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Community Garden Guide

Vegetable Garden Planning and Development

New Garden Preparation

Site Selection

Choosing the garden site is very important. The site should receive at least 6 hours of direct sunlight (although the more light the better). The site should also be near a water supply and accessible to the gardeners. Loam soil is most desirable. If the garden site does not have loam, the soil structure can be modified over time by adding compost or organic matter. The site should also be free from rubble and debris, should be relatively free of pollutants and away from pollution sources.

Garden Shape, Preparation and Row Orientation

Garden Shape

The shape of a garden area can have an effect on how easy it is to manage. If the garden area is to be tilled and cultivated each year with a power tiller, consider a rectangular shaped garden. A longer garden means less turning and re-aligning of the tiller. Gardens that will be worked only by hand tools may be square in shape. If the garden site has shape limitations then a compromise between efficient use of space and ease of tilling must be made.

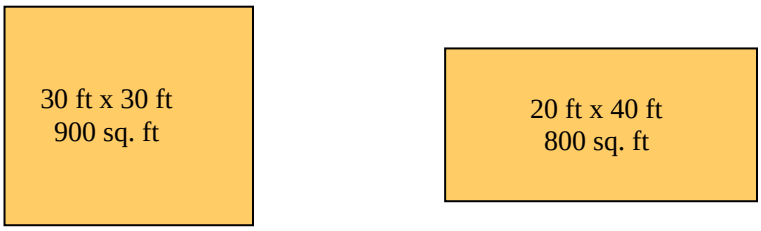


Figure 1. Options for garden shape

Preparation - Double Digging

Double digging is an extremely labor intensive technique that can be used to prepare a small garden site and is most effective on heavier loam or clay soils. Preparing a garden site in this manner will maximize rooting depths of plants and enhance percolation of water through the soil. The technique consists of digging a trench about 8-10 inches deep across one end of the garden (trench A below). Place this top soil at opposite end of the garden. It will later be used to fill the last trench. Loosen the soil in the bottom of the newly dug trench to a depth of 8-10 inches. Incorporate organic matter/compost into the trench. Dig a new trench (trench B below) immediately next to the first trench and deposit the top soil into the first trench. Continue this process until the entire garden site has been tilled. Place the top soil from the first trench into the last trench (trench G below) after the bottom soil in the trench is prepared.

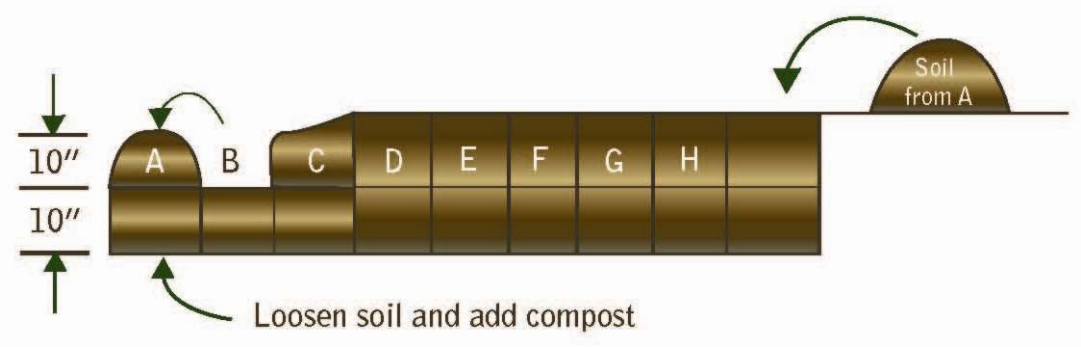


Figure 2. Double Digging

The double digging technique is not recommended for sandy soils as they generally allow good root penetration. Incorporation of organic materials such as compost or green manure crops will benefit sandier soils by increasing moisture retention in the soil.

Broad Forks

Broad Forks are soil preparation tools that provide good seedbed preparation for small gardens while minimizing mixing of the soil layers. The tines of the tool are pushed into the ground and rotated backwards, breaking up and loosening the soil.

