

Chapter 3

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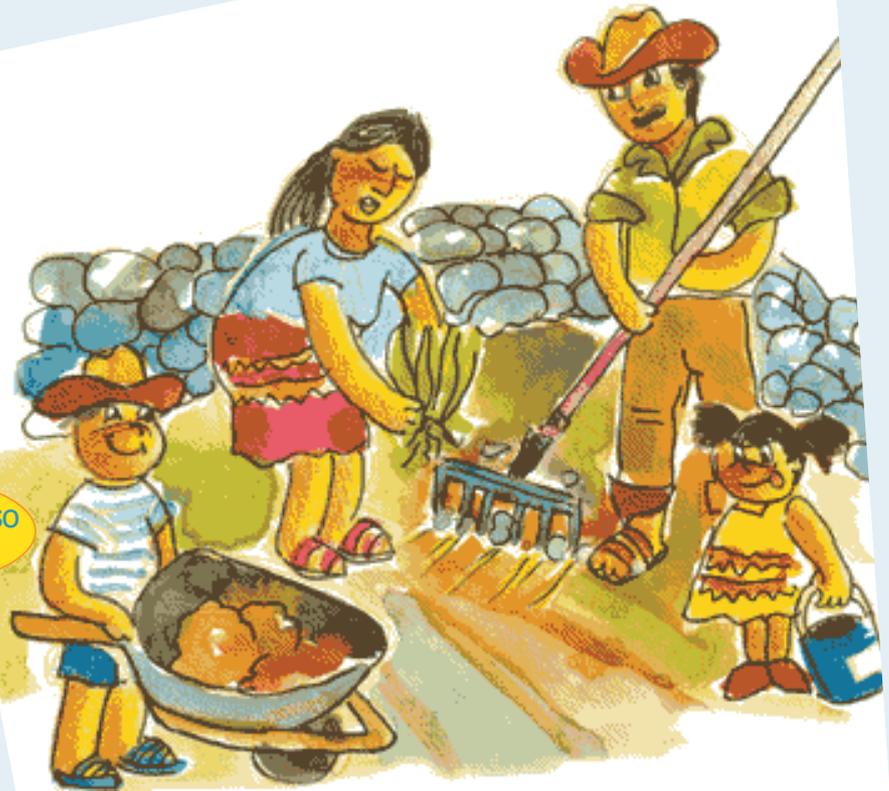
Why is it important to take care of the soil in the garden?

If a carpenter does not take care of his hand saw.... when it breaks... the carpenter is left without work.

If a dairy farmer does not take care of his cows.... if they die... he is left without a dairy.

If the horticulturist does not take care of his soil.... when the ground dies.... he is left without a garden.

The soil can also die.





The soil is alive.

Although we do not see them because they are very small, the ground is inhabited by millions of animals and plants that are beneficial for the vegetables. These are microorganisms. If the microorganisms die, the ground also "dies" since it cannot nourish plant growth.

We cannot destroy in a short time what nature took millions of years to create.

