
  - -Some water will be wasted to evaporation and to areas that don't need to be watered such as your pathways.
  - -Also with this method, moisture will get on the leaves and encourage disease.
- Drip irrigation system (highly recommended for larger gardens or farms)
  - -Water is delivered right to the roots of the plant where it is needed; very little is wasted.
  - -The only time/labor that is required is set up, and to turn it off and on; it can also be put on a timer.
  - -Moisture from irrigation is kept off the leaves decreasing the chance of disease.
  - -Water is introduced gradually which is better for the plants.
  - -There is some up-front cost for the system, and drip tape must be replaced each year.
  - -Can be intimidating for first time users to set up.

When to Water

When you water can be just as important as how you water in terms of disease control and plant health.

- The preferred time to water is in the morning, when water has more time to enter the soil and be taken up by plants before it evaporates.
  - -Moisture that gets on the leaves will evaporate as the day heats up.
- Watering in the evening or after dark is not recommended for vegetable as moisture on the leaves may not be allowed to evaporate until the following day creating potential for disease (less of an issue with drip irrigation).
- Watering during the heat of the day is not recommended as this can damage your plants and waste water to evaporation.

How Much to Water

Plants require sufficient water to survive and stay healthy, but too much water can be just as harmful to your plants as a lack of water. Also, different plants have different watering requirements; and temperature as well as humidity play a role in how much water plants will use.

- Most vegetable crops require around 1 inch of water per week.
  - -More will be needed if the air is hot and/or dry.
  - -Less may be required if cool and wet conditions prevail.
  - -Some crops may need more or less water depending on their growth habits, and what stage of growth they are in.
- Gauge how much water falls in your garden.
  - -Use a small container and make a mark at 1 inch; be sure to empty this each time it rains and keep track of how much water has accumulated in a log book.
  - -You can also purchase a rain gauge.
  - -An easy way to judge your soil moisture is to simply dig several inches into the soil; if the soil is damp, you should have adequate moisture in your soil for your plants.
  - -A more expensive and advanced way to measure soil moisture is with an irrometer which measures osmotic pressure in the soil related to moisture content.
- If fields are muddy for several day, or have standing water on them for more than a few hours, plants can be damaged or killed because their roots aren't receiving enough oxygen.
  - -Raised beds are a good option for spots that consistently receive or hold too much water.
- Make sure moisture is penetrating at least 6 inch into the soil when you water your garden
  - -If only the first couple of inches is staying wet, the roots of your plants may only grow very shallow in the soil which can cause malnutrition and instability.

(For information about watering and Irrigation, see our Resources Section 14.)

Mulching

Mulching is an excellent practice that suppresses weeds, improves your soil, retains moisture and helps control disease. Many types of mulches have been adapted to vegetable production, some require more management than other. We encourage everyone to utilize mulch in whatever way they can that makes sense. However some options will be better than others for your system.

Benefits of Mulching

- Creates a physical barrier that smothers weeds by physically restricting them and by cut ting off light.
- Cuts down on weed seeds that lay dormant in your soil by creating ideal conditions for them to germinate and then smothering growth; weeds germinate and then die without producing more seed.
- Helps soil retain moisture by preventing evaporation.
- Effectively eliminates soil erosion.
- Reduces disease pressure by creating a barrier between disease-harboring soil and the susceptible leaves of your crop.
- Helps regulate soil temperatures.
- Natural mulches also break down over time to increase organic matter in the soil.
- Mulches not only control weeds that haven't emerged, they can be used to smother existing weeds before planting. Example: a black plastic tarp staked down over weeds for several weeks.

Types of Mulch

Natural Mulches

Natural Mulches break down to become organic matter and improve your soil. They may take more labor to manage.

- Straw
  - -Best Natural Mulch
  - -Can contain weed seeds
  - -Source Carefully
- Grass Clippings
  - -Can contain weed seeds
  - -May have residual herbicides/pesticides
  - -May break down too fast
- Leaves
  - -Can acidify soil
  - -Shred to prevent them from blowing away
- Woodchips/Saw Dust
  - -May rob nitrogen from your plants
  - -Don't use anything that has been sprayed or treated with chemicals
  - -Best in pathways, not in the beds around plants
- Cardboard/Paper
  - -May not be very nice to look at
  - -Cheap if you collect your own
  - -Don't use glossy paper

Synthetic Mulches

Synthetic mulches form a more impermeable barrier to weeds and moisture loss. They don't contribute to organic matter and they must be removed from your garden and thrown away making them less sustainable than natural mulches. Drip irrigation should be used under these mulches for proper irrigation.

- Polyethylene Plastic Mulch
  - -Most popular mulch for larger producers
  - -Requires specialized equipment to install on a large scale
  - -Starts to break down after one season of use
  - -If left too long, can become a mess in the garden
- Woven polypropylene UV resistant ground cover
  - -Great product for small scale growers
  - -Thicker and more durable the standard plastic mulch
  - -UV resistant means it can be used for multiple seasons
  - -Ground staples required for installation
- Landscape fabric
  - -Fairly inexpensive
  - -Not very durable
  - -Does not retain moisture as well

(To find out where you can purchase some of the above mulching systems, see our Resources page. 15.)

