CENTER FOR
AGRICULTURE & FOOD SECURITY

CONVOY OF HOPE

Issue 03.

Planting Basics

Introduction

Key Points

- Plant Selection
- Garden Location
- Water
- Soil
- Tools
- Harvest

If you are considering planting a garden but don't know where to start, we would love to be a part of your gardening journey. Starting something new can be intimidating, but if you are willing to dig deep and get your hands dirty, gardening is sure to be a rewarding experience. This document provides basic tips on getting started with your garden, as well as additional linked resources if you wish to explore deeper.

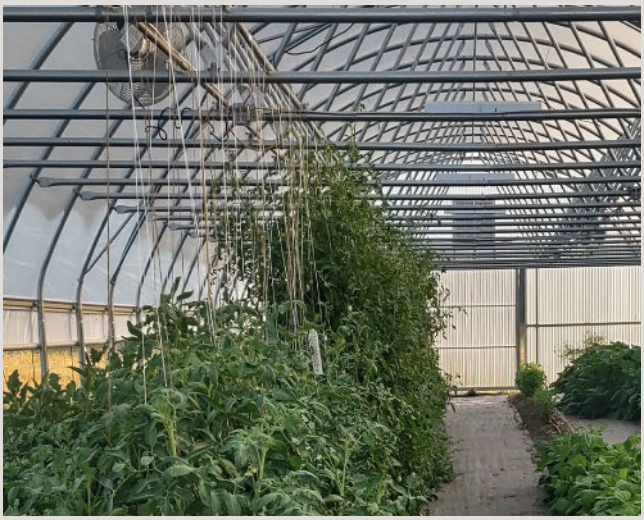
Selecting Plants

When planning a garden, it is easy to get excited about the wide variety of vegetables and fruits you can grow. There are many factors to evaluate when selecting plants for your garden. You will want to consider your tastes, available garden space, and season and climate. Choose only varieties of vegetables and fruits that your family will truly use and enjoy. If your available growing area is small, consider growing vegetables that produce in abundance, including tomatoes, pole beans, root crops, or leafy greens (Gunter, 2022). A larger garden can accommodate plants such as squash, melons, pumpkins, or corn (Gunter, 2022). Many online resources and planting guides are available with plant-specific information, such as this one from Rare Seeds (Baker Creek Heirloom Seed Co., n.d.).

IMPORTANT FACTORS FOR PLANT SELECTION

1	Hardiness Zone/Last Frost Date
2	Days to Maturity
3	Amount of Garden Space
4	Sunlight Available

The table above indicates the most important factors to consider when selecting crops for your garden. Every plant has a preferred temperature/time of year it should be planted in the garden. This will vary based on where you live and the plant variety. Start by finding your region's growing hardiness zone. Hardiness refers to how strong your plants will need to be to endure the winter and frost seasons. For U.S. residents, the USDA website is an excellent resource for determining your hardiness zone (USDA Plant Hardiness Zone Map, n.d.).



Tomatoes are planted in high tunnels with specifications made to accommodate the plant in the temperature environment it calls home.

Plant Selection

Internationally, the website Plant Maps provides a hardiness zone map for many other regions of the world (Plantmaps-Hardiness Zone Maps and Much More, n.d.). You will also want to determine the last frost date for your area to decide when it is generally safe to plant your seedlings out in the garden in temperate zones, or regions with mild climates and warm temperatures. In warmer/tropical locations, you will want to plant during cooler weather to avoid the hottest times of the year. Review the days to maturity for your plant choice, or the average number of days from planting the seed to harvest date, to determine if the selection is appropriate to grow in your area. A good rule of thumb is to plant seeds two to three times deep as the seed is wide. A seed packet can provide valuable information on seed depth and when it is safe to plant a specific crop outdoors. You may consult a planting chart, such as this one from Territorial Seeds, to determine the optimal temperature, days to maturity, and suggested distance between plants/rows (Reynolds, 2020).

