Gardening for health

Home gardening in Namibia

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How to use this book

Many people in Namibia do not have food to eat. This book will give you information about how you can grow some of your own food.

Many Namibians also do not have enough different types of food. This book can help you get more types of food for yourself and your family.

The book can be used in your home and in your community. For example, parents, adults, young people, teachers, health workers and community workers can use it. So read these pages and share the information.

You may want translations of some of the difficult words if English is not your home language. These words have been underlined the first time that they appear in this book. They are explained in Ju/'hoansi, Otjiherero, Damara/Nama and Setswana in grey boxes on the sides of each page. The boxes look like this:

<table>
<thead>
<tr>
<th>English</th>
<th>Ju/'hoansi</th>
<th>Otjiherero</th>
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This book is also available in Afrikaans, Oshiwambo, Rukwangali, and Silozi.

In this book there are blocks with information to help make things better in your community. These blocks look like this:

**Community action:** Many children in Namibia under the age of 5 don’t get enough food to eat. Children are underweight and can’t grow properly. By sharing food, the community can help to make sure that these children can also be healthy.

There are also blocks that help you to remember important things. These are shown like this:

**Expert’s tip:** For great tomatoes: don’t crowd seedlings; give the plant lots of light; take off the bottom leaves; and water your plant regularly.
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That’s why we grow our own.

Vegetables are so expensive these days!

We all need food to live

How can we get food?

There are three main ways to get food:

- Collecting food in your area, like wild spinach
- Buying food from shops
- Providing your own food by raising animals and growing vegetables.
**Staying healthy**

Every living thing needs food to survive, but to stay healthy we need to eat many different healthy foods.

In some places it might be difficult to eat lots of different kinds of food because the food is not always fresh or easy to get. People may not have enough money to buy different kinds of foods. Growing your own food is not only exciting to do, it is also a good way to feed yourself and others. You might also be able to sell some of your food for extra money.

**Why we eat**

Food is important for all of us. Having enough food makes us feel safe. Traditional food can remind us of when we were young and of our homes. Many of us celebrate something important, like a wedding, with special foods. When we eat healthy food we feel well.

Food gives our bodies energy and the nutrients that it needs to:
- stay alive and move
- grow and repair
- fight infections

When your body does not get enough food, it becomes weak and can’t work to keep you alive and healthy. So it is important to eat enough of the right types of foods to keep healthy, stay fit, and enjoy your life.

People living with HIV and AIDS or other illnesses need to make sure that they eat a balanced diet. This will mean that:
- their body’s immune system will be stronger to fight off other infections better
- they will live longer with HIV before developing AIDS, and
- AIDS drugs will work better in their bodies.
Healthy food

Healthy food is important for everyone. Especially for children, pregnant women, older people and people living with tuberculosis (TB), HIV and AIDS.

- **Fruit and vegetables**
  Fruit and vegetables help the body to fight sickness and disease. Try to eat as many a day as you can. Some of these are paw-paws, bananas, eenyandi (jackalberries), eembe, guavas and oranges. Vegetables include carrots, tomatoes and pumpkin.

- **Beans, lentils, meat, chicken, fish, milk and eggs**
  These foods build the body and keep us strong. Other examples of body-building foods are peas, soya, groundnuts, milk products like cheese, and mopane worms.

- **Omaere, maas and yoghurt**
  These help to break down the food we eat so our bodies can use it.

- **Pearl millet (mahangu), brown bread, brown rice, and porridge (maize or mealie meal)**
  These foods give us energy to grow, play, work and learn. Other examples of energy-giving foods are cassava, posho, matooke, samp, potatoes, sorghum, and wheat.

- **Butter, oil, peanut butter and nuts**
  These give us energy. They can be added to porridge or other foods.

People living with HIV and AIDS need to avoid the following:

- Some traditional herbs. First ask your health worker about them.
- Alcohol.
- Smoking.
- Garlic. It makes some AIDS drugs not work like they should.

**Expert’s tip:** If you lose your appetite (don’t feel like eating anything), then try at least to eat a little food as often as you can during the day. If you get diarrhoea (a runny stomach), remember to drink lots of water and avoid foods with a lot of fat or oil.

**Community action:** Many children in Namibia under the age of 5 don’t get enough food to eat. Children are underweight and can’t grow properly. By sharing food, the community can help to make sure that these children will also be healthy.
Prepare and store food safely

If food is not made or stored safely, it can carry germs that cause sickness. People who live with TB, HIV and AIDS get sick more easily because their bodies can’t fight off germs properly.

Preparing food

- Wash your hands before and after you prepare or eat food.
- Cover the place or bin where you keep your rubbish.
- Keep your cooking area and dishes clean.
- Cover any open sores you have with a plaster.
- Cook meat and chicken until there is no pink inside.
- Use safe, clean water. It is always best to boil the water first.
- If an egg is cracked, don’t use it.
- Mix four cups of water with a teaspoon of bleach (like Jik) and use it to wash all your fruit and vegetables before you eat them. This will kill all germs.
- Cook eggs well. If you boil them, make sure they are completely hard.
- Cover your food to stop flies and dust from getting onto it.
Storing food

- Cover and store food in containers.
- Store fresh food in a cool place or a fridge if you have one.
- To kill any germs, heat left-over food to boiling point before eating it.
- Don’t eat cooked food older than one day, especially if it has not been in a fridge. Throw left-overs away if they have been in the fridge for more than three days. Bad food will cause diarrhoea.

Healthy eating does not have to be expensive

- Choose vegetables and fruit that are in season. This is when they are cheap.
- If fruit is too expensive, eat more vegetables.
- Beans and soya mince are cheaper than meat and chicken and are just as good for you.
- Drink water and rooibos tea instead of fizzy drinks that have lots of sugar in them.
- Make your own fresh food instead of buying ready-made meals or take-away food.
- If you grow your own vegetables, you will always have a fresh and cheap supply of healthy food.
Recipes for a healthy diet

These recipes are healthy and easy to make. They are for everyone. If you live with HIV, AIDS or TB, then these recipes will help you put on weight. They will also help if you feel too nauseous to eat other food.

**Tomato and bean soup**

Mix 5 tomatoes (or 1 tin of tomatoes) with 1 tin of baked beans. Boil them up and then leave the mixture to simmer for 10 minutes. When the soup is cooked, you can also add some herbs like parsley or basil to it, or some cheese.

**Bean soup**

Cover 1 cup of dried beans with water and leave them to soak overnight. Then pour off the water and cook the beans in lots of fresh water for about 30 to 40 minutes, until they are soft. Add some salt and mash them. Add enough water for a thick or thin soup. You can also boil rice or maize meal with the beans.

**Lentil or split pea soup**

Soak some dried lentils or split peas in water overnight. Pour off the water and cook the vegetables in fresh water for about 20 minutes, until they are soft. You can also cook other vegetables with this soup. Add salt before you eat it.
Healthy food

Sprouting seeds

Sprouts are seeds that are starting to grow into a new plant. They are good for you because:

- they contain vitamins, minerals and protein
- they help your body to break down other food, and
- they are a cheap and easy way to get fresh food.

How to sprout seeds

1. Put the right amount of seed into a bottle with a wide neck (see chart at the bottom of the page).
2. Pour water into a bottle until it is half full.
3. Use a tight rubber band to tie thin cloth over the bottle.
4. Soak the seeds overnight.
5. Pour off the water.
6. Keep the bottle in the dark until sprouting begins.
7. Pour fresh water through the sprouts twice a day. If it is hot, do this three times a day.
8. Eat the sprouts when they are ready (see chart).