Trellising

Many vining varieties of crops such as beans, most varieties of tomatoes and cucumbers, greatly benefit from being trellised. Trellising provide your crops some form of vertical structure to climb or be secured to. Trellising allows these plants to grow upward instead of growing along the ground where they are susceptible to pests, disease, and getting stepped on.

Types of trellising:

Florida Weave for Tomatoes
We recommend this trellising technique for tomatoes. Posts are set between every 2 or 3 plants. A string is wrapped around the first post, woven in between the plants, and then wrapped around the next post until you come to the end of your row. Once at the end, you then go back using the same technique on the opposite side of each plant. You will create multiple figure eights around the stems using this technique which will act to support the stem. You will add more strings in this manner as the stem grows upwards, with a string about every 8-12 inches.

Tools/materials for the Florida weave:
- 7 foot T-posts which are strong and durable for many years of use
  - -1 post for every 2-3 plants + 1 post for each end
- T-post driver as well as a T-post puller for the end of the season
- Tomato twine or synthetic bailing twine; do not use weaker strings
  - -About 300 feet of twine per 100 foot row

- A small diameter PVC tube about 2 feet long
  - -Run the string through the tube and hold the tube on one end to keep you from having to bend over when running the twine lower down.

Hortonova Netting for Beans, Peas and Cucumbers

Hortonova is a plastic horticultural netting with 6 inch squares. It can be purchased in many lengths and widths. For beans, we use a 5 foot width on 7 foot T-posts. The length just depends on how long your rows are. We drive the T-posts in the ground every 4 feet along the row and use nylon outdoor grade rope to run along the top of the posts. The netting is hung vertically from the ropes as well as being secured to each T-post with twine or zip ties. We keep the netting 6 inches off the ground so we can weed and mulch under the netting.

Tools/Materials for Hortonova Netting:

- Hortonova Netting
  - -5 foot width is good for most uses
- T-posts
  - -1 post for every 4 feet in your row
  - -7 feet or taller to allow room for climbing beans
- T-post driver; T-post puller for removal of posts
- Nylon outdoor grade rope for the top of the posts
  - -You don't need a thick rope, just one that is strong and in good shape that will hold up to being outside.

- Twine or zip ties to secure netting to the rope and posts
- Stakes for the ends of the row to secure the rope and lend extra support
  -Shorter T-posts driven at a 45 degree angle away from the end posts will work for this.

Pruning

Pruning is the practice of removing non-essential parts of your crop to increase the overall health of your crop. Tomatoes are the best example of the usefulness of this practice in the garden. Tomatoes should be pruned fairly heavily in order to reduce disease, increase fruit production, and make the crop more manageable.

Benefits of Pruning

- Pruning reduces disease by removing foliage near the bottom of the plant that can be susceptible to picking up disease from the soil.
- Pruning also reduces disease by thinning foliage to increase airflow; this helps keep the leaves dry and less susceptible to disease.
- By removing excess plant material, more energy is available to go into fruiting which will increase production.

How to Prune Tomatoes

- Only indeterminate tomato varieties need to be pruned
- Pruning tomatoes is traditionally done using a technique called “suckering”

- Suckering a tomato plant is done several times as the plant grows by removing a part of the plant called a sucker.

- Suckers grow between the main stem and the branches of the tomato plant
- Suckers are identified by their location, and by the fact that they are rounded, unlike a branch which will be flatter.
- Suckers should be removed during the early stages of growth before they have be come too big as removing well developed suckers can damage the plant.
- The top sucker on each plant can be left to become a second leader, which is a secondary main stem.

Tomato Pruning Techniques Online Resource

Weed Control

Practicing efficient weed control in the garden is important for saving time and labor. Pulling established weeds on a hot summer day can be miserable and extremely time consuming. The following methods focus on preventative weed control and address weeds early on when they are small and easy to remove.

Many of the methods for preventative weed control have already been addressed in other sections of this manual. This section will list these.

Steps for controlling weeds in the garden

- Use mulch around your crops whenever possible to smother weeds
  - -Leave as little soil uncovered as possible in your garden.
  - -If using natural mulch like straw, be careful not introduce weed seeds with the mulch.
  - -See the section on mulches in this manual for more details about mulch
- Address weeds as soon as they emerge
  - -Especially important for managing large areas of bare soil
  - -Managing weeds at this stage is far less time consuming and labor intensive.
  - -Plan small amounts of time each week for weeding instead of waiting and having to commit a large block of time.
- Invest in quality tools that make weeding easier.