Types of Gardens (Gunter, 2022)

In-Ground Garden

- Usually requires more space
- May require less irrigation water
- Keeps roots cooler

Raised Bed Garden

- Elevated above ground at least 6 inches
- May consist of mounded soil or soil framed by building materials
- Warmer soil temperature and fast soil drainage

Container Garden

- May be grown in pots, tires, plastic containers; ability to relocate
- Frequent watering required
- Minimum amount of weeds
- Good option for limited space

Choosing a Location

When choosing an ideal garden location, consider the amount of sunlight available, proximity to the home, and proper soil drainage. A garden requires a minimum of 6-8 hours of full sunlight per day. There should be no shade during those 6-8 hours (Kristine Hahn, Michigan State University Extension, 2016). A garden should be located close to home to allow for frequent monitoring of plants and ease of movement of supplies, tools, and water. Choose a growing area with well-drained soil and adequate air circulation, avoiding low spots (2016).

You may choose from different types of gardens; kitchen gardens, market gardens, and production farms. In a kitchen garden, vegetables and/or herbs are grown for a family's own use. A market garden is a small-scale commercial production, where crops are produced in amounts that may be sold to others and beyond personal consumption. A production farm is a large-scale commercial operation, where large quantities of vegetables or crops are produced and sold.

Water

Healthy plants and active production require proper watering. When watering for established crops, allow the water to penetrate to a depth of 5-6 inches (Stein & Welsh). Be sure to water plants thoroughly to ensure strong root systems develop. Moistening only the first inch or two may be harmful to plants over time, causing them to develop only a shallow root system and limiting their growth.

Overwatering plants can cause problems as well. Most crops will not thrive if soil is kept constantly wet. If water is applied too often and soil remains fully saturated, plant roots can become damaged by lack of oxygen (Stein & Welsh). To check if you are watering to a depth of 5-6 inches, simply dig down into the soil about 6 inches to see if it is wet to that depth (Gunter 2022). With practice, you will get an idea of how long it takes to irrigate adequately.

Drip line irrigation system pictured at the base of plants. Small holes on the top of drip tube release water slowly.

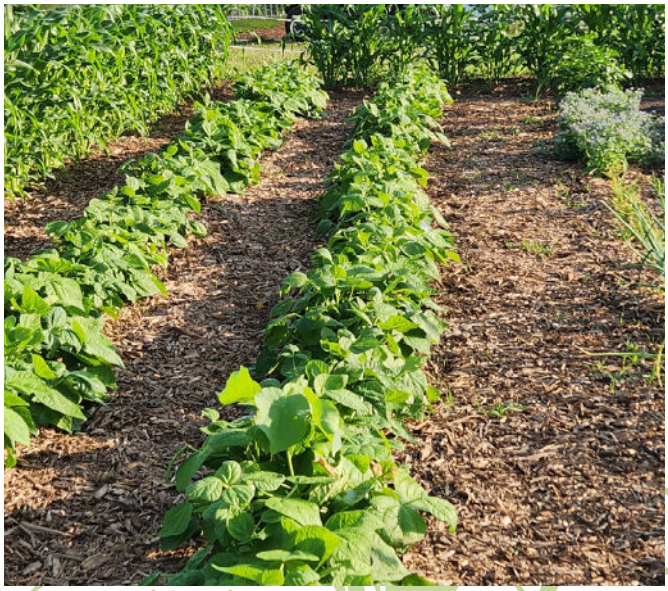
The average vegetable garden needs about 1 inch of water per week, depending on how humid your climate is. Dry climates may need more irrigation. You may use a rain gauge to see how much of the required water is being supplied by rain. This will help in determining how much irrigation water you need to supplement (Gunter 2022). Some plants with a very deep root system — such as okra, watermelon, and tomatoes — may require up to 2 inches, while more shallow-rooted plants — like corn, lettuce, and broccoli — require ¾ to 1 inch (Stein & Welsh).

How much water your plants require also varies a bit depending on your soil type. Sandy soils require more frequent watering, due to the texture causing water to drain more quickly. Clay soils, however, require less water, because the clay particles hold onto water for longer periods of time.

Watering is important throughout the whole growth cycle of a plant. It is especially important to consistently water at seed germination/early seedling growth and later during the time of enlargement of the edible fruit/vegetable (Stein & Welsh).

It is best to water plants in the morning or evening rather than during the heat of the day. Watering in the morning helps to conserve water and reduce fungal growth.