<table>
<thead>
<tr>
<th>Type of seed</th>
<th>Amount per bottle</th>
<th>When ready</th>
<th>Length when ready</th>
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<tbody>
<tr>
<td>Beans</td>
<td>1 cup</td>
<td>4–7 days</td>
<td>1 cm</td>
</tr>
<tr>
<td>Peanuts</td>
<td>1 cup</td>
<td>1–2 days</td>
<td>1 cm</td>
</tr>
<tr>
<td>Lentils</td>
<td>1 cup</td>
<td>2–5 days</td>
<td>0.5–1 cm</td>
</tr>
<tr>
<td>Peas</td>
<td>1 cup</td>
<td>2–5 days</td>
<td>1 cm</td>
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Know your rights

Every person in the world has the right to have enough healthy food.

One in three households in Namibia are classified as ‘food insecure’. This means they do not have enough to eat. Learning how to grow food is one way to solve this problem.

All the countries that belong to the United Nations agreed in 2000 to wipe out poverty in the world by 2015. Namibia is one of the countries that agreed to this.

The Namibian Government is working in many ways to try to reach this goal.

The Ministry of Gender Equality and Child Welfare set up an income generation department. This department helps people to make small businesses and earn an income for themselves. Visit their offices for more information.

Learning to grow food can help you have enough food, and you can also earn money from your hard work.
There are some parts of Namibia that get a lot of rain, while other parts get very little. Each area is different, but there will be wild plants and animals that are found there naturally. People use some of these plants and animals for food. For example, people collect mopane worms, and catch fish, frogs and birds. These are all used as food.

In the next part of this book we will look at some local plants that people collect and use for food.
Local food plants

**Mahangu or pearl millet (Pennisetum glaucum)**

**What it looks like:** Mahangu is a cereal crop. It is an important daily food in Namibia. Mahangu can be stored for many years after harvesting.

**How you use it:** Mahangu is used to make porridge (pap). It can also be made into flour and be mixed with sour milk. It can also be used for making pancakes and Owambo bread (oshikwiila).

**It’s good for you because** Mahangu is more nutritious than other cereal crops. It is also broken down by the body more slowly, which means you feel full for longer. It has more proteins and fats than other cereal crops.

**Where you find it:** Mahangu is found mainly in the north-central regions, e.g. Ohangwena, Omusati, Oshana and Otjikoto, as well as part of Kunene.

**Marula (Sclerocarya birrea)**

**What it looks like:** The trunk of the marula tree grows up to 18 metres tall. The fruit is small, and turns yellow when ripe. The fruit ripens from February to June. Inside the fruit are two or three seeds.

**How you use it:** Marula fruit can be eaten raw. You can also use it to make wine or beer. The crushed kernels can be eaten raw as a snack. They can also be boiled in water to take the oil out of the seeds. The oil can then be used for cooking.

**It’s good for you because** the pulp of marula fruit contains lots of Vitamin C and sugar. Marula seeds are rich in protein and oil.

**Where you find it:** Northern and north-eastern Namibia.

**Makalani palm fruit (Hyphaene petersiana)**

**What it looks like:** The makalani palm can grow up to 25 metres tall. It has very large grey-green leaves. The large, round fruit has a hard white seed (nut) inside.

**How you use it:** The fruit flesh is pulped and dried. This can be eaten as a snack or as a meal with roasted pumpkin seeds. The leaves are used to make roofs and baskets, and the hard nut is used for carving.

**It’s good for you because** the nuts contain a lot of protein.

**Where you find it:** Northern Namibia.
Kalahari melon, wild watermelon, tsama or etanga (*Citrullus lanatus*)

**What it looks like:** This is a plant that creeps along the ground, with hairy leaves and rounded fruit. The flesh of the fruit can be pale green or yellow. It has brown seeds.

**How you use it:** The flesh of the Kalahari melon can be made into a pulp and then eaten or drunk. The seeds taste like nuts if you roast them. The seeds are very good food for your livestock. The oil can be pressed out of the seed and used to keep your skin soft. The fruit peels are used for making jam.

**It’s good for you because** the seeds contain a lot of vitamins and proteins. The fruit is an important way to get water during dry months.

**Where you find it:** The tsama grows all over Namibia, but mainly in the sandy areas of the Kalahari Desert.

Jelly melon or African horned cucumber (*Cucumis metuliferus*)

**What it looks like:** The large fruit of this creeping plant is yellow, orange or red, with blunt spikes that look like horns. The flesh is greenish and watery. The leaves and stems are hairy.

**How you use it:** Horned cucumbers are eaten raw with sugar. You can also eat the seeds and cook the leaves.

**It’s good for you because** the seeds are rich in oil. They taste like nuts.

**Where you find it:** Kalahari Desert.

**Expert’s tip:** You can grow the Kalahari melon and jelly melon plants in your garden in the same way as watermelon.

Wild spinach or *ombidi* (*Amaranthus thunbergii*)

**What it looks like:** This is a leafy green vegetable. The leaves are hairless and shiny. The plant grows half a metre high.

**How you use it:** The leaves are taken from the stem and cooked very quickly without water, like spinach. The seeds can also be cooked.

**It’s good for you because** the seeds and leaves are very nutritious.

**Where you find it:** Central and northern Namibia, in open fields.
**Omutete (Cleome gynandra)**

**What it looks like:** This is a green leafy plant that grows to 150 cm tall and looks like spinach.

**How you use it:** The young leaves and flowers can be boiled and eaten. The leaves can be boiled quickly for a few minutes and made into small balls. These balls are then dried in the air and sun. They can be stored for a year and are soaked in water before being cooked.

**It’s good for you because** omutete contains many different nutrients. The seeds also contain many oils.

**Where you find it:** Northern and far north-eastern Namibia, in open fields.

**Baobab (Adansonia digitata)**

**What it looks like:** The baobab has a thick, grey trunk. It often has no leaves, but if it gets them, it will be in spring or summer. Baobabs can live a long time. Some are believed to be up to 4,000 years old.

**How you use it:** The fruit of the baobab contains many seeds. The fruit tastes a bit sour, but is very good for you. The fruit can also be made into a drink. The leaves and seeds are edible. The seeds are either eaten raw, or they are roasted, ground and used to make a hot drink that tastes like coffee.

**It’s good for you because** the fruit pulp contains many nutrients. The shells of the fruit have many vitamins so they are used to feed livestock.

**Where you find it:** North-eastern and north-western Namibia.

**Manketti or mongongo (Schinziophyton rautanenii)**

**What it looks like:** The manketti is a tree that grows nuts. It can grow up to 20 metres tall, and has white to yellow flowers. The fruit is reddish-brown. This tree can survive a few years of drought.

**How you use it:** The fruit is eaten fresh. The pulp can be dried and will stay edible for up to 8 months. It can also be eaten as a thick, cooked sauce. The nut kernels can be finely ground and added to meat or vegetables to make a soup or gravy.

**It’s good for you because** the nut kernel is very rich in vitamins and iron.

**Where you find it:** North-eastern Namibia.
How else can I get food?

Don’t you need lots of tools for gardening, Simon?

No, Albert. I can do almost everything just with this spade.

You can start a garden

There are three different types of vegetable gardens:

- Micro-gardens
- Community gardens
- Home gardens
Micro-gardening

A micro-garden takes up very little space. But even if it is small, you can grow quite a few different kinds of vegetables in it. It does not use a lot of water. Micro-gardens are useful if you don’t have enough space, water or good soil to have a normal garden.

A micro-garden is made using hydroponics. This means that you grow plants with their roots in clean sand, gravel or water. No soil is used and the plant nutrients (plant food) are added to the water.