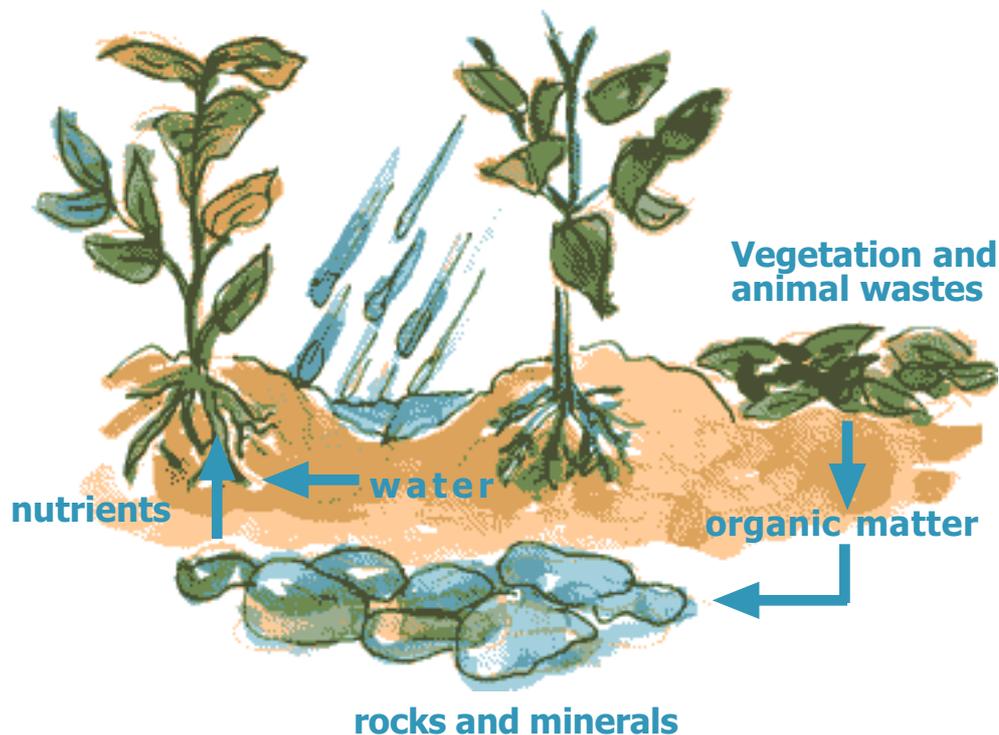
It is important to learn to take care of the soil and to give back the nutrients that we removed with the harvest.



But first let's see what things happen in the soil.

The microorganisms in the soil are almost always very busy decomposing plant and mineral waste.

They prepare the soil nutrients as plant food.



Humus is the organic matter in its final state of decomposition caused by microorganisms in the soil.

Soils rich in humus have many nutrients and are more porous.

Porous soils retain more water and are more fertile.



What is humus?



Important! One of the most essential jobs in the garden is to add organic matter to the soil.

Why?

Organic matter:

- Increases the capacity of sandy soils to retain water.
- It softens heavy soils (clay) increasing its ventilation and improving root growth.
- It serves as food for the soil organisms.

Where can organic matter for the garden be obtained?



Sandy soil:

The water drains faster and dries easily.



Clayey soils



Soils with organic matter

There are many types of organic matter

- 1- Organic fertilizer or "compost".
- 2- Worm humus.
- 3- Farm animal manure.

All of these improve the soil but some have more advantages than the others! We will only look at the most beneficial.

Test 7

Complete the following sentences:

- 1- Soil organisms are.....
(alive-dead)
- 2- Plants absorb useful.....from the soil.
(food-nutrients)
- 3- Soils rich in humus are.....
(poor-productive).
- 4 If you add organic matter to clayey soil it.....
(hardens-softens)



1- Compost

Organic compost can be prepared in the garden.

What you need is easy to get: kitchen leftovers, vegetable scraps and animal manure.

Let's see how to prepare it!



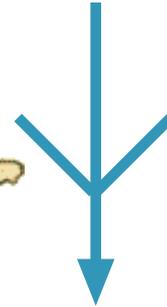
Animal manure



vegetable scraps



kitchen leftovers



organic compost



Answers for
test 7

- 1- alive
- 2- nutrients
- 3- productive
- 4- softens

Important! To prepare organic compost never use:

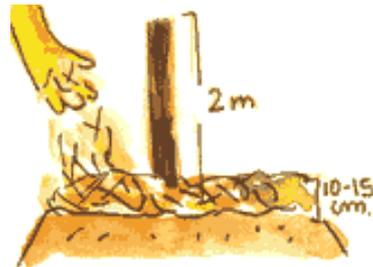
- Cat or dog excrement, it can contain diseases that affect people.
- Weeds with seeds, they contaminate the ground.
- Toxic plants (like eucalyptus leaves, walnut leaves) which prevent the growth of other plants.
- Plants treated with herbicides.
- Scraps of infected plants.
- Poisonous plants.
- Glass, metal and plastic do not decompose.
- Leftover fats and meats decompose very slowly and produce a lot of odor.



