



The ability to grow your own food--vegetable gardening--is the skill that built civilization. Without this basic skill man was destined to be a hunter gatherer, unable to stay in one place and create homes, villages, towns, cities, and nations.

No one can tell you exactly how to garden; there are too many variables involved. No one's garden has the same soil, water, sunlight, climate, drainage, terrain, wind, weather, or resources. Add to this the fact everyone likes different vegetables, of which there are thousands of varieties, has different skill levels and time to spend in the garden. You see that the odds of two gardens being the same are very low. In this chapter we tell you what has worked in Gloucester County based on the best advice from the Master Gardeners and the Virginia Cooperative Extension (VCE).

Vegetables can be raised throughout the spring, summer, and fall in Gloucester. With succession planting you can be eating your own produce year round. Spring plantings can include asparagus, beets, broccoli, Brussels sprouts, cabbage, carrots, cauliflower, Swiss chard, collards, lettuces, onions, peas, radishes, spinach, and turnip greens. Summer plantings after the average last frost date in Gloucester—usually April 21--can include tomatoes, okra, corn, potatoes, beans, cucumbers, eggplant, melons, peppers, squash, and pumpkins. In August plant cabbage, cauliflower, collards, beets, lettuce, carrots, beans, radishes, spinach, chard, and onions.

Your gardening can extend in to the winter with the use of green houses, cold frames, hoop tunnels, and row covers. Your cool weather plants will grow with

protection from the weather as long as they have ten hours of light, with less than ten hours they will still survive but their growth will slow greatly. Planting these plants early in the fall so they are good size then the ten hour of light is past will allow you to have fresh vegetables all winter.

## **PLANNING YOUR GARDEN GUIDELINES**

When planning your garden, it is important to ask yourself a few basic questions:

How much time will you be able to devote to your garden on a regular basis? The answer to this question will dictate the size of your garden. You must remember that, once planted, the garden will have to be weeded once a week, irrigated during droughts, and vegetables harvested when ripe. Depending on the type of vegetables, you may also need to undertake pest control measures.

What vegetables do you like to eat and how do you plan to use the harvested produce? The answer to these questions will dictate what vegetables to plant and how many seeds/transplants of each vegetable to plant. In addition to eating freshly harvested vegetables, you will want to determine how much produce you want to can, freeze, dry, or store. Successive plantings of certain crops, such as beans, will give a longer harvest period and increase your yield. Make a list of recommended varieties and their planting dates. Use care in choosing the seeds, making sure the varieties you select are adapted to your area and intended use.

How much space is available? That is, how much area can be converted into usable garden space, not simply how much empty ground is available.

## Some Additional Planning Hints

Summer is the best time to plan next year's garden so you have the fall to prepare the soil and winter to order the seeds.

Plan the garden on paper first. Draw a map showing the arrangement and spacing of your crops.

To keep the garden growing all season, make a spring, summer, and fall garden plan. There are many online programs to layout and plan your garden a lot of them are free.

Plan the garden and order seeds by January or February. Some plants may be started indoors as early as January.

In your plan, place tall and trellised crops on the north side of the garden so they won't shade the sun loving vegetables. Use the shade for vegetable that can take the strong summer sun.

Group plants by the length of their growing season. Plant spring crops together so later crops can be planted in there area when the early crops mature. Consider the length of harvest as well as time to maturity. Place perennial crops to the side of the garden where thy will not be disturbed.

## Locating the Garden

Vegetables grow best in a level area with loose, well drained soil and at least six hours of sun. Eight to ten hours is ideal and afternoon sun is better than morning sun.

Use contour rows, terraces, or raised beds on sloped sites to avoid erosion. South facing slopes are warmer and less subject to frost damage.

Avoid placing the garden in a low spot, at the base of a hill, or at the foot of a slope bordered by a solid fence. Such areas are slow to warm up in spring, and frost settles in these places since cold air naturally drains to low areas.

Avoid windy locations; if you must plant in a windy spot, build or grow a windbrack.

Locate the garden near a good and easily accessible supply of water.

Choose a garden location near your home so it is convenient to work in the garden when you have a few minutes.

Avoid planting near trees and shrubs; they compete for nutrients and water and may cause excessive shade.

Sites too close to buildings may result in plants not receiving enough sunlight. Observe shading patterns through a growing season before starting the garden. If you have a shaded area you wish to use anyway, plant shade-tolerant crops.

Avoid locations for the garden where buildings with lead paint have stood. Lead may be present in the soil in toxic amounts.

Gardening where sod has long been established requires a great deal of preparation to eliminate sod, weeds and soil insects.

Keep the garden away from areas that are likely to flood, especially with salt water.

Don't discount planting vegetables in containers if you are short on gardening space. Vegetables are beautiful and some lend an exotic touch when planted among your flowers.

Dig a few test holes where you plan to put your garden to see how deep the top soil is, how hard the soil is, and you can put water in the holes to see how well it drains

Do a soil test on the area you are planing for your garden. This can tell you how suitable the area is and what you may need to add to the soil. You can also have it tested for toxicens that may be in the soil from the past.

## TYPE OF GARDENING METHODS

There are many ways of gardening and they can be used together as you planing your garden.

### Raised Beds

Building your beds 12 or more inches off the ground and 3 to 4 feet wide will improve drainage and raise soil temperature in fall and spring. Since you fill the

bed, you can make a fertile soil mix that will ensure you get the very best produce. You can plant earlier and harvest later, extending your producing season. Physically, it is easier to work in raised as you do not have to bend over so far and you can reach all areas from the sides of the beds.

### Succession Plantings

To obtain a succession of crops, plant something new in the spots vacated by spent plants. After you harvest turnips or beets in late spring, then plant tomatoes. After the spinach, lettuce, chard or sugar snap peas are harvested in early summer, you can then plant potatoes. You just do not follow root vegetables with other root vegetables, or fruits with fruits. As you get into fall you can plant lettuce and spinach again where your potatoes or tomatoes had been.