The benefits of a micro-garden are that:

- it uses very little space
- it is cheap to run
- it doesn’t need as much attention as other types of gardens
- it attracts fewer pests
- it produces a lot of food
- it can produce throughout the year

The Ministry of Agriculture, Water and Forestry is working with the United Nations Food and Agriculture Organisation to encourage micro-gardening in Namibia. If you would like to find out more, please contact them. Their contact numbers can be found at the end of this book.
Community gardening

What is a community garden?

This is a garden that a few people have decided to make together. This means you share the work, fun and benefits of growing your own food.

A community garden can provide food for you and your family. You can also learn new skills from the other people working in the garden. You can get together when there are problems and learn to solve things as a group. And best of all, gardening will keep your body healthy because of the exercise that you do when you work in the garden.

Starting a community garden

Every community garden is different. It can be big or small, and can take any shape. A community garden is usually close to the homes of its gardeners.

If many people work on one plot, there will be times when they don’t agree. They may become angry with each other. It might also be difficult to plan things together, in a way where each person knows what all the others are doing. So it may be best to divide the land into small parts. Then each person can look after his or her own piece.

- In a community garden, everyone shares the work as well as the harvest. And you, the gardeners, decide for yourselves how to run your garden.

- Some community gardeners give part of their harvest to orphans, people living with HIV/AIDS, and poorer members of the community. In this way, your whole community can benefit from the garden.
Making your community garden successful

If you want your garden to succeed, here are some simple steps you can follow:

* Invite everyone in your community to become part of the garden.

* Make a sign for your garden to let everyone know it is a community project.

* Choose a good leader. A successful garden needs strong leadership and committed women and men from your community.

* Talk about each person’s work and responsibilities before you start gardening. This helps to avoid disagreement later. For example, you could agree that John looks after the beans, and Maria looks after the tomatoes.

* Leave some space open for your children to play in. Encourage them to help in the garden.

Home gardening

Making your own garden at your home is another way of getting food. The rest of this book will tell you more about home gardens.

It will show you how to start your own small home garden with a small amount of money. For example, you can grow tomatoes in an old drum or tyre. This means you can start planting and enjoying your own food very quickly.
Some years ago, a few women shared a dream. Their dream was to have enough food to feed themselves and their children. These women were not afraid of work – there just were no jobs for them. They tried for a long time to find work, but everything seemed hopeless.

One day their friend, Phillip, said, “Let’s build a garden and grow our own food. I’m sure someone will help us”.

And Phillip was right. The municipality gave them some land with enough water. The Ministry of Gender Equality and Child Welfare gave them enough money to buy a water tank. Suddenly the garden was real!

Because of their success, an organisation that helps people gave the group some money to buy seeds and compost. They also got manure for free from a friendly farmer.
Together, the group prepared the soil and put in the compost. They planted seeds. They fetched water from the tank and watered their seedlings.

After a few months, the group came to their garden to find many of their new plants eaten by rabbits. “They just came during the night and ate everything,” the women said.

But the group did not give up. They decided to build reed fences around their plants to help protect them. They also grew them in seedling pots in protected areas.

When harvest time came, they all shared the fruit and vegetables. What they could not eat themselves, they sold in the town nearby.

Now the group plans to get some shading for their crops. Phillip believes that if all of them keep working together towards a shared goal, they will reach it.
Selma, what’s wrong with my carrots?

The soil

Where to start

Starting a home garden takes a lot of work. Luckily, you don’t have to do the same work again each year.

Growing your own food is not only useful, it can also be enjoyable. But like with anything you do for the first time, you need to learn to do things properly from the start.

Many vegetables and some fruits are easy to grow. The most important things they need are sunshine and water. They also need loosened soil, some fertiliser, some weeding, and some protection against insects, birds and other animals. If you have an area that gets sunshine for 6 hours a day, then you can make a home garden there.

Types of soil

Soil is the sand and all the things you find in it.

If you want to grow food, you need to know a little bit about your soil. Almost any kind of soil can be used to grow fruit and vegetables. Salty, stony or very shallow soil needs to be improved (made better) before planting. This can be done by sieving out the stones and bringing soil in from other areas nearby. You can also add fertilisers such as compost and manure, and build raised beds.

Expert’s tip: Raised beds

Building raised beds is one way of gardening if you have poor soil. This type of gardening has many advantages:

- Your soil warms up earlier in spring. This means you can start planting earlier in the season.
- Your soil can get good drainage. This means it can let the water flow through easily.
- Your soil is loose, which makes it easier to grow plants in.

Raised beds should be no more than 1.5 metres wide, so that you can easily reach the middle from any side. They should be 7.5 metres long.
Soil test

Do this test to find out what type of soil you have.

Sandy soil is coarse when you touch it and feels like sugar. It can’t be shaped by your hand. Sandy soil does not hold water very well, but drains well and is easy to work. If your soil is too sandy, you will need to add a lot of compost or manure to it so that it can hold water better. This type of soil contains very few nutrients.

Silty soil feels like soft flour. It is smooth, and can’t be shaped by your hand. Silty soil holds water better than sandy soil. This type of soil also needs a lot of compost or manure, but it has some nutrients and drains well. It is easy to work with when moist (slightly wet).

Loam soil sticks together, but it can’t be squeezed into a ball. Loam soil contains particles of sand, silt and clay. Loam is the best soil for vegetable gardens because it contains lots of nutrients and holds water well. It does not need as much compost or manure as other soil types.

Clay soil sticks together and it can be squeezed into a ball without breaking. Clay soil has very fine particles, so it keeps water very well. Clay is found in river beds. Many people use clay for making pots. If you only have clay soil in your area, mix it with a bit of sand to let the water drain. Carrots, potatoes and garlic don’t grow well in clay because the roots find it difficult to push through the clay. Clay soil must be turned over well.

Expert’s tip: Soils that are difficult to grow vegetables in

- **Very stony soil**: Vegetables will not grow well in soil that has too many stones. If you can’t take all of the stones out, plant your vegetables in raised beds (read page 20) or in pots (read page 39).
- **Very shallow soil**: If you can’t dig any deeper than 20 cm, your soil is too shallow. Dig out your soil and put it into raised beds or pots.
- **Very salty soil**: You can find out if your soil is salty by digging a little hole in your soil. If there are small white crystals near the top of the soil that taste like salt, then your soil is salty. The salt will damage the roots of your vegetable plants. It is important not to let your soil dry out too much if the soil or water you are using is salty.
To grow well, a plant needs many different things. These come from the soil that the plant grows in and are called *nutrients*. The nutrients *dissolve* in water and are taken up in the plant’s roots.

Plant food is made up of many different types of nutrients (*minerals* and *elements*). Some types of nutrients are needed by the plants in large amounts, while others are only needed in small amounts.

Sometimes the plant does not get enough nutrients from the soil. Many farmers and gardeners add nutrients in the form of manure, compost or other fertilisers, to improve the soil. If you don’t feed your soil with more nutrients, after a while your plants will not grow well.

**Expert's tip:** Healthy plants need healthy soil. Taking care of your soil will give your plants the best chance of *survival*. It will make them grow well, and you will get a good harvest.

**Myth:** Gardening is very expensive.

**Truth:** Yes, it can be, but it doesn’t have to be.
Types of manure

Animal manure

Animal manure is animal dung. It is used for fertilising plants. Adding manure to your soil will give it the nutrients your plants need.

- Cows and horses will give good manure.
- Chicken manure has the most nutrients in it. It is very strong and only a little should be used at a time.
- Straw used as bedding for animals is also very good for your soil.
- Don’t use sawdust from wood. It takes long to break down in the soil and uses a lot of nitrogen from the soil.
- Don’t use pig, dog or cat faeces because this can make people sick.

