

# A Beginner's Guide to Vegetable Gardening in Kentucky

## Plans and Preparations

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This material has been adapted from Home Vegetable Gardening in Kentucky (ID-128). For more in-depth information and explanation of the topics discussed, the original publication can be located at <http://www2.ca.uky.edu/agcomm/pubs/id/id128/id128.pdf>.

### Start with a Plan

A plan helps you get the most out of your garden.

#### Step One

Begin by thinking about vegetables you and your family like to eat. Then think about what you want to grow. Some vegetables will grow better in Kentucky than others because of the average daily temperatures and rainfall. It also is important to learn about the needs of each vegetable variety you may plant in your garden. Does it grow better in sun or shade? How much water does it need? What type of soil does it grow best in? Is it a cool season crop or a warm season crop?

#### Step Two

Choose where you will put your garden. Finding the right spot is important. For example, you do not want your garden at the bottom of

a hill and it should be on the south side of any buildings or large trees. Also, find a spot that is easy for you to get to, so that you can watch and maintain it.

How much space do you have for a garden? If you have a small space, you may want to think about raised bed, square-foot, or container gardening.

#### Step Three

People often like to grow tomatoes, cucumbers, squash, green beans, and corn, but there are many other vegetables that can be grown in Kentucky. It is important to know all you can about the plants before you begin. Do any of them come back every year? When can they be planted? How much sunlight do they need? Figure 1 shows a list of vegetables that grow well in Kentucky along with when to plant and harvest each vegetable.

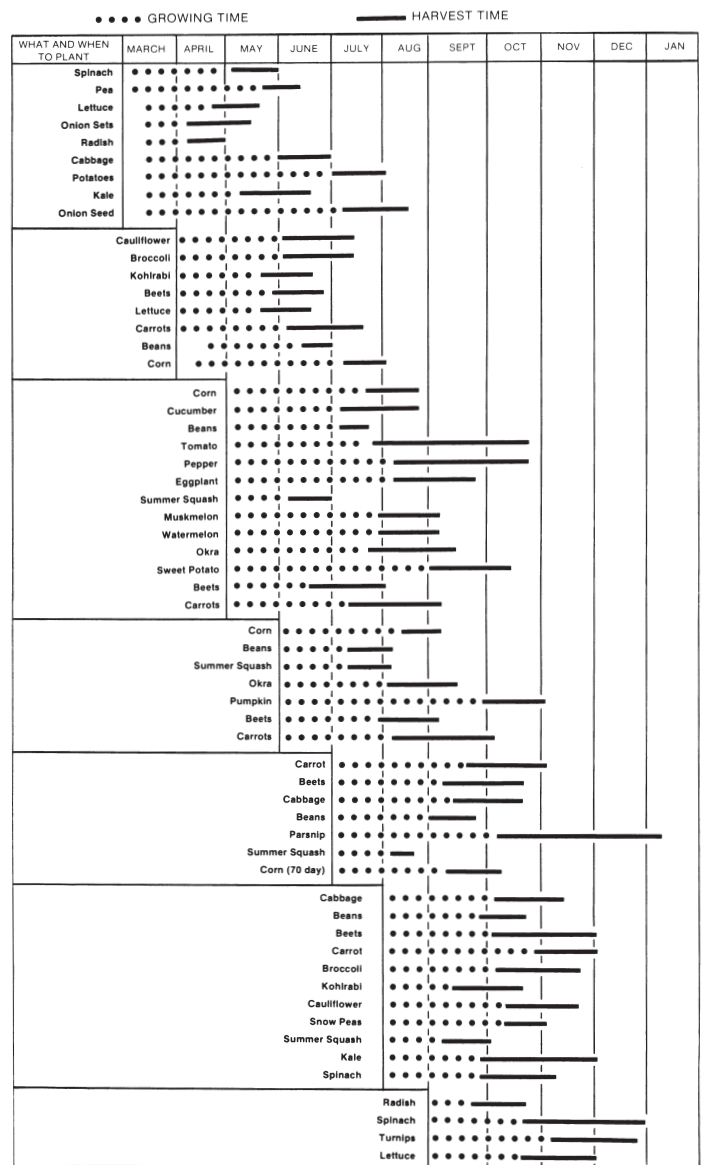
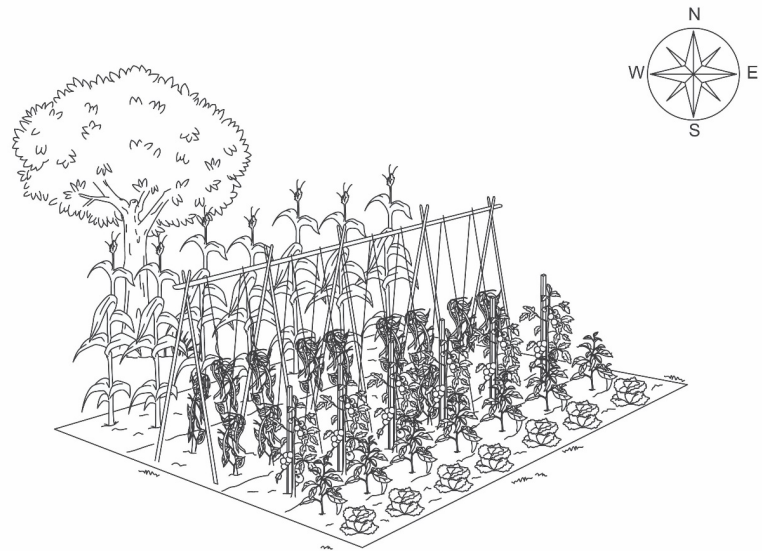


