



## **Table of Contents**

<b>Chapter 1 – The Love of Gardening</b>	<b>3</b>
<b>Chapter 2 – Growing Seasons</b>	<b>6</b>
<b>Chapter 3 – Plowing and Tilling</b>	<b>11</b>
<b>Chapter 4 – Your Crops</b>	<b>14</b>
<b>Chapter 5 – New Technologies and Your Garden</b>	<b>46</b>
<b>Chapter 6 – Organic Farming and Gardening</b>	<b>51</b>

## **Chapter 1 – The Love of Gardening**

The love of gardening is usually associated with the smell of the soil, the freedom of movement and the enjoyment of the bounty. Most of us do not know why we should plant this vegetable or that one. Many novices in this area select vegetables by color or taste versus good planting sense. This is a mistake that could lead to a poor harvest. But I would suggest to the reader that perhaps the planting and enjoyment of fresh air is more important than the yield. I would also suggest that you should decide now whether it is the pursuit or the harvest you are interested in. Making this decision will make the ingestion of the knowledge within these pages easier and more enjoyable.

Once you have made this decision, you can decide whether to flip to your favorite vegetable or focus more on time and technique. It has been my experience that people who just enjoy gardening are mostly focused on their favorites versus attempting to gain a “giant world of veggies”.

In an effort to be thorough, I will make a list of every item you will need to build a modest garden for **most** vegetables. You will need:

1. A shovel
2. A hoe
3. A tiller or plow of some kind
4. A various assortment of seeds\*
5. Fertilizer or Enriching Chemicals \*
6. Insecticides & Herbicide (Insect and Weed Killer)\*
7. Stakes & Poles
8. A plot in which to plant your seeds
9. Irrigation Tools of some kind (Garden Hose / Ditches/ Sprinklers)

\*Items 5 and 6 are to be excluded if your goal is “organic” vegetables, and Item 4 can’t be genetically manipulated seeds. To develop a strong garden we will use a technique called succession planting. For those of you who don’t know, this is after one crop is harvested, another crop is immediately planted in its place. In order for this process to work, one crop must mature as another crop’s planting season comes. This rotating system must coordinate the season, maturation of crop one, and planting season of crop two.

We are going to review seeding techniques, planting techniques, plant types and the environment. We will first evaluate the vegetable, the best climate conditions, soil conditions and average growing season. Fertilizers vary greatly; therefore specific fertilizers vary in their effectiveness on plants under various conditions.

## **Chapter 2 - Growing Seasons**

The growing season is defined by average temperature and daylight hours. In North America, this term is typically used to refer to the time period between the first and last frost. The total time of daylight hours is dependent on the latitude at which the plants are put down. The average temperature at the latitude is critical always, as the average temperature increases as you move toward the equator and decreases as you move away from it.

In the United States the growing season is usually from about May to October. In Europe this season is typically April to October. The length of day, average temperature, soil conditions, and other factors contribute to specific regional plant growth.

Frost is significant as it usually indicates the first occurrence of freezing overnight temperatures. Frost is usually the limiting factor in most annuals. In tropical or sub-tropical areas, the weather is not the limiting factor, but water is. In the “dry” season, the water limitation causes plants to recede in that part of the year.

Most plants you will see in your local market will be divided into two categories - annuals and perennials. Annuals complete their lifecycle in a single season, and require seeding to renew and grow again. Perennials are persistent and renew themselves again and again in various growth cycles. Our vegetables will complete their lifecycles in a single season, and begin again with a new plant, next season.

### **Soil Issues and Geography**

Potassium is one the most critical and important limiting factors in the growth of the plants. Listed below is the potassium information for many states:

#### **Low Potassium**

- Florida
- Georgia
- South Carolina
- Virginia
- Michigan, and
- Maine

#### **Medium Potassium**

- Alabama
- Louisiana
- Texas
- Ohio

- Pennsylvania
- New York
- Kentucky
- Tennessee
- Minnesota, and
- Wisconsin

### **High Potassium**

- California
- Oregon
- Nevada
- New Mexico
- Arizona
- Idaho
- Washington
- Nebraska
- N. Dakota
- S. Dakota, and
- Utah

### **Other Critical Soil Factors**

Other critical soil factors are:

- Iron
- Soil Acidity
- Magnesium
- Soil Temperature and Moisture



- Manganese
- Zinc
- Sulfur
- Soil Texture
- Boron
- Ammonium
- Sodium
- Aluminum
- Copper
- Chloride
- Nitrate, and
- Bicarbonate

Many of these nutrients are micronutrients. Boron is relatively new as a plant nutrient. Many of these nutrients are utilized as they become available for consumption. Soil acidity, temperature, water availability, carbon dioxide and other conditions limit a plant's ability to utilize these elements.

From these conditions, and other factors, you already know that certain crops are associated with certain parts of the country. For instance, wines are associated with California in the United States. The soil acidity and temperature are often driving factors for this particular plant. In the plants that you sow, it will serve you well to know your soil and its nutrients, and

weaknesses. You can test your soil for PH, or acidity levels and find your region's average temperature and sunlight by looking it up. Many annual plants now have suggestions based on your latitude and longitude. Some plants thrive in regions where shorter growing seasons are fine. It is in your best interest to match your plant to the growing season, sunlight and precipitation in your region.

