



Nestlé Healthy Kids

A Guide to Vegetable Gardens

The Nestlé Healthy Kids Programme: Promoting nutrition education and physical activity

The Nestlé Healthy Kids Global Programme aims to increase nutrition and health knowledge and to promote physical activity among school-age children around the world.

Nestlé Healthy Kids local programmes are implemented in many countries around the world. They are based on multi-stakeholder approaches, working with partners such as national and local governments, NGOs, nutrition health institutes and sport federations.

This brochure has been produced by the Nestlé Healthy Kids Global Programme for distribution to teachers and parents. It is a simple and useful guide that explains how everyone can grow their own vegetables, whether small-scale, for home or classroom observation purposes, or large-scale, to help feed a local community.

The original version of this booklet was developed by Nestlé Ecuador: the Healthy Kids programme in Ecuador was the first to promote gardening as a means for encouraging vegetable and fruit consumption while developing environmental awareness. This programme offers workshops on organic gardening and how to implement them in educational centres.

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1. Introduction

1.1 Why grow your own vegetables?

Nowadays, families strive to prepare balanced menus, based on nutritious ingredients. A **vegetable garden** is a simple and sustainable way to improve your quality of life.

Freshly-picked radishes or a tasty fresh lettuce that is the product of your own labour: these are very real examples of how we can improve the nutrition and physical well-being of families and children.



1.2 The benefits of a vegetable garden

Better quality, more nutritious food

- All the fruit and vegetables grown in your garden are easily grown by yourself. It does not require specific skills and is relatively inexpensive.

Environmentally-friendly

- Using organic waste matter as fertilizer, we can reduce landfill waste, thereby reducing pollution.

A vegetable garden has other benefits too

- A shared space and activity that encourages both children and adults to spend time outdoors.
- A vegetable garden can increase children's vegetable consumption and willingness to try new vegetables they have grown.
- A place to learn, an opportunity to work the land and learn about our local environment. A garden can teach us to love Nature, create an interest in conservation and encourage us to respect life.

2. Where can you plant a vegetable garden?

2.1 Who can help?

Large vegetable gardens are much more successful when the community is involved and motivated. Getting people involved right from the start in planning and discussing the garden is an excellent idea. This will build commitment, spread the workload, help you avoid mistakes and stimulate interest in the school or the community's activities.

Parents and volunteers can help with garden work. Parents can help with children's gardening tasks and homework. They can visit the garden and participate in talks, demonstrations, food fairs and celebrations.

In addition, local partners, company volunteers and local communities can be involved and provide their time, expert advice/collaboration, help, supplies, equipment, etc.



2. Where can you plant a vegetable garden?

2.2 What you need to build a vegetable garden

All an organic vegetable garden needs is a little soil: it doesn't need to be big. In this guide, we recommend using grow boxes or plant pots. You might start out with just four lettuces in a plant pot, or some leafy tomato plants in a large window box, but the experience is always magical and satisfying.

Every plant, every living thing, opens a door into a world of discovery and learning. All we have to do is watch and care about what we are doing.



2.3 Tools and basic equipment

Trowel

- Handy for moving seedlings to the beds. Also ideal for making drills for the plants. Cuts without damaging.



Hoe

- Hoes are used for weeding and gardening. The steel blade sinks into the earth to remove weeds and stir the soil, thus giving keeper plants more moisture, nutrients, and growing space.



Secateurs

- Secateurs should fit your hand comfortably. Use them to make clean, accurate cuts.

Those tools are best used by adults. Should children need to use them, ensure adult supervision at all times!



2. Where can you plant a vegetable garden?

2.3 Tools and basic equipment

Hand fork

- Good for weeding around the plants and aerating the soil. Ideal for turning the soil.



Watering can

- Use a watering can if you have one or simply punch a few holes in a plastic bottle.