Green manure

Green manure is about growing a crop that you can plough back into the soil. It improves the soil by giving it nutrients. The crop should be dug back into the soil just before the plants flower. Beans are a very good crop to use as green manure, because their roots improve your soil by adding nitrogen to it.

Seaweed

If you live near the sea, seaweed should be easy to get. It is very healthy for your plants. Wash it in fresh water before adding it to the soil, because too much salt can damage your crops. Seaweed is best used as a mulch (see page 31 for more about mulching). Dig it into the soil after harvesting your crop.

Bloodmeal, fishmeal and bonemeal

These take long to improve the soil, but the effect is long-lasting. Bloodmeal and fishmeal have lots of nutrients. Once an animal has been killed for food, its blood can be dried. This dried blood is known as bloodmeal. Bonemeal is made from dried bones. It is a good idea to put a few bones and some dried blood on your compost heap (read pages 24-25 for more about composting).

Liquid manure

This can be put on top of your soil while your plants are growing.

- Put manure or compost into a woven plastic or cloth sack.
- Hang the sack in a drum of water. Some of the manure will break up and dissolve in the water.
- After two weeks, add some fresh water to the manure mixture and use it in your garden.
- This is a good way to use chicken manure.
Composting

Composting uses small living things called bacteria to break down organic waste from your kitchen, garden or farm. The waste is broken down into a dark, crumbly substance called compost. Adding compost to your soil often will improve it.

Making a compost heap

Build your compost heap in a place where it won’t get rain, wind or too much sun. Remember it takes about 3 months for organic waste to break down. Here is how you can have compost every 6 weeks:

1. Start your heap of compost by putting a thin layer of small sticks on the ground. This will let air move underneath the compost heap.

2. Cover the sticks with 20 cm of plant matter like grass, leaves or straw. Water them.

3. Sprinkle 10 cm of manure on top of the plant layer, and water it.

4. Now add a thin layer of ash and soil. Repeat these layers 3 times.
Cover your compost heap with a sack or plastic so that it stays wet. Black plastic attracts more heat, and is the best to use.

- Test the temperature of your compost heap by pushing sticks into it. If they are warm when you pull them out, then your compost heap is doing well. Put the sticks back in.
- These sticks also help air to flow through your heap.
- If the sticks are dry, add some water to the heap.

- After 6 weeks, mix your compost heap carefully with a spade.
- Now make a second compost heap next to the first one, so you will always have enough compost.

After another 6 weeks, the first compost heap will be ready for use in your garden.

**Important:** Always wash your hands after you have worked with compost.
Chemical fertilisers

Chemical (or inorganic) fertilisers contain many nutrients. But if you use these fertilisers wrongly, they can harm your soil. You will not need to use chemicals if you use enough manure or compost.

When you buy a chemical fertiliser, first read the instructions on how to use it. It is best to ask your Agricultural Extension Officer about this kind of fertiliser before you use it.

Tips for using chemical fertilisers

- Water your plants before you use the fertiliser on them.
- It is a waste to give plants chemical fertilisers in late summer unless you are growing winter vegetables.
- The best way to use chemical fertiliser is to throw or spread it evenly between your planting rows.

Comparing fertilisers

<table>
<thead>
<tr>
<th>Organic fertiliser: compost and manure</th>
<th>Inorganic fertiliser: chemicals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Advantages</strong></td>
<td><strong>Advantages</strong></td>
</tr>
<tr>
<td>- There is little danger of giving the soil too much organic fertiliser.</td>
<td>- Plants can use the nutrients immediately.</td>
</tr>
<tr>
<td>- Nutrients are let out into the soil slowly and stay in the soil longer.</td>
<td>- You know exactly what nutrients a chemical fertiliser contains, and you can work out exactly how much to give your plants.</td>
</tr>
<tr>
<td>- It improves the structure of the soil.</td>
<td></td>
</tr>
<tr>
<td>- It lets sandy soils hold more water.</td>
<td></td>
</tr>
<tr>
<td>- It is much cheaper.</td>
<td></td>
</tr>
<tr>
<td><strong>Disadvantages</strong></td>
<td><strong>Disadvantages</strong></td>
</tr>
<tr>
<td>- Plants can’t use the nutrients immediately.</td>
<td>- Chemical fertilisers are easily washed below the plant’s root, so the plant can’t reach the nutrients.</td>
</tr>
<tr>
<td></td>
<td>- You might give your plants too much chemical fertiliser or it might come too close to the plant’s roots. If you do this, you will ‘burn’ the roots and damage the plants.</td>
</tr>
<tr>
<td></td>
<td>- You need to know what nutrients your soil and plants don’t have before you buy fertiliser.</td>
</tr>
<tr>
<td></td>
<td>- Chemical fertilisers can leave too many salts in the soil. These can kill all the living things in the soil.</td>
</tr>
</tbody>
</table>
Mixing your own soil

Every plant needs good soil if it is to grow well.

To make sure your plants have good soil, you need to dig a hole 60 cm deep, 1 metre wide, and 1 metre long. Then carefully mix together the following:

- 30 shovels of the soil you took out of the hole
- 3 shovels of compost or manure
- Some old, crushed bones

Then put the mixture in the hole. Whatever you grow in your improved soil now has a better chance of survival.

Community action: Encourage your community to start a compost heap.
Rotating your crops

Planting the same crop in the same soil each year takes all the same nutrients out of it. The same pests and diseases will also attack the plants every year. It will be hard to grow the crop in that soil.

Crop rotation is a way of planting different crops in the same space, one after the other. This allows the different plants to use the different nutrients in the soil. Crop rotation also cuts down on the problems you will have with pests and diseases.

An example of a good crop rotation programme is to plant the following:

1. Plant cabbages and spinach
2. Plant carrots, beetroots and sweet potatoes
3. Plant beans and peas
4. Let the soil rest
My name is Monica and I am a Herero-speaking Namibian. I live near Omaruru, in Ozondje, where I have a small home. I work as a domestic worker in Omaruru itself.

I could not always afford to buy many different fruits and vegetables from the shops. The shops also did not always have many different kinds of fruit and vegetables.

Then one day my life changed. I remember it so clearly. I was listening to the Herero service on the radio. They were speaking about growing vegetables. Then I decided I would try to grow some myself.

First I got some goat manure from a friend’s farm to improve my soil. Then I saved the seeds from some tomatoes and beans and planted them. I gave my plants water from a bucket twice a week. I have no special tools or a fence around my garden, but everything I planted just grew into plants and all of a sudden I had more than enough!

When I have too much, I just go out into the street and sell it. People always want vegetables.

I am looking forward to the new season now. I want to try to grow some different vegetables as well.
Water

It’s so hot! My plants need too much water.

Try mulching, Paul!

It is important to know how much water your plants need because this affects your harvest. Enough water will let your plants grow quickly. Too little water can make some plants taste bitter, grow very slowly, and give poor harvests.

The amount of water plants need depends on the type of soil, the air temperature and the wind.

- Clay soils keep water inside them much better than sandy soils do, so they don’t need water that often – read page 21.
- Dry, warm winds cause the soil to dry out quickly.
- Plants also need more water if there is a warm wind blowing.
- Seedlings are very young plants that have been grown from seeds. They need to be watered every day. As they grow bigger, they will need less water.
- Different vegetables need different amounts of water. Cabbage, spinach and tomatoes need lots of water, but carrots or potatoes do not need as much.

How much water is enough?

- Water your plant bed.
- Dig a hole 40 cm deep next to the bed.
- Your soil should be damp (a little wet) to this depth.

Expert’s tip: It is best to water your bigger plants in the late afternoon. Water your seedbeds early in the morning.
Keeping water in the soil

Mulching

Mulch is a dead layer of grass or leaves put on top of the soil between seedlings or plants. Mulch will protect the soil, stop weeds growing, and stop water from being lost through evaporation. Mulch should not touch the seedlings or plants.

