



DESERT VEGETABLE GARDENING BASICS



SOIL:

Our desert soils are typically low in organic matter. Because of this, and the typical alkaline nature of our soils, nutrients aren't always readily available for plant uptake.

For successful vegetable gardening, soils need organic matter added to them regularly.

For preparation of a new garden bed a 6-8" layer of compost worked into the soil provides good organic matter, enhancing the soil structure.

For optimal root development, the soil should be worked to a depth of about 18 inches. This will accommodate the root system of just about any vegetable you will want to grow.

At *least* annually - best is twice a year, with the change of seasons - add 1-2" of compost to maintain the organic content of soil.

For heavy clay soil, very rocky soil, or extreme caliche conditions, raised beds may be preferred.

Depending on the condition of your soil, you may also need to amend it periodically with gypsum and/or sulfur to loosen soil or lower the pH.

Aim for a near-neutral pH (7). This should be good for most vegetables.

WATER:

Deep watering is essential here in the desert. Plants need a deep healthy root system to survive our grueling summers. Deep watering also leaches harmful salts down below the root zone of the plants.

Drip and flood irrigation are well suited to our conditions. Application of water on the soil surface can prevent accumulation of salts on foliage.

When using a hose, always use a breaker, nozzle, or water wand that allows you to deliver a gentle flow of water. Also set the hose to a low enough flow that high pressure doesn't build. High pressure will compact the soil!

Take advantage of rainwater! Skip watering for a cycle after a good rain.

A drip system should have a designated valve for your vegetables to allow for best scheduling. Regularly adjust the watering schedule through the seasons, check for leaks, or clogged emitters.

Learn to recognize the difference between heat stress and water stress.

Water Stress: Not enough moisture is available in the soil for the plants to absorb.

→ More water is needed, right away.

Heat Stress: There is adequate water available to the plant, but transpiration (loss of moisture) exceeds the root system's ability to take up moisture, so the foliage wilts in the hot dry air.

→ Adding more water may cause the roots to rot. Provide top mulch and shade.

Mulching around your plants during the hot months helps maintain moisture and keep the root systems cooler.

FERTILIZER:

Use fertilizers according to the plant needs. Usually fertilizers aren't necessary once the plant begins setting fruit.

Keeping the organic content of the soil at a good level will enhance the action of the fertilizers, and over time will supply small amounts of nutrients into the soil so less fertilizer is needed.

Organic fertilizers offer many benefits over synthetically formulated fertilizers. They break down more slowly in the soil, releasing nutrients gradually. They provide natural food for beneficial soil microorganisms. They are less likely to burn plant roots when mixed in the soil.

Some good organic all-purpose or vegetable fertilizers are available, or you can create your own blend to cater to your soil conditions and your plants' needs.

- N nitrogen - promotes foliage development
 - P phosphorus - promotes root development, flowering
 - K potassium - promotes stem/root strength, flowering
 - sea kelp provides micronutrients
- } macronutrients

PEST CONTROL:

Why use nasty synthetic chemicals on the veggies you'll be putting in your body? Encourage a healthy balance between a few pests and some good beneficial insects (or lizards, or birds...). If some assistance is needed, try using something organic that is less harmful to the environment, other yard fauna, your pets, or yourself. Allowing some of your vegetables to flower will entice beneficials to visit and produce offspring in your garden.

Floating row covers might be helpful in keeping some insects from reaching and harming plants. Chicken wire and/or netting can be an effective barrier for larger pests such as birds or rabbits.

Be sure to rotate your plantings from year to year. Repeated plantings of the same vegetable in the same location in consecutive years can encourage pest problems and potentially deplete certain nutrients from the soil depending on the vegetable. A diversity of plants intermixed makes it more difficult for pests to find target plants.

Botanical pesticides are derived from plants and break down into more harmless compounds in a relatively short time compared to synthetic pesticides.

- pyrethrum – from pyrethrum daisy (*Chrysanthemum cinerariifolium*)
 - active ingredient pyrethrin, on contact acts fast on most insects
 - non-toxic to most mammals; degrades rapidly when exposed to light or moisture
- neem – from seeds of neem tree (*Azadirachta indica*)
 - can affect hormones of some insects preventing them from molting or emerging from eggs, most effective on leaf-eating insects and less so on sucking insects
 - safe for humans

PLANTING SEEDS:

Planting from seed allows a greater variety of fun and delicious vegetables to be grown, as compared to what is available at most of our garden and nursery centers.

Some vegetables are best started from seed planted directly in the ground (direct seeding), while others are better off transplanted into your garden as established seedlings (transplants). Remember, soil preparation is critical to allow best root development!



-direct seeding - Seed should be sown in prepared soil at a depth of 2-3 times the diameter of the seed (or recommended depth on seed packet).

-Cover the seed lightly with soil and keep the upper layer of soil moist until the seed germinates.