Figure 1. Vegetable crop timetable.

### Step Four

Draw a picture of your garden (Figure 2). Do you have any plants that may come back more than one year? If so, plant them together. Think about how big your plants will grow. Tomatoes, corn, and pole beans can grow to be tall. Tall plants can shade smaller plants. Some small plants like to grow in shade, such as lettuce. As you plan the rows of your garden, leave 2.5 feet between your rows, to allow space for walking. Spacing between rows in raised beds is much smaller since there is no need to walk between rows. Depending on the plants being grown, the rows in raised beds can be as close as 12 to 20 inches.



### Prepare Your Garden

Healthy soil will help your garden grow. The best garden soil is one that you can easily work and feels soft to touch. Good garden soil will drain well after it rains, so that your plant roots are not sitting in mud. Most home gardens do not have perfect soil, but you can add things to your soil to improve the texture and fertility and help it become healthier over time.

### The Soil Test

A soil test is a good way to measure the health of your soil. The results can tell you what, if anything, you need to add to your soil to make it healthier and help your garden grow.

To test your soil, you need to take a soil sample. You can use a soil probe, garden spade or shovel to collect the sample. Collect several “cores” (or individual samples) of soil from your garden area by digging down 4-6 inches to obtain your sample. Figures 3 and 4 show how to use a garden spade (Figure 3) or soil probe (Figure 4) to collect the sample. After you have collected the sample from six or seven different spots in your garden, remove any leaves or twigs that might have been on the top of the ground and put all soil in a plastic or paper bag and mix it together. Take your sample to the local County Cooperative Extension Office to have it tested (<http://extension.ca.uky.edu/county>). Your local county Cooperative Extension office will also be able to advise you on how to collect a soil sample, if needed.

Figure 2. Example garden.