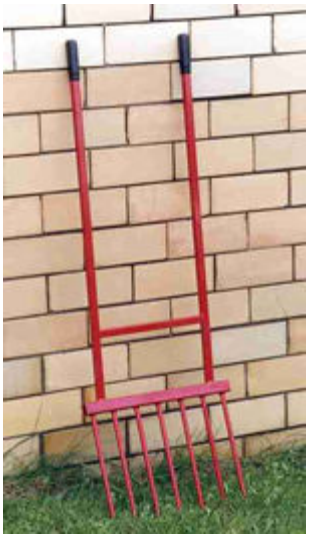


Figure 3. Broad Fork

Preparation-Direct Tillage

A new garden site can be successfully developed by direct tilling the existing sod. Initial site preparation can include moldboard plowing the site followed by rototilling. The soil must not be wet during any tillage operation. Tilling wet soil will damage the soil structure, affecting the soil's productivity.

Garden sites can also be successfully developed by rototilling alone. Creating a garden site in an area of existing sod cover will require multiple passes of the rototiller. In general a 5 HP tiller, as a minimum, will be required. The initial tillage pass should be shallow, approximately 1-2 inches deep. Subsequent passes of about 2 inches in depth should be performed until the soil is tilled to a depth of 6-8 inches.

Row Orientation

An additional consideration is the orientation of the garden rows. Rows oriented north - south will receive more even exposure to the sun, minimizing the effects of plant shading. Attention needs to be paid to the slope of the garden area and the potential for erosion. Protection from soil erosion should take precedence over orienting rows for sun exposure. The use of organic mulches on erosion-prone sites may allow row orientation for maximum sun exposure.

Till-less Garden

Till-less gardens can be an effective method for developing a new garden site. In general this method is reserved for smaller garden areas because of increased labor requirements
and higher initial costs. Try to select a site that has good soil conditions as described above. A till-less garden is just what the name implies — the garden soil is left undisturbed during initial establishment of the garden.

1. Begin by mowing all vegetation as close to the ground as possible.
2. Place newspapers 10-15 pages thick directly over the mowed area. Be sure to overlap the newspapers 3-4 inches to prevent weeds from growing between the pages.
3. Spread compost, top soil or well-rotted manure to a depth of 4-6 inches over the entire newspaper area.
4. Plant garden seeds in the prepared garden bed.

Depending on the source of topsoil or rotted manure, there may be weed issues to deal with during the first year of establishing a till-less garden. Solarization, mulch and/or cover crops can be used to reduce weed pressure. Planting the new garden site to fast growing, large-leafed, shade-producing plants such as pumpkins or winter squash can help suppress weeds.

Garden Sizing

Some gardeners prepare a garden site and size it based on available space. Gardens can also be sized to accommodate production of an estimated amount of food a family will consume in a year (Tables1, 2 and 3). If garden space is limited or if there is uncertainty on how large of a garden to make, it may be useful to calculate the garden area required based on vegetable production goals. Tables 1 and 2 provide information and a procedure for determining garden size. Plan a mix of vegetable varieties and space allocation in the garden to suit personal preferences and quantities of produce desired.

Soil Test

Soil testing of the garden site is essential. Soil tests provide valuable information about fertility and pH and provide the basis for fertilizer and liming recommendations. Plan on soil testing the season before the garden is planted, preferably before the ground freezes. This allows for planning of fall applications of nutrients and lime to prepare the garden site for spring planting. Another benefit of fall testing is that fertilizer prices are more likely to be discounted during that season. Information about how to take a soil test and costs are usually available from your County Cooperative Extension Office.

Fertilizing

Compost is an excellent fertilizer for the home garden. Compost can be produced at your own home from vegetable scraps, lawn clippings and other organic material. Inclusion of waste meat products is not recommended as it will tend to draw wildlife scavengers.

Commercial composed manure fertilizers are available at many local feed and seed stores. Livestock manure makes excellent fertilizer but use of this material may import many weed seeds. Composting the manure for a year or two will greatly reduce the number of viable weed seeds in the manure. Information on how to successfully make your own compost can be obtained from your County Cooperative Extension Office.

