

# Close Together Planting

## Sustainable Agriculture

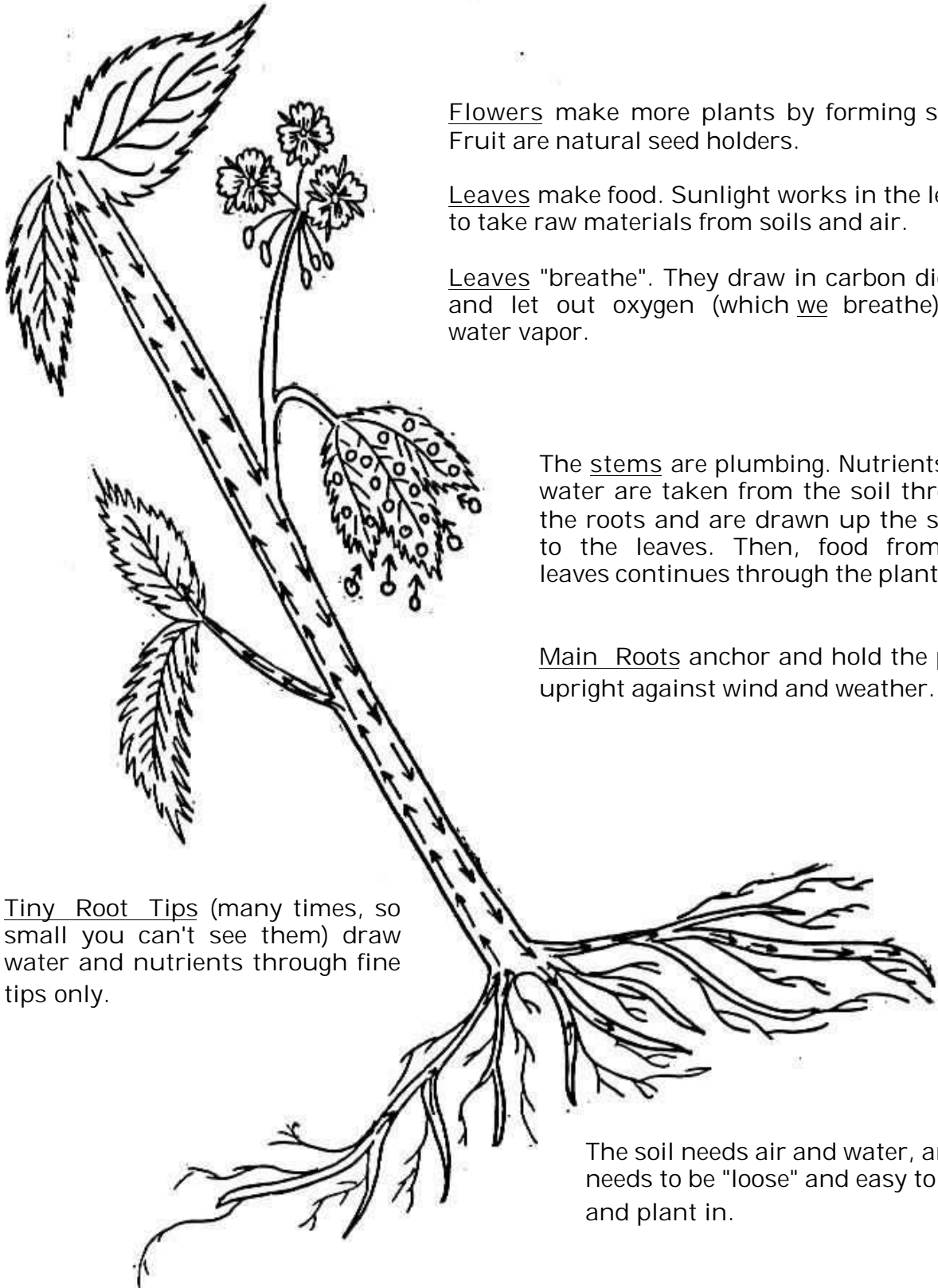


Training Pac

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# I. Plant Growth



Flowers make more plants by forming seeds. Fruit are natural seed holders.

Leaves make food. Sunlight works in the leaves to take raw materials from soils and air.

Leaves "breathe". They draw in carbon dioxide and let out oxygen (which we breathe) and water vapor.

The stems are plumbing. Nutrients and water are taken from the soil through the roots and are drawn up the stems to the leaves. Then, food from the leaves continues through the plant

Main Roots anchor and hold the plant upright against wind and weather.

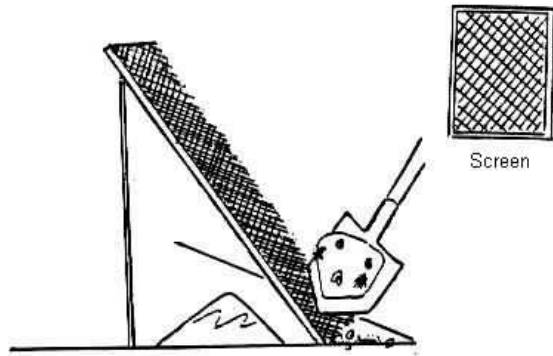
Tiny Root Tips (many times, so small you can't see them) draw water and nutrients through fine tips only.

The soil needs air and water, and needs to be "loose" and easy to dig and plant in.

## CHOOSING YOUR LOCATION

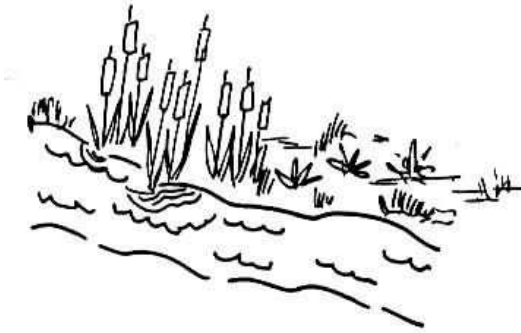
### NEW WORD - Screen

Wire mesh fastened to a frame - placed at an angle - (see picture). To sift soil, throw sand, stones, grass against mesh. Sand will go through, stones and grass will remain behind.



When you get ready to plant a garden, you must first decide where to plant. You need to think of the following to make sure your garden can grow well.

### 1. WATER

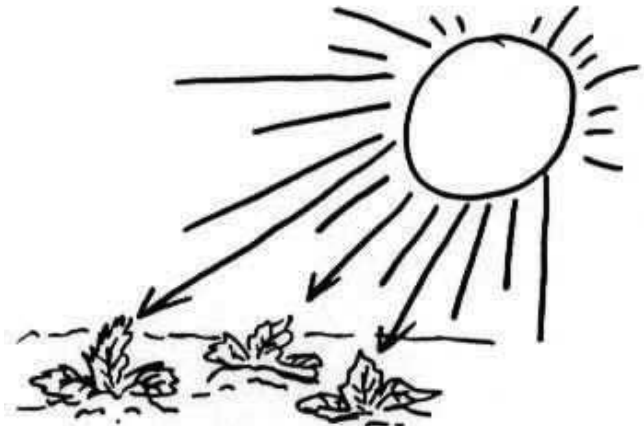


You will want to be able to water your garden. Plant your garden somewhere close to a well or stream or some other source of water.

Vegetables need a lot of water. A good way to decide where your garden should be and how large is to let your water supply provide the size.

### 2. SUN

Most vegetables grow best in direct sunlight. Pick the sunniest spot available because your plants have to have a minimum of 6 hours of a day of sunshine.



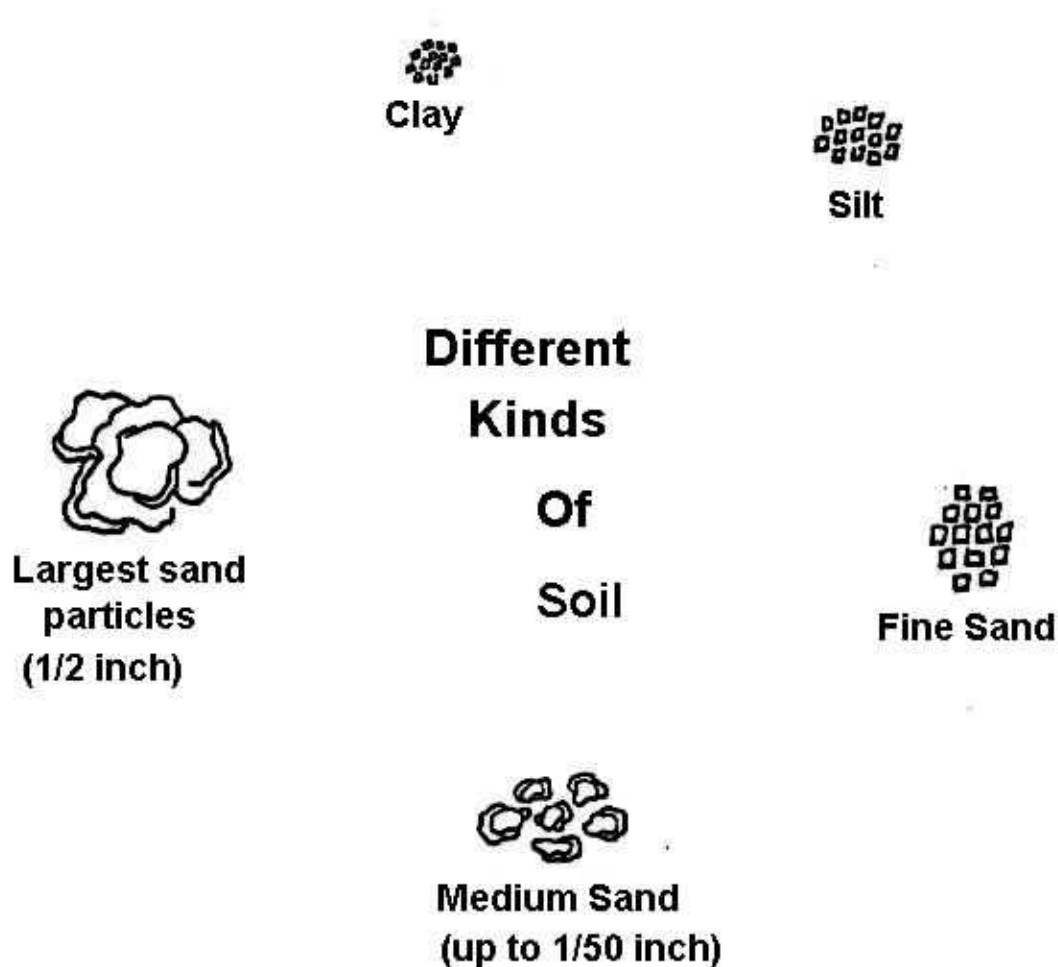
### 3. SOIL

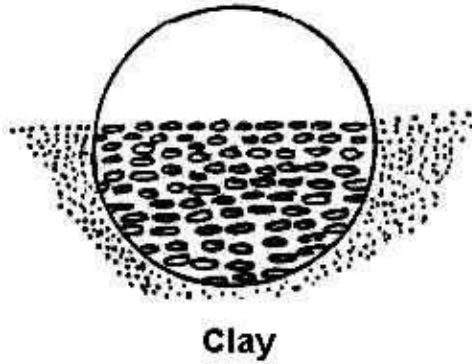
You must look at the soil where you want to put a garden. Sometimes soil is very hard or mostly rocky. If the soil is too bad, you may not be able to plant in it. Some very hard soil or rocky soil can be chopped, dug and sifted to make it soft enough for plants. To sift it, put it through a screen or very small netting to take out the rocks and big hard clods. If the soil is not right, it cannot grow plants.