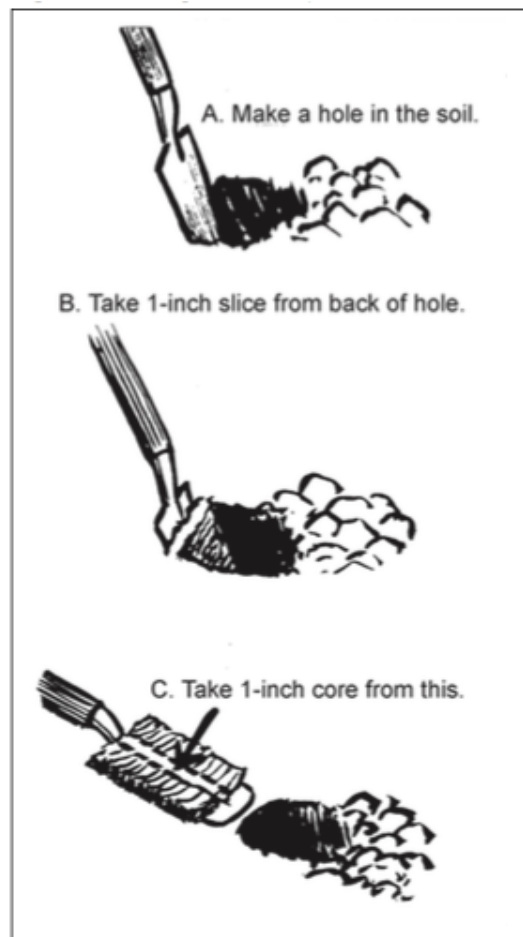


Figure 3. How to take a soil test.

## Understanding Your Soil Test Results

The soil test will measure the acidity or pH of your soil. The pH scale is from 0 to 14. A low pH (0-6) is called acidic soil and a high pH (8-14) is called an alkaline soil. Certain plants like soil with a low pH (very acidic), while other plants like soil that is more neutral or alkaline. Most vegetables will grow best in a slightly acidic soil (pH = 6.2 to 6.8). If your soil pH is too high or too low, your vegetables will not be able to use the nutrients in the soil to grow and do well.

September, October, and November are the best months to test the soil in your garden. The results will let you know if you need to add fertilizer, lime (to raise the pH) or sulfur (to lower the pH). Your local county Cooperative Extension agent or farm supply store should be able to help you understand your soil test results and make a recommendation if you need to add anything to your soil.