Weed Control

If a new garden site is being established in sod that has just been tilled it is wise to spend a year or two on weed control before vegetables are planted.

Smother Crop

A good strategy for initial weed control is to establish a smother crop. Plant buckwheat by broadcasting 1 lb. of seed per 1,000 sq. ft of garden area. After seeding, lightly rake in the seed to a depth of ½ to 1 inch. Plant buckwheat between May 15th to June 15th in the Great Lakes region. Till the buckwheat into the soil at first flower. Keep the garden area tilled weekly for 1-2 weeks and plant cereal rye between September 1-15 as a smother crop at a rate of 1 lb. of seed per 1,000 sq. ft. After seeding, lightly rake in the seed to a depth of ½-1 inch. Till the rye into the soil the following spring when it reaches 4-5 inches in height or 2-3 weeks before the planned vegetable seed planting date. Repeat the entire smother crop rotation a second year if the weed problem is severe. Cereal rye has allelopathic properties that retard or prevent plant growth. It is essential that seeding be delayed at least two weeks for large seeded crops such as squash, beans or corn to be assured residual allelopathic effects have diminished. Small seeded vegetable planting should be delayed three weeks after cereal rye is tilled in.

Solarization

Soil solarization can be an effective method of weed control for smaller garden areas. Place clear plastic over the tilled garden area in the spring until mid- summer. Anchor the edges of the plastic down by burying the edges in a shallow trench to protect from the wind. An effective variation of this method is to first plant buckwheat at the rates mentioned above. Till the buckwheat in at first flower and then place the plastic over the garden area. In both instances, leave the plastic in place for about 1-2 months. Solarizing also helps control soil borne diseases and pests.

Mulches

The use of straw mulch can be an effective way of controlling weeds on a new or existing garden plot. Several types of straw mulch including, rye, wheat, oats, and barley are effective and genrally are available in the Great Lakes area. Straw mulches are available in late summer from area farmers. Straw used for mulch in the garden should be clean and free of weed plants and seed. A visual inspection of a straw bale can give a good indication of the straw quality. Break open a bale of straw and examine it. The bale should only contain stems and leaves of the grain plant. The presence of broadleaf or grass

plants indicate that the straw is contaminated with weed seed and should not be used. Organic mulches break down over time and become a valuable source of organic matter for the garden soil.

Figure 3. Quality straw

There are a number of plastic garden weed barrier mulches on the market. Plastics provide excellent weed control and can enhance growth of plants through the soil warming effects of some of the mulches. The use of plastic mulches generally requires the use of a trickle irrigation system to deliver water to the plants. Plastic mulches generally only last a year or two depending on how they are used. Proper disposal of used plastic mulch must be considered. Recycling of plastic mulches is generally not an option.

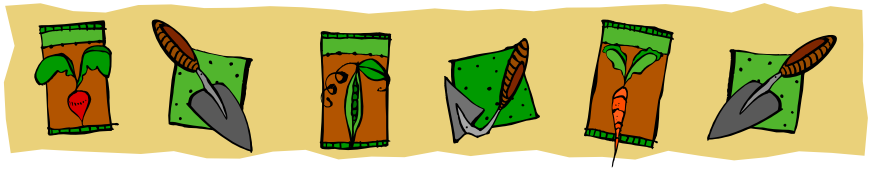


Table 1. Family Garden Planning Guide

Here are some general guidelines you can use when planning a family vegetable garden. These are estimates only and have been compiled from a variety of sources. To use this guide:

1. Decide which vegetables you would like to plant and whether you want only enough to eat fresh or enough for extra to preserve.
2. Review the suggested quantities needed per person and compare with your own family. Adjust down or up based on your family's likes and dislikes.
3. If you use the recommended estimates in column 2, you can use column 3 to determine the amount to plant following traditional plant spacing guidelines. (You will need a planting guide to determine recommended spacing, depth etc. Contact your extension office if you need a guide.)
4. If you've made adjustments to the per person needs in column 2, you can estimate the amount to plant using column 4.