Spray bottle

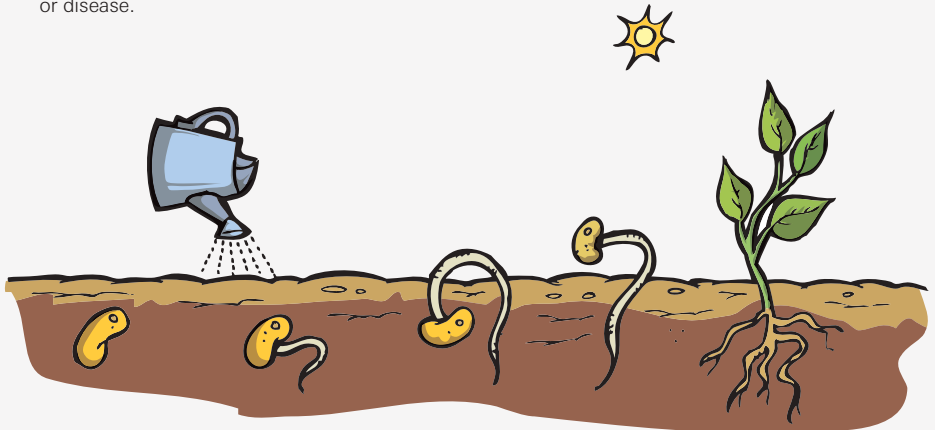
- Use for spraying plants, getting rid of dust and treating pests.



2.4 Seeds

The best way to grow healthy plants is to keep your own seeds or buy them from certified organic shops.

- The seed is the part of the plant that we sow in our garden. Good seeds are clean, germinate quickly and are resistant to pests or disease.



2. Where can you plant a vegetable garden?

2.5 Good soil

The soil is the starting point for every food chain and the top priority for organic gardeners. Good soil is essential if you want plants that:

- Grow well
- Are resistant to disease and pests
- Are nutritious



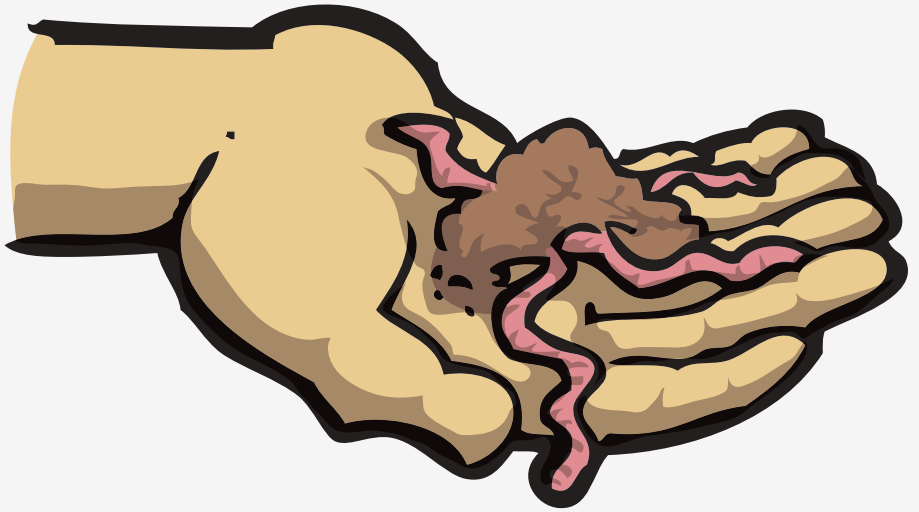


3. The importance of fertilizer

3.1 Organic fertilizer

Plants feed on substances found in the soil, but over time the floor nutrients in the soil are depleted, and we need to use fertilizer to replace them.

Organic fertilizer is a natural product obtained from the decomposition of plant and animal matter. Organic fertilizer can make the soil more fertile. There are a number of different organic fertilizers, including compost, vermicast (worm humus), and manure.



3. The importance of fertilizer

3.2 Compost

Compost is made by allowing food leftovers and garden waste to decompose. It is also known as compound fertilizer.

- Organic plant matter: weeds, plant waste (hay, pods, fruit, fallen leaves, old plants, etc.), sawdust, wood shavings.
- Domestic waste: biodegradable products (all kitchen waste other than plastic, tins, glass and other non-biodegradable products).
- Plant ash, lime, earth, water.

Avoid fatty foods like meat and dairy products, and large chunks of wood, plastic, metal, glass, wire and other materials that are not biodegradable.