Good soil is land used for planting. Good soil is a mixture of clay, sand and rotted plants. It also has small living animals which are so tiny you cannot see them with your eyes.

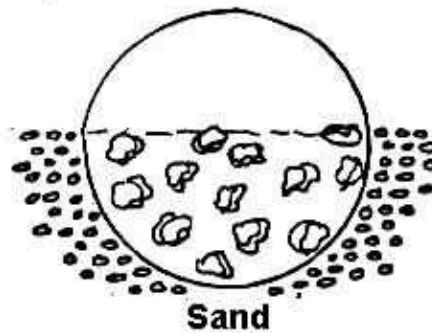
Soil is different in different parts of the world.

One of the most important things about gardens is to make the soil just right for your plants to grow. It is important to know what kind of soil you have.





Clay is made up of very tiny pieces of soil. (It can be used to make pottery and bricks when it is dried.) These tiny pieces are flattened and fit closely together so tightly that it is hard for water and air to get inside. When soil has too much clay in it, the plant roots cannot grow deep into the soil because it is too hard. Air does not get to the roots and water runs off the top; when clay gets wet it dries out slowly because water goes down slowly. But clay has a lot of very important nutrients in it, so it is good to have some in your soil. Too much clay is not good because it is too hard.



Sandy soil has larger particles than clay, and they are more rounded, rather than flat. This shape allows more room between each particle so air and water can flow through it more easily. It also dries out more quickly so it must be watered a lot and too much watering can wash away valuable nutrients.



Loam is best for growing a garden, it is a mixture of clay, sand and compost. Compost is soft, crumbly, brownish or blackish and is made by allowing dead leaves, plants and waste to rot. It is made by man to help in the garden. Loam is ideal for planting, because it has clay, with its wet, healthy nutrients and sand, to drain well and let water and air go down to the roots of the plant and compost to help feed the plants.

## TEST YOUR SOIL

Make a ball with a handful of soil. Throw the ball up into the air. If the ball sticks together before it lands, there is too much clay in the soil. You will have to add some sand.

Another way to test the soil is to water it. If the water does not sink into the soil, runs off or form puddles on the surface, there is probably too much clay in the soil.

Before you start your garden, remove all large rocks from where your garden bed will be; remove all grass; remove all weeds. If the weeds were very thick and were growing everywhere, plant legumes the first year. Legumes are beans or peanuts. These will help make your soil better the next year.

## II. CLOSE TOGETHER PLANTING

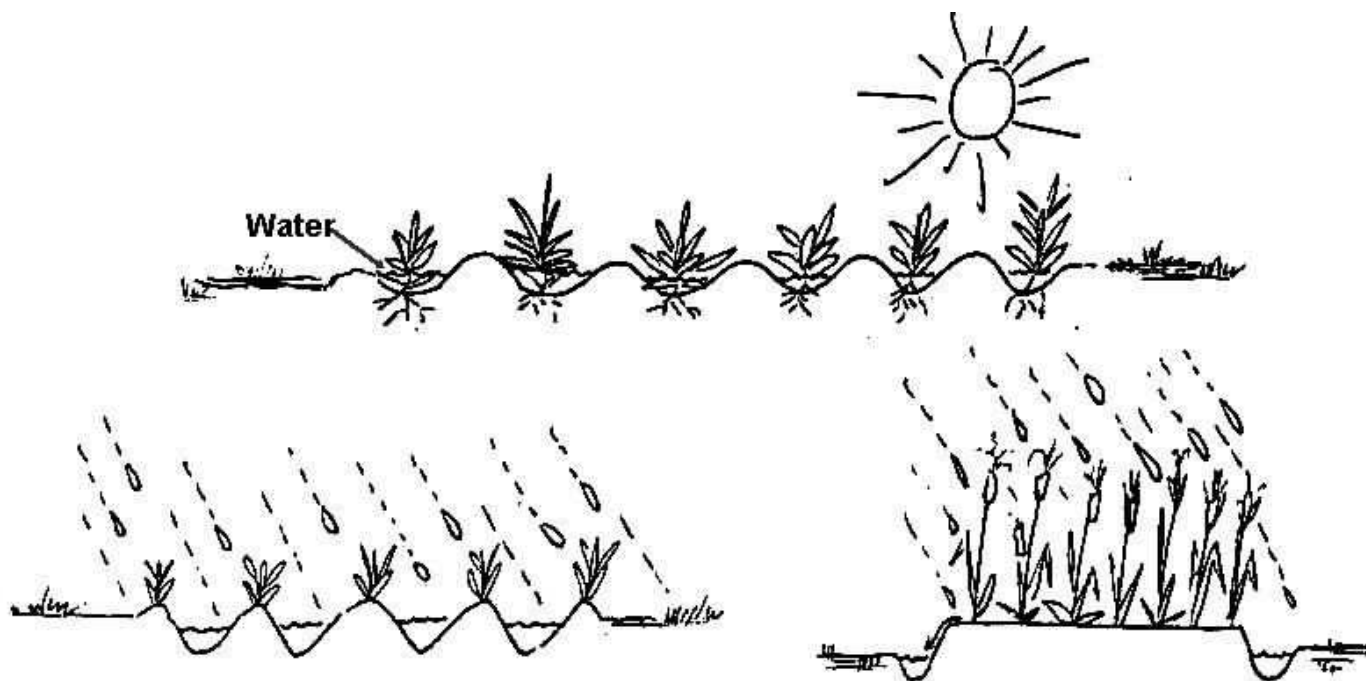
Close together planting is a way of gardening first used by the French farmers centuries ago. It is good especially if you have only a very little space to plant in.

The farmers who started this kind of gardening had lots of manure. If you have lots of manure cover your bed-to-be with six inches of good rotted compost or manure before you ever start your deep digging. Then mix in more compost or manure as you go. (Remember, you can only do this if you have a lot of manure).

The way you plant your garden depends upon the kind of weather you have in your area. If you live in a dry place where it is very hard to get water, you would want to plant your garden so that you catch every drop of water you can on your plants. If you live in a place where there are monsoons and heavy rains you would want to plant your garden so that the plants are raised higher and will not be washed away.

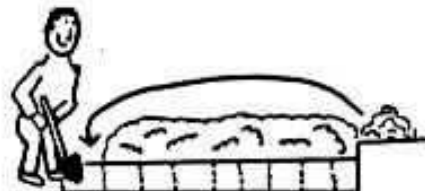
If your climate is dry, you will want to make rows. You will want to grow your vegetables down inside the trenches. This way you catch every drop of water on your plants. You can also make your garden lower than the ground around it. Make a high edge all the way around. Then, flood the lowered bed with water. This will keep all the water on your plants.

If your garden is in a wet area, you will want to plant you garden on raised beds. This way the plants are above the water and will not be washed away.



## STEP ONE: MAKE A GARDEN BED BY DEEP (DOUBLE) DIGGING

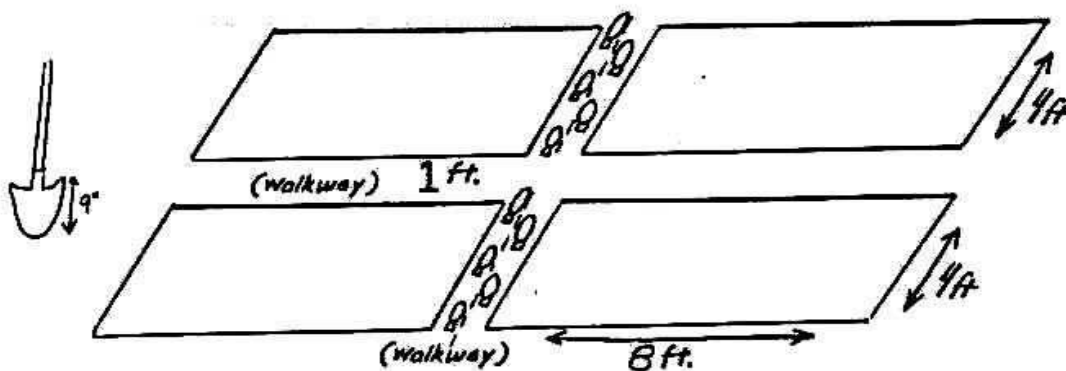
1. Dig a trench 8 foot long and a foot wide by removing the top nine inches of soil alongside
2. Loosen the soil in the trench another nine inches. The trench should then be 18 inches deep, half filled with loose soil. REMEMBER TO ADD SAND IF THERE IS TOO MUCH CLAY IN YOUR GARDEN. Twelve inches is deep enough.
3. Cover the bottom nine inches of loose soil in the first trench with nine inches of top soil from a second trench dug alongside the first.
4. Loosen the bottom nine inches of the second trench.
5. Continue these first four steps until you have dug three or four trenches right alongside each other.
6. Cover the bottom nine inches of soil in the last trench with the nine inches of top soil that you had removed from the first trench.
7. Try to get the soil broken down to a fine texture.



Level the garden bed so it is completely flat and level. Try to break down the soil to a fine texture. Then raise the garden bed four to six inches above the ground around it. This will keep it from being flooded by heavy rains.

The end result, is a raised garden bed 8 foot long and 4 foot wide. Four feet is a good width for a garden bed because you can easily reach into the middle of it to plant, weed or harvest without stepping into it.

You can make as many of these beds as you would like. Leave one foot walkway between each bed. If you do not have enough space, you can make the bed smaller.



## BENEFITS OF A RAISED GARDEN BED

1. The roots of the plants will grow deep into the soil. Deeply rooted plants have healthier roots and stand stronger.
2. Water sinks down deep into the soil and stays there.
3. Air can get to the roots and aid the growth process.
4. Compost is mixed into the soil helping the plants get minerals they need and providing nutrients at all levels.

## STEP TWO: YOUR FERTILIZING PROCESS

Sprinkle a dusting bone meal, some wood ashes an inch or more of well rotted manure (if you did not use manure when you made your garden bed.) over the top. Rake or cultivate this fertilizer into the top 3 to 6 inches.

## STEP THREE: AFTER YOUR DEEP DIGGING IS FINISHED

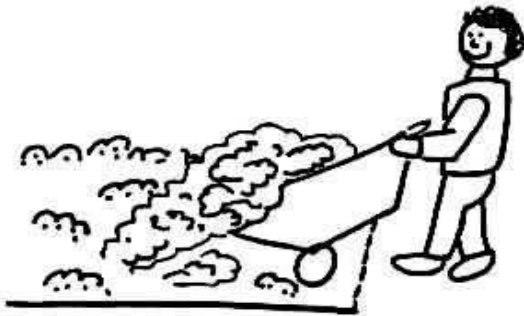
1. Soak the soil with gentle spray of water.
2. Your garden bed should be smooth and flat, but soft.
3. Leave this finished bed for two days.

## NOTES

If there is a shortage of water, several thickness of newspaper soaked good and laid around the base of plants will keep them moist for several days.



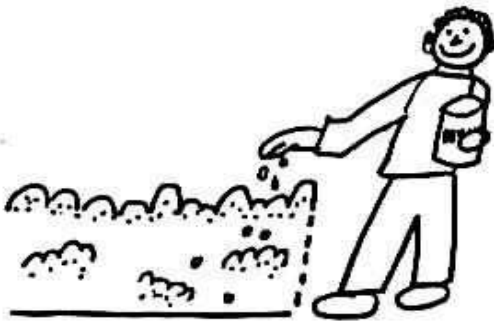
1) Prepare the Soil.



2) Add Compost or Manure.



3) Spade it in.



4) Add bone meal, wood, ash and other additions.



5) Rake Smooth.