With a good amount of manure, vegetable and kitchen scraps, organic compost can now be prepared



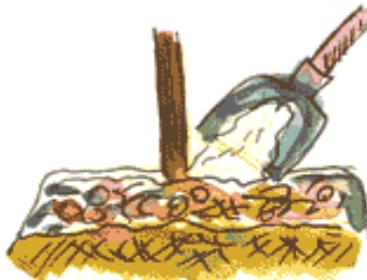
In winter choose a dry and sunny place; loosen the soil 30 to 60 cm deep, without turning it.



Bury a 2m high stick in the center. First place a layer of dry straw or stems on the loose soil.



Without flattening the under layer, add a layer of kitchen and vegetable scraps.



Sprinkle a small amount of ash or lime to avoid bad odors when the decomposition starts.



The following layer is made with manure.



Then another layer with soil. It has to be watered daily.

Placing more layers in the same way.

Remember, that the height of the pile shouldn't be more than 1.50 ms. or less than 75 cm.



When the pile has a lot of layers and has reached a height of approximately of 1.50 ms:

- The pile should be covered with 3 cm of soil or sand and a layer of straw (mulch) covering everything.
- Finally you water the pile and remove the stick leaving a hole for ventilation. If you have more material, do not continue adding it. Prepare another pile.

You should take care of your compost! The moisture and the ventilation have to be maintained.

In a few days, there is great activity in the prepared pile.

The microorganisms are transforming the scraps into **fertilizer**.

But remember, that in order for the microorganisms to work, you must assure suitable moisture and ventilation for them.



Some suggestions to take care of the compost



- 1- Two or three days after having prepared the pile, you should stick your hand in it to verify if it is hot.
If the mixture is just lukewarm, you have to add water.
- 2- If when you squeeze a handful of the mixture:
 - Drops of water are released, it means that there is enough moisture.
 - Water runs, it means that there is too much moisture.
 - Nothing comes out, it means that it lacks moisture.
- 3- In the summer it is necessary to water it every day so that it does not dry out.

Compost needs special care

- 4-If the pile is under direct sunlight, it has to be protected with branches.
- 5-In case of too much rain, cover the pile with a plastic or old sheeting.
- 6-After three weeks turn the pile with a rake or shovel. Repeat this operation every 10 days to air out better.



After three months the compost will be ready!



The finished compost:

- Has a pleasant odor of soil and leaves.
- Its color is very dark.
- The materials that were placed in the fertilizer are not recognizable.

Test 8

Match the phrases that correspond to each other.

Cat and dog excrement...

The compost pile must be watered...

The compost must be kept...

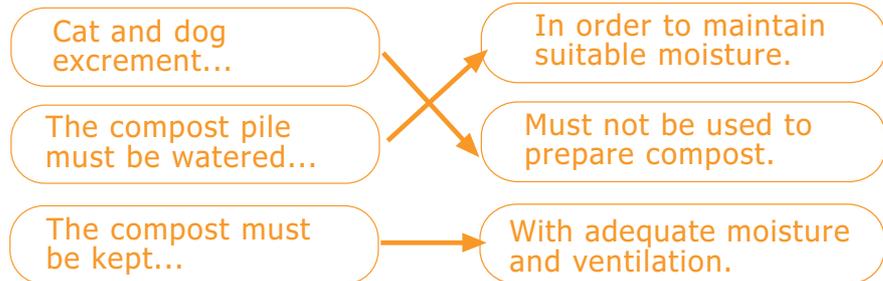
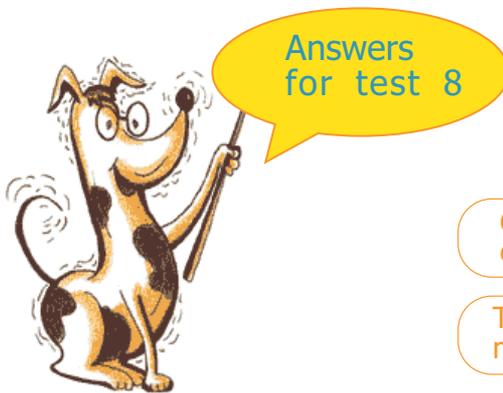
In order to maintain suitable moisture.

