

## WHAT IS ORGANIC GARDENING?

Organic Gardening is a holistic gardening practice that avoids the use of chemical pesticides and fertilizers, focusing instead on improving soil and plant health. Organic gardeners observe and work with natural biological relationships and life cycles.

## WHY GARDEN ORGANICALLY?

- Chemical fertilizers yield short-term benefit by feeding the plant, but they diminish soil health by killing off soil-dwelling beneficial organisms.
- Chemical pesticides do not discriminate between good/bad insects and are toxic to the air, soil, water, plants, animals, and humans.
- Organic gardeners focus on soil health; they use compost and mulch to increase the soil's water retention and to foster soil biology. Soil-dwelling organisms improve soil fertility and facilitate the uptake of nutrients by plants.
- Focusing on soil health helps to improve air, water and soil quality while nurturing biodiversity and improving human health
- Organic gardening practices like composting slow climate change by sequestering carbon

## DEFINITIONS

**COMPOST:** Organic material, mostly from plants, that has been broken down and digested by soil-dwelling organisms, including microorganisms like bacteria, fungi and protozoa, and macro-organisms like earthworms, sow bugs and insects.

**ORGANIC AMENDMENTS:** Organic fertilizers containing the macro-nutrients (nitrogen, phosphorus, potassium) and trace minerals which are vital to plant health and growth, but often absent or unavailable in desert soils

**ORGANIC MULCH:** Organic matter placed on top of the soil to prevent water evaporation and protect plant roots from extremes of heat and cold. Unlike rock mulch, organic mulch,

especially alfalfa hay, enriches the soil as it breaks down

**COVER CROP** aka GREEN MANURE: Plants grown as an alternative to allowing a garden lie fallow between growing seasons; these are usually nitrogen-fixing crops like grasses and legumes and are often tilled into the top layer of soil 4 to 6 weeks before the next planting so they can break down and serve as plant food.

## GETTING STARTED

### CHOOSE A LOCATION AND START DIGGING

- Choose a site close to a water source that receives at least six hours of sun, and some afternoon shade in summer. You can use shade cloth to create shade.
- Mark off your planting area and dig down, loosening the soil to 20-24 inches before adding compost and amendments.

### IMPROVE YOUR SOIL

**Soil Testing** - Tucson soil is typically alkaline and needs additional nutrients to grow non-native vegetables. A soil test will help you determine exactly what it needs. You can have your soil tested by a private lab or use a commercial home test kit (optional).

#### Add Organic Matter

Garden soils should contain 5% organic matter. Since organic matter typically comprises less than 1% of our desert soil, we need to add 3 to 5 inches of organic matter to our vegetable garden beds per year.

#### Choose a Method:

- Dig in compost or organic amendments a few weeks before planting –or-
- Cover with organic mulch a season before planting. The mulch will decompose (break down) –or-
- Grow a green manure crop a season before planting (4 to 6 weeks).

#### Types of Organic Matter to Add to Your Soil while Digging:

- Compost, aged manure, grass clippings, coir, worm castings, biochar, etc.
- Pre-mixed organic soil builders are available at some nurseries. Look for those that are labeled certified organic.

#### Amendments should provide the three macronutrients – nitrogen, phosphorus and potassium (NPK) – plus trace minerals.

**NITROGEN (N):** promotes lush, green growth.

Organic sources: alfalfa meal, blood meal\*, cottonseed meal, fishmeal and emulsion, bat guano, composted animal manure

**PHOSPHORUS (P):** promotes root growth and reproductive cycle. Organic sources: bone meal\*, fish emulsion and meal, bat and bird guano, colloidal and rock phosphate

**POTASSIUM (K):** promotes plant strength and disease resistance. Organic sources: granite dust, greensand, kelp meal

**TRACE MINERALS:** promote soil health, plant photosynthesis, and general plant health.

Organic sources: volcanic dust, granite dust, greensand, bat and bird guano, kelp meal, compost, composted manures

**SOIL SULFUR:** can minimally raise the pH of desert soil which tends to be alkaline, but it has little effect on soil that is high in calcium. It is better to slowly lower pH by consistent addition of compost and mulch at the start of every growing season. Adding soil sulfur (in a slow-release form that looks like lentils) at fall planting will give needed sulfur to your brassica crops (broccoli/cabbage/kale).

\*Although bone meal and blood meal are widely available and in use as organic amendments, it should be noted that mad cow disease is a concern.

## WATER-SAVING MEASURES FOR DESERT GARDENING

- In-ground beds, which collect rainwater and protect plants from drying winds, use less water than containers/raised beds.
- Water deeply but infrequently to force your plants to grow deep roots that will anchor plants against the wind and thrive in cooler/moist root zones. Aim to irrigate no more than every other day in the summer and every 3 to 5 days in cooler weather. (Hand water seedlings and new transplants between irrigations.)
- Install a drip irrigation system, rainwater collection basins and rainwater cisterns.
- Use plenty of compost and mulch well between plants to maintain soil moisture.