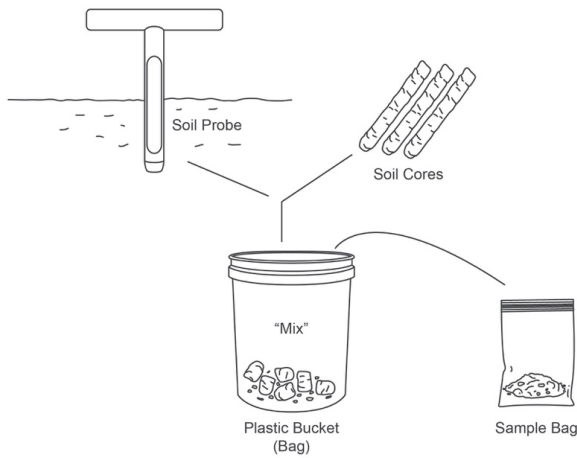


Figure 4. Steps for soil test with a soil probe

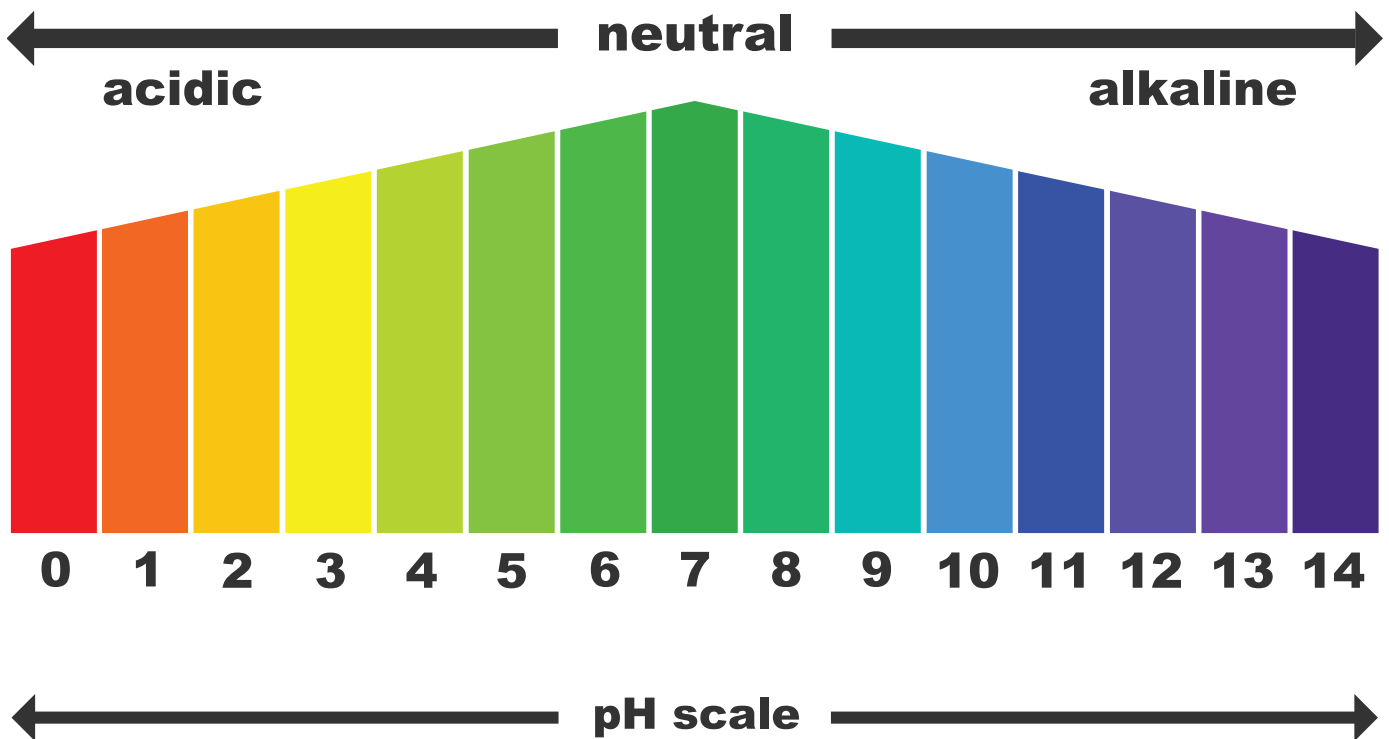


Figure 5. pH scale.

## Organic Matter

Organic matter is something you can add to soil. It will add more nutrients, help the soil pH vary less, and over time improve soil texture. Organic matter is material that was once-living (plants or animals) that is now dying or decaying, such as animal manure or yard waste.

Manure is an excellent source of nitrogen for plants, but fresh animal manure during the spring is harmful because it contains too much nitrogen that can hurt your plants. It may also contain bacteria that is harmful to humans. Fresh manure should be added at least 120 days before you harvest from the garden. It is best to add fresh manure to the garden in the fall after crops have matured and not plant any crops until the following spring. Bagged composted manure, from your local garden center, may be added to the garden at any time because it has decomposed. A good rule to consider when applying manure is if it looks and smells like manure it is “fresh”

and should be applied at least 120 days before harvest.

## Getting Your New Garden Site Ready

After the ground thaws in the spring, you want to start preparing your new garden site. You can turn over the sod by plowing, rototilling, or hand spading. It is best to till the ground several weeks before you plan to start planting. The first year of your new garden, you want to dig down eight inches and turn the soil over.

If the soil is sticking together as you work and making large clumps, it is too wet and you may damage the soil. To check if the soil is too wet, squeeze a handful as if you were making a ball out of it. If you can easily form a ball, or if it drips water, it is too wet. The soil should crumble easily while working it. If it does not, wait for the ground to dry out. Work the garden soil until it is fine but not powdery, and then rake the soil. You are now ready to lay out your garden

using the drawing that you made earlier and start planting.