Let's take Canada for example. Canada at its extreme has a very long growing season of more than 280 days. In Upper Canada, the growing season is as short as 40 days. A plant would need to complete its entire life cycle from germination to reproduction and death in 40 days. Sounds quite amazing – right? For every latitude, there is an ideal plant for that environment. It just takes a grower who can research, and find an ideal plant for your conditions.

## **Chapter 3 - Plowing and Tilling**

Turning over the earth is an absolute essential duty. You need to turn over the dirt to plant your seeds, but also to increase soil gases, as roots require access to carbon dioxide, the gas that is the primary required gas for plant metabolism. So tilling provides aeration for root structures and sets the stage for planting.

Any good tilling machine can turn over your earth fairly quickly, or you can use manual methods like shoveling. Since shoveling provides a hearty workout, you may forgo this by purchasing a quality tilling machine or mechanical plow.

Plows turn over the topsoil, while they create a natural fertilizer from dead plant materials. These are the plants killed by plowing. Plowing also removes weeds. Humans, oxen, and horses have pulled plows. Today's plows are pulled by motorized tractors. Originally there was no plow - in the beginnings of agriculture, there only existed handtools. In these very rich areas, the natural flooding turned the soil. In most other areas, the soil needed to be turned manually to produce richer topsoil.

The original plow was called a moldboard plow. This plow allowed a complete turn of the soil in a single pass. All modern plows have a sharpened blade or “disc”. The discs or blades lift the earth and turn it over.

Europe’s plows from 1400-1890 all use metal blades and animals to pull the plow. The disc blades used in the modern plow is very different from the design used in the late 1800s. While there exists much more complex plow designs, the basic cast steel or iron concave disc that looks much like a “spade” design was a common tool during recent times. This plowing technique creates furrows and troughs. These furrows and troughs create uneven grooves in the ground and can dramatically increase erosion. This erosion can lead to an increase in topsoil loss through wind and rain. The topsoil grows richer with each year as more dead plant material is deposited and the earth grows richer in decomposed materials. The loss of the very rich topsoil is devastating to future crops.

Today’s plows reduce erosion by not producing ridges and furrows. These plows also create a double action that turns earth completely. This modern plowing action is more efficient than older techniques used by simple mounted plows. The modern plow is called a semi-mounted plow. Today’s plow enriches the ground with CO<sub>2</sub>, gets rid of weeds, and certain bacteria.

The fact that these plows turn the earth completely creates a far more efficient action.

These points underscore why anyone who wishes to cultivate should turn the earth. No-till farming is a good example of not turning the earth to achieve maximum results. No till farming does not turn the earth, and allows old plant material to remain. Herbicide is used to remove unwanted plants, and the earth is enriched naturally.

Your little garden doesn't require a lot of tillage or herbicide, but you should understand the importance of maximizing your plants' health by turning over the earth, reducing competition with weeds and increasing aeration.

## **Chapter 4 – Your Crops**

Vegetable is a term used to collectively refer to plants consumed in the human diet. The term vegetable is used arbitrarily and in a culinary fashion. It is only distinguished from fruits as fruits are almost always used to refer to plants whose product is sugary and produces seeds. The term “vegetable” is more commonly used in cooking than science. Some fruits are also commonly referred to as vegetables. The tomato makes this leap as it contains elements from both groups. It is not sweet to the taste, but it contains seeds. Some other examples of this would be rhubarb, pumpkin and the avocado. For the purpose of this book, we shall keep this culinary term as described here. Vegetables are divided into different types like leafy, stem, bulb, root and legume. Vegetables are also thought of as savory, not sweet. You should keep this in mind as we go through this section.

Listed below are some examples of vegetables from each category:

### **Leafy Vegetables**

- Cabbage
- Collards
- Lettuce, and
- Kale

### **Root Vegetables**

- Beetroot
- Carrot
- Ensete
- Ginger
- Gobo
- Jicama
- Maca, and
- Black cumin

### **Bulb and Stem Vegetables**

- Asparagus
- Cardoon
- Celery
- Elephant Garlic, and
- Kurrat

### **Podded Vegetables (Legumes)**

- Black-eyed pea
- Drumstick
- Fava bean
- Azuki bean
- Lentil
- Lima bean
- Pigeon pea

- Velvet bean
- Rice bean, and
- Runner bean

### **Fruiting and Flowering Vegetables**

- Avocado
- Chile Pepper
- Parwal
- Snake Gourd
- Tomato
- Zucchini
- Sweetcorn
- Cayenne Pepper
- Cucumber, and
- Pumpkin

### **Seaweed Vegetables**

- Ogonori
- Sea Grape
- Sea Lettuce
- Wakame
- Kombu, and
- Nori

This completes our list of vegetable categories and some samples from each. It is obvious that seaweed vegetables are not practical for your



average garden. We will now review specific types of vegetables, growing needs and recommendations on each vegetable type.