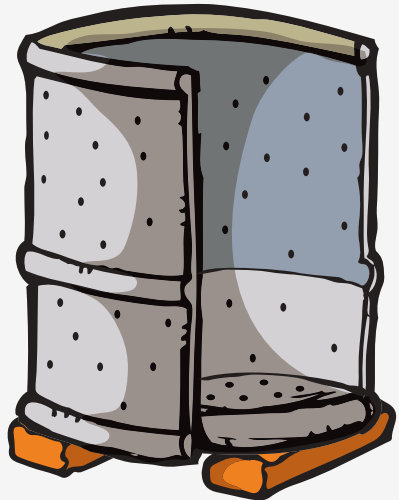
3.3 How to make compost

What to do

There are different ways of making compost: on the ground, in a container, or in a pit dug in the ground.

If you are using a container, it is best to pierce a few small holes to allow water to drain. Whichever method you choose, you will need to follow these instructions:

1. Choose a shady spot that is easily accessible.
2. Flatten and level the ground and aerate by turning the soil over. If you are using a container, puncture the sides to allow air to circulate. It is also best to mount the container on bricks to raise it above the ground and make it easier to remove the compost when ready.



3. The importance of fertilizer

3.3 How to make compost

What to do

3. Layer the waste matter for composting:

- The bottom layer (drainage layer) should be about 2 cm deep and contain dry matter like leaves, hay and dry stalks.
- A 20 cm layer of plant matter: kitchen and garden waste.
- A 5 cm layer of manure or other animal fertilizer. If you do not have any manure, you can use lime or ash.

- Finally, 2 cm of soil or mature compost.

You will need to water the compost heap as you work: water speeds up the fermentation process. Keep on adding layers in this order until your container is full. The compost heap should be about one metre high. Don't forget to keep watering.

- #### 4. When you have added the last layer, cover with straw, dry grass or a damp cloth to keep the heat and moisture in. Water one last time.

3.3 How to make compost



Don't forget

- Keep your compost heap moist.
- Turn the heap once a fortnight to make sure everything decomposes at the same speed.
- It takes 90 days to several months to make organic compost, depending on the temperature and humidity.

Organic compost should be dark brown, with a soft, crumbly texture and pleasant earthy smell.

4. Step-by-step guide to making a vegetable garden

4.1 How to make a vegetable garden

You can create your own vegetable garden by sowing seeds in grow boxes made of wood, brick or breeze blocks. You can also sow your seeds in any other unused clean and appropriate container.

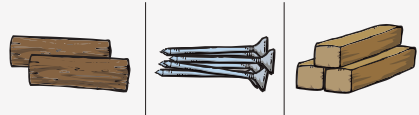
Make sure you put the containers somewhere that gets sunlight during most of the day and is close to a water source.



4.2 Making a grow box

What you need

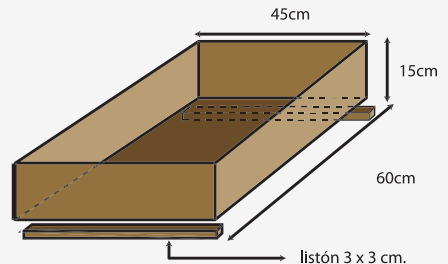
- Wood
- Nails
- Wooden batons



What to do

Make your grow boxes using wood. The ideal size is 60 cm long by 45 cm wide and 15 cm high. Reinforce the corners with wooden batons and make sure that you use plenty of nails to attach the base – you don't want it to break under the weight of the soil. Remember that the boxes should be easy to carry: don't be tempted to make them any bigger.

Leave about half a centimetre between each plank or make small drainage holes. Stand the boxes on small wooden batons or bricks.



4. Step-by-step guide to making a vegetable garden

4.3 Preparing the soil

To prepare the soil you can mix:

- Garden soil
- Compost or decomposed organic animal waste
- Sand

What to do

Make sure that the soil does not contain any stones, glass, litter, etc. Break up any large lumps with your hands and mix until all three ingredients are evenly distributed. You will use the mix to fill the grow boxes.



4.4 Filling the grow boxes

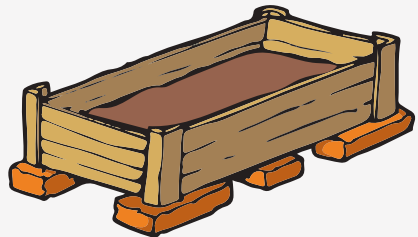
How to fill the grow boxes and container

- Place a 2.5 cm layer of gravel, pebbles or broken clay tiles on the base for drainage.
- Add 5 cm of plant matter – garden or kitchen waste (fruit peel, pods, leaves).
- Add a 10 cm layer of the soil mix that you prepared earlier: one part garden soil, one part compost and one part sand.
- Finally, cover with a 2 cm layer of vermicast (casting and manure produced by worms which act as fertilizer).