   Pounds needed per person ÷ column 4 = amount of row (feet) to plant per person
5. If you plan to can or freeze excess, use column 5 to plan how much preserved food you'll get from your fresh produce.

1	2		3		4	5	
Vegetable	**Estimated need (lbs) per person**		**Approximate row length to plant per person**		**Approximate yield (lbs) per foot of row**	**Amount of fresh produce (lbs) needed For 1 quart preserved ***	
	Fresh	**If Preserving**	**Fresh**	**If Preserving**		**Canned**	**Frozen**
Asparagus	6	6	10 ft	10 ft	0.6	4	2-3
Bean, lima (bush)	2-4	4-5	7-13 ft	13-17 ft	.30 (shelled)	4-5	4-5
Snap, Dry & Pole Beans	8	8-15	8 ft	8-15 ft	1	1.5-2	1.5-2
Beets	5-10	10-15	5-10 ft	10-15 ft	1	2.5-3	2.5-3
Broccoli	8	8-10	10 ft	10-13 ft	0.8	-	2-3
Cabbage	10	10-15	5 ft	5-8 ft	2	3 (sauerkraut)	-
Carrots	5-10	10-15	5-10 ft	10-15 ft	1	2.5-3	2.5-3
Cauliflower	8	8-10	10 ft	10-13 ft	0.8	-	2-3
Chard	3-5	5-6	2-3 ft	3-4 ft	1.5	2-6	2-6
Corn, Sweet	12-24 (ears)	24-60 (ears)	6-12 ft	12-30 ft	2 (ears)	4-5	4-5

❶ Vegetable	❷ Estimated need (lbs) per person		❸ Approximate row length to plant per person		❹ Approximate yield (lbs) per foot of Row	❺ Amount of fresh produce (lbs) Needed for 1 quart preserved *	
	Fresh	If Preserving	Fresh	If Preserving		Canned	Frozen
Cucumbers	5-10	10-15	5-10 ft	10-15 ft	1	1.5-2	-
Lettuce	5-10	-	10-20 ft	-	0.5	-	-
Onions	5-10	10-15	3-7 ft	7-10 ft	1.5	2-3	2-3
Peas, pod	3-5	5-10	4-6 ft	6-13 ft	0.8	-	4-5
Peas, shelled	3-5	5-10	6-10 ft	10-20 ft	0.5	4-5	4-5
Peppers	3	3-10	2 ft	2-7 ft	1.5	2	2
Potatoes	50-100	50-100	25-50 ft	25-50 ft	2	5	-
Pumpkins, Rutabaga	10-20	10-20	5-10 ft	5-10 ft	2	2-2.5	2-2.5
Spinach	2-5	5-8	3-6 ft	6-10 ft	0.8	2-3	2-3
Squash, summer	5-7	7-10	3-4 ft	4-5 ft	2	2.5-3	2-3
Squash, winter	10-20	10-20	5-10 ft	5-10 ft	2	2	3
Tomato	20	20-40	8 ft	8-16 ft	2.5	3	-
Turnip	5-10	5-10	3-5 ft	3-5 ft	2	-	2.5-3
Watermelon	10-15	-	5-8 ft	-	2	-	-

*

Blank lines indicate that freezing/canning is not recommended for this vegetable or that there are better means of preserving.

Table 2. Row spacing (ft) for selected Vegetables

Beans, Snap	1-1.5	Lettuce	1-1.5
Beans, Pole	3-4	Melon	5
Beans, Dry	2-3	Onion	1-1.5
Beets	1-1.5	Parsnip	1-1.5
Broccoli	2.5	Peas, Snap & Snow	3-5
Brussels Sprouts	2-2.5	Pepper	2-3
Cabbage	2-2.5	Pumpkin	6
Carrots	1.5-2	Radish	1.5
Chard	1.5-2	Spinach	1-1.5
Cucumber	4	Squash, Summer	4
Eggplant	2.5-3	Squash, Winter	4-6
Herbs	1-1.5	Tomato	3
Kale	2	Turnip, Rutabaga	1.5
Kohlrabi	2	Watermelon	5
Leek	2	Zucchini	4