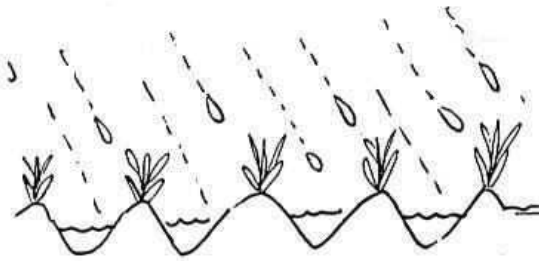
## THE PLANTING PROCESS

1. Take an inch thick stick and draw rows lengthwise in the prepared garden bed.



2. You will then have hollows and ridges.

A. If you have a lot of rainfall, plant seeds in rows along the ridges.



B. If you have little rainfall, plant seeds in hollows.



It is possible to plant the seeds close together because the garden bed has been prepared by deep digging. This allows the roots of the plants to grow deep. Since the roots grow deep they get plenty of moisture and nutrients from the soil and the plants can grow close together. This will help your plants to produce many large and tasty fruits, vegetables and melons.

In close together planting, the plants are planted so close that the outer leaves of the plants will touch as they get bigger. Whether you are setting out transplants or planting from seed, you are going to put the plants closer than you ever have before. When the plants are big, you will have a solid garden of plants in your little space. If your soil is deep enough; is fertilized well; is watered well and you keep it weeded carefully, that little piece of earth will be able to support all those plants.

When the plants are fully grown, you should be able to see the ground beneath. This kind of shading helps the soil stay moist and protected from too much wind and rain. The plants will also protect each other from too much wind and rain. Weeds do not grow well because they are shaded too much by the good plants.

Close together planting like this works better with leaf and root crops like lettuce, spinach, cabbage, beets, carrots and turnips.

Big vegetables like corn and squash are going to take more room no matter how hard you try.

Look below to see how far apart to plant your seeds. The plants are listed from shortest to tallest (unless they are put in a trellis).

Corn	8" apart	2" deep
Okra	8" apart	1" deep
Tomatoes	24" apart	1/2" deep
Bush Beans	4" apart	1" deep
Pole Beans	8" apart	1" deep
Peppers	18" apart	1" deep
Jicama	4" apart	1" deep
Squash	18" apart	1" deep
Pumpkins	18" apart	1" deep
Melons	18" apart	1" deep
Cucumbers	4" apart	1" deep
Onions	1" apart	1" deep
Carrots	1" apart	1" deep
Radishes	1/2" apart	1/4" deep

Carefully follow planting instructions on seed packet for each type of seed.

### III. COMPOST, FERTILIZER AND SOIL ADDITIONS

NEW WORD - Waste - paper, newspaper, cardboard (not tins or plastic).

NEW WORD - Organic Material - vegetable leaves, and foodstuff which cannot be eaten.  
Also tea and coffee grounds.

Compost is rotted leaves, plants and dead insects. It is important because it helps the soil grow plants better. You should never use Citrus fruit or the peelings from them, nor cabbage leaves in compost. Remember that the best soil is:

1/3 clay  
1/3 sand  
1/3 compost

#### THERE ARE THREE KINDS OF COMPOST

1. Manure
2. Rotted plant and animal life. Eggshells are excellent for compost.
3. Earthworm castings and rotted root hairs (very small roots.)

MANURE is very good compost. It has already been changed by being chewed into pieces by some animal. Dry manure is compost. Fresh manure is just manure. It contains worms and diseases. Do not use manure that has not been dried. Do not use human waste -- Human waste carries many diseases.

The best manure for your garden is horse manure. Remember not to use any fresh manure. Get some manure that has been completely dried. It should be at least two weeks old.

Cow manure is good also. You can use a lot of it in your garden. Rotted cow manure ruins beans. Beans do not need as much fertilizer.

Sheep or goat manure is not so good for your garden unless you use only a little. Sheep and goat manure is very strong. If you use too much of it, it will be too strong for the plants and will kill them.

Chicken manure is also strong but you can use it if you mix it with sawdust and then wait for a few weeks before you use it.

Humus in the soil helps beat down the aphid population and also helps so much when there is a drought.

Garden residues for compost - Tomato and squash vines, flower stems and pepper plants. Grass cuttings are excellent also.

## COMPOST DOES A LOT FOR YOUR GARDEN

NEW WORD - Recycle - to treat something or allow it to rot in order to use it again.

When you add compost to the soil, you are improving the soil, making it easier to work with. Water and air penetrate better. Also, compost helps recycle waste, leaves, grass and other organic material. Compost allows the plants to choose the nutrients they want.

Compost also makes the fruits and vegetables taste better.

Compost is made from plant materials, (such as leaves, twigs, and grass), garbage and manure. There are several ways of making compost.

1. Use a barrel. (This method takes about two weeks.)
2. Make a pile. (This method takes about three months.)

### USE A BARREL

1. Cut out the top and bottom of a rain barrel or an oil drum.
2. Fill the drum with 1/3 plant material, 1/3 waste and 1/3 manure. Chopped into very small pieces and mixed well.
3. Cover everything in the drum with one inch of dirt to prevent odors and flies. This is very important.
4. Help the compost rot by making it moist.

You will have to turn the contents of the barrel once every three days. Do this by lifting the barrel off the material, mix the material and put it back in the barrel.

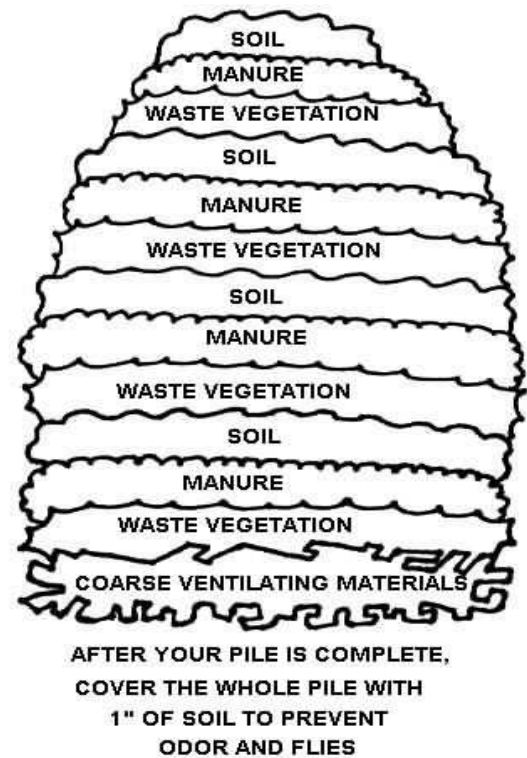
After two weeks you will have a barrel full of compost.

### MAKE A PILE

Find a place where water drains off quickly and make a compost pile there.

1. Begin by loosening the soil at the place where you are going to make your compost pile.
2. Get some twigs and lay them across each other until you have a pile about three inches high. This is to allow air to circulate = ventilation.
3. Put six inches of plant material, (grass, leaves, and small twigs), on the pile of large twigs.
4. Add four inches of waste.
5. Cover the whole pile with four inches of fresh manure. (Manure is the most important ingredient of a compost pile. The manure will rot the rest of the material in the compost pile.)

6. Lastly, cover everything with one inch of dirt to prevent odors and flies. (This is very important because flies carry many diseases.)
7. You can add layers of plant material, waste and manure (in that order) until the pile is five feet high.
8. When the pile is five feet high you should not add anymore plant material or waste to it. You can start a new compost pile.
9. As it rots, the pile will shrink down to about two feet.
10. It is helpful to keep the whole pile moist while it is rotting.



After you have made this pile you still have not made compost. The pile will not become compost until it "rots".

You will have to completely "turn" or "mix" this pile about once a week with a shovel, pitch fork or rake. Take some of the material from the bottom of the pile and place it on the top of the pile. Keep doing this until the entire pile has been turned. At this time you may add more manure to the pile with dirt again, and wet it down again.

After about three months, (if weather is warm), all of the material will be rotted and you will have compost.

Since a pile of compost material takes about three months to rot you might want to start a new compost pile every month. That way you will always have some compost to put in your garden.

### SOIL ADDITIONS

Besides compost, there are some other things you can put in your soil to improve it.

Add limestone if the soil is too acid. (Soils in areas of heavy rainfall tend to be acid).

Add crushed rock or eggshells if the soil is too alkaline. (Areas of light rainfall tend to be alkaline).

Phosphorous, potassium, and nitrogen are important nutrients in the soil.

Grind up some bones for phosphorous.

Add wood ash for potassium.

Add fish, blood, or ground up horn for nitrogen.

### MANURE TEA FOR FEEDING PLANTS

Two shovels of manure (cow or horse) in a 5 gallon bucket of water. Mix well, let it sit until the sediment settles to the bottom of the bucket, then dip out liquid and pour around the base of the plants.

## IV. PLAN YOUR GARDEN

### Planning Your Garden

Planning your garden has a lot to do with where you live. It has to do with how hot the sun is in your area. When you plant your garden make sure your plants will get enough sun but not too much sun. Too much sun will burn your plants.

If you live where the sun is very hot, you need to plant the taller plants toward where the sun rises, then the tall plants will help shade the shorter plants.

If you live where the sun is not very hot, you need to plant the shorter plants toward where the sun rises, then the shorter plants will get enough sun, and will not be shaded by the taller plants.

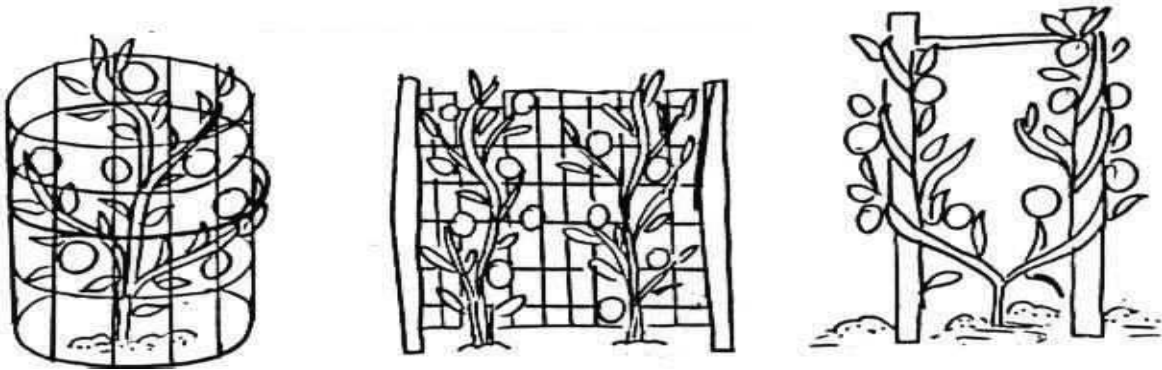
The chart from Page 8 lists the plants from tallest to shortest.

Some plants like corn need the hot sun.

Other plants like lettuce need to be partially shaded.

Tomatoes, cucumbers, pole beans, and even pumpkins and squash can all be grown on trellises to save room in the garden.

Here is a picture of three kinds of trellises.



Corn, okra, pumpkins, and squash take up a lot of room. They must be planted together in a separate field.

Peppers, tomatoes, herbs, and even carrots can be used as ornamental plants. They can be used as borders or hedges around your house or compound.

Remember to keep the garden bed moist at all times while the seeds are beginning to grow. It is best to water the garden lightly just after sundown or just before sunrise. Water once a day until the plants are three weeks old. When the plants are three weeks old, you will only need to water them every three days, but you will not water them lightly -- instead you will water them until the garden bed is thoroughly soaked. This heavy watering will allow the water to go down deep into the soil. The plant roots will be encouraged to grow deep to get the water. The plants will become stronger.