Must not be used to prepare compost.

With adequate moisture and ventilation.

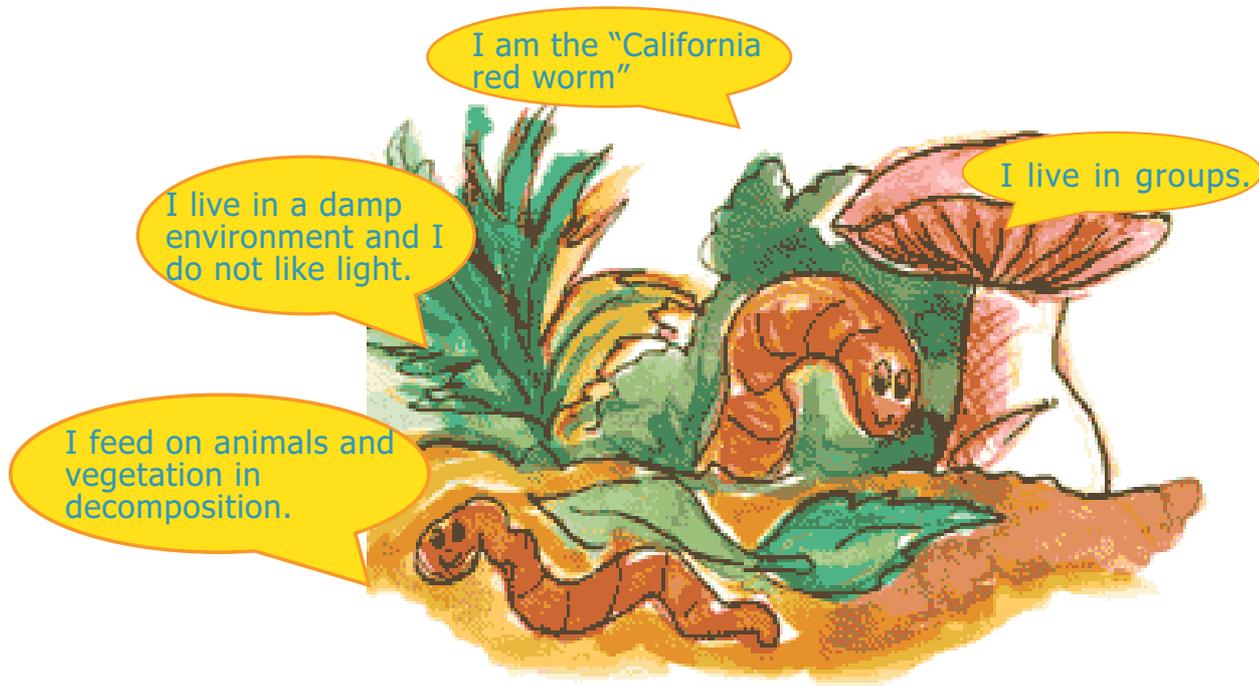
How is it used?

You need about 30 kg of organic compost for every 10 square meters of garden. A 1 m. pile provides approximately 70 to 90 kg. of compost.



2- Worm Humus

The worms known as "California red worms", produce a very useful excrement for the garden soil which is called **worm humus**.



The garden soil can improve greatly if worm humus is added to the soil.

Why?...

Worm humus

- Makes the ground more porous and therefore more permeable for water and air.
- It has substances that help plants grow..
- It has many microorganisms that make the soil nutrients more accessible for the plants.

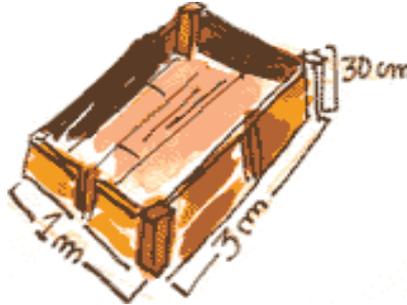
How is worm humus prepared?