There are several different methods of water delivery: hoses, sprinklers, drip irrigation, etc. A hose or sprinkler is cost-effective and easy to use for home gardens. However, sprinklers may cause water waste due to evaporation or increase the chance of plant disease due to wet foliage. Another option is drip irrigation, a hose with small holes laid on the soil near the base of plants. This is a slower, more targeted form of watering. Drip irrigation is the most efficient watering method, conserving more water and reducing instances of plant disease. Drip irrigation is not practical for all types of crops, such as densely packed cover crops or turf. These crops would require overhead watering. To learn more about irrigation, visit Texas A&M Agrilife Extension.



Garden Tools

Garden tools are helpful to prepare and maintain your garden. Depending on the size/type of garden and your specific needs, you may not need every variety of tool (Gunter, 2022).

HOE

A hoe is a cultivation hand tool used to remove weeds and loosen soil between garden rows.

PITCHFORK

Forks are used to pick up/move mulch, straw, or other loose, lightweight substances. Pitchforks may also be used to loosen soil.

RAKE

A garden rake is used to smooth soil surfaces and eliminate stones. Leaf rakes may be used to remove leaf litter/dead plant material.

SHOVEL

A shovel or garden spade is used to dig/turn over soil, incorporate organic matter, and harvest root vegetables. A garden spade has a narrow rectangular blade and may be used for digging, planting, or cutting sod.

SPREADER/ SEEDER

A spreader/seeder may be used to apply lime/fertilizer or to broadcast seed in an even/uniform manner to the soil.

WHEEL-BARROW

A wheelbarrow is helpful for moving soil, rocks, mulch, tools, and more. A lot of physical energy can be saved by using a wheelbarrow or cart instead of carrying heavy or loose items by hand.

TILLER

A tiller is a gas-powered machine that mechanically breaks up soil and prepares a garden bed for planting. A tiller loosens and mixes the soil with less labor/ effort than hand tools.

Soil

Soil provides essential nutrients that plants need to grow. The ideal soil is dark in color, fluffy in texture, and preferably a mixture of sand, silt, and clay particles. Fluffy or granular soil makes it easier for plant roots to penetrate through the soil and grow efficiently. You will want to have soil that has sufficient water drainage but does not drain too quickly. It is important to consider these factors when selecting and nurturing your garden and crops. A good method for planting and digging your soil is to use the double dig method. More information on this method can be found in our Family Sustainability extension bulletin. Your ideal soil may look different depending on the region of the world in which you live. To learn more about textural soil classifications, visit the USDA's website to view their Soil Health Guide.

Plants require 17 essential nutrients from the soil for optimal growth, but not all soil is rich in these required nutrients. A soil test can give valuable information on what nutrients are deficient in your soil, and provide you with calculations for the amount of fertilizer suggested to grow a particular crop. Refer to Convoy of Hope's Plant Nutrient Basics page for more in-depth information on plant nutrients and fertilizer calculations.