Rain is God's way of watering a garden. Rain falls as little droplets which do not disturb or wash away the soil. Rain water is good water which is free of things that can hurt your plants. This makes rainwater better for watering a garden than river water. Water is not the only thing that falls to the ground during a rainstorm. Large amounts of nitrogen also fall to the ground with the rain water. Nitrogen is important for plant growth.

If your garden is in a wet area, you will want to plant your garden on "raised beds". This way, the plants are above the water and will not be washed away.

### PLANT BY PHASE OF THE MOON

The pull of the moon's gravity will help pull the seeds out of their shells. Plant leafy crops in the light of the moon. Moonlight helps the leaves grow. Planting root crops in the dark of the moon will help root growth. This does not mean to plant your crops at night it means to plant during the days of the moon phase.

## STARTING SEEDS IN FLATS

NEW WORD - flat - A flat is a box with very low sides to grow your seedlings in until they are just a few inches tall.

NEW WORD - to thin - carefully pull out the extra weaker plants to allow the stronger plants to grow evenly.

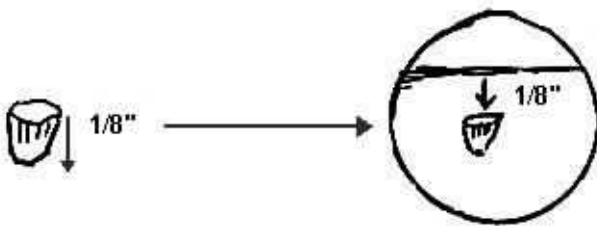
Sometimes it is better to plant certain seeds in flats and transplant them to the garden after a few weeks. This is especially important in cold areas. You can start your planting while there is still frost and cold, and transplant into the garden after the ground is warm enough. This way, you can start your garden early.

1. Seeds started in flats can be completely protected from the weather, insects and weeds until they are strong enough to be transplanted into the garden
2. Because they can be completely protected, seeds grown in flats need less care and watering than seeds planted in the garden.

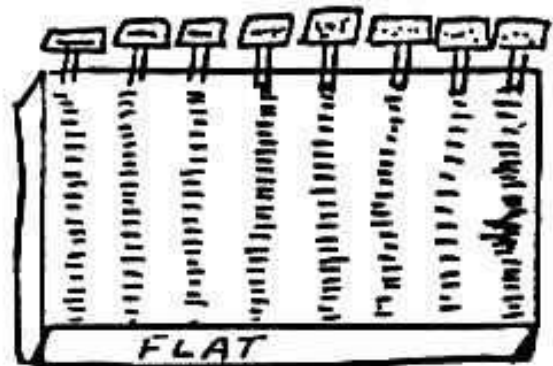
## HOW TO START SEEDS IN A FLAT

Remember the best soil is 1/3 clay, 1/3 sand and 1/3 compost.

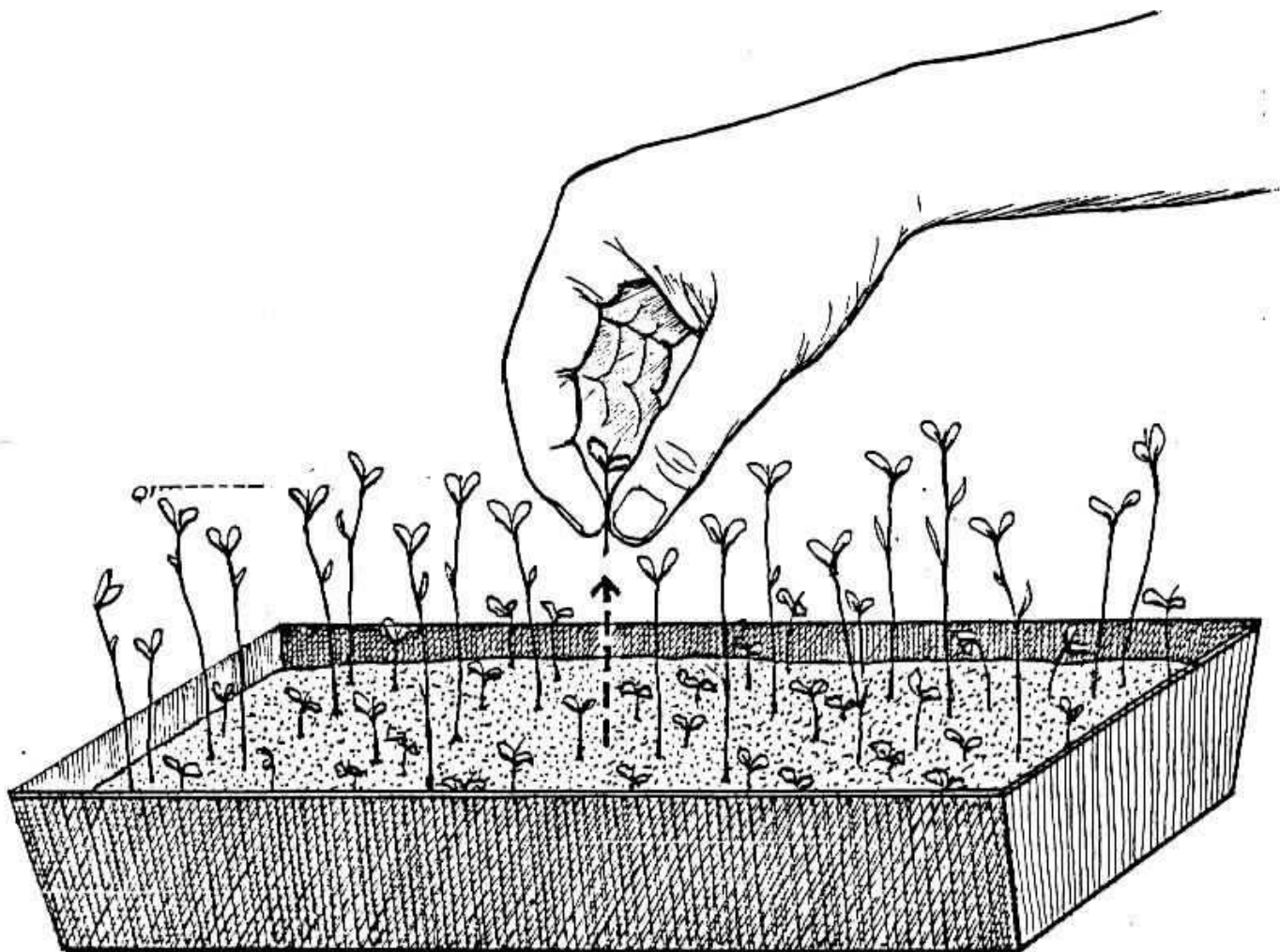
1. Before mixing for a flat, mix the clay and the sand and bake in the oven at a medium temperature (300° F). This will kill all weeds and their seeds.
2. Add compost or dry manure to the clay/sand mixture.
3. Plant the seeds the same depth as the length of the seed. This is a good rule for all seeds if you do not know how deep to plant a seed.



4. Plant the seeds in rows.
5. Mark the rows so that you will know what is planted in them.

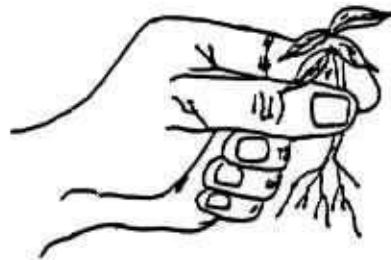


6. Keep the soil moist.
7. After the seeds have begun to grow, thin the plants so that they are not crowded.
8. When the second set of leaves begin to appear, the plants can be transplanted. (Or you can wait until the plants are three inches high.)



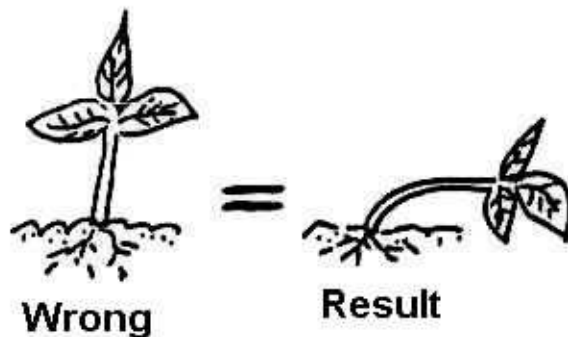
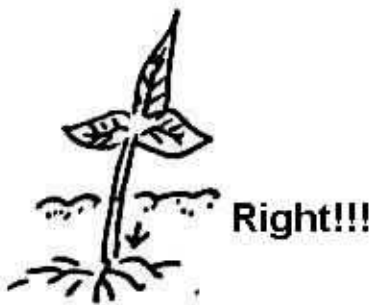
## TRANSPLANTING

1. Prepare rows in the same way as you would for planting seeds (see page 10).
2. Transplant late in the afternoon so that the plants will get some sun but not too much.
3. The soil in the flat must be moist.
  - a) Gently lift each plant out of the flat keeping some soil around the roots. (Try to keep the roots covered)

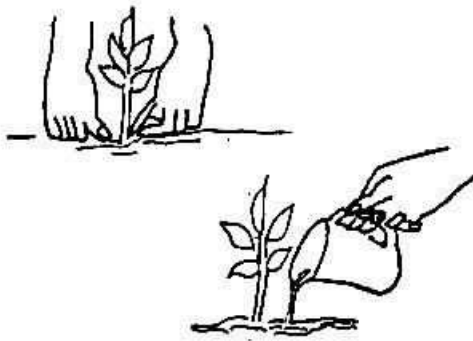


**Wrong**

4. Hold the plant very gently in your hand. Hold it by cupping your hand around the soil, never by the stems. The stems are very fragile and break easily.
5. In the row, make a hole deep enough and wide enough for your plant, using stick or a small trowel.
6. Gently place the plant in the hole, so that the first set of leaves is just above the ground.



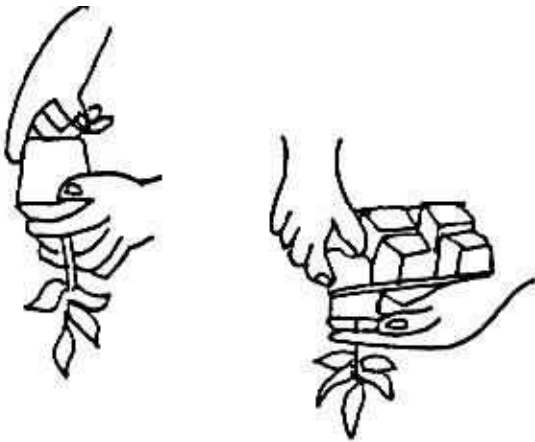
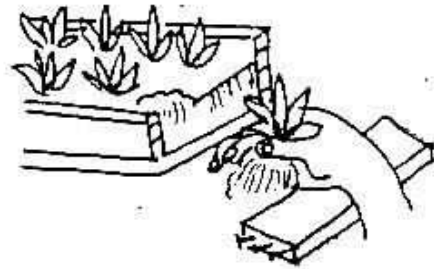
7. Press the soil down firmly but not tightly. (Lightly pat down the soil)



After planting, firm the soil slightly with your hands to remove any air pockets. Don't wait for the newly transplants to show signs of wilt before watering again. A little extra attention in the first few days after planting will ensure healthy plants.

8. When you have transplanted all the plants, water the bed gently but thoroughly.

a) When many plants are grown together in a single flat, their roots intermingle. The individual plants will be damaged less if you pull them apart with your hands rather than using a knife or other sharp instrument.