⇒ **The Tomato**

***History of the Tomato***

The tomato is a hearty fruiting vegetable native to South and Central America. It comes from a group known as the nightshade family. Many plants in the nightshade family are quite poisonous. The tomato was introduced in Europe at first for decoration, though it was grown originally in South America as a food plant. It was eventually adopted as a food plant for lower classes in the last 400 years in Europe. Southern Italians gravitated toward this fruiting vegetable and today it is in many of their dishes. In fact, today, southern Italian food is known for tomato sauces. The Spanish first popularized tomatoes, and then their use was spread throughout Europe by the Italians, British and French.

Determinate tomatoes bear a crop all at once, and indeterminate mature at different rates. The advantage of growing indeterminate tomatoes is that they continue to produce until they are killed off by frost. Please note, the heirloom tomatoes are a popular indeterminate type of tomato. Common tomato varieties include:

- Beefsteak
- Sweet 100
- Moneymaker
- Mortgage Lifter
- Santa 71
- Yellow Pear
- Gardener's Delight
- Brandywine

One of the major points of the tomato is that the major varieties available today are self-pollinating varieties. In nature, the tomato is a cross pollinating plant that keeps the stamens completely enclosed within the corolla. The bee is the primary agent for the transfer of plant pollen.

### **Tomato Growing Needs**

In cooler climates, tomatoes are grown in greenhouses. In more temperate climates, tomatoes are started indoors and transferred outside later. Hydroponic tomatoes are also available, usually in hostile environments and where competition from local plant life is too difficult.

Most tomatoes are picked before fully ripe, but will continue to ripen unless exposed to temperatures below 12 degrees Celsius. Tomato seeds are best planted in less than 2.5 centimeters of soil, and should be watered

with 300 ml of water each day for the first 10 days for best results. Moderate water after this period is suggested.

### **Common Diseases and Pests**

Common tomato diseases are mildew, blight, and mosaic virus. Common tomato pests include cutworms, aphids, loopers, beetles, slugs and whiteflies.

### ⇒ **Corn**

#### ***History of Corn***

Corn is a plant descended from the Mexican highlands. It was cultivated for domestic use more than 9,000 years ago. It varies in height from 2.4 meters to plants as large as 7.2 meters. The body of the corn plant resembles bamboo in that it is knobbed, sectioned and pole-like.

Corn was first cultivated in the Americas. It was cultivated in the hills using a planting technique designed to reduce pests and provide mutual support called the Three Sisters. The Three Sisters was a technique designed for planting corn, beans and squash. For thousands of years, this technique was a very effective method of planting corn.

Corn is primarily cultivated today as a crop for animal feed. It is also used as a cereal crop for corn flakes, and a source for ethanol and bourbon. Today the largest producers of corn are the United States, China and Brazil.

Corn varieties include:

- Flour corn
- Dent corn
- Waxy corn
- Pod corn, and
- Sweetcorn

### **Corn Growing Needs**

The major factor in growing corn is that it has shallow roots. Corn is cold-tolerant, but in temperate zones corn must be planted in spring. Corn is very water-efficient and does well in a variety of environments. Good harvests are relatively easy to predict if corn is two feet by mid-July. The shallow roots do mean a strong dependency on moist soil. While corn is water efficient, it is vulnerable to drought. You should rotate your garden to maximize corn production. It is best to rotate corn in your garden with a nitrogen-fixing plant. Soybeans and alfalfa are good choices. Your choice of the variety should involve looking at soil moisture levels first, and soil acidity second. You should follow instructions on the packet, and gather

information. Corn is very light sensitive and direct sunlight is best. Most domestic corn is bred to be resistant to many pests or negative conditions.

### **Corn Pests**

Common corn pests include corn earworm, armyworm, corn leaf aphid, and the corn silkily. Please note that corn is particularly susceptible to the corn borer. The genetically engineered “Bt corn” is somewhat resistant however. Common diseases are Goss’s Wilt, Grey Leaf Spot, and Maize Dwarf Mosaic Virus.

### ⇒ **Potato**

#### ***History and Status of the Potato***

The potato is a perennial plant from the nightshade family. The potato vegetable is a starchy tuber that is dug up and eaten. It is one of the most popular vegetables on earth because of its survivability, ease of preservation, production potential and ease in planting. The potato originated in the lower Andes and currently is grown in the Americas, China, India, Australia and Europe.

Today there are countless varieties of potatoes that come in many different colors. Potatoes typically come in brown, yellow, pink, red, and blue. Some

skins look black also. Potatoes are classified for cooking use according to moisture content, and are classified as mashing, boiling, baking, roasting or salad. These various classifications describe cooking use, with mashing having the highest moisture content with no fibers and boiling indicating the lowest moisture content with the ability to retain shape even after boiling. The potato has earned its place in Western cooking because it is a highly practical and highly productive crop. In your garden, you have the option of growing varieties of potatoes that are not “production variety” potatoes. Most production produce holds that status because it can be processed and provided to customers without harm while passing through the supply chain. Common varieties on potatoes are:

- Yellow Finn – a small potato with yellow flesh
- Russet - a large brown potato with white flesh
- Red Gold – red skinned, with yellow inside
- Yukon – yellow skin with yellow inside
- Kerr’s Pink – a Scottish boiling potato
- Maris Piper – a general purpose potato
- Golden Wonder – Frying and chip potato

Today there are more than 4,200 varieties of potatoes. You can grow non-production potatoes in your garden and sample flavors that are NOT

available in your supermarket. Small potatoes are called new potatoes or fingerlings. In your garden you have the option to grow non-production varieties of potatoes that have unfamiliar flavors and we would suggest some of the following flavorful potatoes:

- Almond
- Russian Banana
- Klondike Rose
- Blue Mac
- Brigus
- Cowhorn, and
- Congo

### **Potato Growing Needs**

Potatoes are generally grown in rows under mounds and require medium watering. The potato plant itself may even produce fruit. The fruit is not required for successful cultivation and may be saved to produce seeds for planting later. Many varieties are produced by planting one or two seeds of the vegetable with about 12 inches of space between each plant. Potatoes are in contention with other plants for underground space for its tubers. Ground that is excessively full of roots is unsuitable for potatoes. A higher level of tillage is required for potatoes because they are tubers. Sometimes tilling 2 or 3 times is necessary for cultivating potatoes. From your garden,

you will pull your potatoes from the soil as new potatoes, with a curing process to thicken the skin. Because of this your potatoes will probably be more flavorful.

### **Potato Pests**

Soft and dry rot will most likely infect potatoes that have been wounded while underground. Both of these conditions result from bacteria eating the potato away from the inside out. Potato scab is a growth on the surface of the potato and can be removed by boiling. Scab is a simple barnacle-like growth on the potato that results in an abnormal outer texture. It does not affect the food value of the potato or its nutrition, and can be easily removed by the home gardener.

Insect pests include the potato beetle and root nematode. These pests infect the potato plant and can easily be avoided by rotating crops in affected areas.

### ⇒ **Cabbage**

#### **History of Cabbage**

Cabbage is a member of the Cruciferae family. It is a biennial plant whose vegetable is a leafy cluster. The modern cabbage is relatively young,



having been bred only about 1900 years ago. While the cabbage's leaf spread is almost indistinguishable from collards, it has one very important difference - the cabbage has a large concentration of immature leaves called a "head". The cabbage head is eaten raw, cooked, fermented and preserved. The cabbage has a few varieties you might enjoy like:

- Jersey Wakefield
- Danish Ballhead
- Savoy, and
- Red Cabbage

### **Cabbage Growing Needs**

Most cabbage is associated with early and late growing periods. Early cabbage matures in 50 days, while late cabbage matures in 80 days but produces a larger head. Cabbage has a flexible sunlight requirement, which does not require direct or intense sunlight. It can be started indoors and does NOT do well when maturing in mid-summer. Cabbage keeps well and is an excellent winter vegetable. It requires moderate to heavy water and flourishes in soils with strong and diverse mineral content.

## **Cabbage Pests**

Various caterpillars and butterflies are the most common pests to cabbage. These include the cutworm, cabbage worm, and diamond-backed moth larvae. Basic pesticides will repel these pests.

## ⇒ **Collards**

### **History of Collards**

Collard greens date back to pre-historic times and originate in the Mediterranean. These green leafy vegetables were grown with Kale, and the ancient Romans and Greeks made no distinction between the two plants. Today we associate Kale with salads and foods consumed raw while collards are always served cooked. Collards come from the Brassica family and are used mostly today in the United States, Africa, Brazil, Spain and Portugal. While collards come from the same family as cabbage, they are known for not having a “head”. The head is a large concentration of immature leaves at its center. Collards also sit on a stalk that can sometimes be as high as 60 cm tall. The collard is prepared cooked because, just like the cabbage, the mature leaves can be tough and difficult to digest. The leaves are boiled, flavored and served. Collards are a highly productive crop as they are available year-round, but are preferred

after the first frost. Those who eat collards prefer the post frost vegetable because the leaves are said to be more flavorful that time of year. In Portugal and Spain, eaters also savor the broth of the collards as it is flavorful and rich in vitamins. Collard greens are also known as tree cabbage and their varieties include:

- Flash
- Vates, and
- Georgia LS

### **Collard Growing Needs**

Collards are resistant to cold and the leaves should be picked before they reach maturity. They are best planted from early spring for a summer harvest and mid-summer to late fall/early winter harvest. Moderate soil moisture is required with 3 feet between rows. Seeds should be sown from  $\frac{1}{4}$  to  $\frac{1}{2}$  inch deep. The plants become quite large so please leave about 2 feet between each plant. Harvesting the collard is best when older but more mature leaves are cut, leaving the younger, less mature leaves. This allows continued harvesting until the end of the season. Some gardeners prefer the less mature leaves because they are more tender. Remember that this is okay, but your leaf collection times will vary over a wider period, and older leaves must still be harvested before they reach complete maturity.

## **Collard Pests**

Aphids and worms are the principal enemies of collards. Aphids can be seen as they build-up colonies on the backsides of leaves. Please watch for this. Various caterpillars and butterflies are the most common pests to cabbage and collards. These include the cutworm, cabbage worm, and diamond-backed moth larvae. Basic pesticides will repel all these pests.