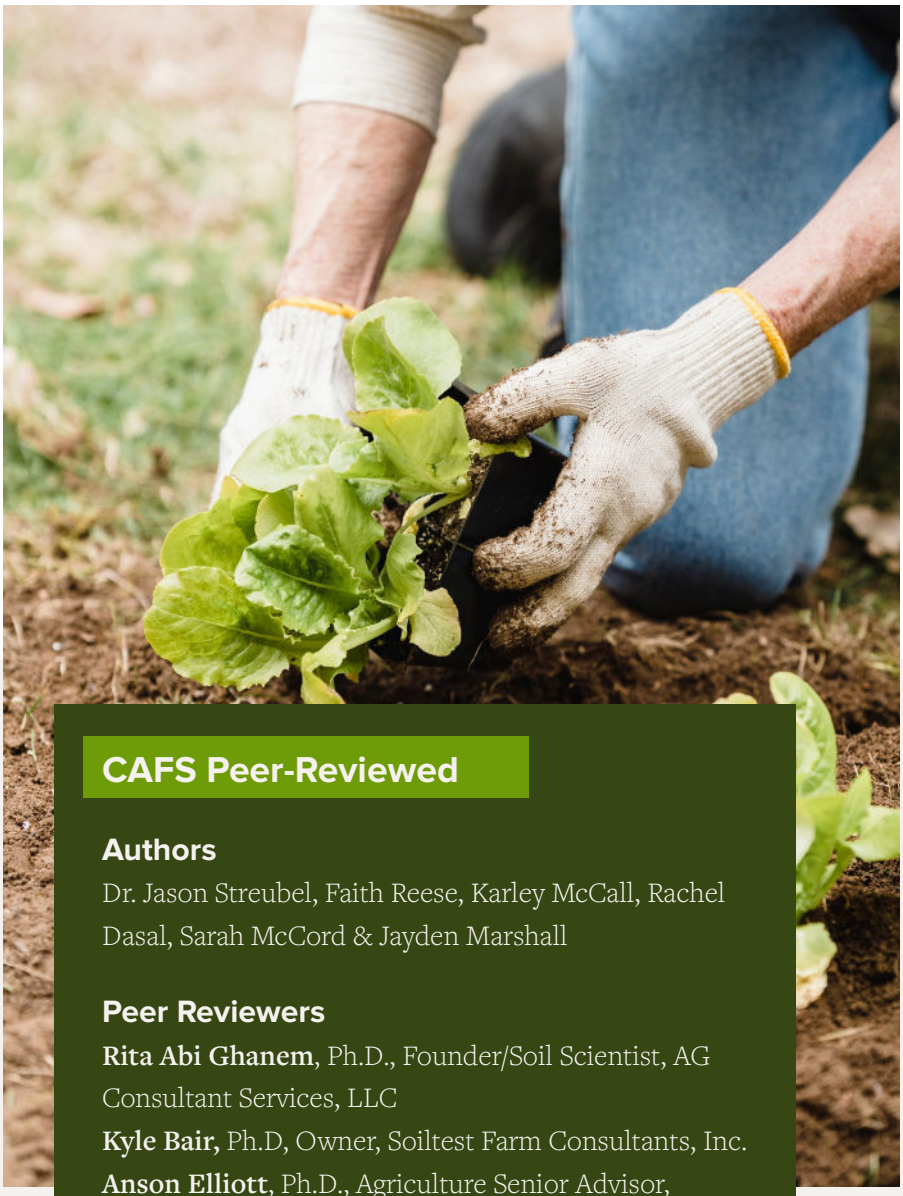
Another important component of soil is organic matter. Organic matter is any material produced by plants or animals that is decomposed and returned to the soil. You can improve the health of your soil by increasing its organic matter content. Soil organic matter is a source of nutrients for tiny soil organisms. As these soil organisms decompose, these nutrients are mineralized and become available for plant uptake. Organic matter also improves soil structure, drainage, and the ability to hold water. Organic matter can be added to soil by incorporating compost.

Harvesting

Harvesting may be the most important aspect of gardening. If you cannot pick, preserve, and enjoy your harvest, you lose valuable resources, including your time, hard work, and financial investment.

Produce is best harvested in the morning, as morning-harvested vegetables are fresher and sweeter (Tanner et al. 2020). If you harvest at a different time, keep your vegetables in a shaded area. Keeping vegetables cool prevents early decay. Carefully handle the plants when harvesting vegetables and treat harvested fruit gently to prevent bruising. It is important to pick produce frequently so your plants continue to produce new fruits/vegetables instead of producing seeds and ending their life cycle (Tanner et al. 2020).

There are many different ways to harvest depending on the type of crop. For example, potatoes and peanuts must be dug from the soil, whereas tomatoes and squash are plucked from the vine. Some vegetables will stay fresh for a long time, while others may spoil quickly. Many vegetables require refrigeration to extend their shelf life. Research your crop to understand when to harvest, how to harvest, and how to store. Visit Clemson Cooperative Extension to learn more about harvesting specific vegetable varieties.



CAFS Peer-Reviewed

Authors

Dr. Jason Streubel, Faith Reese, Karley McCall, Rachel Dasal, Sarah McCord & Jayden Marshall

Peer Reviewers

Rita Abi Ghanem, Ph.D., Founder/Soil Scientist, AG Consultant Services, LLC

Kyle Bair, Ph.D, Owner, Soiltest Farm Consultants, Inc.

Anson Elliott, Ph.D., Agriculture Senior Advisor, Convoy of Hope

Conclusions

There is a lot to learn when you first approach the task of planting a garden. If the results of your initial effort are not what you had hoped, do not be disheartened. You cannot learn to grow plants without experimentation, hands-on experience, and yes, even failure. You will learn new things with each growing season. There are many resources available to help cultivate your knowledge and grow your understanding. With time, effort, and experience, your garden will produce bountiful harvests.

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