Your grow box is ready for planting

- Use the same system to fill any plant pots, plastic tubs and other containers that you plan to use to grow vegetables, herbs and other plants.

It is best to grow plants with fairly short roots in grow boxes: lettuce, spinach, beetroot, chard, parsley, coriander, radishes, herbs, etc. Use deeper containers for plants with longer roots.



5. Planting your vegetable garden

5.1 Sowing seeds directly into the ground

There are two ways of sowing seeds, depending on the size of the seed. The best planting method is always indicated on the seed packet.

Sowing directly into the ground

- Sowing the seeds where they will grow. Usually this method is best for larger seeds that are easy to handle.

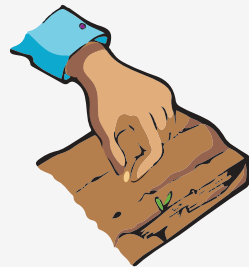
Sowing indirectly into seedbeds

- Best for plants with very small seeds that are difficult to handle. The seeds are germinated in a propagator and moved outdoors later.



- Make sure that your grow boxes are moist.
- Use a trowel or your finger to make holes 2-3 cm deep. Place the seeds in the drills.
- The distance between the drills will vary according to the size of the plants. Leave 1-2 cm between small plants like radishes. For larger plants like lettuces, you will need to plant the seeds in drills 20-40 cm apart.
- Using your hands, gently cover the seeds with soil. Make sure that they are not buried too deep and remove any lumps of soil.

The following plants can be sown in the ground: radishes, potatoes, carrots, beetroot, beans, peas, garlic, spinach, cucumber, coriander, parsley and basil.



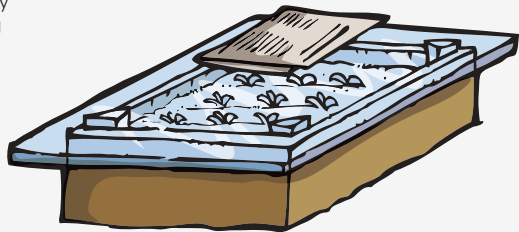
5. Planting your vegetable garden

5.2 Sowing indirectly into seedbeds

This method uses a *seedbed* or propagator. The baby plants are protected from heavy rain, frost and strong sun. Once they are ready to be transplanted, the plants can be moved outdoors.

Plants best started into seedbeds

- Lettuce, onion, cauliflower, broccoli, celery, chili peppers, tomatoes, oregano, strawberries, cucumber, gooseberries.
- You can use a sheet of plastic or glass and sheets of newspaper to protect baby plants from the cold at night, depending on the temperature in your country.



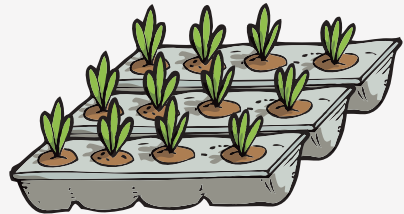
5.3 Seedbeds



You can grow seedlings in plastic pots, ice-cream tubs, egg boxes or any other container. Why not try cutting a milk carton in half? Fill the containers with the soil mix you used in your grow boxes.

Before planting any seeds, you need to sterilize the soil. Scatter with plant ash to prevent disease; plant ash is the residue of burned plant parts.

You will need two heaping spoonfuls of ash for each small container. You can also use boiling water to sterilize the soil.



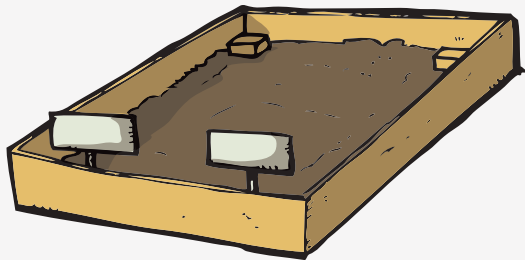
5. Planting your vegetable garden

5.4 Planting the seeds

Make 2 cm drills in moist soil. Place the seeds 5 cm apart, cover with soil and water carefully.