What to use for mulching

- Grass cuttings
- Leaves
- Soft pieces of small wood (but not sawdust)
- Seaweed
- Bedding straw
- Manure
Mulch can be worked back into the soil when you harvest your food plants.

Planting under trees

Namibia’s very hot sun can damage plants. It is good to provide some shade during the heat of the day. By shading plants, you will help to keep the soil cooler and your plants will need less water. Shading can be made from different things, but one easy way is to grow your plants under large shady trees.

- If you have a big tree at your home, make a plant bed around its trunk. Dig out some of the soil for your food plants, and make a ridge on each side of the bed. How wide the plant bed is will depend on how much shade the tree gives.
- Choose a tree with deep roots so that it will not compete with your food plants for water and nutrients. Camelthorn trees and other acacias are the best for this.
- Use compost or manure to improve the soil.
- The ridges on each side of the bed stop the water from flowing away from the plants.
Pests and diseases

Plants can be damaged by pests and diseases (sicknesses that attack plants). You need to keep pests and diseases away from your plants because they will affect your harvest.

Pests and diseases can be controlled naturally or chemically (with poisons). If you use chemical controls, read page 36 for a warning.

Important:
It is better not to use chemicals at all because they add poisons to the soil, air and water. Chemicals can be dangerous to people’s health if not used correctly. If you would like to find out more about chemical controls, get more information from your nearest Agricultural Extension Officer.
Types of pests

There are many different types of pests. The table below will help you know what pest is attacking your plant, and what to do about it.

<table>
<thead>
<tr>
<th>The problem</th>
<th>Cause</th>
<th>What to do</th>
<th>Plants affected</th>
</tr>
</thead>
</table>
| Many small insects on plant. Leaves are curled. | Aphid | • Grow garlic nearby.  
• Mix 2 teaspoons of dishwashing liquid with 20 cups of cold water. Spray onto sick plants until the problem goes away. | All vegetables |
| Green caterpillars on plant. Strange holes in the leaves. Many small droppings around the plant’s base or on the leaves. | Caterpillar | • Carefully look around and on your plants. Take off any caterpillars by hand. Grow mint nearby.  
• Mix 2 teaspoons of dishwashing liquid with 20 cups of cold water. Spray affected plants. | Cabbage, cauliflower, leafy vegetables |
| Tiny, grey caterpillars in the soil, just below the surface, biting into the plant stem. The whole plant falls over. | Cutworms | • Plant African marigolds nearby.  
• Crush 4 chillis with 1 small onion and a clove of garlic. Add 10 cups of water and let the mixture boil. Let it rest for two days. Strain it and spray your plant with the liquid. Remove the worms by hand. | Cabbage, carrot, potato, cauliflower, tomato, runner bean, spinach beet, seedlings |
| White or grey marks on top of leaves. | Leaf miner | • Take out infected leaves by hand and burn them.  
• Keep your garden free of weeds. | Cabbage, pumpkin, tomato |
| Very small pests attack leaves. Leaves become yellow with red dots. Fine spider webs on backs of leaves. | Spider mite | • Take out infected plants and burn them.  
• Grow garlic nearby.  
• Mix 2 teaspoons of dishwashing liquid with 20 cups of cold water. Spray onto plants. | Runner bean, tomato, spinach beet, pumpkin, watermelon |
| Tiny white insects flying around the plant. | White fly | • Spray the white insects off with lots of water.  
• Plant basil nearby.  
• Make 6 teaspoons of a chilli-and-garlic paste, and mix it with 16 cups of soapy water. Pour the mixture onto the vegetable or fruit to keep these flies away. | Sweet potato, tomato, sweet melon |

drippings
- outoto
- /aruron
- mantle a mefuta ya
clove
- omuze
- !-i
- karolwana (ya strain
- omuze
- Sip
- gagamatsa
infected
- zundaka
- /aegusa
tshelano
paste
- ovirunga
- huni //aresa
- kgomaretsa
# Types of diseases

There are many different types of diseases. The table below will help you find out what is wrong with your plant and what to do about it. Remember, it is best to prevent the disease from the beginning.

- If you see a diseased plant, take it out of your garden quickly.
- **Rotate** your crops and space your plants correctly (read page 28). This will also help prevent disease. Plants growing too close to each other stay wet and can get fungal diseases.

<table>
<thead>
<tr>
<th>The problem</th>
<th>Cause</th>
<th>What to do</th>
<th>Plants affected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leaves turn brown or dark marks appear. Leaves curl up.</td>
<td>Blight</td>
<td>Rotate crops. Destroy infected plants. Store potato tubers in a cool dry place.</td>
<td>Carrots, pumpkin, potato, runner bean, tomato</td>
</tr>
<tr>
<td>Seedlings collapse.</td>
<td>Fungi kill the plant if the area around it is too wet</td>
<td>Rotate crops. Destroy infected plants. You can soak the seeds in a teaspoon of bleach (like Jik), mixed with 4 cups of water, before planting.</td>
<td>Carrots, cauliflower and many other vegetables</td>
</tr>
<tr>
<td>White, powdery dust on leaves. Lower leaves and stem turn grey.</td>
<td>Mildew</td>
<td>Plant vegetables further apart. Don’t wet the leaves when you water the plant. <strong>Remedy 1:</strong> Pour 8 cups of boiling water over two-thirds of a cup of basil leaves and stems. Allow the mixture to cool. Take out the leaves and stems and use the water to spray infected plants. <strong>Remedy 2:</strong> Mix 4 cups of milk with 60 cups of cold water. Spray your plants every ten days if they need it.</td>
<td>Cabbage, cauliflower, runner bean, sweetcorn, sweet melon, onion, pumpkin, watermelon</td>
</tr>
<tr>
<td>Red or rusty spots on the leaves. Leaves wilt.</td>
<td>Rust</td>
<td>Destroy plants. Don’t wet the leaves when you water the plant.</td>
<td>Runner bean</td>
</tr>
<tr>
<td>Leaves wilt and turn yellow, even when the soil is moist.</td>
<td>Wilt</td>
<td>Rotate crops. Destroy all plants with this disease.</td>
<td>Cabbage, sweet potato, tomato</td>
</tr>
<tr>
<td>Change in colour in lower leaves. Plant becomes stunted. Leaves fall off.</td>
<td>Black rot</td>
<td>Rotate crops. Destroy all plants with this disease.</td>
<td>Cabbage, cauliflower, sweet potato</td>
</tr>
</tbody>
</table>
Other animals that can be pests

Mice and other rodents

If mice are a problem, you can kill them by mixing maize meal and cement. Leave this scattered near your garden.

Birds

If birds are a problem, you can put a 1-metre-long stick in the ground. Then tie a plastic bag to the top. When the wind blows, the plastic bag moves and makes a noise. This will frighten away the birds. You may need many sticks and bags if your vegetable garden is big.

Birds can be a problem with seedlings. Seedlings need to be protected with netting until they are bigger.

Expert’s tip: Instead of using a plastic bag, you can also hang shiny objects such as tin cans or strips of foil from sticks or branches in nearby trees. Birds don’t like lots of movement or noise.

Rabbits

Grow African marigolds near your garden. This will keep the rabbits away.

Moles

Castor oil is the best for keeping moles away. Mix castor oil and soapy water and sprinkle it on the ground where the mole has been digging.
Biological control

This is a way of controlling pests and diseases by using nature to help you.

**Rotate your crops:** Read page 28, where this was explained.

**Use good seed:** Many diseases can stay in the seeds of a plant after it has been attacked. So it is important to use seeds only from healthy plants.