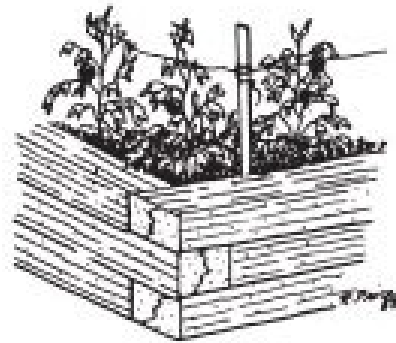
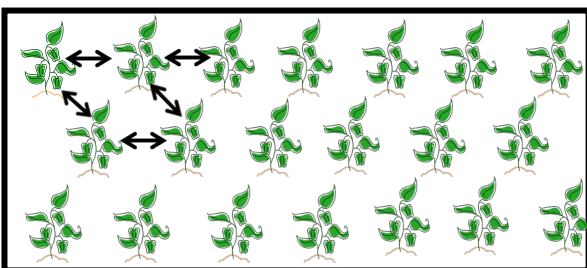
### Vertical Gardening

Use trellises, nets, strings, cages, or poles to support growing plants. As you know pole beans take up less space than bush beans. Plants like cucumbers are climbers; summer squashes can be taught to climb with a trellis and some string. Growing these plants vertically, you can see them easily before they balloon in size. You can double your produce by planting vegetables that cannot take the hot summer sun, such as lettuces and chard, underneath the vertically growing plants which will shade them.

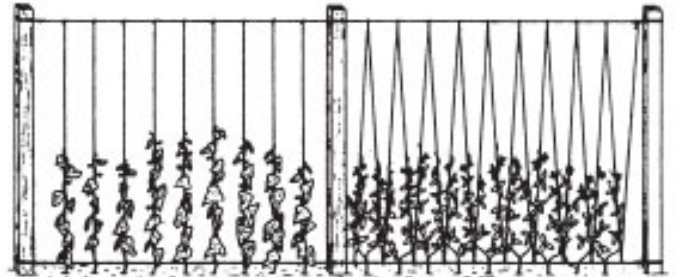
### Intensive Plantings

Seed packages tell you to plant/space seeds/seedlings 3 inches apart and 10-12 inches between rows. If the seedlings can be happy 3 inches apart, why use up extra space between rows? You don't have to. Plant or thin seedlings so they are in a cross-hatched design as shown below:

Each doubled pointed arrow is 3 inches long and each seed/seedling is planted that distance from the next seed/seedling. This reduces the space available for weeds to grow.



**Raised Bed Gardening**



**Verticle Gardening**

### Interplantings

Growing two or more types of vegetables in the same place at the same time is known as interplanting. Long-season (slow-maturing) vegetables such as carrots and short-season (quick-maturing) vegetables such as radishes can be planted together. Filling your space with vegetables reduces the room for weeds to grow and reduces insect and disease problems as no one pest-specific plant is massed.

### Square Fool Gardening

In this method your gardening space is divided in to 1-foot by 1-foot squares. The number of seeds that can be planted within each square is based on the size of the plant. For example, one tomato plant will fill a square or 16 carrot will fill the same size space.

### Wide Row Gardening

Growing in wide rows in the vegetable garden basically means that instead of planting an individual row of seed or plants, you set them out in strips that are 1 - 4 feet in width. The row can be any length you like. Wide rows allow you to squeeze more vegetables into less space. Planting single rows require that you have to leave space to walk between them. A wide row still allows you to reach into the center of the row to seed, weed or harvest, but you won't be walking in between the plants.

### **No-Till Gardening**

No-till gardening is a way of growing crops from year to year without disturbing the soil through tillage. No-till is an agricultural technique which increases the amount of water that infiltrates into the soil, the soil's retention of organic matter and its cycling of nutrients.

### **Lasagna Gardening**

Lasagna gardening is a no-dig, no-till organic gardening method that results in rich, fluffy soil with very little work from the gardener. It incorporates 5 or more distinctive layers of various organic materials that will decompose quickly. The name "lasagna gardening" has nothing to do with what you'll be growing in this garden.

### **Soil Bag Gardening**

The primary benefit of growing directly into a bag of soil is speed. Convenience and cost savings are also big benefits of this method. With this method, the container, soil preparation, and so forth are all taken care of and only the plant or seeds are needed to complete it. A small garden (or part of one) can be planted in less than a minute – literally.

### **CORE Gardening**

The method is simple. The idea is to incorporate organic material down the core, or center, of your raised bed before planting. As this material breaks down it will release vital nutrients to your plants while enriching the soil and raising the moisture retention ability in your soil bed. Most of the time this is done with rotted straw, but we're using rotted grass clippings and mulched leaves.

### **Wood Chip Gardening**

The most common way of using woodchips for gardening is to spread them on the ground as mulch. The functions which woodchips as mulch can have is to provide moisture retention, smother weed and will moderate summer soil temperatures by serving as insulation.

### **Straw Bale Gardening**

Straw Bale Gardening is a simply a different type of container gardening. The main difference is that the container is actually the straw bale itself, held together with two or three strings, the outside crust of the bale serves as the container.

### **Ruth Stout No-Work Garden**

My no-work gardening method is simply to keep a thick mulch of any vegetable matter that rots on both my vegetable and flower garden all year round. As it decays and enriches the soil, I add more. The labor-saving part of my system is that I never plow, spade, sow a cover crop, harrow, hoe, cultivate, weed, water or spray. I use just one fertilizer (cottonseed or soybean meal), and I don't go through that tortuous business of building a compost pile.

## **PREPARING THE SOIL**

Once the location is selected, then you need to prepare the soil. Be safe and have your soil tested. Get a soil test kit, directions, and application from the Gloucester County VCE Office. Send your soil sample to Virginia Tech and follow the advice you receive to ensure that your soil produces the best vegetables possible. A good time to get a soil test is in the fall as you can get the results back and amend the soil as needed, and it will be ready in the spring when you put in your seeds and transplants. Most vegetables grow well with a soil pH of 6.0 to 7.0. The addition of lime or sulfur will correct the pH. Heavy spring rains can be a problem in preparing the soil. You should never work the soil when it is excessively wet—soil sticks to the shovel—as you can destroy the soil structure. Organic matter like manure, leaf mold, sawdust, straw, and compost improves both clay and sandy soils.

At the end of the summer, you can prepare the soil for the following summer by planting annual rye grass, red clover, hairy vetch, or other cover crops that prevent soil erosion and enhance the nitrogen content of the soil. These should be planted in September or October—early enough to allow for the cover crop to take hold before the first killing frost (November 8 to 28). Come spring, till in the cover crop as you prepare for the spring planting.

## APPLICATION OF TEA AND COFFEE IN THE GARDEN

When first starting your garden to the final harvest the most effective and most important of all practices is careful observation in the garden. Many serious weed, disease, or insect problems can be halted or brought under control early by an observant gardener. So grab your cup of tea or coffee, your phone with camera and pad and pen and walk the garden. Pull a weed, pick a bug but do not try to correct everything you see, if you do this you will not make it to all the garden and will miss a problem. You should observe, take notes and pictures of the whole garden then make a work plan. The following is a list of some things to help you start your garden and keep it in good shape.