-seedling transplants - Seeds should be sown in a sterile medium (ex. potting soil or equal parts perlite and vermiculite).

-Plant as directed on seed packet, or at a depth of 2-3 times the seed diameter.

-For most seed, 70-75° F is optimal for germination (check seed packet).

-Keep the containers in bright light (not direct sun).

-Keep the soil moist - cover with plastic or mist several times a day.

-Once the seed has germinated, remove the plastic and place the containers in brighter light.

-Once the 2nd set of true leaves appear, the seedlings can be transplanted from small cells into 3 or 4" pots.

-Allow at least a week to harden-off plants before transplanting into their final growing spot in the garden, to reduce the amount of shock and stress.

-Pamper the vegetable transplants the first few weeks!

LAYOUT & ORGANIZATION

Some vegetables take longer to mature, and will overlap the planting for the next season.

Strategically place these off to the side or at the end of a bed where they won't be in the way for preparing beds and planting for the new season.

HARVEST:

Check plants frequently and pick the vegetables as they mature. Many vegetable varieties continue to produce more edibles if the mature vegetables are harvested regularly.



Vegetable Gardening Through the Seasons

We have two main gardening seasons here in the desert – spring and fall. With a little effort, these seasons can be extended, and you can potentially be growing in your garden year-round. Light and temperature are important factors in determining what to plant when, and where.

Choose quick maturing varieties to plant. For spring crops, this allows them to mature before the wicked summer heat hits. For cool season crops, this allows a succession of plantings to stretch out your harvest.

SPRING

For spring gardening, you need to consider soil and air temperatures in deciding when to plant seed or set plants out – the soil and air need to be warm. Since warm soil and air temperatures are needed for tomatoes, eggplants and peppers (sweet and chile) to germinate, you can get a head start by planting seed indoors early in January, with plants ready to set out as soon as warm weather arrives.

To start early, you can “pre-heat” the soil by covering it with plastic. To protect the foliage from late frost threats, cover the plants in the evening, or even construct a temporary cold frame over the bed to hold in heat.

To prolong the spring veggie season, providing some plants with additional shade is helpful. Erect a shade cloth structure, or plant in an area that would receive some afternoon shade from other vegetation in the yard.

If using shade cloth, it is best to use fabric rated at 30-50% shade. Anything above 60% is too dark and plants will suffer from insufficient sunlight, becoming etiolated (leggy and pale) and less productive.

Reduce nitrogen applications once fruit-bearing veggies (tomatoes, sweet peppers, eggplant, melons, cucumbers, etc.) begin flowering. Too much will promote beautiful foliage at the expense of the fruit production.

Remember to adjust your watering schedule through the season!

SUMMER

Wilting of plants can be the result of either heat stress or water stress during the hot months. Check the soil for moisture to determine the cause droopy plants!

Mulching around your plants during the hot months helps maintain moisture and keep the root systems cooler.

A major problem is temperatures that are too high to allow fertilization of the flowers. Temperatures above 95/100° F make pollen infertile for tomatoes, cucumbers, etc. Other plants (melons, squash, okra, cowpeas, etc.), however, will thrive in such temperatures.

When looking at seed packets or plant labels, “full sun location” usually translates into “afternoon shade is helpful” here in the low desert, for summer growers.

For many vegetables, light afternoon shade or all-day filtered sun is beneficial or necessary in the summer. Others prefer, and thrive in, full sun (melons, squash, okra, cowpeas, etc.).

Try providing some extra shade (especially afternoon shade) to plants such as tomatoes, eggplant, peppers, and cucumbers, to help them survive the summer. In early fall, they will perk up and begin producing again.

Cut tomatoes back to a height of 12 - 18" in mid-August to rejuvenate them for the fall season. Resist the temptation to plant large-fruited tomatoes! Smaller varieties do much better here, as they resist cracking, etc.

Remember to adjust your watering schedule through the season!

MONSOON

If you would like to garden through the summer, the onset of the monsoon season is ideal for planting a variety of vegetables (teparty beans). You can also plant another round of some things planted in the spring (corn, squash, beans, etc.)

FALL

As with spring, the fall planting season is somewhat ruled by soil and air temperatures – now we are waiting for them to drop. Many of our fall season growers need a cool soil to trigger their seed germination. Keeping the soil moist, by spraying it a few times a day, will help decrease the soil temperature. Leaving your summer shade cloth up for a while will help if air temperatures are still high.

For fall/winter gardening, choose a location to maximize the hours of sun exposure. Most vegetables need at least 6 hours of sun.

If whiteflies are abundant, it may be wise to postpone planting for a couple of weeks, in hopes that their population will decline with the cooling of the season.

Aphids are a common pest in the cooler season. Attract beneficial ladybeetles, lacewings, etc. to your garden to keep aphid populations under control.