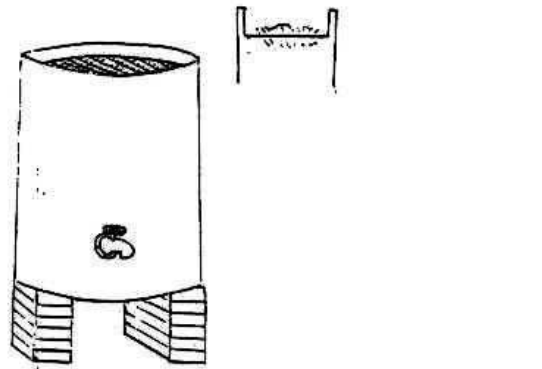
For transplants grown in individual plastic pots, tip the pot and tap the plant into your hand -- don't pull it out. Plants in six packs should be turned over and pushed out from the bottom of your thumb. Hold the soil in place with your other hand.

\*\*\*\*\* Of necessary review section - How to Plan Your Garden \*\*\*\*\*

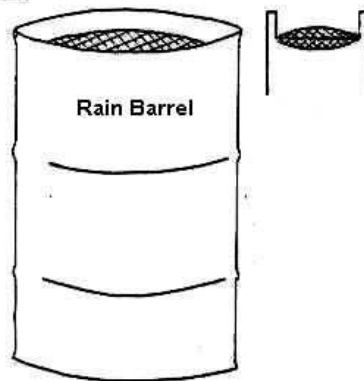
## WATERING YOUR GARDEN

1. Here are two ways that you can catch rain water and use it on your garden.

a) A Tank



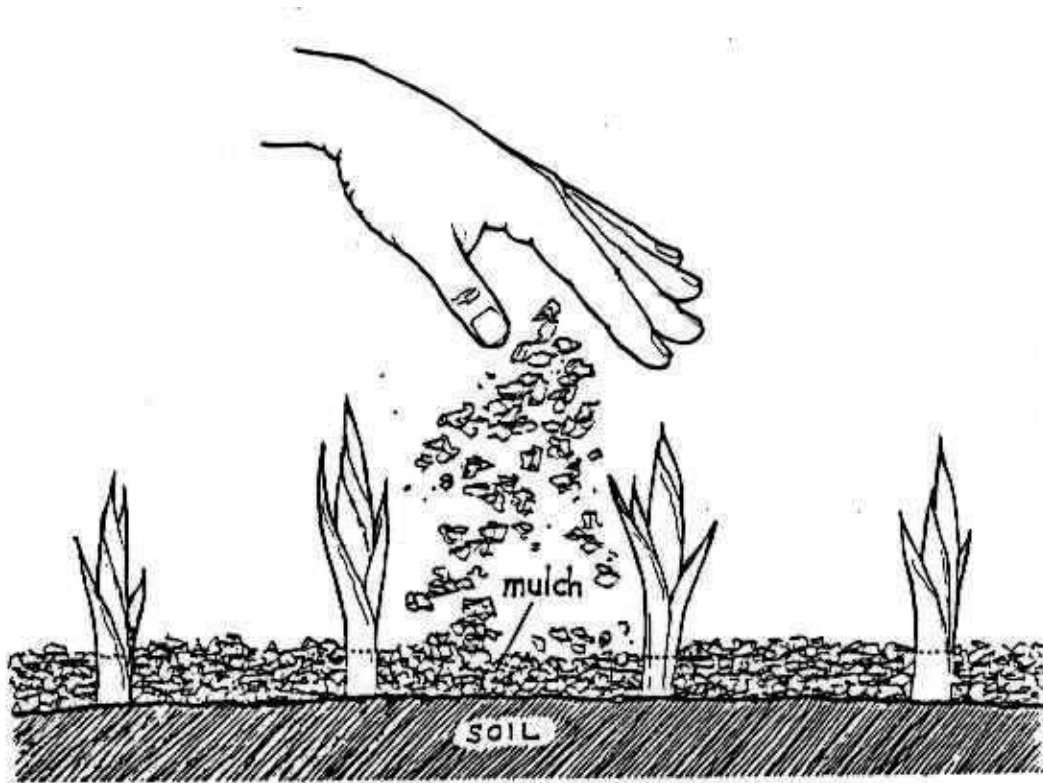
b) A Rain Barrel



2. Keep the garden moist at all times when the plants are first beginning to grow.
3. Use a watering can or spray nozzle on a hose to water like soft raindrops.
4. When the plants are three weeks old you can water more heavily but less often. Every 3 to 4 days, either from rain or by watering.
5. Cabbage, cauliflower, and broccoli like water on their leaves, and are lovers of cool weather. Radishes also do well in early spring. Most other plants do not like water on their leaves.

NEW WORD - Mulching - covering soil around the plants in order to keep moisture in and prevent weed growth.

- Mulching keeps your plants moist and helps keep weeds away. Use dried grass, leaves, manure, compost or sawdust as a mulch. Spread an inch or so of the mulch on the garden bed. Black plastic, brown paper, aluminum coated plastic and foil can also be used instead of mulch. You can determine the way you will mulch by your climate - for example - if you live in a very hot climate black plastic will burn your plants.



Vegetables need a lot of water. Flowers can survive longer without water than vegetables, so can trees and bushes. Roses and Chrysanthemums love a lot of water. Water often. Some vegetables never recover from a drought and almost all of them will produce a lot more with abundant water. A good way to decide where your garden should be and how large it should be is to let your water supply decide the size. Unless you live in an area with dependable spring to fall, long abundant rains, don't cultivate and plan to garden in places that you can't get water to. If you are working with a limited water supply, figure that your garden needs at least an inch of water a week, either from the sky or from your water system.

## V. PLANT MAINTENANCE

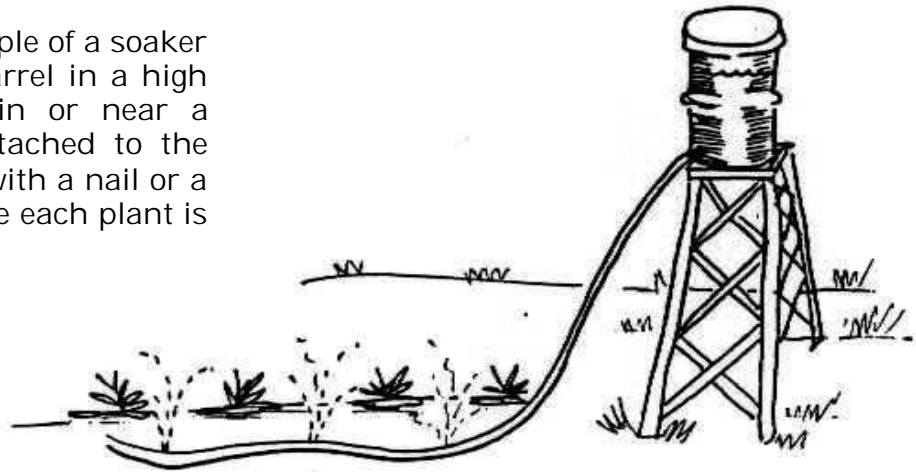
### IRRIGATION AND WATER SYSTEMS

#### SOAKER HOSE

1. Take a hose and block it up at one end.
2. Make tiny holes evenly spaced along the length of the hose.
3. Attach the open end to your water source.

The water will spray up to 3 to 5 feet through the holes, depending on the water pressure. It has a gentle soaking action that is good for your tender plants and older ones too. If you have a big garden you can hook up to 2 or more lengths of hose.

Pictured here is an example of a soaker hose clean bucket or barrel in a high place about 10' high in or near a garden. The hose is attached to the bucket or barrel. Then, with a nail or a pin, a hole is made where each plant is located.

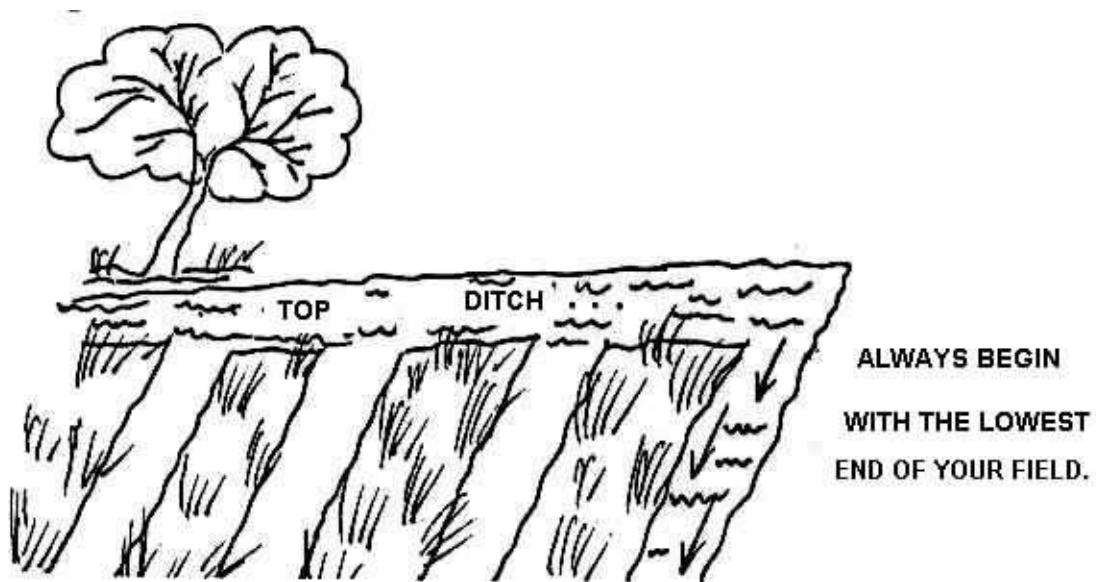


Bucket - Another way to water is to carry the water in buckets and pour it beside the plants. Some farmers have made very good gardens watering this way. Remember to be very gentle on young tender seedlings. Too much water at once can uproot them and they will die. Also, new seeds cannot take a hard flow of water. They need to be watered gently until they come up.