## Fertilizing Your Garden

Nutrients are important to grow high quality vegetables. You can supply nutrients to your garden by adding fertilizer. Use your soil test results to determine if and how much fertilizer you should apply. Too much fertilizer can be harmful to your plants. The label on the fertilizer bag will show you the percent nitrogen (N), phosphorus (P), and potassium (K) in each bag. It will be written as N-P-K. If your fertilizer bag says 5-10-5 that means the bag contains 5% nitrogen, 10% phosphorus, and 5% potassium. Nitrogen, Phosphorous, and Potassium are all important to help plants grow. Nitrogen helps plants grow quickly and increases the amount of seed, fruit, and/or leaves the plant produces. Phosphorous helps plants use sunlight, water, and carbon dioxide to make their own food. Potassium, also called Potash, helps improve the quality of fruit and protect the plant

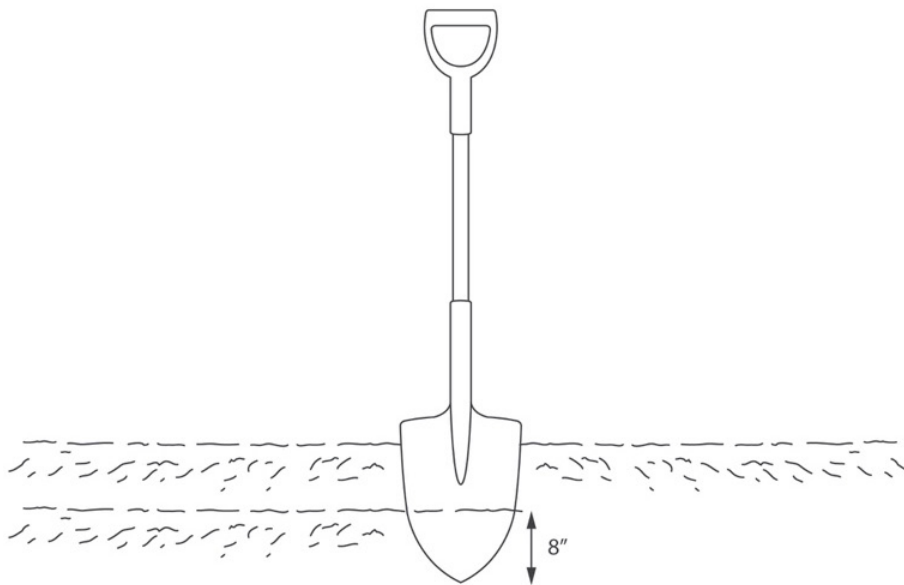


Figure 6. Garden spade depth.

against diseases. Most Kentucky soils have enough P and K for most plants. Generally, you will only need to add N fertilizer if a soil test shows a need for P and/or K. Adding too much P to the soil should be avoided. Over time, the extra P will make its way to lakes and rivers where high levels result in algae growth, toxic conditions, and even fish kills.

Always make sure to apply the right amount of fertilizer to your garden. If you do not apply enough, the plants will grow slowly and may have a hard time producing. If too much fertilizer is applied, it can harm the plants or cause them to grow too fast. Plants that grow too fast are more likely to have diseases or pest problems, and the stalks may be weak and more likely to break. Table 1 shows the correct amount of phosphate (P<sub>2</sub>O<sub>5</sub>) or potash (K<sub>2</sub>O).

**Table 1.** Phosphate and potash.

Soil Test Level	Fertilizer (lb/1000 sq ft)	
	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
High (above 60 P, 300 K)	0 - 1	0 - 1
Medium (60 - 30 P, 300 - 200 K)	1 - 2	1 - 2
Low (below 30 P, 200 K)	3 - 5	3 - 5

You can also use the size of your garden to estimate how many pounds of fertilizer you need to apply.

**Step One:** Measure the length and width of your garden.

**Step Two:** Multiply length x width = square feet.

**Step Three:** Divide the number of square feet by 1,000.

**Step Four:** Multiply by 2 = pounds of N actually needed.

**EXAMPLE**

Your garden is 40 feet long and 20 feet wide. How much N should you apply?

**Step One:** Length = 40 feet and Width = 20 feet

**Step Two:** 40' x 20' = 800 square feet

**Step Three:** 800/1000 = 0.8

**Step Four:** 0.8 x 2 = 1.6 lb. actual N needed

After you know the amount of actual N needed, you can then calculate the amount of fertilizer needed.