Remember to mark each drill with the name of the plant and the date using labelled stakes or lolly sticks. You can use a pencil, pen or felt-tip pen.

Strong, healthy seedlings need moist soil that is free of weeds. Water in the morning and the evening.





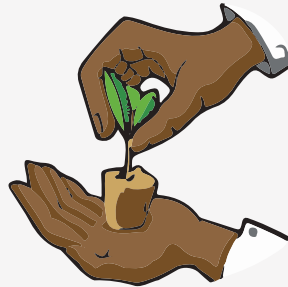
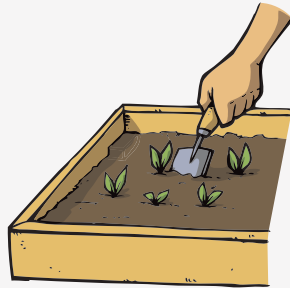
5. Planting your vegetable garden

5.5 How to transplant seedlings

The seedlings are ready to be planted out when they have four leaves or the stalk is as thick as a pencil. Transplanting means moving the seedling and surrounding soil to the grow box or container.

Here are some tips for transplanting seedlings:

- A.** Choose the sturdiest, healthiest plants.
- B.** Plant out in the afternoon or on a cloudy day to ensure that the seedlings are not damaged by strong sunlight.
- C.** The day before planting out, water the grow boxes and plant pots thoroughly, to create the best possible environment for the seedlings.
- D.** Remove the seedlings and a little soil, using a trowel or small spoon.



E. Use a stake or spade to make 10 cm drills in the grow box or pot, making sure you leave the right amount of space between each plant.

F. The plant roots should point downwards and be separated. In one quick movement, cover with soil and press down lightly to remove any pockets of air. Make sure that you bury plants as deeply as before.

G. When you have finished transplanting the seedlings, water gently, making sure that the roots remain covered. You can punch holes in a water bottle or jar lid to produce a fine spray.



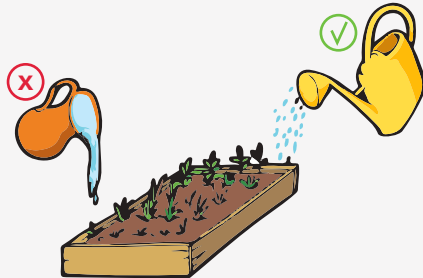
6. Looking after your vegetable garden

6.1 How to care for your garden

How to care for your vegetable garden:

Watering

- Water carefully, ideally close to the ground. It is important to keep the bed moist. You can punch holes in a plastic bottle to provide a fine spray. Watering in the middle of the day can damage the plants.



Weeding

- You will need to keep your vegetable garden free of weeds, which will compete with the vegetables for light and nutrients. Pick out weeds by hand, don't use chemicals.

Hoeing

- This involves moving the soil between the plants to aerate the soil, remove weeds and improve drainage. You should hoe regularly, being careful not to damage the roots. Use a small rake or garden fork.



Mulching

- Create mounds around the base of the plants to help them grow upright and aerate the soil. Use a trowel to heap the soil around the plants, being careful not to damage the plants or roots. You can also add a little organic fertilizer around the plant itself from time to time.

Staking

- We need to provide support for tall plants or a trellis for climbers, to keep the fruits off the ground. Place a stake or cane next to the plant and attach the plant using twine or cord.

Mixing crops

- You can grow root vegetables together with plants where you eat the leaves, flowers or fruit. You can also grow different-sized plants together, although you will need to make sure that no plants are overshadowed.

Crop rotation

- For each spot, it is best to grow a different kind of crop each gardening year. So if you grew root crops in a particular place one year, go for leafy plants the next, and so on. For example, you might sow lettuce one year and grow radishes in that spot the following year.