## ⇒ **Turnips**

### **History of Turnips**

The turnip comes from the same family as the collard and cabbage. Resultingly, its leaves are edible and the entire plant is routinely eaten. The turnip is known for its unique flavor and its versatility in use. It can create a bountiful harvest as it is an excellent producer for humans and livestock. Some larger sub-species can be 2 pounds per turnip. Turnips are high producers on the farm. The origin is unknown, but they are widely suspected of originating in the Middle East. Turnips are neither tubers nor leafy vegetables - they are called “taproots”. This curious name evolved from that fact that a portion of the turnip is visible above ground.

Their flavor resembles mustard greens in that it is sharp and very distinctive. Until the 18th century, Europe primarily cultivated the turnip as a feed for animals, and as a garden curiosity. The turnip has not been regarded very long as an accepted vegetable for human consumption.

### **Turnip Growing Needs**

The turnip also requires a non-competitive root environment to flourish. The ground should be tilled properly to remove competing root systems. The turnip is flexible with the ability to grow in light and poorer soils, and can also be used to enrich lighter soils while serving as a feed for stock. The turnip thrives with less water and nutrient requirements than other plants, earning it a reputation for being a hardy plant. The turnip does well in moderate moisture, and slightly acidic soils. They require good soil aeration and do not do well in soils with very high moisture content. Like others in its family turnips are cold resistant and drought tolerant.

### **Turnip Pests**

Flea beetles, clubroot, root knot, leaf spot, white rust, scab, anthracnose, and the turnip mosaic virus may attack turnips. Scab is only a surface infection that can easily be removed with superficial washing and skinning. The other pests destroy the taproot and render the vegetable unusable.

⇒ **Lettuce**

**History of Lettuce**

Lettuce has been revered from ancient times for its medicinal properties. Lettuce was widely regarded as a plant that helps people sleep, and as an appetite stimulant. Lettuce is known for its bitter flavor and the modern species used today usually have very little nutrient content, with the water content of the plant close to 90%. Lettuce plants have a tendency to “bolt” or have their leaves go vertically upward after growing a specific length from the plant.

The varieties of lettuce are:

- Butterhead
- Iceberg
- Looseleaf
- Romaine
- Batavian
- Cos
- Saladin
- Great Lakes
- Webbs Wonderful
- Rossimo, and
- Tom Thumb

## **Lettuce Growing Needs**

Lettuce tends to mature in 70-80 days before bolting. It is a cold-tolerant plant that can be planted in either early spring or late summer. It thrives in a variety of environments and even grows wild all over Europe. Lettuce thrives in cold, but does NOT do well in very hot summers. Lettuce should be started in the protection of shade during harsh summers and likes mildly acidic soils. Seeds should be planted at a depth of  $\frac{1}{4}$  to  $\frac{1}{2}$  inch below the surface and the plants should be spaced 16 to 18 inches apart. Light watering is recommended, and root aeration is essential.

## **Lettuce Pests**

The most common lettuce pests are aphids, worms, foliage rot, and tip burn. Tip burn is a dying off of leaves at the outer edge of the leaf.

⇒ **Okra**

## **History and Background of Okra**

Okra originated in Africa and means “lady’s finger”. The plant originated in what is today Ethiopia. Okra has taken off in the past 40 years as a component in Japanese cuisine. In the past 300 years, Africans brought it to America as a food via the slave trade. Typically one plant grows 5 to 8 lobes per plant, and the vegetable itself is a capsule filled with seeds. The

pods are fibrous and soft when young, but become woody and tough when mature. The pods are picked while they are young, and most often served cooked. The leafy portion of the plant is also edible and of moderate to savory flavor. Okra leaves are often included in salads in other parts of the world.

### **Okra Growing Needs**

Okra grows best in tropical and sub-tropical zones. It tolerates high heat and high moisture very well. It is somewhat drought resistant and thrives in direct sun, and heavy clay. Okra is annual, and its varieties are as follows:

- Annie Oakley
- Dwarf Green Long Pod, and
- Clemson Spineless

You should plant okra in warm soils in early spring. This is best done one week to 10 days after the last frost of the season. Seeds should be planted in mounds 1 to 2 feet apart.

### **Okra Pests**

Aphids, cabbage worms, diamond-backed worms and moths are common okra pests. A simple pesticide will do. We suggest Monsanto products for this particular plant.



⇒ **Broccoli**

**History and Background of Broccoli**

Broccoli is another plant from the Brassica genus. In this book, all cabbage, turnips, mustards and collards are also from this genus. This means that all these vegetables are related. Before we started reviewing items from this genus, we reviewed a lot of vegetables from the nightshade family. Even if you are not familiar with these plants, you can see that humans eat a lot of domesticated plants from just a few families. Some reasons for this are taste, productivity, toxin levels, and an accumulated knowledgebase about the plant. Broccoli is no exception. Broccoli is known as a fibrous, green vegetable that sprouts from a stalk. It freezes well, and is also eaten raw.