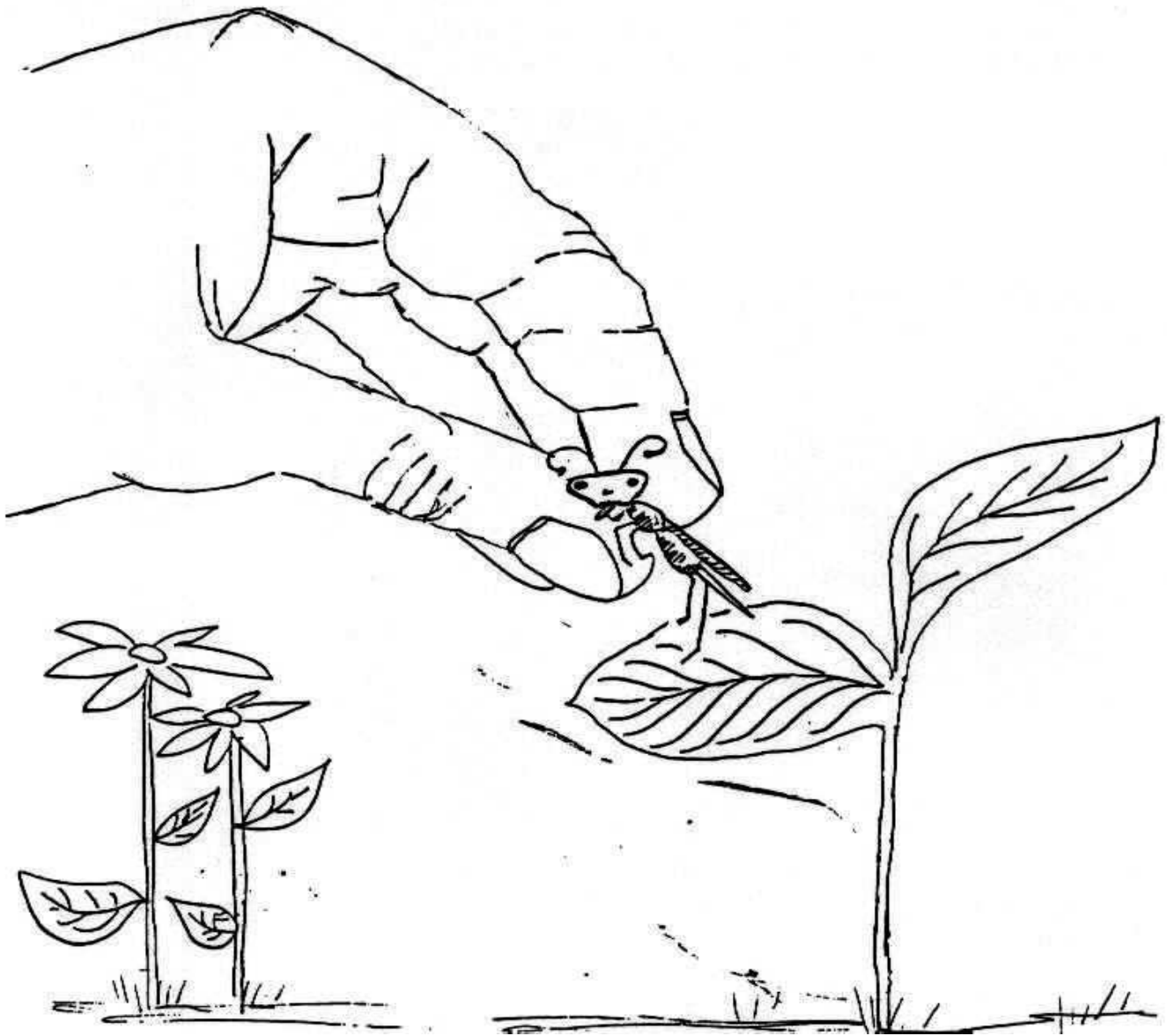
NEW WORD - Irrigation - To bring heavy flow of water by trenches into your garden, flood the garden, if you have a lot of water, or else run it down little ditches along each row.

1. Flood Irrigation. Flooding is best for big fields of plants such as corn, alfalfa, wheat and rice.
  - a) The water will flow along the main trench to the field.
  - b) You will open the wall of the field by digging away a small section.
  - c) When the whole field is wet you will close the wall again.
2. Row Irrigation
  - a) The water will flow along the main trench to the field.
  - b) Open the wall so that the water runs down the lowest row.
  - c) When the row is wet; block the water so that it will flow into the next row.
  - d) As each row is wet, go to the next row until all the rows are wet.

The exact places for the trench must be carefully planned. The water has to flow downhill, but you want it to flow slowly so that it doesn't wash the plants. Make your trenches according to the slope of your land.



## INSECT CONTROL

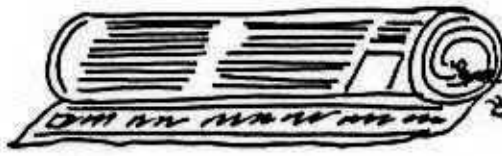


1. The first rule for keeping insects out of your garden is to keep the garden clean. Remove all trash from your garden. Pick up all sticks, twigs, branches, leaves, old rags, pieces of wood or any other trash that may be lying around. Do not let the insects have a home where they can breed.
2. If you see insects in the garden you can pick them off with your fingers and kill them.



3. Wash the insects off with some water. Aphids and other sucking insects can be washed off the plant stems they have been feeding on. They will not return.
4. Make a poison by adding one cup of soap shavings or one cup of kerosene to a gallon of water. Then spray it on the plants.
5. Rotation of crops helps to control aphids and other insects.
6. Soil rich in humus helps control aphids.

7. Place rolled up newspapers on the ground at night. During the night, crickets and other bugs will crawl into the newspaper. In the morning, you can burn the newspaper.

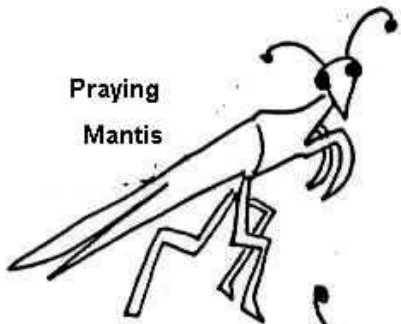


**Damp, Rolled Newspaper  
Attracts Insects**



**Burn Bugs in  
Morning**

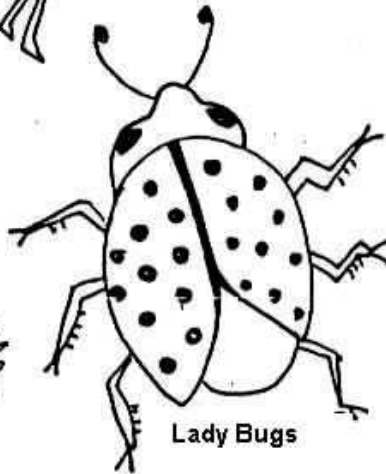
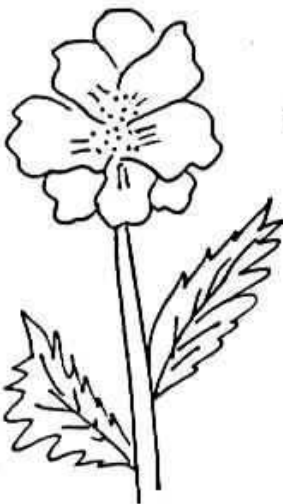
8. Wasps, praying mantises, and lady bugs kill harmful insects. Don't kill wasps, praying mantises or lady bugs if you see them in your garden.



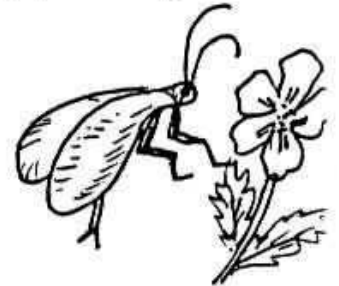
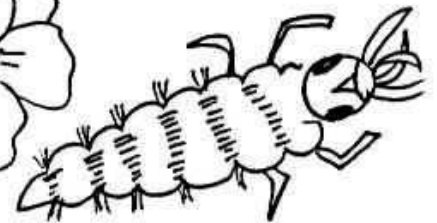
**Praying  
Mantis**



**Bees and  
Wasps**



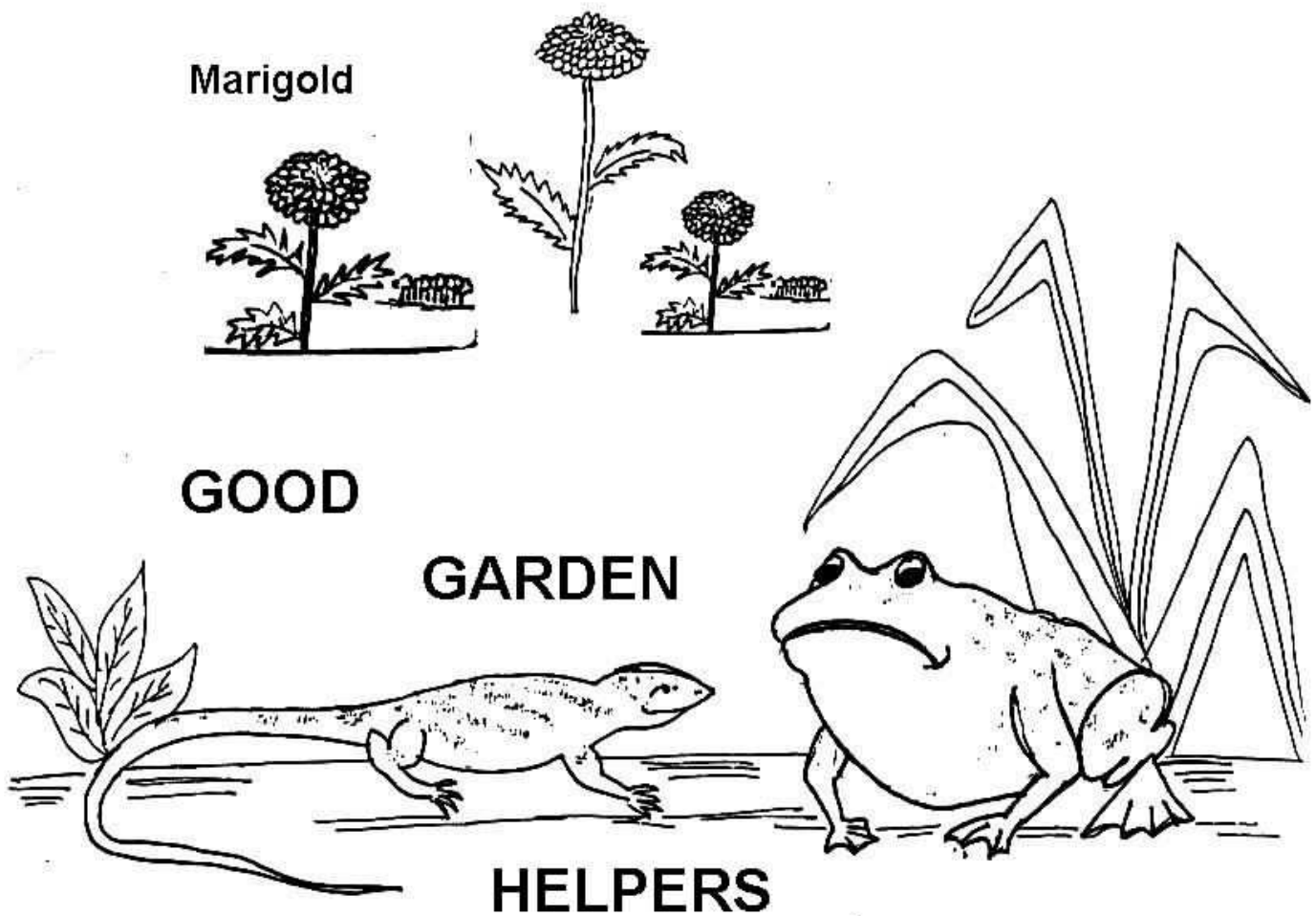
**Lady Bugs**



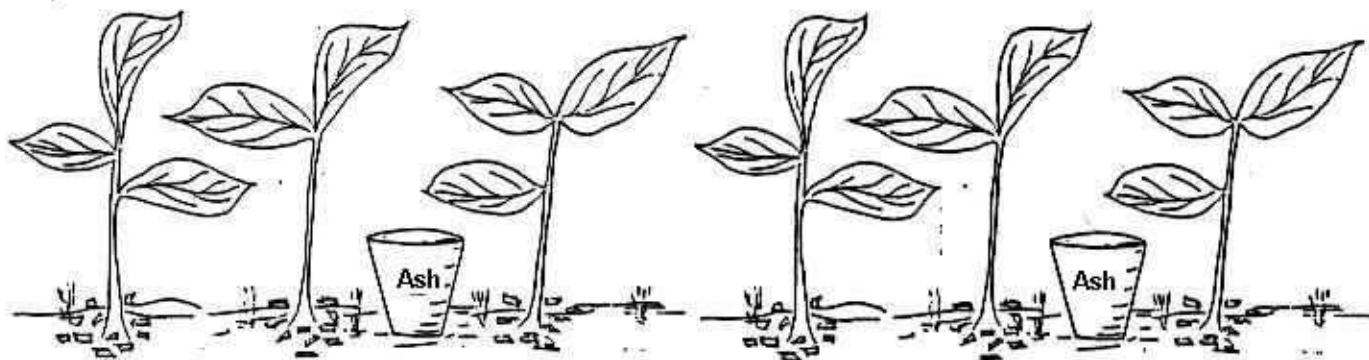
**GOOD**

**BUGS**

9. Birds, frogs, and lizards also kill insects. Let these animals live in your garden. But remember that birds can also eat your plants.
10. Plant a border of marigolds around the garden. The marigolds will keep insects away from the garden.
11. Plant a border of peppermint around your garden to help keep ants away.
12. Plant sunflowers five feet outside your garden. The sunflowers will attract insects away from your garden.