Water in the morning so plants have time to dry before the cool evening. Drip irrigation systems prevent foliage from getting wet when watering.

Use interplantings in the vegetable garden as opposed to solid plantings of a crop. This can slow the spread of diseases and insects, giving you more time to deal with them if they occur.

Space plants properly and thin young vegetables to a proper stand. Overcrowding causes weak growth and reduces air flow, resulting in increased insect and disease problems.

Keep down weeds and grass by cultivating early and often. When they are small they are much easier to control and there is less of a chance of damaging the roots of your crop.

Use a mulch to reduce soil splash, which brings soil and soil-borne diseases into contact with lower leaves. Leaf and other organic mulches are extremely effective for weed control, as are inorganic weed mats, plastic, and other fabrics.

Avoid injury to plants. Broken branches, cuts, bruises, cracks and insect damage are often the site for infection by disease-causing organisms.

Do not work the garden when the plants are wet with rain or dew to prevent spreading diseases.

*"If temperatures go above 90°, snap bean, tomato and pepper flowers can fail to develop fruit."*

– Virginia Cooperative Extension

Do not use tobacco products when working in the vegetable garden. Tomato, pepper and eggplant are susceptible to a mosaic virus disease common in tobacco and may be spread by your hands.

Remove and dispose of infected leaves from diseased plants as soon as you observe them. Remove severely diseased plants before they contaminate others.

Clean up crop refuse as soon as you are finished for the day.

Sanitize stakes and wire cages prior to use with a light bleach solution.

Keep old sacks, baskets, wooden stakes, decaying vegetables, and other rubbish, which may harbor insects and diseases, out of the garden.

Staking tall vegetable plants or planting them in wire cages prevents the leaves, blossoms, and fruit from coming in contact with the soil where they may pick up diseases.

Time plantings in such a way that the majority of your crops will avoid the peak of insect infestations. For example, plant squash as early as possible to avoid borers, which lay eggs in July. Keeping a record of the dates that insect problems occur will help in planning next year's garden.

Inspect plants for egg clusters, beetles, caterpillars, and other insects as often as possible. Hand-pick as many pests as you can. Avoid sprays until the population of insects has reached a critical threshold level. Remember not all insects are bad, some are our best help in controlling problems, know your bugs.

Where slugs are a problem, use approved baits and traps and try to create drier conditions. Heavy mulches may encourage slugs. Diatomaceous earth, crushed eggshells, and hydrated lime near plants may help deter slug activity.

## SEED AND PLANT SELECTION

During the winter order your seeds from a reliable seed catalog. Choose disease resistant varieties whenever possible. Start your own seedlings indoors according to directions on each seed packet. Vegetables that do well as transplants are broccoli, cabbage, cauliflower, sweet potatoes, tomatoes, and peppers. Onions, lettuce, spinach, peas, cucumbers, watermelons, beans, carrots, melons, squash, corn, and radishes do well if seeds are directly sown in soil.

When you sow your seeds, either indoors in pots, Styrofoam cups, or other containers or outdoors in the prepared garden bed, think about the size of the plant that can grow from one seed and plant that one seed so that you do not need to thin out the seedlings once they start. Many seeds are wasted when a single seed will do.

***“Invest in a soil thermometer and use it! If you plant seeds too early, many won’t germinate if the soil is too cold—and many kinds actually rot.”***

**– Alma Eacho, GEMG Emeritus**

***“If temperatures go above 90°, snap bean, tomato and pepper flowers can fail to develop fruit.”***

**– Virginia Cooperative Extension**

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## SPRING AND FALL PLANTING DATES

The table below shows spring and fall vegetable planting dates. The earlier dates will be for areas not close to tidal creeks or bays, but that do have fairly sandy soil. The further you are away from tidal bays, rivers or creeks, the earlier you plant. For example, a Naxera resident would plant later than a Hayes resident.

<b>Vegetable</b>	<b>Spring Plant Date</b>	<b>Harvest Date</b>	<b>Fall Plant Date</b>	<b>Harvest Date</b>
Asparagus	2/09 - 3/31	3/31 - 6/09		
Beans - Bush	4/20 - 6/29	5/20 - 10/20	7/19 - 8/30	9/19 - Freeze
Beans - Pole	4/20 - 6/14	6/14 - 10/2		
Beans - Lima	4/25 - 6/29	7/09 - 10/20		
Beans - Wax	4/20 - 7/09	6/09 - 10/20	7/19 - 8/30	9/19 - Freeze
Beet	3/05 - 4/20	4/30 - 6/29	8/10 - 9/12	9/29 - 12/8
Broccoli	3/11 - 4/30	5/20 - 7/19	7/31 - 8/20	10/9 - 12/18
Brussels Sprouts	3/11 - 4/30	5/30 - 8/08	7/21 - 8/20	10/9 - Jan.
Cabbage	3/01 - 4/15	4/30 - 6/24	7/31 - 8/23	10/9 - Freeze
Chinese Cabbage	3/11 - 3/31	5/20 - 6/29	8/20 - 8/28	10/19 - 12/28
Carrot	3/01 - 4/10	4/30 - 6/29	8/20 - 9/29	10/17 - Jan.
Cauliflower	3/11 - 4/10	4/30 - 6/09	8/30 - 9/19	11/8 - Freeze
Chard, Swiss	3/10 - 4/30	4/30 - 10/27	8/20 - 9/29	10/29 - Freeze
Collards	2/15 - 3/31	4/30 - 6/19	8/20 - 9/19	11/8 - Jan.
Cucumber	4/20 - 5/10	5/30 - 8/8	8/20 - 9/22	10/9 - Frost
Eggplant	5/05 - 5/10	6/29 - 9/17		
Endive	3/11 - 4/10	5/20 - 6/29	9/09 - 9/29	11/28 - Jan.
Kale	3/05 - 4/15	4/20 - 6/04	8/30 - 10/09	10/24 - Freeze
Kohlrabi	3/01 - 4/30	4/20 - 6/29	9/19 - 10/24	11/26 - Jan.
Leek	2/19 - 4/10	6/29 - 10/27	7/01 - 8/20	11/08 - Jan.
Lettuce - Bibb	3/01 - 4/20	5/10 - 6/19	9/19 - 10/04	10/13 - 12/28
Lettuce - Leaf	3/01 - 4/20	4/15 - 6/09	8/19 - 10/24	9/27 - 12/18
Muskmelon	5/05 - 6/05	6/29 - 8/28		