Loopers are also common on cole crops (cabbage, broccoli, cauliflower, Brussels sprouts). Pick the caterpillars from the plants or use *Bacillus thuringiensis* (Bt).

Cool-season leafy vegetables will need more frequent nitrogen applications – about every 2 weeks.

Remember to adjust your watering schedule through the season!

WINTER

A variety of cool season crops can be planted in succession to provide you with a prolonged supply of fresh produce. Plant a little spinach, leaf lettuce, radish, etc., seed every few weeks.

If you are keeping your tomatoes, eggplant or chilies through the winter, protect them from frost. Also, young cool-season growers are more susceptible to frost damage than more established plants, so you may need to cover them as well if frost is predicted.

For protection, cover plants in the evening and protect them until danger of frost has passed the next morning. Frost cloth (*N-sulate*) can be left on plants for a few days or up to a week, allowing sufficient sunlight to penetrate, but bed sheets and burlap are too thick and must be removed the next morning.

A FEW REFERENCES

BOOKS

Desert Gardening for Beginners: How to Grow Vegetables, Flowers and Herbs in an Arid Climate
Cathy Cromell, Linda Guy and Lucy Bradley, AZ Master Gardener Press

Native Harvest: Authentic Southwestern Gardening
Kevin Dahl, Western National Parks Association

Desert Harvest: A Guide to Vegetable Gardening in Arid Lands
Jane Nyhuis, Growing Connections

Desert Gardening Fruits & Vegetables
George Brookbank, Fisher Books

All New Square Foot Gardening
Mel Bartholomew, Cool Springs Press

Earth-Friendly Desert Gardening
Cathy Cromell, Jo Miller & Lucy K. Bradley, AZ Master Gardener Press

The Organic Gardener's Handbook of Natural Insect and Disease Control
Barbara W. Ellis and Fern Marshall Bradley, Editors, Rodale Press

Carrots Love Tomatoes: Secrets of Companion Planting for Successful Gardening
Louise Riotte, Storey Communications, Inc.

Companion Planting (Rodale's Successful Organic Gardening)
Susan McClure, Rodale Press

Great Garden Companions: A Companion-Planting System for a Beautiful, Chemical-Free Vegetable Garden
Sally Jean Cunningham, Rodale Press

U OF A PUBLICATIONS

Fertilizing Home Gardens in Arizona – AZ1020-20014
<https://extension.arizona.edu/sites/extension.arizona.edu/files/pubs/AZ1020-2014.pdf>

Integrated Pest Management for the Home Garden – AZ1521
<https://extension.arizona.edu/sites/extension.arizona.edu/files/pubs/az1521.pdf>

Alternative Pesticide Options for The Home Gardener – AZ1765-2018
<https://extension.arizona.edu/sites/extension.arizona.edu/files/pubs/az1765-2018.pdf>

Small Scale Composting in the Low Desert of Arizona – AZ1632-2014
<https://extension.arizona.edu/sites/extension.arizona.edu/files/pubs/az1632-2014.pdf>

Vegetable Planting Calendar for Maricopa County – AZ1005-2018
<https://extension.arizona.edu/sites/extension.arizona.edu/files/pubs/az1005-2018.pdf>

SEED CATALOGS

Native Seeds/SEARCH

3061 N. Campbell Ave. (retail store)
3584 E. River Rd. (mailing address)
Tucson, AZ 85718
(520) 622-5561; toll free (866) 622-5561
www.nativeseeds.org
traditional crop seeds of the southwest (vegetables, herbs, gourds, etc.)

Seeds of Change

P.O. Box 152
Spicer, MN 56288
(888) 762-7333; fax (320) 796-6036
www.seedsofchange.com
organically produced seed - wonderful array of vegetables, herbs, flowers, etc.

Terroir Seeds LLC, Home of Underwood Gardens

P.O. Box 4995
Chino Valley, AZ 86323
(888) 878-5247
www.UnderwoodGardens.com
heirloom garden seeds

Seed Savers Exchange

3094 North Winn Road
Decorah, IA 52101
(563) 382-5990
www.seedsavers.org
heirloom plant varieties (vegetables, herbs, flowers, etc.)

Renee's Garden

<http://www.reneesgarden.com> (no catalog in print, website only)
great variety of vegetables, herbs, and flowers

BENEFICIAL INSECT SUPPLIERS

ARBICO Organics

P.O. Box 8901
Tucson, AZ 85738-0910
order: 800.827.2847
e-mail questions: drbuglady@arbico.com
www.arbico-organics.com

U of A MARICOPA COUNTY COOPERATIVE EXTENSION

4341 E. Broadway Rd.
Phoenix, AZ 85040
Master Gardener Help Desk: (602) 827-8201 or maricopacountyplanthotline@gmail.com
Publications: <https://extension.arizona.edu/pubs>