-Crouching down and pulling weeds by hand may seem like a lot of work, but very little is accomplished by this method.
-There are some fantastic weeding tools out there that are well designed to make this job easier on you; some of these tools are outlined below.
-Invest in several tools that are good weeding in specific conditions; no one tool is good at doing everything.

Tools for Weed Control

For Mulch, see the section on Mulch in this manual.

Scuffle Hoe

- Different sizes and shapes available
- Each hoe has several cutting surfaces of various size/shape for getting into tight spots while also being about to clear larger areas
- Good in tight quarters on a small scale
- Can be inefficient for larger areas
- Works best in loose soil

Stirrup Hoe

- Cuts on the push and pull
- The blade is sturdy enough to cut out larger weeds
- Comes in different sizes
- Blade runs nicely under the surface of the soil
- Not a great tool for narrow spaces or close to crop (exception might be smaller sizes)
- Better for larger areas than a scuffle

Wheel Hoe

- Improves ergonomics, with less energy involved in weeding
- Interchangeable blades for many different tasks
- Robust enough for tougher weeds
- Handles large spaces efficiently
- Does not work well in close quarters or in between plants

Other Hoes Designed for Weeding

- Chopping Hoe
- Swan-neck Hoe
- Collinear Hoe
- Dutch Hoe

Smaller Hand Tools for Weeding

- CobraHead
- Asparagus Knife
- Cape Cod Weeder

(For more information on tools for weeding and cultivation, what they do and where to get them, see the Resources section 16.)

Pest and Disease Control

Organic does not mean there are no options for pest and disease control. There are effective pesticides and disease control methods that are allowable for use in organic systems. More importantly, there are also strategies to reduce pest populations before they become a problem. These strategies take more foresight and planning but are proven effective.

Strategies for Pest and Disease Control

- Scouting for pests and disease among your plants is important for identifying problems early to make control more effective.
- Organic growers should take a broad, system wide, preventative approach to pest control instead of only addressing problems when they happen.
- Select varieties that will be resilient/resistant to diseases and pest.
  -See section on Variety Selection
- Maintain healthy plants that will resist pest and disease pressure.
- Use mulches to protect foliage from soil-borne disease.
  -See section on Mulch
- Prune your plants to control disease
  -See section on Pruning
- Rotate your crops to control buildup of disease.
  -See section on crop rotation
- Remove and disposed of any heavily diseased plants that are finished for the season, or too far gone to save.
  -Collect disease plant matter and either burn it or bag it and send it to the dumpster.
- Water your crops properly to avoid creating favorable conditions for disease.
  -See section on irrigation

Row Cover/Insect Netting for Pest Control

Using a physical barrier such as row cover or insect netting is an extremely effective strategy called "exclusionary pest control". This method may not be effective at controlling all pests, but is for most.

- Row cover is a thin fabric designed to hold some heat around plants and exclude pests.
  -Light can penetrate and reach your plants, but is reduced.
  -Row cover comes in different weights; the lighter weight the row cover is the more light will get through to your plants.
  -Heat build-up may be an issue for some crops and/or seasons.
- Insect netting holds almost no heat and is very transparent, allowing a lot of light through to your plants.
  -More expensive than row cover.
  -More useful when growing summer crops.
- Install row cover or netting as soon as you plant to keep pests from being introduced.

- Install hoops every 18-24 inches to help support the row cover over your plants to give your plants room to mature.
- The row cover or netting must be secured to the ground around the edges of your bed.
    -Use sod staples or weights every few feet to hold the row cover down.

Powders and Sprays for Organic Pest Control

There are effective powders and sprays available to use in organic systems to treat pest and disease problems that are not manageable in any other way. Always do your research before using these products as some may be harmful (though usually less harmful that conventional chemicals) and all take a degree of knowledge to use correctly.

Considerations:

- Products may be harmful for you or the environment, especially if used incorrectly.
- These products are expensive so you will want to use them as little as possible.
- Early and consistent application of these products are required for effectiveness.
- They are not systemic, which means they easily wash off of plants after application.
    -Rain or spray from a sprinkler or hose will render most organic products useless.
- Effective on specific pests at specific stages adding complexity to their use by gardeners.
- We recommend varying the mode of action when utilizing these products so pests don't build up a tolerance.
    -This means using several different products in rotation.

(For more information on this organic pest and disease control, please see our Resources section. 17.)

Extending the Growing Season

It is important to be able to have fresh produce from your garden for more than just the summer months. But growing in the spring, fall and winter presents a set of unique challenges. Technology has allowed us to address those challenges to a fair degree and keep growing food even when it's cold. Here's what you need to know to start.

Three Systems for Extending the Season

There are three main systems available that help extend the growing season by regulate temperatures around your plants. Generally speaking these systems consist on similar elements which include some kind of frame and a transparent covering that allows light to get to your plants. These systems create what is known as the greenhouse effect which allows light from the sun in and then traps the heat energy created by that light. Some of these systems can also be actively heated by an introduced heat source like a radiator or electric heater to supplement the heat energy from the sun.