### SPRING AND FALL PLANTING DATES *(continued)*

Mustard	2/19 - 3/26	3/21 - 5/20	9/29 - 10/29	11/06 - Jan.
Okra	5/20 - 6/10	7/09 - 9/17		
Onion (Seed)			9/29 - 11/08	Next Spring
Onion (Sets)	2/09 - 5/10	3/21 - 10/27		
Peas	2/09 - 3/21	4/10 - 5/30		
Pepper	4/20 - 5/20	6/19 - 9/27		
Potato	3/05 - 3/31	5/20 - 10/07		
Pumpkin	5/10 - 6/05	6/24 - 10/07		
Radish	3/01 - 4/10	3/06 - 5/20		
Rutabaga			9/09 - 10/09	11/28 - Jan.
Southern Pea	5/20 - 6/30	7/14 - 10/7		
Spinach	3/01 - 3/21	3/21 - 5/20	9/09 - 10/14	10/19 - Freeze
Squash, Summer	4/21 - 5/20	8/19 - 9/19		
Squash, Winter	4/21 - 6/29	7/19 - 9/27		
Sweet Corn	4/10 - 6/09	6/19 - 9/07		
Sweet Potato	5/20 - 6/20	8/08 - 9/17		
Tomato (Transplants)	4/20 - 6/05	6/09 - 9/27		
Turnip	2/09 - 3/21	3/21 - 5/30	9/09 - 10/19	10/9 - Jan.
Watermelon	5/20 - 6/10	7/09 - 9/07		
Adapted from Virginia Cooperative Extension Publication, Vegetable Planting Guide & Recommended Planting Dates, Revised December 2006, Publication 426-331				

### VEGETABLE PLANTING DISTANCES AND YIELDS

The table on the next page shows the planting distances in and between rows as well as the approximate yields you can expect for each 10-foot row.

Vegetable	Planting Distances in Feet and Inches		Approximate Yield per 10 ft. of row
	In Rows	Between Rows	
Asparagus	18"	48-60"	3-4 lbs.
Beans, bush	1-2"	24-36"	3-5 lbs.
Beans, pole	4-12"	36-48"	6-10 lbs.
Beans, lima	3-4"	24-36"	3-5 lbs.
Beans, wax	2"	24-36"	3-5 lbs.
Beet	2-3"	12-24"	8-10 lbs.
Broccoli	15-24"	24-36"	4-6 lbs.
Brussels Sprouts	18-24"	30-36"	3-4 lbs.
Cabbage	12-18"	30-36"	10-25 lbs.
Chinese Cabbage	12-24"	18-36"	20-30 lbs.
Carrot	1-2"	15-30"	7-10 lbs.
Cauliflower	12-24"	24-36"	8-10 lbs.

## VEGETABLE PLANTING DISTANCES AND YIELDS (*continued*)

Vegetable	Planting Distances in Feet and Inches		Approximate Yield per 10 ft. of row
Chard, Swiss	6-12"	18-30"	8-12 lbs.
Collards	12-24"	24-36"	8-15 lbs
Cucumber	12-18"	48-72"	8-10 lbs.
Eggplant	18-24"	30-42"	10-12 lbs.
Endive	9-12"	18-30"	3-6 lbs.
Kale	6-18"	18-36"	4-8 lbs.
Kohlrabi	4-6"	12-36"	4-8 lbs.
Leek	2-6"	12-30"	10-20 lbs.
Lettuce (Bibb)	6-10"	12-24"	4-8 lbs.
Lettuce (Leaf)	3-6"	12-18"	5-10 lbs.
Muskmelons	24-36"	60-90"	15-25 lbs.
Mustard	2-4"	18-30"	3-6 lbs,
Okra	12-18"	36-48"	5-10 lbs.
Onions (sets)	2-4"	12-24"	7-10 lbs.
Peas (English)	1-3"	12-30"	2-6 lbs.
Pepper	12-24"	30-36"	5-18 lbs.
Potato, Irish	10-18"	24-42"	10-20 lbs.
Pumpkin	2-4'	5-8'	10-20 lbs.
Rutabaga	3-6"	15-30"	8-12 lbs.
Southern Peas	3-4"	24-36"	5-18 lbs.
Sweet Corn	6-12"	24-36"	7-10 lbs.
Spinach	3-6"	15-30"	4-6 lbs.
Squash, summer	18-36"	36-60"	20-80 lbs.
Squash, winter	2-4'	3-10'	10-80 lbs.
Sweet Potato	12-18"	36-48"	8-12 lbs.
Tomato	18-36"	50"	15-45 lbs.
Turnip	2-3"	12-24"	8-12 lbs.
Watermelon	3-4'	5-10'	8-40 lbs.

Adapted from Virginia Cooperative Extension Publication, Vegetable Planting Guide & Recommended Planting Dates, Revised December 2006, Publication 426-331





## VEGETABLE VARIETIES BEST SUITED TO VIRGINIA

In the chart below are vegetable varieties recommended by VCE for Virginia. In addition, varieties that the Master Gardeners have grown successfully are included. Don't, however, let yourself be limited by these varieties. Be adventuresome and try new varieties, especially the disease-resistant ones.

Vegetable	Variety
Numbers in parentheses indicate number of days till beginning of harvest period.	
Asparagus	Jersey Giant F1 (2-3 yrs) Jersey Gem F1 (2-3 yrs)
Bean, Bush	Blue Lake Roma II (59) Dwarf Horticultural (65) Derby (55) Slenderette (55) Kentucky Wonder 125 (60)
Beans, Lima	Bridgeton (65) Jackson Wonder (65) Fordhook 169 (75)
Beet	Ruby Queen (65) Detroit Dark Red (60)
Broccoli	Packman (60) Windsor (66) Green Goliath (80)
Brussels Sprouts	Jade Cross (110)
Cabbage	Gourmet (70) Stonehead (75) Dynamo AAS (68) Guardian (80) Two Season (85)
Carrot	Gold King (72) Danvers (72) Imperator (78)
Cauliflower	Candid Charm (65) White Sails (55)
Corn, Sweet	Silver Princess (73) Breeders Choice (68) Silver King (82) Argent (86) 'Improved Silver Queen' Golden Queen (95) Silver King (82)
Cucumber	Dasher II (60) Everslice (60) Bush Whopper (68) Sweet Slice (65) County Fair (55)
Eggplant	Mission Bell (95) Black Knight (110) Little Fingers
Kale	Vates Dwarf Blue (55) Dwarf Siberian (80)