The Turks first domesticated broccoli. The time of earliest domestication was about 8 B.C.E. Broccoli became a favorite and was spread by the Roman Empire. The vegetable was spread throughout Europe by the Italians who gave it to the French, and English. It gradually gained popularity in the United States and is rated as perhaps the number one vegetable in the US.

Broccoli varieties include:

- Cruiser
- Green Comet, and
- Green Goliath

### **Broccoli Growth Needs**

Broccoli should be planted  $\frac{1}{4}$  to  $\frac{1}{2}$  inch deep in warm soil. A slightly elevated soil PH gives the broccoli an advantage. Broccoli prefers direct sunlight while young, and there is an advantage to adding a base to low PH soils. Many gardeners prefer to transplant from an indoor environment to an outside garden. You should however be warned that this should only be done when the transplant can move to a warm soil with a temperature higher than 64 degrees Fahrenheit. Plants are best put out in early spring, once weather has consistently warmed past 64 degrees Fahrenheit. Seedlings should average 18 inches apart and rows should be 3 feet apart.

### **Broccoli Pests**

Aphids and worms are the principal enemies of broccoli. Aphids can be seen as they build-up colonies on the backsides of leaves. Please watch for this. Various caterpillars and butterflies are also common pests to broccoli. These include the cutworm, cabbage worm, and diamond-backed moth larvae. Basic pesticides will repel all these pests.

## ⇒ **Squash**

### **History and Background of Squash**

Squash is a fruiting vegetable native to the Americas. It can be eaten raw or cooked, and it stores very well. Squashes are divided into summer and winter squashes, and they obviously be rotated in fields to provide year-round food. Squashes are from the family of Cucurbitaceae, and are the cousins of zucchini and pumpkins. Summer squashes are thin skinned and are harvested and ready for eating. Winter squashes are often cured and kept using the cured skin as a method of preserving the food through the winter. By now you should have noted how important the ability to preserve food is. Each vegetable we have mentioned had to readily have a tendency to store well. Therefore, it made sense to domesticate only vegetables that lend themselves to storing well.

The squash plant is often consumed entirely. The leaves are eaten as greens and the seeds are eaten raw or pressed for oil.

Squash varieties are:

- Hubbard and Banana
- Pumpkin, Zucchini
- Butternut, and

- Cushaw

## **Squash Growing Needs**

### ***Summer Squash:***

The best time to plant is after the last frost. Roots of the plant are shallow and soils should be drained and aerated. Ideal harvest times are midsummer and early fall. The ideal time to pick squash is when they are 2 to 8 inches in diameter. Many people pick the fruit when it is over mature and hard. This is a mistake. Most squash is ready to pick 4 to 8 days after the plant flowers. Water the plant light to moderately.

These varieties include:

- Pan Patty
- Black Beauty
- Cocozelle, and
- Aristocrat

### ***Winter Squash Needs:***

Winter squash is a vining fruit and is harvested when the fruit is mature.

Winter squash matures to include a very tough outer skin and requires a longer cooking time. These are open-pollinated varieties that include:

- Pumpkin
- Swan White
- Table Ace
- Table Gold
- Sugar Loaf
- Honey Boat, and
- Sweet Honey

### **Squash Pests**

Cucumber beetles destroy seedlings, vines, leaves and fruit. These beetles hatch in large groups and move together attacking the plant in unison until they reach maturity. Squash bugs attack vines and immature fruit. They feed on the fruit until it matures.

⇒ **Chile Pepper**

**History and Background of Chile Pepper**

The Chile pepper is also from the nightshade family. This makes it a relative of the potato, tomato and other common vegetables. Chile peppers have been eaten for more than 9000 years, and are one of the oldest vegetables eaten by man. They originate in the Americas, just like tomatoes.

The Chile pepper gets its heat from a chemical named capsaicin. This is the main ingredient in pepper spray. This chemical is responsible for the power of many peppers known for heat like jalapeno, cayenne, and the famous habanero. Listed below are some varieties of Chile peppers:

- Bell peppers
- Paprika
- Jalapenos
- Scotch bonnet
- Aji pepper
- Naga
- Habanero
- Red Chile
- Cayenne, and
- Gypsy

## **Chile Pepper Growth Needs**

These peppers typically take 74-84 days to mature. These plants are best started indoors in late winter and then transplanted outside in the early spring. Take care to make sure the last frost has passed and that there is no chance of freezing the plants. Set the transplants 18 to 24 inches apart and 15 to 20 inches apart from row to row. Peppers do best in well-drained moist soil. These plants are especially vulnerable to drought and hot winds. Please take special care to keep growing soil irrigated and aerated.

## **Chile Pepper Pests**

Chile peppers are vulnerable to the tobacco mosaic virus and aphids. It is possible to spread the virus to pepper plants after handling cigarettes. Aphids can be located on the underside of leaves and can indicate a severe problem. A good insecticide is suggested if this activity is found.

## ⇒ **Onions**

### **History and Background of Onions**

The onion is a leafy bulbous vegetable that dates back more than 7000 years from the present day. The onion was first eaten in the wild, and was known to have been cultivated in the Middle East first. It made an excellent vegetable because it stores well and produces very well from transplants.