**Step One:** Read the label of the fertilizer bag. The first number is the percent of nitrogen available in the fertilizer.

**Step Two:** Divide the percent of nitrogen available by 100

**Step Three:** Divide the pounds of actual N needed by the percent of N available in the fertilizer to equal the pounds of fertilizer needed.

**EXAMPLE**

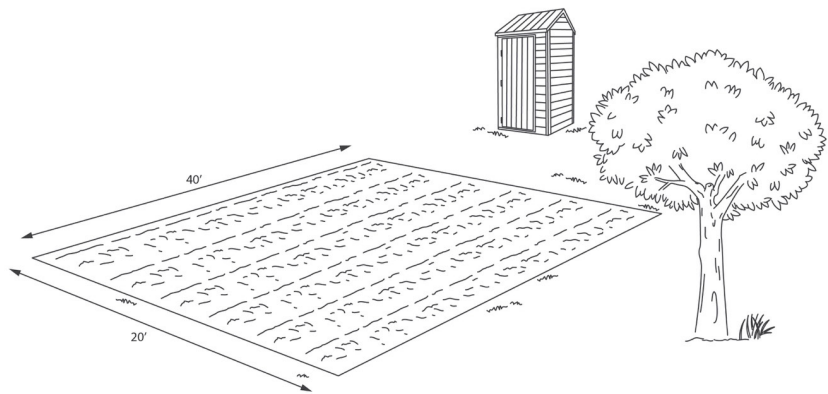
Based on the size of your garden, you

need 1.6 pounds of actual nitrogen. The fertilizer you are using is 5-10-5. How many pounds of 5-10-5 do you need to apply?

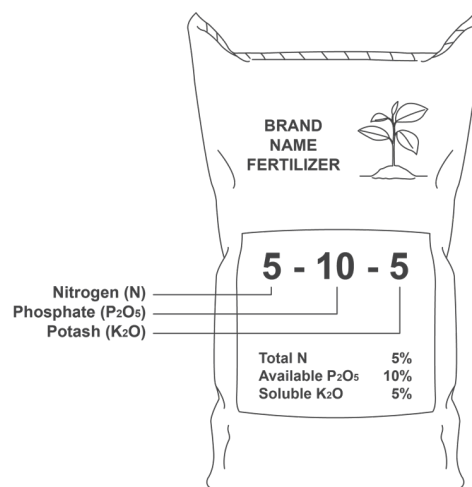
**Step One:** The first number on the fertilizer label is 5, so there is five percent actual N available.

**Step Two:** 5/100 = 0.05

**Step Three:** 1.6/0.05 = 32 pounds of 5-10-5 fertilizer is needed for the 800 square foot garden.



**Figure 7.** Example of 40' x 20' garden plot.



**Figure 8.** Sample fertilizer bag label.

## Calculate the Amount of Fertilizer to Apply to Your Garden

Note, in this example, 3.2 pounds of P was also applied. Make sure your soil actually needs P before applying it. Otherwise it is best (and costs less) to use a fertilizer high in N such as 33-0-0 or 44-0-0.

1. What are the measurements of your garden? \_\_\_\_\_ Length \_\_\_\_\_ Width

2. Use the measurements from Step 1.

\_\_\_\_\_ Length x \_\_\_\_\_ Width = \_\_\_\_\_ Square Feet

3. Divide the number of square feet from Step 2 by 1,000.

\_\_\_\_\_ Square Feet / 1,000 = \_\_\_\_\_

4. Multiply the number in Step 3 by 2.

\_\_\_\_\_ x 2 = \_\_\_\_\_ pounds of N needed

5. What are the numbers on your fertilizer bag label?

\_\_\_\_\_ N \_\_\_\_\_ P \_\_\_\_\_ K

6. The first number is the percent of N available in the fertilizer. Divide the percent of N available (Step 5) by 100.

\_\_\_\_\_ N Available / 100 = \_\_\_\_\_

7. Divide the pounds of actual N needed (Step 4) by the percent of N available (Step 6).

\_\_\_\_\_ pound N needed / \_\_\_\_\_ percent of N available = \_\_\_\_\_ pounds of fertilizer needed.