Vegetable	Variety
Lettuce	Mission (80) Dark Green Boston (70) Parris Island Cos (75) Buttercrunch (65) Salad Bowl (50) Summer Time (72)
Muskmelon	Ambrosia (82) Apollo Short'n Sweet (85) Athena (87)
Mustard	Tendergreen F1 (40) Southern Giant Curled (45)
Okra	Annie Oakley (50) Clemson Spineless (56)
Onion	White Portugal (100) Mustard (110) Sweet Sandwich (105) Ebenezer (110)
Peas	Knight (56) Sugar Snow (70) snap Wando (68) Green Arrow (70) Dwarf Gray Sugar (68) Super Sugar Snap (62-66)
Peas, Southern	Queen Anne (56) Purple Hull Crowder (60-70)
Pepper	Lady Bell (110) Boynton Bell Mucho-Nacho (100) Hugh Jalapenos Red Cayenne (110)
Potato, Irish	Steuben (100) Superior (100) Pontiac (100)
Potato, Sweet	Beauregard (100) Centennial (120) Jewel (120) Baker (120)
Pumpkin	Magic Lantern (100) Merlin (100) Howden Biggie We-Be-Little Jack-Be-Little
Radish	Cherry Belle (24) Icicle (30)
Spinach	Melody (50) Vienna (80)

## VEGETABLE VARIETIES BEST SUITED TO VIRGINIA *(continued)*

Vegetable	Variety
Squash, Summer	Butterbar (50) Superpik (50) Goldrush (50) Puma F1 (50)
Squash, Winter	Table Ace (80) Waltham Butternut (96) Buttercup (100) Butterbush (96)
Swiss Chard	Rhubard (50) Lucullus (45-55)
Tomato	Big Beef (AAS) (73) Mountain Spring Celebrity (70) Better Boy VFN (105) Sweet 100 (65) Plum Dandy (Roma)

Vegetable	Variety
Turnip	Tokoyo Cross (40) Purple Top White Globe (55) All Top F1 (45)
Watermelon	Petite Sweet (80) Sugar Bush (75) Starbrite (90) Chifton Seedless Yellow (86) The Heart Series (Jack, Queen, and King of Hearts) (80)
Adapted from Virginia Cooperative Extension Publication, Vegetables Recommended for Virginia, May 1, 2009, Publication 426-480	

## COMPANION AND BENEFICIAL PLANTS FOR VEGETABLES

Over time we Master Gardeners have experimented with companion planting—grouping plants together to increase production and to ward off the bad insects. The table below, although not based on scientific research, does summarize our experiences as well as our reading about selected vegetables.

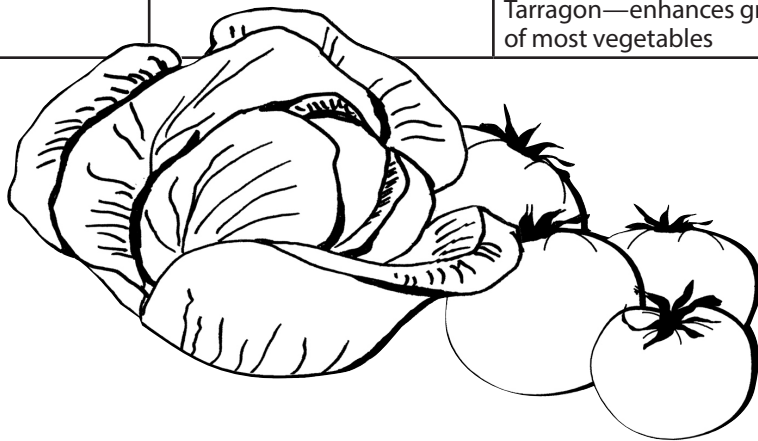
Vegetable	Companion Plant	Beneficial Plant	Enemies
Asparagus	Lettuce, tomatoes	Basil Parsley	Onions, garlic, gladiolus
Beans—Bush	Beets, cabbage, carrots, celery, corn, cucumbers, eggplant, lettuce, peas, radishes, strawberries	Garlic—repels aphids Marigold (French and African)—deters Mexican bean beetles, nematodes, and other insects Rosemary—deters cabbage moth, bean beetle, and carrot fly Summer Savory—deters bean beetles	Onion family, gladiolus, fennel
Beans—Pole	Carrots, corn, cucumbers, eggplant, lettuce, peas, radishes	Marigold (French and African)—deters Mexican bean beetles, nematodes, and other insects  Rosemary—deters cabbage moth, bean beetle, and carrot fly Summer Savory—deters bean beetles	Beets and cabbage family, kohlrabi, sunflower, gladiolus, fennel
Beet	Kohlrabi, bush beans, cabbage, onions, sage		Pole beans

## COMPANION AND BENEFICIAL PLANTS FOR VEGETABLES (*continued*)

Vegetable	Companion Plant	Beneficial Plant	Enemies
Cabbage	Bush beans, beets, celery, onions, sage, tomatoes	Hyssop—deters cabbage moth  Lavender—repels slugs and moths Marigold (French and African)—deters Mexican bean beetles, nematodes, and other insects Mint—deters white cabbage moth Nasturtium—deters aphids, squash bugs, striped pumpkin beetles Sage—enhances growth and deters cabbage moth and carrot fly Thyme—deters cabbage worm	Strawberries, tomatoes, pole beans
Carrot	Onions, radishes, bush beans, pole beans, lettuce, peas, leeks, sage, tomatoes	Rosemary—deters cabbage moth, bean beetle, and carrot fly  Sage—deters cabbage moth and carrot fly	Dill, celery, parsnips
Cucumber	Bush beans, pole beans, corn, lettuce, onions, peas, radishes	Marigold (French and African)—deters Mexican bean beetles, nematodes, and other insects  Nasturtium—deters aphids, squash bugs, striped pumpkin beetles Tansy—repels ants, cucumber beetles, Japanese beetles, squash bugs, and some kinds of flying insects, among others.	Potatoes, aromatic herbs, sage
Eggplant	Bush beans, pole beans, spinach	Catnip—repels flea beetles	None
Leeks	Bush beans, carrots		Peas, beans
Lettuce	Asparagus, bush beans, pole beans, carrots, cucumbers, onions, radishes, strawberries		None
Lima Beans	Beets, radishes		None
Muskmelon	Corn, radishes	Nasturtium—deters aphids, squash bugs, striped pumpkin beetles	None
Onion (set)	Carrots, radishes, beets, cabbage, celery, cucumbers, lettuce, peppers, squash, strawberries, tomatoes	Savory—enhances growth  Summer Savory—deters bean beetles	Beans, peas, asparagus
Peas—Garden	Bush bean, pole bean, carrots, corn, cucumbers, radishes		Onion family, gladiolus