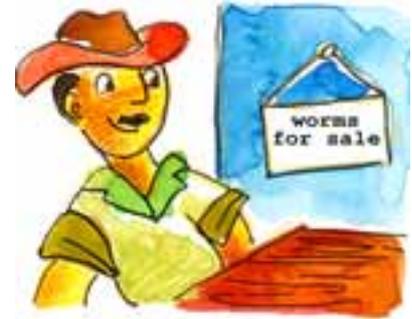
Worm humus: Preparation method.



With the compost that you prepared you can feed the worms but only 40 to 50 days after having made the pile.



First you prepare a breeding farm with wood planks to build a bed, 1m by 3m long by 30 cm. high.



Buy or obtain California red worms. Buy a minimum of 9,000 for a 3m² bed.



Place 25 to 30 cm. of unfinished compost (40 to 45 days old).



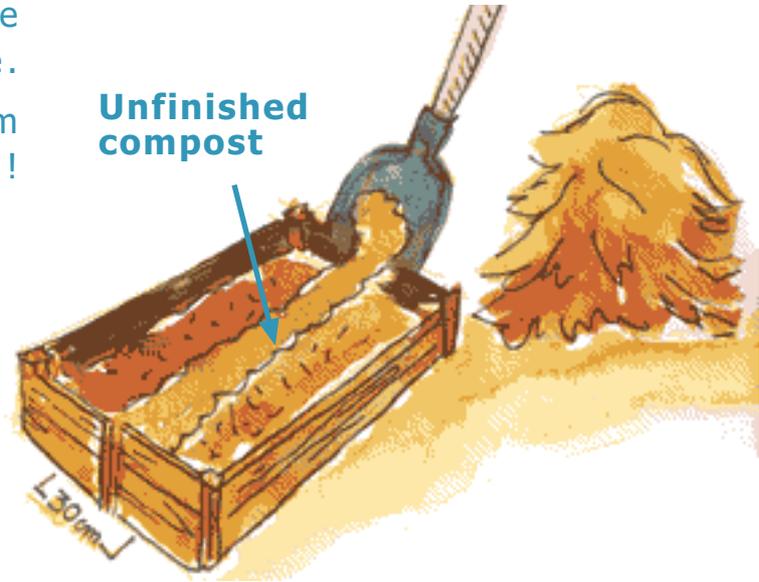
Distribute the worms on the surface of the farm, on the compost.



Water periodically to maintain adequate humidity, (in summer it should be watered daily).

Some care guidelines for worm humus:

- 1- Once a month, turn it with a spade and add a layer of unfinished compost. Repeat this operation once a month.
- 2- Keep the farm moist, the same as with the compost pile.
- 3- After 6 months your worm humus will be finished!



How is humus harvested?



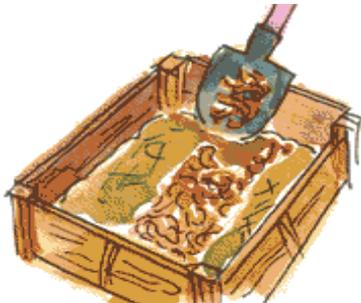
Do not water for three to four days.



Add a layer of unfinished compost; water only the new compost for 3 to 4 days.

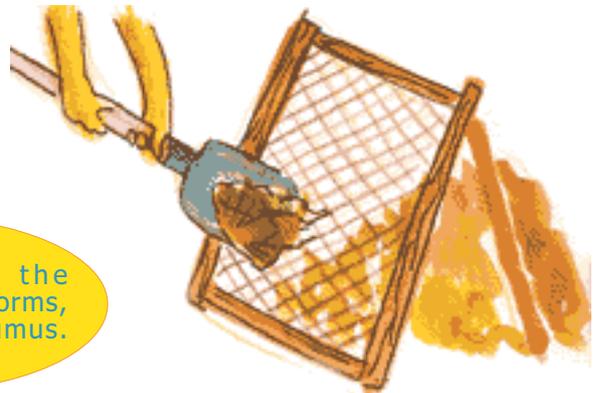


The worms will quickly move to the layer where there is food and humidity.



After two days remove only the new compost layer (this is where the worms are). The finished humus is left on the bed.