Apply fertilizer in the spring. Spread the fertilizer evenly over the garden area either before plowing or after plowing but before rototilling or hoeing to get the soil ready. Read the label on the fertilizer bag to know how long to wait after applying fertilizer before planting.



## Crop Rotation

If you are using the same garden spot every year, you will want to move the crops around at least once every three years. If crops are planted in the same place every year, problems with insects and diseases may begin. Different insects and diseases impact different crops. For example, aphids may damage tomatoes but do not feed on corn. By moving crops around, you do not allow the diseases and insects to build up. Some crops are a lot alike and have the same disease and insect problems. On smaller gardens, it is not enough to move a crop only a few feet every few years. You could consider not growing that crop for a year or two, or growing some of that crop in a separate raised bed or container for a few years

## Controlling Pests

Insects can be a problem for home gardeners. Pesticides are chemicals that can help keep insects away from your garden, but because they are costly and people generally do not like to be exposed to chemicals; most home gardeners try not to use a lot of pesticide. There are things you can do to help use less pesticides, but still protect your garden. First, plant pest-resistant varieties when you can. Some crop varieties may not have as many problems with insects as others. Finding out which varieties are the most resistant can help lower the amount of problems with insects. To learn more about pest-resistant varieties, see Vegetable Cultivars for Kentucky Gardens (ID-133), <http://www2.ca.uky.edu/agcomm/pubs/id/id133/id133.pdf>.

Garden planning is an easy and inexpensive way to prevent insects and disease. Taking time at the beginning of the season to make a garden plan and following planting instructions will help prevent many pests. As you plan, make sure your plants are getting enough sun and are not overcrowded. The amount of

**Table 2. Suggested crop rotation.**

Plant	Follow With	Do Not Follow With
Beans	Cauliflower, Cabbage, Corn	Onions, Garlic
Beets	Spinach	Chard
Cole Crops*	Beans, Onions	Tomatoes
Carrots	Lettuce, Tomatoes	Dill
Cucumbers	Peas, Radishes	Potatoes
Kale	Beans, Peas	Cole Crops*
Lettuce	Carrots, Cucumbers, Tomatoes	
Onions	Lettuce, Cole Crops*	Beans
Peas	Corn, Carrots	
Potatoes	Beans, Corn, Turnips	Tomatoes, Squash, Peppers, Eggplant
Radishes	Beans	Cole Crops*
Tomatoes	Carrots, Onions	Cole Crops*, Potatoes, Peppers, Eggplant

\*Cole crops include cabbage, broccoli, cauliflower, mustard greens, collards, brussel sprouts, and turnips.

space left between each plant is important. If the plants are too close together, they will not get enough air movement between them. This could create a place for insects and disease to live. During planting, read the labels on seed packets or transplants. It will tell how far apart to place each plant. Water and fertilizer are also very important to help your garden grow. Too much or too little water or fertilizer can also add to pest problems. It is important to plant your garden in an area that drains well after rain and not to over water if you are able to irrigate.

Keeping your garden clean by weeding and removing dead plant material throughout the growing season will help keep pests out too. After a plant has stopped growing, or at the end of the season, remove all of the plants from the garden so that the pests cannot hide there during the winter months. Either

compost or destroy what is left of the plants. If you had many pest problems, it is best to destroy plants so that you are killing the pests. Garden waste can be placed in yard-waste recycling containers if available in your area or it may be burned in rural areas.

Finally, keep an eye on your garden. You will be working there almost every day. Walk through and look for insects, weeds, and diseases so that you can catch problems and take action before they cause too much damage. There can also be animal pests, such as raccoons, deer, turkey, etc. Depending on the animal, there are ways to help keep them out of your garden. If you need help identifying an animal, insect or disease look at gardening books or websites, or contact your local county Cooperative Extension office for help to identify the problem.