**COMPANION AND BENEFICIAL PLANTS FOR VEGETABLES (continued)**

<b>Vegetable</b>	<b>Companion Plant</b>	<b>Beneficial Plant</b>	<b>Enemies</b>
Pepper	Basil, onions		None
Potato		Dead Nettle—deters potato bug	Pumpkin, squash, cucumbers, turnips, rutabagas, tomatoes, sunflowers, raspberry
Radish	Onions, bush bean, pole bean, carrots, cucumbers, lettuce, melon, peas, squash	Chervil—enhances growth Nasturtium—deters aphids, squash bugs, striped pumpkin beetles	None
Spinach	Celery, eggplant, cabbage, strawberries		None
Summer Squash	Corn, onions, radishes	Borage—deters tomato worm Nasturtium—deters aphids, squash bugs, striped pumpkin beetles  Tansy—repels ants, Japanese beetles, squash bugs, and some kinds of flying insects, among others.	Potatoes
Sweet Corn	Bush beans, pole beans, cucumbers, melon, peas, squash		None
Sweet Potato			None
Tomato	Cabbage, carrots, celery, onions, parsley	Basil or Thyme—enhances growth  Bee Balm—improves growth/ flavor Borage—deters tomato worm Dill or Lovage—lures hornworms away Marigold (French and African)—deters Mexican bean beetles, nematodes, and other insects Nasturtium—deters aphids, squash bugs, striped pumpkin beetles Tarragon—enhances growth of most vegetables	Dill, potatoes, cabbage, kohlrabi, fennel



## VEGETABLE CROP ROTATION

A good vegetable crop rotation plan is this simple rule: Do not plant the plants within a particular family in the same location as last year, since they share many of the same insects and diseases.

<p><b>Mustard Family (Crucifers)</b> Broccoli, Brussel Sprouts, Cabbage, Cauliflower, Collards, Garden Cress, Horseradish, Kale, Kohlrabi, Mustard, Radish, Rutabaga, Turnip, Watercress</p>	<p><b>Gourd Family (Cucurbits)</b> Cantaloupe, Cucumber, Gourd, Pumpkin, Squash, Watermelon</p>	<p><b>Composite Family</b> Globe Artichoke, Jerusalem Artichoke, Lettuce, Endive, Chicory, Salsify</p>
<p><b>Parsley Family</b> Carrot, Celery, Chervil, Parsley, Parsnip</p>	<p><b>Nightshade Family (Solanaceous plants)</b> Eggplant, Pepper, Irish Potato, Tomato</p>	<p><b>Goosefoot Family</b> Beet, Chard, Spinach</p>
<p><b>Legume Family</b> Bean, Cowpea, Lentil, Peanut, Soybean</p>	<p><b>Lily Family</b> Asparagus, Chives, Garlic, Leek, Onion, Shallot</p>	<p><b>Grass Family</b> Corn</p>
<p><b>Morning Glory Family</b> Sweet Potato</p>	<p><b>Mallow Family</b> Okra</p>	

## KEEPING THE WEEDS OUT

The really hard part of vegetable gardening is managing the weeds. As you know, if there is bare soil, the weeds will occupy it. The best way to keep weeds at bay is to keep the soil covered with mulch. In addition, mulch will prevent moisture loss through evaporation and will moderate summer soil temperatures by serving as insulation.

Garden mulches include straw (not hay), grass clippings, shredded leaves, newspapers, black or red plastic, and even burlap coffee bags. Kathy LaLiberte, writer, and active gardener, suggests that the mulch used should be matched to the crop, weather conditions and soil type. As regards the crop, not all vegetables enjoy the same growing conditions. The heat lovers—tomatoes, peppers, melons, and eggplant—do well with plastic mulch. Plastic mulch, however, is not water permeable; therefore, extra care in mid and late summer must be taken to ensure these plants have sufficient water. Woven weed barrier fabric is an alternative to plastic as water does flow through it; however, it does tend to make plants shallow-rooted.

Cool-weather crops such as broccoli, lettuces, and other greens cannot take the extra heat generated by plastic and do better with shredded leaves, straw, or newspapers which lower the soil temperature.

As we have hot summers here in Gloucester, plastic mulches can stress plants and burn up organic matter. Conversely, in northern states where summers are cool and wet, soil cooling mulches such as straw and newspapers could further cool the plants and stunt their growth. In addition to crop and weather, you need to consider your soil type. Don't cover heavy, wet soil with moisture-retentive mulches and don't cover dry, sandy soil with plastic.

Some recommends mulching the vegetable garden with wet newspapers (4 or more sheets thick), topped with a good, thick layer of straw. There must be sufficient straw on top of the newspaper so that weeds do not grow up through it. At the end of growing season, the straw and newspapers can be turned under to improve the soil quality.

## VEGETABLE HARVEST AND STORAGE

Good eating is the ultimate reward of growing vegetables – BUT – good eating depends on good quality. And food quality depends on timely harvest and proper storage (<http://ccesuffolk.org/assets/Horticulture-Leaflets/Vegetable-Harvest-and-Storage.pdf>).

### Cold, Moist (32 - 40 Degrees F, 90 - 95% Relative Humidity)

#### ROOT CROPS

##### Beet

- Begin harvest when beet is one inch in diameter. Beet tops at this time make excellent tender greens.
- Do main harvest when beets are two to three inches.
- Harvest spring-planted beets before hot weather (July).
- Harvest fall beets before the first moderate freeze.
- For storage, wash roots, trim tops to one-half inch, place in perforated plastic bags, and store in refrigerator, cold moist cellar, or pit.
- Storage life—two to four months.

##### Carrot

- Harvest spring carrots before hot weather (July).
- Harvest fall-planted carrots before the first moderate freeze.
- For storage, wash roots, trim tops to one-half inch, place in perforated plastic bags and store in refrigerator, cold moist cellar, or pit.
- Storage life—two to four months.

##### Horseradish

- Harvest after several severe freezes.
- Store in the ground all winter; mulch with straw or leaves and dig when needed. Can also be stored in cool cellars.

##### Parsnip

- Harvest in late fall after several moderate freezes. Exposure to cold develops the sweet flavor.
- Same storage requirements as for carrots.

##### Potato, Irish

- Harvest when the tops have yellowed and/or died.

- Do not leave in ground exposed to high soil temperatures from sun because this will accelerate over-ripening.
- Wash potatoes and remove those diseased or damaged
- Cure for about a week in a shaded, well-ventilated place (open barn, shed, or garage). Avoid exposing tubers to light. They will turn green with even small amounts of light.
- Store in as cool a place as possible. Ideal storage conditions are hard to find at this time of year other than commercial cold storage (40 degrees F). Cool basements are probably the best storage available. Keep humidity high and provide good ventilation.
- Storage time—two to four months.