## ORGANIC PEST CONTROL

First identify the insects or other arthropods that are damaging your plants and only then choose control methods that target those pests. Since organic sprays and diatomaceous earth can kill more than the target pest, try introducing beneficial insects (ladybugs, Green Lacewings, assassin bugs) before resorting to sprays. Common desert pests include aphids, Bordered Plant Bug, stink bugs, leaf-footed bugs, spider mites, scale, thrips, grasshoppers, harvester ants, leafhoppers, leaf miners, root-knot nematodes, grubs, slugs, snails, Squash Bugs, Squash Vine Borers, and Tomato Hornworms.

#### Good Garden Practices to Avoid Pests:

- Prune and clean out infested dead plant material
- Knock off insects with a strong water spray. This is often all that is needed for minor infestations of aphids or spider mites.
- Handpick hornworms, squash bugs, Bordered Plant Bugs etc

· Learn when harmful insects like squash vine borers lay their eggs and use row covers at this time.

### **ORGANIC PEST CONTROLS YOU CAN MAKE AT HOME**

-Garlic-Oil Spray for aphids: Soak 3-4 ounces of chopped garlic bulbs in 2 Tbsp olive oil for 24 hours. Add 1 tsp fish emulsion to one pint water and add the garlic solution. Strain and store the liquid in a glass container. Spray the front and back sides of leaves as necessary during a cool time of day.

-Hot Pepper Spray for aphids and caterpillars: Mix ½ cup of ground hot peppers with 2 cups of water. Strain and spray as needed. (Source: Your Organic Garden, Jeff Cox 1994)

-Trap Plants: Occasionally a single plant such as broccoli, Brussels sprouts, or dill will attract aphids. Allow them to infest this plant, then carefully remove and discard the plant before they migrate to other plants.

### **COMPANION PLANTING**

Some gardeners report that locating strongly scented plants such as marigolds, basil, catnip, horseradish, onions, garlic, or nasturtiums near their vegetable crops will attract beneficial insects and deter harmful ones. Much free information on companion planting can be found on the Internet. A HEALTHY PLANT AND HEALTHY SOIL NATURALLY DETER PESTS AND DISEASES

### **ORGANIC DISEASE CONTROL**

- Plant stress is a major cause of disease in desert gardens. Too much sun, poor air circulation, too little or too much water, high winds, and poor soils are all contributing factors.

- Avoid the stress factors by educating yourself about plant needs and desert gardening. This leaflet is a great start!
- Practice good gardening habits. Purchase disease-resistant plants, add organic matter to soil, mulch between plants, clean out diseased plant material often, and disinfect garden tools. Avoid composting diseased plant material or using it as mulch; throw diseased plants in the trash.
- Learn about plant growing requirements and desert garden seasons to help plants resist disease.
- Keep your soil healthy. Rotate crop locations in your garden yearly to maintain and restore soil nutrient balance. Nutrient deficiencies or lack of beneficial microorganisms can stunt plant growth and make plants more susceptible to frost damage and diseases.
- NEVER purchase diseased plants!
- Spray leaves and water soil around plants with compost tea or tea made from worm castings or seaweed extract.
- Control powdery mildew by spraying plants with baking soda solution.
- Neem oil is a fungicide that also kills pest insects that feed on foliage. Follow directions to avoid harming beneficial insects.

### **DIY ORGANIC REMEDIES**

#### **Fungicides**

-Garlic: Combine 5-10 garlic cloves with 1 pint of water in a blender. Strain and spray on plants.

-Baking Soda: In 1 gallon of water mix 1 Tbsp baking soda, 1 Tbsp dormant or mineral oil, and 1-2 drops of blue Dawn dish soap. Spray on infected plants.

#### **Replenishments**

**Aerated Compost Tea:** Brewing tea from compost is a controversial practice; while brewing tea under aerated conditions for 12 to 24 hours can breed an astounding quantity of beneficial microorganisms that promote plant health, it can also breed pathogens like e-coli. If you want to make compost tea, make sure to use a pump to aerate continuously while brewing it, use the tea within 4 hours, and spray or apply directly **only to plants not intended for food.**

**Note:** To feed while repelling, add compost tea or fish emulsion to the fungicide mix.

**Resources:** Rodale's Ultimate Encyclopedia of Organic Gardening

### **WHAT ELSE SHOULD I KNOW?**

- Shade: Summer vegetables such as peppers and tomatoes can be burned by harsh afternoon sun in the desert. Protect them from western exposure with tall plants like corn and sunflowers, or trellised ones.
- Don't be afraid to thin young plants. Overcrowded plants compete for resources and poor air circulation due to overcrowding can breed disease.
- Remove diseased or insect-infested plants immediately.
- Experiment with different gardening techniques, planting dates and plant varieties. Record your successes and failures.

### **NEED HELP?**

**For more info about our meetings and our club: [www.tucsonorganicgardeners.org](http://www.tucsonorganicgardeners.org) and [Facebook.com/TucsonOrganicGardeners](https://www.facebook.com/TucsonOrganicGardeners)**

**The Tucson Organic Gardeners**

# Organic Gardening Basics

in the Southwestern Desert



[www.TucsonOrganicGardeners.org](http://www.TucsonOrganicGardeners.org)