6. Looking after your vegetable garden

6.2 How to improve soil

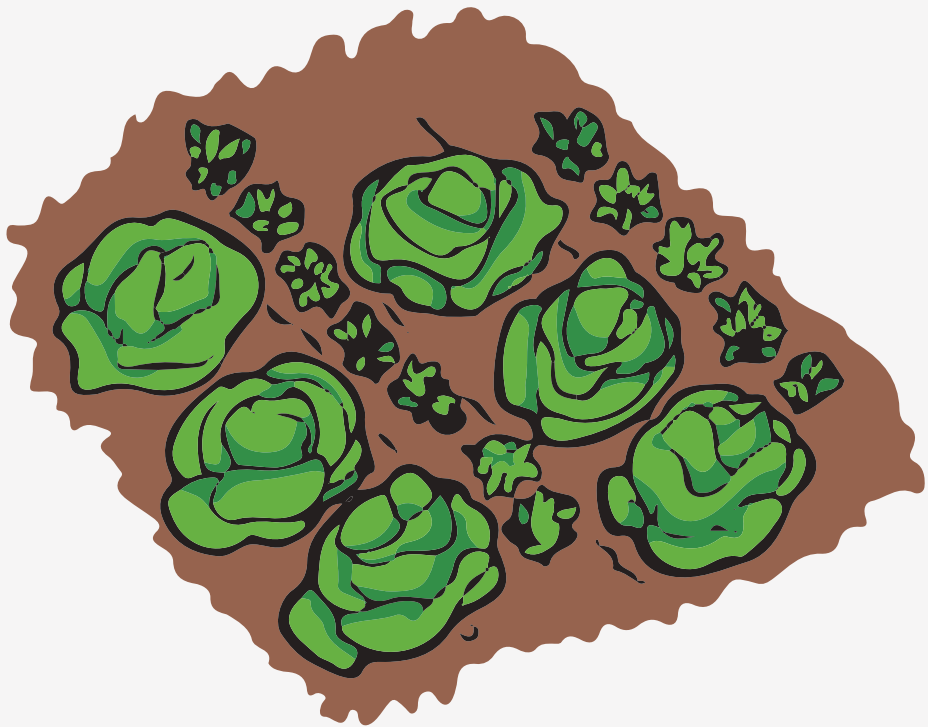
Why is crop rotation important?

- To avoid exhausting the soil
- To prevent spread of pests and disease
- To improve and maintain soil fertility

Remember to feed the soil regularly with compost or organic fertilizer. Scatter over the soil to maintain nutrient levels.

Fertilizer

- After you have harvested your vegetables, you will need to add fertilizer to the soil to replace the nutrients that have been lost. To enrich your soil you can add compost (organic fertilizer) or vermicast. Take all the soil out of the grow box or pot, mix in the organic fertilizer and replace the soil. You are now ready to sow the next crop.



7. Using Water Wisely

7.1 Watering and saving water

Of all the water on our planet, 97.5% is salt water while freshwater makes up just 2.5%. Only 0.1% of all water on Earth is fit for human consumption.

So we need to look after that water, which is the source of all life:

plants, humans and animals cannot survive without water.



Agriculture uses almost 70% of all extracted water in the world, which means that watering efficiently is one of the best ways to save water. Here are a few tips to help you save water and use it wisely.

How should I water my garden?

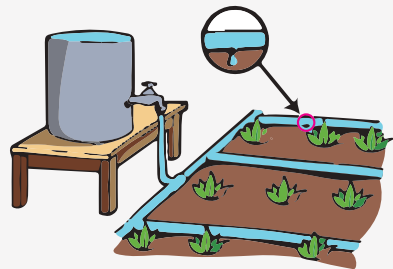
You need to provide just enough water: avoid over watering and save water. You might not have a lot of spare time, but depending on your climate, you may need to set aside a few minutes every day in order to water your vegetable garden slowly and carefully.



Hoses and buckets use a lot of water and the water is not distributed evenly, which makes the soil clump. Watering cans with small holes and slender hoses with a slower flow rate will help you water more effectively and save water. Don't have a watering can? Simply punch holes in the cap of a plastic bottle with a nail: now you have your own homemade watering can.



You may want to consider a watering system, depending on your climate, and on the size and utilisation of your garden. Some systems use sprinklers and drip hoses. Drip irrigation reduces water usage by more than 50% and also makes watering easier and more efficient. Drip irrigation systems are made up of a network of porous or perforated tubes, which are placed on or under the ground and carry the water directly to the roots. The method minimizes water loss from evaporation: experts estimate that water consumption can be reduced by between 40% and 60%.



7. Using Water Wisely

7.2 Simple tricks for saving water in your garden

Water is a finite resource. Our planet may contain vast quantities of water, but only a tiny fraction is suitable for supporting life.