**Choose the right plants:** Grow vegetables or fruits that are not likely to get the diseases found in your area.

**Plant at the right time:** Different pests and diseases attack plants at different times. Potatoes, for example, suffer from diseases in hot weather. Plant in early spring, when it is cooler.

**Use natural enemies:** Insects such as the praying mantis, ladybirds and spiders eat aphids and other small insects.

**Use light:** Put a light like a paraffin lamp in a tray of water in your garden. Cutworm moths are attracted to the light and will drown in the water.

Chemical control

Chemical poisons can be used to kill pests. But poisons need to be used carefully, because they can make you sick if they get onto your skin or into your body. Talk to your nearest Agricultural Extension Officer first before using any chemicals. Rather use biological controls or other natural methods.

Natural methods

**Herbs** are plants that are grown for flavouring food. They can help keep pests away. These plants can be grown in between your fruit and vegetables.

* **African marigold** (*Tagetes erecta* and *Calendula officinalis)*: The smell of this flower keeps away many garden pests and other animals like rabbits. The flowers will give you many seeds, and will brighten up your garden.

* **Mint** (*Mentha spicata)*: Mint keeps most pests away from plants. Mix together equal amounts of mint, chopped onion, garlic and water. This mixture can be sprayed onto the leaves of your plants.

* **Garlic** (*Allium sativum)*: Garlic keeps aphids and onion flies away from your plants. Sprays made from garlic are good for treating any blight, mould or fungal diseases (read page 34).
Helpful tools

The tools below are useful in your garden, but you can also start without them.

For most vegetable gardening you will only need a few simple tools. You can start your garden with these, and then get more tools as your garden becomes more successful. A spade, a garden fork and a wheelbarrow should be first on your list.

- **Spade:** This is used to dig, scoop or shovel soil, and for clearing the ground.
- **Garden fork:** This is used for turning over the soil, taking out weeds and mixing in compost.
- **Wheelbarrow:** This is to transport sand and mix your soil in.
- **Rake:** This is used to make the ground smooth before you plant seeds in it.

You can get these tools later, as your garden grows:

- hand fork
- hoe
- watering can
- pest control equipment
- hosepipe

**Expert's tip:** Make a watering can by taking a tin and making some holes in the bottom.
Planning and preparing your garden

Preparing your garden

Take away all the grass, bushes, roots and stones from the ground that you have chosen. You might need to put a fence around your garden to keep animals out. You can make a hedge or fence from the bushes that you have dug out.

You can now begin to prepare the beds.

- A bed can be ten steps long by one step wide. You can make the bed longer if you have more space, but try to keep the bed only one step wide. This way, you can reach all your plants without having to walk on the beds. If you have decided to build raised beds in your garden, then read the information on page 20 about how to do this.
- Leave a path about four hands wide between the beds so that you can work easily from one bed to the other.

Planning your garden

Once you have decided where your vegetable garden will be, you can begin planning it.

- **Slope**: Look at the slope of the ground and where rainwater will go. Rainwater should not run quickly through your garden, but it also should not make large pools of water in your garden. The ground should be level.
- **Protection against animals and the weather**: If your area gets a lot of frost in winter, don’t grow plants that are sensitive to frost. Strong winds can damage or even destroy vegetable plants and shade structures. Your garden needs to be protected from the wind. Fencing or hedges from thorn-tree branches help keep goats and chickens out of the garden.
- **Location**: Your garden should be close to your home. It needs to be quick and easy to get to, because you work in it every day.
- **Size**: In a big garden, you can grow pumpkins and watermelons easily, but in a small garden it is better to grow smaller crops, such as wild spinach. Think about planting what your family enjoys eating, and decide what size to make your garden.
Vegetables in pots

Not everyone has soil that is good enough for a vegetable garden or enough space to make one. Luckily, there are many vegetables that can grow well in pots. These include onions, tomatoes, carrots, spinach beet, beans and garlic.

<table>
<thead>
<tr>
<th>Advantages of growing vegetables in pots</th>
<th>Disadvantages of growing vegetables in pots</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The soil warms up quickly in spring.</td>
<td>• You may not be able to grow as many plants.</td>
</tr>
<tr>
<td>• Drainage is better.</td>
<td>• The plant roots may not develop so well because of the smaller space.</td>
</tr>
<tr>
<td>• You need less water and manure.</td>
<td>• You may get a smaller harvest.</td>
</tr>
</tbody>
</table>

You can plant in any type of pot, as long as it has holes at the bottom for water to drain through. Keep the potted plant in the shade. You can use clay pots, big tins, plastic boxes, metal crates, wooden boxes, washtubs, plastic bags and buckets. Try using whatever you think could work.

Making a plant nursery

Some seeds will need more protection than others when they start growing. One way of giving them this protection is to plant your seedlings in a big pot, and to put the pot in the shade of a large tree. Try some other ways of keeping your seedlings protected and see what works best for you.
Seeds and tubers

Tjimune, with these seeds we’ll have enough vegetables to feed our family for the whole year!

You can save the seeds of some of your vegetables after harvesting. These include beans, peas, herbs, squashes and tomatoes.

- You don’t need to save the seeds of tuber vegetables because they can be grown by planting the tuber. For example, the potato plant will grow by planting a potato tuber.
- Saving your own seeds is cheaper and better than buying them because a shop might not always have what you want.

Saving your own seeds

Seeds should only be saved for 3 years at the most. After that they must not be used and you should buy new seeds.

When saving your own vegetable and fruit seeds it is important to:

- harvest seeds only from the plants that have given the best harvest
- harvest seeds only from healthy plants because seeds can carry diseases
- harvest seeds only when the fruit is very ripe
- store the seeds in a dry, cool place away from insects and other small animals like mice.
Beans and peas

Let the seed pods turn brown on the plant. Harvest the pods and let them dry out for a week or two. Take the shells off the seeds and store them in a cool, dry place.

Tomato seeds

Pick the ripe fruit from the plant. Cut the fruit and squeeze out the pulp into a container. Add a little water, and then leave the mixture for three days at room temperature. Stir it from time to time. The bad seed will rise to the top, and the good seed will sink to the bottom. Pour off the pulp and bad seed, and spread the good seeds out thinly so that they can dry completely. Store the dried seeds in a cool, dry place.

Summer squash, pumpkin, melon and watermelon

Pick overripe fruit and split it in half. Scrape out all the flesh with the seeds in it. Soak the seeds in warm water overnight. Wash the seeds enough to clean them. Then leave them to dry for two days. Turn the seeds over from time to time so that all their parts are open to the air and can dry. Stop when the seeds are dry.

Storing your seeds

If seed is not stored correctly, it cannot be used after very long. If you are planning to keep your seeds for a while, they should be sealed in a container that does not let in air. Glass jars with rubber seals or tightly sealed plastic bags stored inside jars are good for storing seeds.

Seeds should always be stored in a cool, dry place. Label all stored seed with the name of the plant it comes from, and the date that you packed it.

Expert’s tip for planting tubers (potatoes and sweet potatoes):

Buy a potato or sweet potato from the shop. Make sure it has small growth buds (called eyes). You can plant the whole potato tuber, or you can make a few new plants from one tuber. This is done by cutting a thick slice of the potato with the growth bud on it. Rub the cut side with Sunlight soap or fine wood ash. This kills any germs on the cut side and protects it from pests. Once the potato slices have been planted, the growth buds will grow into new plants.
Buying seeds

You can buy seeds from some supermarkets or from a farmers’ cooperative like Agra. It is better not to buy hybrid seeds because you can’t save them after a harvest. This means you will have to keep buying new seeds every year.

Reading the seed packet

If you read the seed packet before you buy the seed, it will help you to make sure the seeds are the best for your home garden.