Onions vary from varieties of that are extremely pungent to sweet varieties. The onion has had a long history with modern man, as it is an excellent storage vegetable and is highly productive. Onions are from the Allium family. This makes the modern onion the relative of leeks, chives, garlic and shallots. Onion varieties include:

- Vidalia
- Walla Walla
- Ebenezer
- Stuttgarter
- Sweet Spanish
- Texas Glano, and
- Red Globe

### **Onion Growing Needs**

Onions typically are planted in the early spring. Moist, well-drained soil that is slightly cool helps young onion plants grow. Place sets 1 inch deep with 2 to 4 inches between sets, and you should allow 12 to 16 inches between rows. Weeds should be kept back if at all possible in the presence of green onions, because they do not tolerate competition well as the roots are shallow. Hoe the onions often and keep weeds clear. Do not allow hilling around dry onions as this can promote rot.



## **Onion Pests**

Soil borne fungus and root maggots routinely attack onions. Root maggots can be taken care of with an insecticide. The fungus often attacks onions that were “hilled”. It is best to enjoy these garden onions soon after harvest if possible. Soil borne fungus often attacks onions injured by a hoe. Please be careful when removing weeds from your garden.

## ⇒ **Leeks**

### **History and Background of Leeks**

The leek is from the same family as the onion. The leek is a collection of elongated leaves, and the upper part of the plant looks exactly like the traditional green onion. Leeks have a history longer than 4000 years and were prized by the empires of the ancient world like the Egyptians and Sumerians. The vegetable is a favorite of the Welsh.

Leek varieties include:

- Siberia
- Electra
- Carina
- Goliath

- Kilima
- Jolant
- American Flag, and
- King Richard

Leeks are roughly divided into two groups of summer leeks and overwintering leeks. These refer to growing seasons.

### **Leek Growing Needs**

Leeks are often started indoors and transplanted out in mid-March and early April. This is done after the last frost, and when soil temperatures are warm. Leeks grow best in warm soil with lots of manure, and thrive in moist, well-aerated soils. The best soils are relatively neutral, and they are at their best in moderate climates.

### **Leek Pests**

Soil borne fungus and root maggots routinely attack leeks. Root maggots can be taken care of with an insecticide.

⇒ **Garlic**

**History and Background of Garlic**

Garlic is also from the Allium family - the plant family that includes onions and leeks. Garlic grows wild throughout Asia, but its origin is unknown. It has been widely accepted by most cultures and is prized for both medicinal and cooking purposes. In Western cooking garlic is more likely to be used as a flavorful herb than an actual vegetable. Garlic is used in its bulb form, and the “heads” of it are consumed. It is used for flavoring and to accompany meats. Garlic is used to flavor other culinary dishes and are not consumed alone in the west. Garlic varieties include:

- New York White
- Susanville
- German Red
- Spanish Rosa
- Asian Tempest
- Merrifield Rocambole

Garlic is often used as a seasoning. It also yields allicin, an anti-microbial substance. Garlic has been considered for medicinal values as an anti-coagulant, tool of lowering cholesterol, treatment for intestinal worms, and aid in heart health.

## **Garlic Growth Needs**

Garlic is a hearty winter plant that enjoys moist soil. The plant will produce in direct sunlight and partial sun. Garlic does not require much space, and you can plant the bulbs as close as 4 inches apart, but it is suggested to allow 6 inches between plantings. Irrigate moderately and the garlic should grow at an average rate.

## ⇒ **Nuts: Honorable Mention**

Most nuts we know of are considered nuts because of culinary definitions. This book has referred to almost every item in it using culinary definitions. The term “vegetable” is almost always used to refer to items known for their savory taste. While nuts are not vegetables we felt that we need to mention them because nuts serve a very important purpose in nature and at our tables. Nuts are radically different to vegetables because they almost always come from trees. Nuts are also a highly revered food source because they are a high-energy food source and can be pressed for oil.

Conclusively, nuts are extremely high in calories. From a botanical definition, most items referred to as nuts are actually drupes or seeds. True nuts are dried fruit with a hardened ovary wall. Nuts are known for

their oils, and should be added in cooking carefully because many people are allergic to nuts.

On the other side of the spectrum, nuts have been shown to have positive affects on cardiac health. Overall, nuts are known for possible positive health effects, and are a prized food source.

## **Chapter 5 - New Technologies and Your Garden**

Today we know that our garden vegetables require human intervention, but on mass production farms, machines remove the produce. This is why our supermarkets have cheaply priced mass production vegetables, expensive thin-skinned fruits and very expensive “designer” vegetables. An example of a mass production vegetable is a special brand of tomato that can be machine picked. That tomato will always be priced more cheaply than other tomatoes picked by hand. To help you understand this, the manufactured tomato has to meet the following standards:

- The tomato has to be machine picked without damage
- The tomato has to be detached from the plant, cleaned and machined for market on the picker
- The tomato has to have a palatable taste

Unfortunately, taste is almost always sacrificed with mass production. An example of a vegetable where this did not happen is the Yukon Gold potato, but some would argue that the nature of potatoes is to over produce. We will not land on either side of that argument. New technologies for nuts required a tree shaker, and nut-gatherer. The tree

shaker comes along and gently rocks the tree. The nuts respond by falling to the ground. Then the nut-gathering machines come along and sweep up the nuts. Nuts are then returned to the manufacturing facility for washing, shelling and packaging.