##### Radish

- Harvest when one-half to one inch in diameter.
- Wash roots; trim both tap root and tops, store in plastic bags in refrigerator for up to one month.
- Winter or black radishes are stored the same as carrots.

##### Salsify

- Same harvest and storage as for parsnips.

##### Turnip

- Harvest from the time they are one inch in diameter.
- Are best as a fall crop and can withstand several light freezes
- Store same as carrots.

#### COLE CROPS

##### Broccoli

- Harvest terminal head while florets are still tight and of good green color. Smaller size heads will develop.
- Store in perforated plastic bags for up to one week in the refrigerator.
- Freeze any surplus.

##### Brussel Sprouts

- Harvest the sprouts (small heads) when they are firm; begin from the bottom of the plant.
- Sprouts can stand several moderate freezes.
- Harvest all sprouts prior to the first severe freeze and store in the refrigerator in perforated bags

for up to three weeks.

- Freeze any surplus.

#### Cabbage

- Harvest when heads are solid.
- Store cabbage in refrigerator or cold cellar in plastic bags or in outdoor pit for up to two months.

#### Cauliflower

- Tie outer leaves above the head when curds are about one to two inches in diameter (except purple types).
- Heads will be ready for harvest in about two weeks.
- Cauliflower may be stored in perforated plastic bags in the refrigerator for up to two weeks.
- Freeze any surplus.

#### Chinese Cabbage

- Grow only in the fall.
- Harvest heads after the first moderate frost in the fall and store in perforated plastic bags in the refrigerator, cold cellar, or outdoor pit.
- Will keep for up to two months.

#### Kohlrabi

- Harvest when the swollen stems are two to three inches in diameter. Stems become woody if left too long before harvest or if grown under poor conditions.
- Cut off root and leaf stems and store in plastic bags as indicated for carrots.
- Storage life—two to four weeks.

### GREENS

#### Chard (Swiss)

- Harvest continuously. Swiss chard is a beet developed for its top.
- Merely break off the outer leaves.
- A spring planting will provide greens from early summer to the first moderate freeze.
- May be stored up to two weeks in refrigerator.

#### Collards, Kale, Mustard, Spinach

- Harvest the leaves and leaf stems of greens when they reach suitable size.
- Either harvest the whole plant or the outer, larger leaves.

- Wash and trim.
- Greens do not store well, but may be kept in plastic bags in the refrigerator for up to two weeks.
- Freeze any surplus.

#### Endive (Escarole)

- Harvest whole plant.
- Wash thoroughly to remove soil and sand.
- Gather leaves together and tie with rubber band.
- Store in plastic bags in refrigerator for up to three weeks.

### SALADS

#### Lettuce

- Head, semi-head, and leaf lettuce can be stored for up to two weeks in perforated plastic bags in the refrigerator.
- Refrigeration is highly desirable, but do not freeze.

#### Parsley

- Can continue growing in winter if planted in a protected place such as a cold frame.
- If planted in the open, it can be lifted carefully with a ball of soil just before the soil freezes, potted and taken into the house to a cool, sunny room, and harvested for several weeks.
- Parsley will keep in plastic bags in the refrigerator for one or more weeks.

#### Lima Beans

- Harvest when pods have filled. For tender limas, harvest when a bit immature; for “meaty” limas, harvest when mature.
- Shelled limas can be stored in perforated plastic bags in the refrigerator for about a week.
- Surplus limas can be canned or frozen.

### LEGUMES

#### Garden Peas

- Harvest when pods have filled. For tender peas, harvest when a bit immature; for “meaty” peas, harvest when mature.
- Unshelled peas can be kept in a perforated plastic bag in the refrigerator for about a week.
- Freeze or can surplus.

#### Southern Peas (Crowder, Purple Hull, etc.)

- For fresh use, freezing or canning, harvest when

seeds are large and plump, but moist.

- Either shelled or unshelled peas may be stored in the refrigerator for several days.

## VINE CROPS

### Cantaloupe (Muskmelon)

- Harvest when the stem slips easily from the fruit. Lift the melon. If ripe, it should separate easily.
- Store ripe melons in the refrigerator in a plastic bag for up to ten days.
- Try freezing a few boxes of melon balls.

### Squash, Summer

- Harvest when fruit is young and tender. Skin should be easily penetrated with the thumbnail.
- Can be stored for up to a week in a perforated plastic bag in the refrigerator.

## OTHER VEGETABLES

### Asparagus

- Harvest by snapping 10- to 12-inch spears off at ground level.
- Store in plastic bags in refrigerator for up to one week.
- Freeze or can any surplus.

### Onion, Green

- Harvest green onions when they attain sufficient size.
- Wash and cut off roots; remove part of top leaving an inch or more of green.
- Place in plastic bags and store in refrigerator for up to two weeks.

### Rhubarb

- Harvest leaf stalks when one-half to one inch in diameter.
- DO NOT USE LEAVES
- Rhubarb can be stored in perforated plastic bags for up to three weeks in the refrigerator.
- Freeze surplus.

### Sweet Corn

- Harvest sweet corn when kernels are plump and tender. Silks will be dry and kernels filled.
- Check a few ears for maturity. Open top of ear, press a few kernels with thumbnail. If milky juice exudes, it is ready for harvest.

- Sweet corn has a very short storage life.
- Harvest at peak of quality, husk to conserve space, and store in plastic bags for no more than two days in the refrigerator.
- Freeze or can surplus corn.

## Cool, Moist (45-50 Degrees F, 80-90% Relative Humidity)

### Cucumber

- Harvest cucumbers before seeds become half-size. This will vary with variety. Most varieties will be one and a half to two and a half inches in diameter and five to eight inches long. Pickling cucumbers will be a bit more blocky and not as long as slicers.
- Store slicing cucumbers in the warmest part of the refrigerator in a plastic bag.
- Storage life is about one week.
- Pickling cucumbers should be cooled quickly in ice water and can be kept up to two days in a plastic bag in the refrigerator.

### Eggplant

- Harvest when fruits are nearly full grown, but color is still bright.
- Eggplants are not adapted to long storage. Keep in warmer part of refrigerator for about a week.

### Beans, Green

- Bean pods will be the most tender when the small seed inside is one-fourth normal size. From this stage the pods become more fibrous, as the beans mature.
- Store green beans up to one week in perforated plastic bags in the warmer part of the refrigerator.
- Can or freeze surplus.
- Cool cellar storage is also possible.

### Okra

- Harvest okra pods when they are two to three inches long. Over-mature pods are woody.
- Store in plastic bags in the warmer part of the refrigerator for about one week.
- Freeze surplus.

### Pepper, Sweet

- Harvest when fruits are firm and full size.