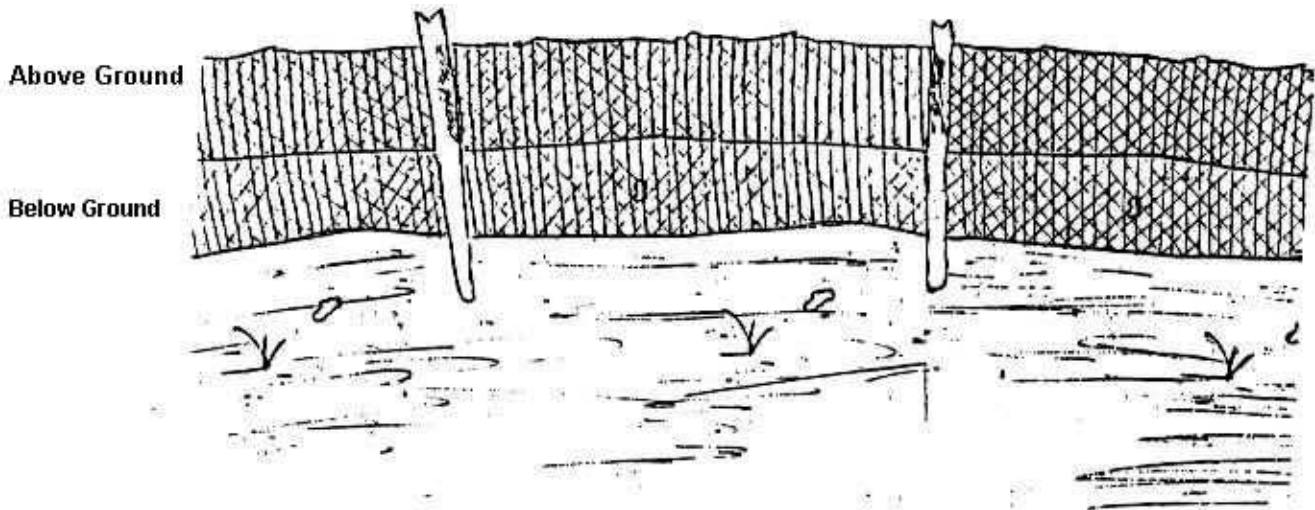
13. Plants that have just started to grow are often attacked by "cutworms". Cutworms eat plants right at the soil line. Place a small roll of paper around each plant to protect the stems from the cutworms.



14. Sprinkle some ashes around the plants to keep cutworms and snails away.
15. Grasshoppers and other insects that chew leaves do not like the taste of onions. Mix some onion juice with a little bit of water and spray it on the plants to discourage chewing insects.
16. Smoke also drives insects away, but you have to be careful not to scorch or burn the plants.
17. Plant tomatoes close to the house, especially the kitchen to keep flies away.

## RODENT CONTROL

Rodents and some farm animals would like to get into the garden and eat plants. To keep them out you will have to build a fence. But some rodents can burrow under your fence. A 4 foot chicken wire fence will stop them if the fence is partly underground. Dig a trench 2 feet deep around your garden; put the wire into the trench - 2 feet below the ground and 2 feet above - fill the trench. A brick or cement block wall built the same way would also keep the rodents out.



## WEEDS

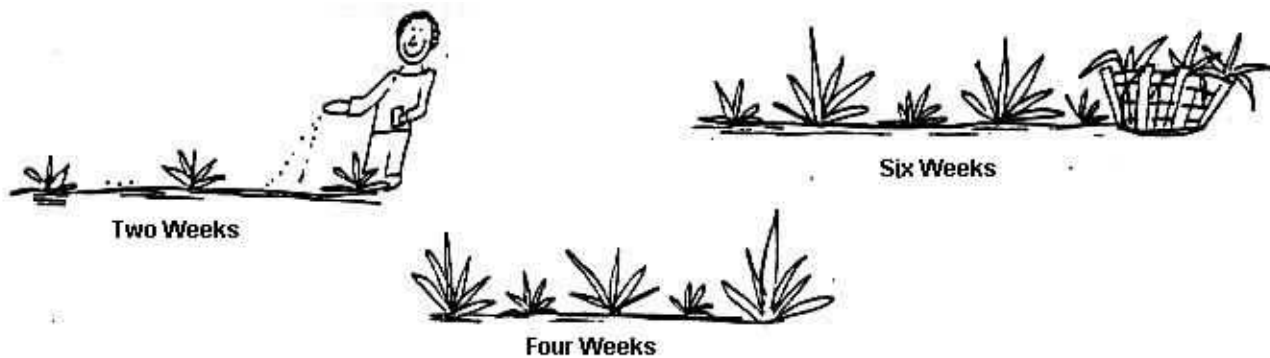
The only really effective way to get rid of weeds is to pull them out by hand. You must pull out the roots of the weeds. If you leave the roots, the weeds will grow again. The weeds will come out easier when you soak the ground before you pull them out. If the ground is too dry, you may pull out plants you do not want to, or leave some roots in the dry, hard ground. If you have a very big field, you can easily use a hoe to loosen the weeds, but be very careful not to cut the weeds up with the hoe and leave pieces that will take root and grow again.

## DISEASED PLANTS

Remove or treat all diseased plants as soon as you see the disease.

## VI. HARVESTING

Replanting - After the crops have been harvested, you can replant right away. Make sure you add more compost or dry manure to the soil. Pull up the old plants and use them to make compost. Plant a small quantity of each crop at one time. Two weeks later, plant a small quantity of each crop. Do this as often as your planting season permits. This prevents waste of crops which cannot be used quickly enough.



Rotating Your Crops - Corn uses up a lot of nutrients in the soil. Beans, peanuts, and other legumes put nitrogen back in the soil. It is a good idea to plant beans or some other legume where the corn was the year before. Plant the corn in a different part of the garden for a year or 2 and then plant it again where the beans have been. This will keep your soil full of nutrients.

Tomatoes seem to like to be grown in the same place every year.

Harvesting Your Crops - As a rule it is best to pick vegetables while tender. Corn is ready to be picked in 65 - 90 days, depending on the type of corn.

Okra pods should be picked just before they are ripe. If they are not picked, the plant will not make new pods.

Beans are ready to be picked about 45 days after planting.

Carrots and onions can be used at almost any time after the first few weeks.

Pick cucumbers any time before they begin to turn yellow.

You can tell if the crop is ready by the taste.

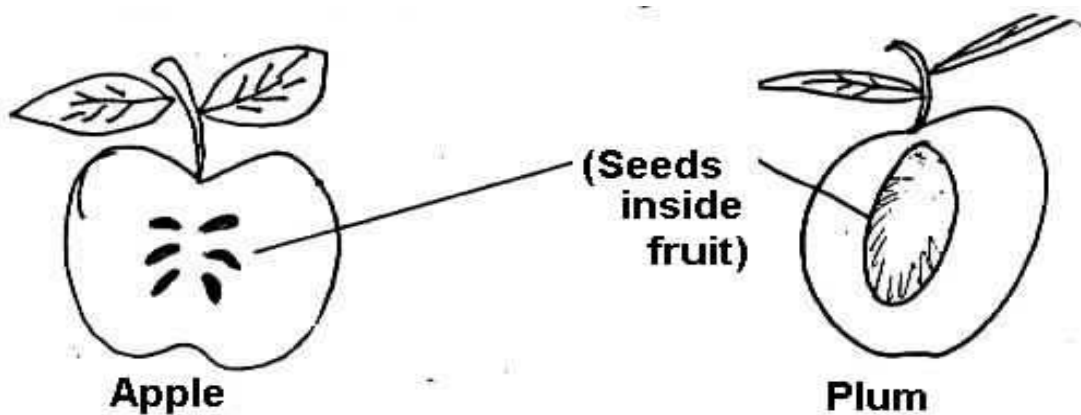
## VII. SEEDS

### Grow Your Own Seeds

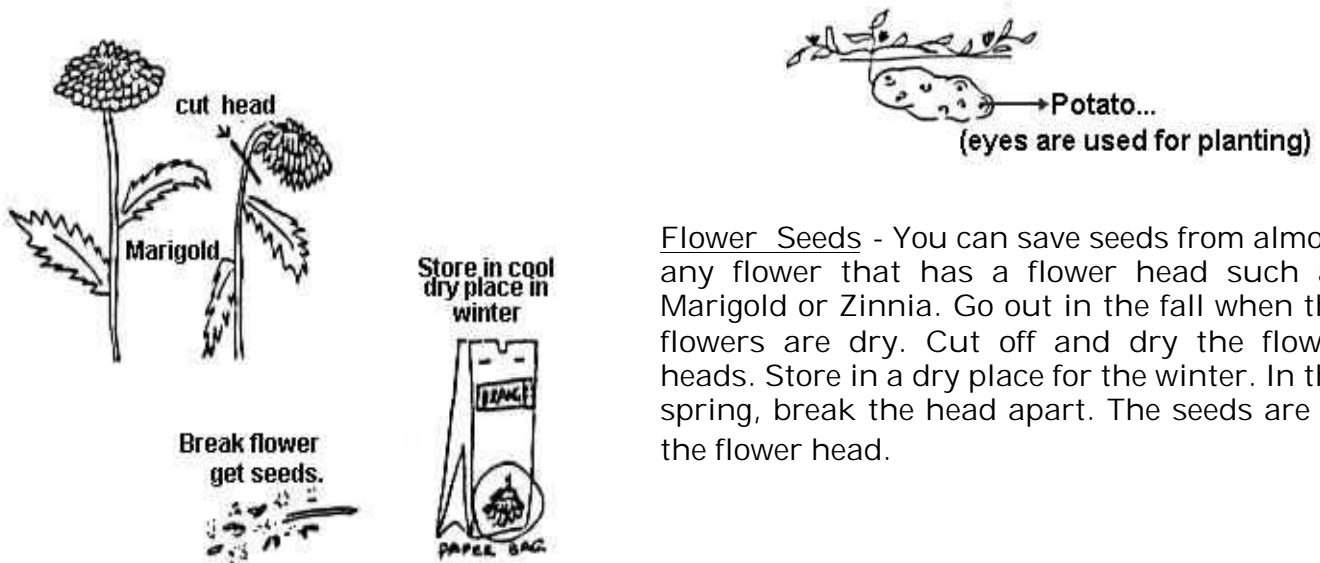
Root vegetables are generally Biennials. This means it takes two years to make a seed. The first year it makes a root and stores food in it. The next year the root vegetables sends up a long stalk. It has all the stored food from a summer's growth in it's root to draw on. The stalk flowers. Where each flower was, seeds will form and can be collected when dry.

### Fruited Plants

Fruited plants make their seed inside the fruit. For example, melons tomatoes, green peppers, and eggplant. First comes the flower, and then the fruit. Let the seed - bearing fruit get fully ripe. Then scoop out the seeds and let them dry naturally - on a newspaper.



Tubers Are under the ground - for example potatoes. The plant sends up a stalk - flowers above the ground. This is not the seed the small knobs on the potatoes are used to grow new plants.