Designer vegetables are often purchased from local growers or brought in fresh. These vegetables are the product of special growers who focus on producing non-machining fruits and vegetables. Non-machining means human picking and sorting. These vegetables are still washed and processed in other ways, but they are not removed from the field in a highly efficient manner. This means they cost more to harvest and that cost must be passed on to the customer. So the rarer varieties of potatoes, tomatoes, and peppers are almost always more costly. Invariably, this is why some casual gardeners plant their own vegetables. Gardening is cheaper if the grower knows what he is doing.

### **Gardening Specialties**

As a gardener you have the option of growing non-edible species of plants. Non-edible is a unique perspective as long as the plant is not poisonous. For instance, the medusa chile pepper is not poisonous, but it is not grown for food. This chile pepper is considered of poor taste and it is grown for its decorative colors. You have the option of growing vegetables for

decoration, and beauty. While most decorative gardens are “shaped”, you can grow this in your conventional garden, and then transfer the peppers onto decorative strings or into displays you make.

Another gardening specialty is the growth of medicinal herbs. Medicinal herbs like dandelion and various worts can be grown in your own herb garden. This book is focused on vegetables and fruiting vegetables, but many different types of gardening exist. Flower gardening is also another option. Flowers can be grown in a decorative pattern, and provide beauty and freshness during their flowering time.

There are also gardens that have monetary goals. Some cultivars try to breed rare plants or create new plants. An example of this would be a new Naga pepper said to be more than 875,000 on the Scoville scale. The Scoville scale measures relative hotness of peppers. This new Naga pepper was not independently verified. A Japanese firm recently made this statement, but verification from other firms has not happened.

It is obvious that there are business implications for creating either rare or exceptional products in the garden. Apparently there is a demand for mass-producing rare and exceptional flower, nut and vegetable products.



## **Gardening – Why do it?**

For most, the home garden is a source of pleasure and is a pursuit that requires being in touch with nature. Most gardeners have a love of nature and like to work with their hands. Gardening requires you to get down into the dirt and love the handling of life's essence. Most gardeners have a love of nature and nature's laws. Throughout this book, we have not recommended specific pesticide and anti-microbial products. We feel that it is best to allow you to make up your own mind about what pesticides to apply. Careful attention was paid to not specifically prompt the gardener to add chemicals. We believe it is up to the gardener to understand the plant's needs before adding fertilizer or pesticides. If the gardener understands the needs of the plant, he can help the plant better overall.

Chemicals are often a "quick fix," but more often than not, they don't fix much at all. A good example is common herbicides. These kill a few weeds and invariably the weeds come back. You spray some more, and they come back again. The cycle never ends. Meanwhile you are making the herbicide producers rich, and you are filling your environment with chemicals designed to kill plants. I do understand that most readers don't want to spend their days weeding their gardens after work, but special attention **MUST** be paid to how many chemicals you spray on something you plan to consume. Many herbicides and pesticides have been

connected with cancer and other diseases. This brings us to an unmentioned garden specialty called organic farming.

## **Chapter 6 - Organic Farming and Gardening**

Organic means no chemicals. Invariably this means lower yields. It also means virtually zero exposure to carcinogens. Organic produce is extremely expensive, but there are very strong potential health and environmental benefits to organic farming. There has been very strong market demand in recent years for organic produce. It is not uncommon for organic produce to be 200 – 400% higher in cost than conventional produce.

Organic vegetables have become very popular in recent years. One major reason is that countries that have reduced the presence of pesticides in the food supply have seen a corresponding drop in cancer rates. Israel banned 21 pesticides in 1995. In the next 3 years the country saw a 30% drop in cancer across the board. It is not a big secret that pesticides are related to cancer. It is well-known in public health and educational institutions. The inclusion of pesticides and other chemicals in the human diet promote cancer, birth defects and other mutations in the human genome.

Many garden owners sight the exclusion of chemicals as the main reason for starting a garden. The organic approach is a more healthful approach to the human diet. Some of these chemicals are so strong that their active ingredient is often used in cancer experiments to generate tumors! It is in your best interest to spare pesticides and other chemicals whenever possible.

We have discussed the positive aspects of gardening like the personal experience of growing a healthful platter of garden vegetables. We have reviewed techniques and vegetable classifications. We have talked about transplanting plants and growing indoors. We did not discuss hydroponics and other growth methods, but these would be a welcome addition in another book. We want you to take away some really important points from this book:

- Plant growth requires commitment, care and the right growth methods.
- Gardening can be a very diverse hobby. Some gardeners may be businessmen; some could be health-oriented while others could be decorators. There is room for everyone at this table.

- The benefits of gardening are beyond count, but the most strategic is that the gardener can produce and harvest whatever plants he wishes.

We have enjoyed expounding on the benefits of gardening and the plethora of wonderful produce that can be had. We would like to leave you with our best wishes in growing whatever delights you.