The packet will also tell you if you are buying hybrid seed. If you see $T1$ or $T2$ written with the name of the plant, then the seed is a hybrid.

Picture: The picture you see on the cover of a seed packet shows you the plant at its very best. Your plants might not always look the same as the picture. They may be different in shape or slightly different in colour. This doesn’t mean your plants are not good enough to eat, unless your plant is showing signs of disease (the pictures on page 34 will help you decide).

Description: The plant is sometimes described on the packet. The packet will also tell you how long the plant needs before it is fully grown.

Date: The date on the packet tells you how old the seed is. Try not to buy seed older than one year because it may not grow.

Planting information: The packet will give you this information as well:
- The best time to sow the seeds
- How warm or cold it needs to be outside before the plant can start to grow
- Where the seed should be planted
- How far away from each other the seeds or seedlings need to be when they are planted
- What size the vegetable or fruit should be when it is fully grown
Succession planting

Succession planting is a way of planting in steps that can be repeated. This type of planting will give you an ongoing supply of that vegetable during its growing season.

How to plant successive crops

We will use carrots as an example. Instead of planting a large crop, plant a small row or even half a row of seeds. For example, plant about enough food for a week or two when you harvest it. Then plant another row or half-row every two weeks. After you have done this three to five times, you will be able to use the space from the first row again for a different crop, because you will have harvested the first carrots you planted. You can also grow different types of carrots.

* Keep notes on how well your succession planting has worked. This way you can improve your planting in future.
* You can use any vegetable or fruit that grows quickly for succession planting. Remember that each vegetable or fruit is different, and will have its own particular growing time.

Weeding

A weed is a plant that you did not plant, or do not want to have where it has decided to grow. A weed will compete with your food plants for water, sunlight, air and plant food.

* You need to take out weeds as soon as you see them.
* Weeds must never be allowed to seed.
* Be careful when you pull out weeds. If they are already big, when you pull them out you might harm the roots of your own plants.
What you can grow

Daddy, can I help you pick the beans for supper tonight?

Of course you can, Ndeshi. You are never too young to start learning about gardening.

There are many different types of food plants that you can grow at home. In this book we have focused on only a few vegetables and one fruit. Don’t be limited by these. Try growing different kinds of food plants and see what works for you. Remember to start small and to grow food that your family likes to eat. It is better to grow one or two crops well than none at all.
Types of vegetables

**Legumes**
These include beans, peas and broad beans. Legumes can be used to improve the soil if their roots are ploughed back into it.

**Leafy vegetables**
These include spinach, wild spinach, and cabbage. They need extra feeding because they take many nutrients from the soil. You need to use enough manure and compost to keep leafy vegetables growing well.

**Fruit vegetables**
These include tomatoes, peppers, sweetcorn and watermelon.

**Root vegetables**
These include carrots, onions and potatoes. Don’t use manure in the soil when you plant these because it causes too many side roots to grow.

Runner bean (**Phaseolus vulgaris**) 
This is a good crop because it is easy to grow and has a long harvesting season.

**Planting:** Take sticks about 2 metres long. Place the sticks leaning inwards so that they cross at the top. Put another stick across the top and tie the tips together. Put sticks 30 cm apart and each row 65 cm apart. Plant 3 to 4 seeds around each stick, 2 cm deep. When the seedlings come up, pull out the two weakest ones.

**Caring:** When the plant reaches the top of the stick, cut it back. Give the soil some manure when the bean pods form. Use mulch.

**Harvesting:** Beans are ready to pick 9 weeks after sowing.

Carrot (**Daucus carota**) 
Don’t grow your carrots in clay soil because the roots will not be able to grow properly. Don’t put compost or fertiliser in the soil because this will cause the carrots to grow in a strange way.

**Planting:** Sow the seeds 1 cm deep, and about 10 cm away from each other. Water the seeds after sowing them. The seedlings will come up after 10 days.

**Caring:** Use lots of mulch. As the carrots grow bigger, you need to give them less water. Start to thin out the plants as soon as the first two or three leaves grow out.

**Harvesting:** The carrots will be ready about 8 weeks after sowing.
Potato (*Solanum tuberosum*)

Potatoes need lots of space to grow in. Look at the “Expert’s tip” box below if your garden is small. Potatoes can be planted in winter if there is no frost. Loam or sandy soils are the best. They should be planted in slightly raised mounds of soil.

**Planting:** When planting a potato, make sure it has small growth buds. Plant potatoes 25 cm deep and 35 cm away from each other. You will see the potato plant come up after about 14 days.

**Caring:** Push up the soil around the plant to cover the tubers. This will stop the potatoes turning green. Water the plants three times a week, but don’t wet their leaves. As the plant gets bigger, you can water it less. This encourages ripening.

**Harvesting:** Potatoes are ready to harvest after about 5 months.

### Expert’s tip:

Potatoes and sweet potatoes can also be planted in an old car tyre. This saves water as well as work time.

1. Put an old car tyre on the ground under some shade. Fill the tyre halfway with soil and manure. Put a potato into the soil and water it regularly.

2. Once the potato has grown higher than the tyre, put a second tyre on top of the first one. Now the potato is shaded again and protected from wind.

3. As the potato plant grows taller, slowly add soil and manure into the tyres. Be careful not to overfill your tyre. Make sure there are always some leaves sticking out of the soil.

4. When the potato plant grows higher than the second tyre, put a third one on top and slowly fill it with soil as the plant grows taller.

5. When the potato plant flowers and dies, the potatoes are ready. By this time the potato plant will have filled the space with potatoes.

6. Simply push the tyres over and pick out the potatoes from the loose soil.

7. This way of growing potatoes saves water and protects the potato plant from heat and wind. It also makes digging for potatoes easier, and it lets you grow potatoes in a very small area.

Spinach beet (*Tetragona expansa*)

This leaf crop is a lot like normal spinach, but it handles heat better, is easier to grow, and can be harvested for many months.

**Planting:** Sow the seeds into a seedbed, about 2 cm deep and about 8 cm away from each other.

**Caring:** Thin out the seedlings when they are about 8 cm tall. Water them and put mulch on the soil.

**Harvesting:** The outer leaves can be harvested about 8 weeks after sowing.
Tomato (Lycopersicon esculentum)

Tomato seeds should be sown only once the danger of frost has passed. Well-fertilised soil is important for tomatoes, and the soil should never dry out.

**Planting:** Wet your seedbeds and sow the seeds 2 cm deep, and 5 cm away from each other. When the seedlings are a few centimetres high, take out the weaker seedlings. Healthy plants can be transplanted when they have four sets of leaves. Do this in the late afternoon and water plants well before transplanting. Plant the seedlings 30 cm away from each other. Plant them deeply, with only the two top sets of leaves showing above the ground. Water the transplanted plants immediately.

**Caring:** Cover the soil with mulch. Put some compost into the soil when the first fruits have formed. Tie your plant to a stick so that it does not lie on the ground. When watering the plants, avoid splashing soil onto the leaves as this encourages diseases.

**Harvesting:** Begin harvesting when your tomatoes are ripe, about 10 weeks after transplanting.

**Expert’s tip:** For great tomatoes: don’t crowd seedlings; give the plant lots of light; take off the bottom leaves; and water your plant regularly.

Pumpkin (Cucurbitaceae)

Pumpkins are very nutritious and can be stored for a long time. They will grow well in most soil types, but they take up a lot of space.

**Planting:** Plant 5 seeds together, 2 cm deep, in well-prepared soil. After 3 weeks, thin out the 3 weakest seedlings. Mulch between the seedlings that you are keeping.

**Caring:** Pumpkins need to be watered after the first 2 to 3 leaves form. Don’t put water onto the leaves because they will become diseased; rather water under them.