- Keep the soil covered with old plants, fallen leaves, sawdust, straw or rice husks. This keeps the soil cooler and prevents evaporation.
- You should water plants in the evening or early in the morning, which is when they are able to absorb the most water. The best times to water plants is between 6 and 8 am or after 5 pm.
- Water plants using the water from rinsing rice and vegetables, vegetable cooking water (allow to cool first) or water used to rinse clothes. Not only is the water reused, it also contains nutrients that will help you to grow strong, healthy plants.



7.3 Dangers of contaminated water

Contaminated water is impure water:

It may contain micro-organisms, chemicals, industrial or domestic waste. They reduce water quality and make the water unfit for human consumption. The main diseases associated with contaminated water are: diarrhoea, typhoid, parasitic infections and cholera.

Water can be contaminated at any time between the moment when it is taken from the source and when you drink it. Often the source is clean, but the water is put into a dirty container. Microbes can get into the water from dirty hands or when a container is left uncovered.

- Protect water sources by not throwing waste into water.
- Carry water in clean containers with an adequate lid.
- Collect rainwater in clean containers: this is the best source of water for watering plants.



8. Dealing with pests and diseases naturally

8.1 Preventing diseases

Not all creatures in our garden are enemies.

Some insects are helpful. Butterflies and bees, for example, should be encouraged because they pollinate plants; mantises and ladybugs prey on harmful insects.

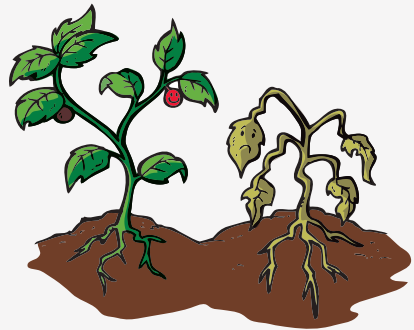
Most diseases in the vegetable garden are caused by micro-organisms such as fungi, viruses and bacteria.

Diseased plants will have spots or black, yellow or white powder on the leaves. If the attack is serious, the plants will look as though they have been burned. Diseases can also cause plants to go mouldy.

Here are a few ways of dealing with pests and diseases. They all use natural materials and/or simple techniques that will not harm the environment:

- Remove and squash any caterpillars that you find in the soil and on the leaves.
- Remove any sick leaves and plants.
- Sow strong-smelling plants in between your vegetables: plants like garlic, onions, coriander and parsley all repel insects.
- Make your own bug traps: try covering strips of bright yellow card with vaseline or oil. Alternatively, fill yellow bowls or containers with water. The insects are attracted by the colour and drown when they fall into the water.

- It is best to destroy all the affected parts by removing and burning the infected plant and roots, don't put them into your compost pile.
- Crop rotation is the best way to keep soil productive and eliminate pests, which can also carry diseases.
- In case of a problem, seek the advice from an agronomist.



Strong plants are less likely to be attacked by pests. If you take good care of your vegetable garden, the plants will be strong and healthy.

9. Harvest time

9.1 How to plant, sow and harvest at the right time.

Guide to plant spacing, sowing and harvesting time.

Once your vegetables are fully grown, it is time to harvest them. The amount of time from germination to maturity – when the fruit is ready to eat – varies according to the type of plant, climate, soil and light.

Cultivation	Sowing	Dist. between plants (cm)	Dist. between furrows (cm)	Days for harvest
Beet	Direct	20	30	70-80
Broccoli	Indirect	40	60	80-110
Carrot	Direct	10	25	80-100
Cauliflower	Indirect	50	60	80-110
Chard	Direct	30	50	60-90
Celery	Indirect	30	60	90
Coriander	Direct	5	30	30 forward
Garlic	Indirect	10	30	120-140
Kassava	Indirect	10	25	80-100
Leek	Indirect	15	20	90-110
Lettuce	Indirect	20	30	60-80
Lima beans	Direct	20	90	120-150
Okra	Indirect	10	25	80-100
Onion	Direct	15	30	90-110
Parsley	Direct	5	15	30 forward
Pepper	Indirect	40	60	70-90
Potato	Indirect	10	25	80-100
Spinach	Direct	20	50	60 forward
Radish	Direct	10	25	30-35
Sweet potato	Indirect	10	25	80-100
Tomato	Indirect	50	80	60-90
White cabbage	Indirect	40	60	70-80

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Good Food, Good Life