Example: Determining Vegetable Garden Size

Garden Planner Worksheet

Row	Crop	Pounds Needed Per Person (See Table 1)		Number of People		Yield per Foot of Row (See Table 1)		Row Length (ft)	Row Spacing (ft) From Table 1
1	*Snap Beans*	*8*	x	*3*	÷	*1*	=	*24*	*1.5*
2	*Carrots*	*10*	x	*3*	÷	*1*	=	*30*	*1.5*
3	*Tomato*	*20*	x	*3*	÷	*2.5*	=	*24*	*3*
4	*Onions*	*10*	x	*3*	÷	*1.5*	=	*20*	*1.5*
5	*Summer Sq.*	*7*	x	*3*	÷	*2*	=	*10.5*	*4*
							Total	*108.5 ft Ave. 22 ft*[1]	*11.5 (≈12 ft) .*[2]

[1]an additional 5 feet of headland space added to each end on garden.
[2]an additional 4 feet of border edge added to each side of garden.

Garden Length Adjustment

Based on the information calculated above there are several decisions that can be made. Generally it is advisable to use average row length as a basis for determining approximately how long the garden should be. In this case it is reasonable to plan a garden about 22 feet in length (Col. F).

To accommodate the planned garden length the onions, carrot, tomatoes and snap beans could each be planted in four rows 22-ft long to accommodate the planned row length without a significant change in expected total yield. The summer squash row could be extended to 22 feet which will more than double the planned amount. Another option is to fill in the remaining space with more of any of the other crops.

Garden Width

The border area can be used to absorb the differences in row spacing as calculated above. For example the width of the garden calculated above does not allow for the fact that tomatoes require three feet of space on both sides of the plants and summer squash requires four feet of row space on each side. The garden width could be increased by 1.5 feet or the garden borders could be reduced by 0.75 feet on each side to allow for the additional 1.5 feet of space needed for the tomato row. Note that the placement of the onion row with the minimum 1.5 feet spacing requirement is overshadowed by the larger required row spacing of the tomatoes and summer squash.

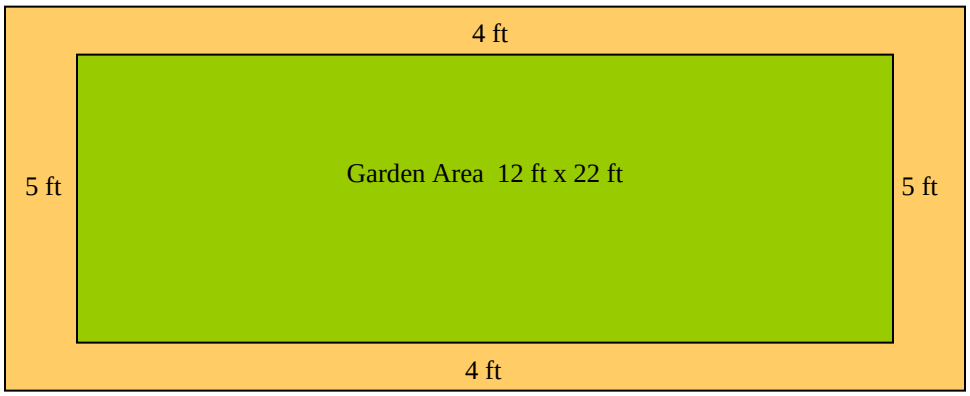
Profile layout of garden rows:

SB = Snap Beans C = Carrots T = Tomato O = Onion SS = Summer Squash

4 feet SB *1.5 feet* C *1.5 feet** T *3 feet* O *4 feet* SS *4 feet* = 18 ft
border *3 feet** *border* = 19.5 ft
(revised width)

*As planned spacing
*As modified spacing

Planned Garden Layout with Border Areas



Total Garden size 20 ft x 32 ft

Table 3. Garden Planner Worksheet

Row	Crop	Pounds Needed Per Person		Number of People		Yield per Foot of Row		Row Length (Ft)	Row Spacing (Ft)
			x		÷		=		
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