- If red fruits are desired, leave on plant until red color develops.
- Sweet peppers can be stored for two to three weeks in the warmer part of the refrigerator in plastic bags.
- Cool cellar storage is also possible.

#### Tomato

- Ripe tomatoes will keep for a week in the refrigerator at 45-50 degrees F.
- Green, mature tomatoes, harvested before frost, should be kept at a temperature between 55 and 70 degrees F. For faster ripening, raise temperature to 65-70 degrees F.
  - Mature green tomatoes should approach normal size and have a whitish green skin color.
  - Mature green tomatoes can be kept from three to five weeks by wrapping each tomato in newspaper and inspecting for ripeness each week.
  - A cellar where temperatures are about 55 to 58 degrees F is satisfactory for holding mature green tomatoes.

#### Watermelon

- Harvest when underside of fruit turns from whitish to yellowish. The tendril at the juncture of the fruit stem and the vine usually dies when the fruit is mature. Thumping an immature melon gives a ringing metallic sound, while the mature melon gives a dull thud.
- Watermelons will store at room temperature for about a week; at temperature of 45-50 degrees F for two to three weeks.



#### Cool, Dry (45-55 Degrees F, 50-60% Relative Humidity)

##### Onion, Dry

- Harvest onions when the tops have fallen over and the necks have shriveled.
- Remove tops, place in shallow boxes or mesh bags, and cure in open garage or barn for three to four weeks.
- Store in mesh bags in as cool a place as can be found in midsummer.
- During humid (muggy) weather, keep ventilated.

##### Pepper, Hot

- Pull plants late in the season and hang to dry in the sun or a warm place.
- Store dried peppers in dry, cool place (usually a basement).

#### Warm, Dry (55-60 Degrees F, 60-70% Relative Humidity)

##### Pumpkin and Squash (Winter)

- Harvest pumpkins and winter squash when the skin is hard and the colors darken. Both should be harvested before frost.
- Remove the fruit from the vine with a portion of the stem attached.
- Store fruit on shelves in single layer so air can circulate around them.

#### Warm, Moist (55-60 Degrees F, 80-85% Relative Humidity)

##### Sweet Potato

- Harvest in fall before frosts and freezing temperature. Handle carefully in the digging process. Cure for one week at a temperature of 80-85 degrees F. Ideal storage is at 55 degrees F and 85% relative humidity. (This might be accomplished in a basement with ventilated boxes covered with periodically moistened burlap sack.)

## PLANTING ADVICE AND TIPS

*"Clippings used as garden mulch should be sun-dried for a day or so. Do not use clippings from lawns treated with herbicides or toxic pest controls."*

*Use only leaves that have been aged at least nine months. This allows the growth-inhibiting phenols to be leached out."*

– Kathy LaLiberte, Writer and Gardener

*"Tomatoes won't grow in cold soil; their roots may rot. Wait until mid-May to plant outdoors. The plants you put in on Memorial Day will catch up to the earlier ones."*

– Celeste Dudley, GEMG

*"Full summer heat in Gloucester is not kind to growing things. Plant tall crops like sunflowers (intermediate size) or corn on the south or west side of the garden to provide shade to bush beans, cucumbers, etc."*

– Barbara Pleasant, Warm Climate Gardening

*"Trellis all peas no matter what the planting instructions say. And when growing peas for the first time, inoculate the seeds with the appropriate nitrogen-fixing bacteria (order it with your seeds) to ensure fast, dependable growth."*

– Barbara Pleasant, Warm Climate Gardening

*"Mid-summer seed germination improves if you plant the seeds, water them well, and place a board over the row. Remove the board when the sprouts reach just below the soil surface."*

– Virginia Cooperative Extension

*"If temperatures go above 90 degrees, snap bean, tomato, and pepper flowers can fail to develop fruit."*

– Virginia Cooperative Extension

*"Keep melon plants covered with floating row cover until the first female blossoms appear (about 35 days) to protect against destructive insects."*

– Barbara Pleasant, Warm Climate Gardening

*"When cantaloupes reach softball size, place them on an inverted coffee can with drainage holes punched in the top. This will increase air circulation and sunlight."*

– Barbara Pleasant, Warm Climate Gardening

*"Green peppers, eggplant, and Swiss chard are decorative enough to use in a large container garden with trailing annuals around."*

– Celeste Dudley, GEMG

*"I have had good luck using crushed egg shells around the stem of tomatoes to deter cutworms."*

– Maxine Slone, EMG Emeritus

*"Heritage or heirloom tomatoes are generally not as disease resistant as modern varieties."*

– Wally Walters, PhD., Retired Organic Chemist and Gloucester Tomato Grower

*"When you are done with the garden for the winter, cover your rows with black weed fabric. The material will heat up during the day and lose all its heat at night. This drastic temperature change kills any weeds underneath. Remove the material when you are ready to start your spring garden, and there will not be a weed in sight."*

– Jodie Sholtis, GEMG

*"Spray Neem oil on plants and veggies to prevent insects from eating plants. Neem is not harmful to humans."*

– Celestine Brooks, GEMG

*"I have had good luck and enjoy the flavor and texture of Blue Lake beans. The bush bean variety comes in earlier, but slows/stops delivering when temperatures rise above 85o F. The pole variety comes in 2-3 weeks later but is more drought/heat tolerant than the bush form and continues producing through August and into fall. If you can keep the bush beans alive through high temperatures, they will produce also in the fall. So plant both and you can have fresh beans throughout the growing season"*

– Jim Newton, GEMG

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## REFERENCES

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LaLiberte, K. (2009). Choosing mulch for vegetable gardens. *Gardener's Supply: The Innovative Gardener*.

Retrieved from: <http://www.gardeners.com/Choosing-Mulch-for-Vegetable-Gardens/5013,default,pg.html>

Lavender Fields Herb Farm. [Handout]. *The Organic Gardening Series: Companion Planting*.

Pleasant, B. (1993). *Warm climate gardening*. Pownal, VT: Garden Way Publishing.

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Below is a partial list of Virginia Cooperative Extension publications that address vegetables. These and other publications about specific vegetables can be found at <https://Resources.ext.vt.edu> or <https://vtechworks.lib.vt.edu>. Please note that Virginia Cooperative Extension has recently created a new site and is in the process of revising many of its publications. Therefore, some publications may be available at one site but not the other. (Type in the publication number [e.g. 456-018] in the search box.)

*Intensive Gardening Methods*, 426-335

*Vegetable planting guide and recommended planting dates*, 426-331

*Vegetables recommended for Virginia*, 426-480

*Weeds in the home vegetable garden*, 426-364



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