Flower Seeds - You can save seeds from almost any flower that has a flower head such as Marigold or Zinnia. Go out in the fall when the flowers are dry. Cut off and dry the flower heads. Store in a dry place for the winter. In the spring, break the head apart. The seeds are in the flower head.

Seeds saved from your garden have a built in resistance to insects and diseases. These seeds also produce better tasting crops and are more nutritious. If you save the best seeds from your garden, you will not run out of seeds. You can save many seeds and share them with others. In fact, you might even sell some seeds for a profit.

Save the best seeds so you can plant them again and little by little make your crop better. Choose the best seeds from each harvest. Save the seeds from:

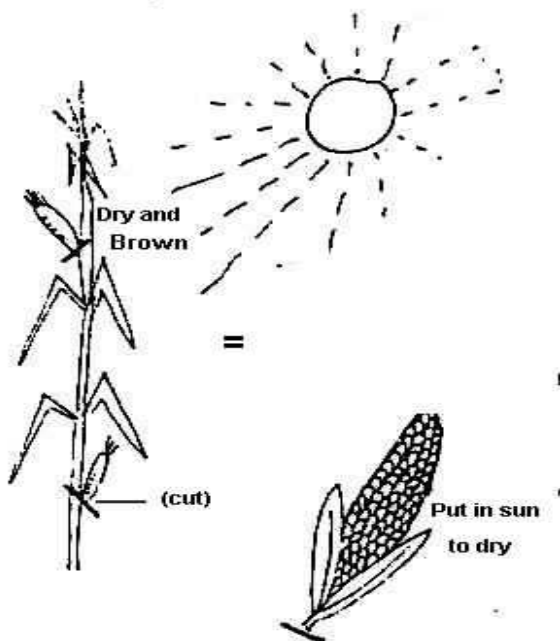
1. Strong, healthy plants.
2. Plants that grow fruit quickly.
3. Plants that don't get diseases.
4. Plants that have large or tasty fruit.

Remove sick or unhealthy plants from your garden before they make your healthy plants get sick.

Harvest the best seeds from fruits and vegetables that are well ripened, but not too ripe. Don't let them rot or blow away.

Collect the seeds on a dry day, after the dew is gone.

## HARVESTING AND CLEANING VEGETABLES

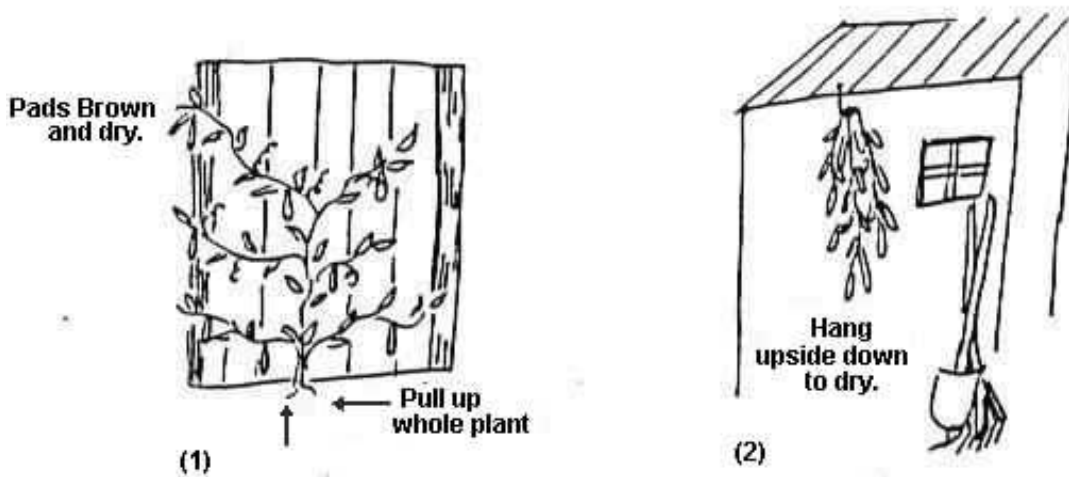


Corn: Pick the corn after the stems and leaves have turned brown. Take away the husks from the ears of corn. Put the corn in the sun to dry. When the corn is completely dry, put it away.

Okra: Remove stems when pods are dry, almost splitting. Remove seeds and dry before storing.

Squash: Pick squash, melons, and pumpkins when they are ready to eat. Wash the seeds and dry them as well.

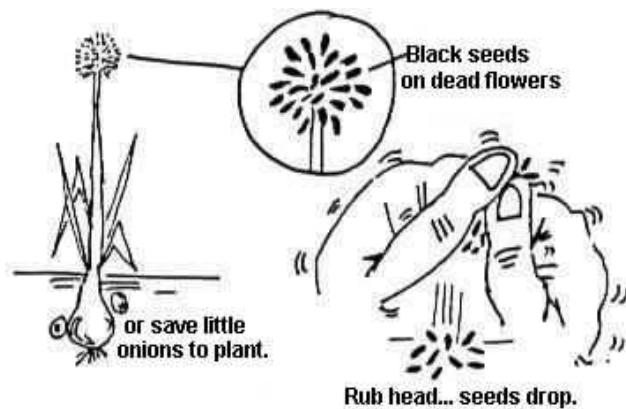
Cucumbers: Should be picked when they are large and golden yellow. Wash the seeds and dry them.



Beans: Pull up the bean plants when the pods turn brown. Hang up the whole plant in a sheltered place to dry.

Peas: Pull up when the pods have turned brown. Hang up to dry.

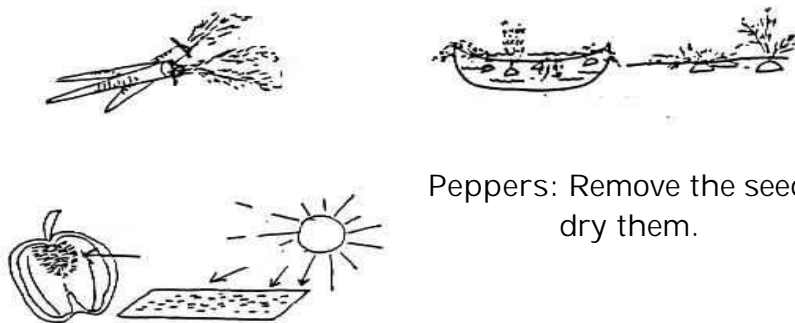
Onions: Wait until you see black seeds on the dead flowers, then cut the stems. Dry the flowers and rub the seeds from the heads. Or save very small onions for replanting. Store small onions in a cool, dark, dry place.



Leeks: Same as onions.

Garlic: Same as onions and leeks.

Carrots: Same as onions. Or save carrot tops in cold place or even in cold water. They will not save very long. You will have to plant them soon. Soak them in water for a few days before you plant them.



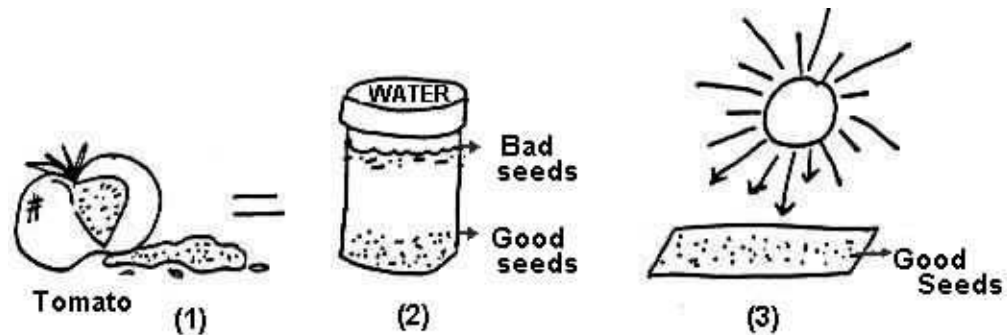
Peppers: Remove the seeds and dry them.

Mustard: Cut the flower stems when the pods are very dry, but not wilted. Remove the seeds and dry them.

Radish: Same as mustard.

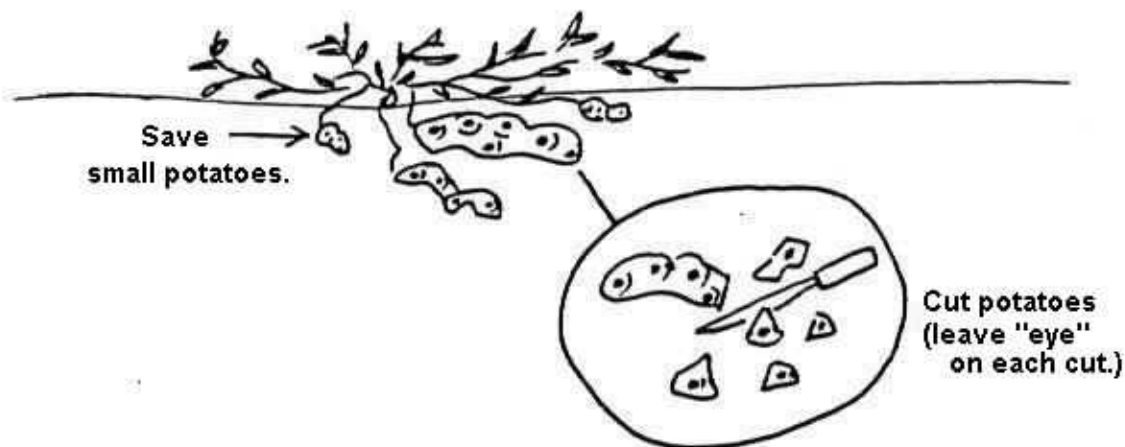
Chinese Cabbage: Same as mustard and radish.

Tomatoes: Pick tomatoes when they are red, but still firm. Place the seeds in a jar of water for two or three days. Good seeds will sink to the bottom. Pulp and bad seeds will rise to the top. Wash the seeds, then dry them on a screen or on newspaper.



Eggplant: Same as tomatoes.

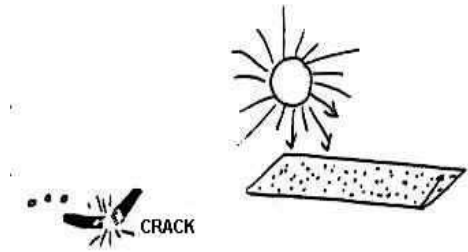
Potatoes: Pull up when plants are dry. Save the smallest potatoes for replanting. Keep some potatoes in a cool dry place and cut them into pieces, (each piece should have an eye (knob) when you are ready to plant them).



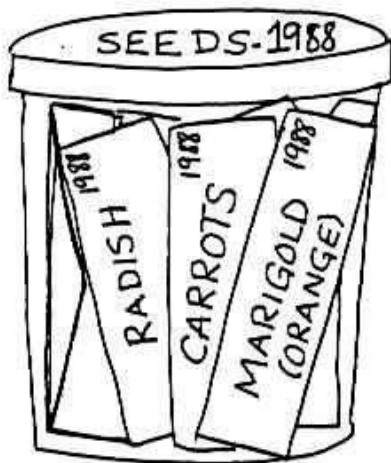
## STORING SEEDS

Seeds must be completely dry to prevent molding and being eaten by insects.

1. Test the seeds to see if they break with a "crack".
2. Mix some wood ash or lime with the seeds, if you can.



3. Save seeds in a jar that has a tight lid.



- a. Several envelopes or plastic bags filled with seeds can be kept in the same jar. Put the date and name of seed on the envelope or jar. Each year use your oldest seeds first.

Or...

- b. Place one type of seed in a small jar with plastic seal on the lid. Baby food jars are excellent for this. Remember to label each jar with the name and date.