After removing the compost with the worms, sift the finished humus.



What is finished worm humus like?

- dark uniform color.
- without odor.
- very loose and spongy.
- with adequate moisture.

If the bed is 1m. wide by 3m. long, 400 kg of humus can be extracted every 6 months. With this amount you can fertilize 300 to 400 m² of garden.



The worm population duplicates every three months!

Test 9

Choose a suitable word to complete each sentence and write it in the squares of "crossword puzzle" (**layer, humus, duplicates, permeable, sift, useful, watered**)

1- Every three months the worm population.....

2- Unfinished compost that is added to the worm farm is placed in a.....

3- Worm excrement is called worm

4- Worm humus makes the soil more.....

5- The worm farm must be.....

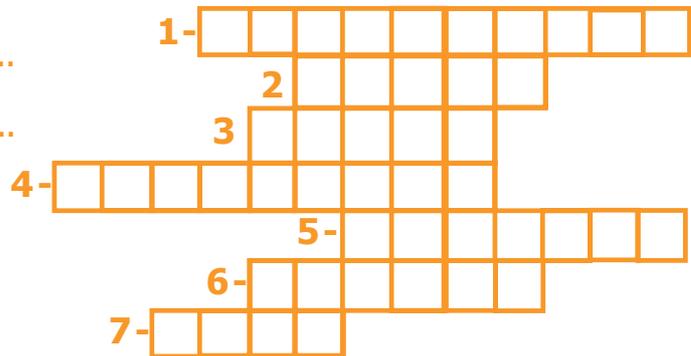
6- Worm humus is very.....

7- Before using humus.....it.

If you had 3,000 worms, after 6 months you will have 12.000.

With the newly produced worms you can:

- Prepare more humus.
- Feed birds or fish.
- Sell them as fishing bait.
- Make worm meal to feed the animals on the farm.



3- Farm animal manure.

If you want to start your garden as soon as possible but do not have organic compost or worm humus, do not worry. Animal manure is a good alternative if it is well prepared.

In the meantime you can prepare the materials to make compost or humus.

Manure provides:

- organic matter
- and nutrients

Manure from these animals can be used:

- birds and poultry
- horses
- cow
- pigs
- goats
- sheep
- rabbits



Answers
for test 9

- 1-D U P L I C A T E S
- 2 L A Y E R
- 3 H U M U S
- 4-P E R M E A B L E
- 5-W A T E R E D
- 6-U S E F U L
- 7-S I F T

It is important to prepare the manure and for this it is necessary to decompose it



To control the temperature: If you put your hand in the pile and it feels too hot, it is necessary to add water to slow the decomposition process.

Fresh manure:

- can burn seedlings if it is placed too close to them.
- may contain many weed seeds.

Decomposed manure:

- is safer for the plants.
- many weed seeds have been destroyed during the decomposing.

To decompose the manure: make a pile and let the microorganisms work for 10 days.



- 1-The importance of the soil in the garden.
- 2-Organic matter, soil microorganisms and nutrients.
- 3-Preparation of organic fertilizer.
- 4-Preparation of worm humus.

Test 10

Place a "T" if the sentence is true and an "F" if it is false.

- 1- Soil with little organic matter is rich in nutrients.
- 2- Plants need nutrients from the soil to grow.
- 3- Microorganisms improve the movement of the air in the ground.
- 4- Water drainage takes place in porous soils.
- 5 When organic compost is prepared it is important to maintain good ventilation.
- 6- In the finished compost the materials placed in the pile are recognizable.
- 7- Worm humus has many microorganisms that improve the soil.
- 8- Animal manure gives the soil organic matter and nutrients.

If the answers were all correct, you can go up another step. Congratulations!

Answers for test 10

- 1- F
- 2- T
- 3- T
- 4- F
- 5- T
- 6- F
- 7- T
- 8- T

If two or more answers were not correct, you should review the material in Chapter 3

- Expert horticulturists**
- Chapter 7**
- Chapter 6**
- Chapter 5**
- Chapter 4**
- Chapter 3**
- Chapter 2**
- Chapter 1**