**Harvesting:** Most pumpkins will be ready 3 to 4 months after planting.

Garlic (Allium sativum)

Garlic has a strong flavour and will grow in most soils, except for clay. It needs to be planted in a sunny place.

**Planting:** Garlic is grown by separating the bulb into cloves and then planting each clove. Plant each clove in a hole 5 cm deep, with the thin end pointing upwards. It should be 12 cm from the next clove.

**Caring:** Water well after planting. Weed the soil often, and use mulch. Flowers should be broken off as soon as they come out so that the bulb can grow more fully.

**Harvesting:** Garlic can be harvested 7 to 10 months after planting.

**Expert’s tip:** Garlic keeps away or kills many different pests in the garden.
**Harvesting and storing**

**Harvesting**

**Winter squash and pumpkins:** Harvest these vegetables when they have fully ripened. They will be the right colour and it will be difficult to break the skin with the nail of your thumb. Take out the fruit with a sharp knife, but leave 5 cm of stalk on the fruit to stop fungi from attacking it. Store in a cool place.

**Potatoes:** Wait until the plant flowers. Use a fork to lift the plant out of the ground. Push the fork straight down into the soil away from the plant, and then push it backwards. The plant can then be pulled above ground and the potatoes taken off it. Store harvested potatoes in a cool, dark place.

**Watermelon:** You will know that your watermelon is ripe if it makes a dull sound when you tap it with your knuckles.

**Onions:** Harvest onions as soon as their leaves bend over. Pull onions out by their leaves. Let them to dry in the sun for three days. Cover each bulb with the leaves of the next bulb so that the onions don’t get burnt by the sun.

**Tomatoes:** Harvest tomatoes when they are red. If they are still light green, wrap each one in newspaper. Put them in a box in a cool place and check them often. They should ripen within two weeks.

**Green beans:** Harvest beans when the seed bulges, but before it becomes too hard. Don’t damage the plant when you pick off the beans. Hold the plant in one hand and pluck the pods off with the other.

**Shell beans:** Let this type of bean dry on the plant itself.

**Spinach beet:** Twist off the leaves near the base of the plant. Pick all leaves that are ready. This will encourage the plant to grow.

**Garlic:** You will know when they are ready because the leaves will dry out. Stop watering the plants when this happens and let the soil dry out. Then lift the garlic bulbs out of the soil with a fork and leave them to dry in the sun for a day. Hang your harvest in a shady place for a month. Then cut off the leaves and roots, and store the garlic in a cool place.
Most fruit and vegetables don’t last long after harvesting. Root vegetables and vegetables like onions and squash last the longest.

- Only store healthy, ripe vegetables.
- Clean all vegetables except carrots and sweet potatoes before you store them.

There are many ways to make your fruit, vegetables and herbs last longer. This is called preserving them. The kind of preserving you choose will depend on the type of fruit, vegetable or herb you are using.

**Burying in sand:** Carrots, sweet potatoes and beetroot can all be buried in sand in a place that doesn’t get frost. Don’t wash them before you bury them, and make sure they don’t touch each other in the sand.

**Hanging in nets:** Squash and pumpkins will keep best if they are hung up in nets.

**Stringing:** Once onions are correctly dried, they can be hung up with string in a cool, airy place.

**Bottling:** Fruit and vegetables with a high water content, like tomatoes, beans and peaches, can be preserved in glass containers. This is called bottling.

**Drying:** You can preserve seeds, fruit and vegetables by drying them, e.g. tsama melon seeds, sundried tomatoes and dried wild spinach. Make sure the place you use has lots of air moving around in it, and give the food time to dry completely. If your food is not completely dried, it will not last as long as it can.

**Pickling:** This is when you add enough vinegar or lemon juice to a food to keep it edible for a long time. Many vegetables and fruits can be pickled. Cucumbers, peppers, cauliflower, apples and pears can easily be pickled, but you need to follow a tested recipe.

**Freezing:** If you have a freezer, you can use it to store vegetables. Frozen vegetables and fruits can last for up to 8 weeks in the freezer. Slice the food and put it in boiling water for a few minutes. Drain the water off and allow the food to cool down. Then put it into the freezer straight away.

**Preserving with sugar:** Fruit and vegetables are preserved with sugar for making chutney, jams and syrups.
When you have grown more than enough

If you can’t store or preserve the extra harvest and you can’t eat it all, you could do the following:

- give it to a hungry person
- swap it for your neighbour’s extra harvest if it is different from yours
- sell it

Giving your harvest away and swopping it are both easy. But selling your vegetables will take some more thinking.

Selling your harvest

Target market

First you need to find out who will want to buy your vegetables. This is called your target market. This could be your neighbours, people travelling through your town or village, or patients at a nearby clinic. It is best to choose a nearby target market, because getting your vegetables to other places will cost you money.

Selling points

- In many areas there are Saturday markets or other local or community markets. Most of these markets will not ask you to pay to be there. You can just take your basket of vegetables and sell them there.
- You can also take your extra vegetables to a nearby hospital or clinic. If the patients waiting outside do not buy from you, perhaps the people working at the clinic will.
- You can also just sit in the shade of a tree near a road where many people walk, and sell your vegetables to them.
- In your community it may be easier to sell the vegetables directly to a shop.

Working out your price

Find out what people would pay for the same food in a shop. You should try to keep your prices lower than the shop’s.
Other tips

- Prepare your harvest for selling by cleaning it and making it look fresh and attractive.
- Make sure you have enough small change to give to your customers.
- There will be some times of the month when people have more money than at other times. For example, if your target market includes older people who get a pension, it will be good to sell vegetables on the day that they get their pension.

Marketing

This is a way of letting your target market know that you have fresh vegetables for sale.

**Posters:** Make some posters to advertise your vegetables. Put these up on a tree close to where you are selling, or on a road where people walk past.

**Word of mouth:** This is one of the best ways of marketing. When people buy your vegetables and they are happy with the price and the quality, then they will tell their friends to buy from you as well. The more happy customers you have, the more customers will come to buy.
Budgeting

Budgeting is a way of knowing how you will spend your money. First you need to know how much money you have. Then you budget for all the things you need or would like to buy with that money.

Budgeting is very important. Without it, you will find it difficult to develop your garden.

If you want to sell vegetables, you need to look at what it will cost to grow them. Your most **basic** costs will be for:

- land
- water (even if you get water from a borehole, you will still need to pay for diesel to run it or for fixing the pump)
- tools
- manure
- seeds

These costs will be ongoing. This means that you need to budget for them each year.

Let’s look at the example of John, who grows tomatoes:

When John started out, he had to buy seeds and pay for water until the fruit could be harvested.

This cost him N$70.

This year, he harvested 50 kg of tomatoes from his garden.

He took 10 kg home for his family to eat.

The rest, 40 kg, he sold at N$3 a kilogram.

This means he got N$120 in total from his sales. To plant again next year, he will need another N$70 for growing vegetables. This means that his **profit** was actually N$50 (N$120 less N$70). If John saves N$25 of this, it means that his garden can grow, because he has an extra N$25 to spend on it.

It is always important to put some money back into your business. This is called **reinvesting**. If you want your business to grow, save and reinvest as much money as you can.
Planning and record-keeping

Keeping a record

It is important to plan your vegetable garden well. You need to know what has to be done in the garden every day. This needs planning and record-keeping.

Keep a record of crop rotation. This will help you to remember what was planted in each bed, and when.

Make a table for each bed. You need to record:

- the type of vegetable you planted
- the date you planted it
- how often you weed and water the bed
- how much you harvested
- what pests or diseases attacked your plants

Copy the table below to keep a record of your vegetable crops.

<table>
<thead>
<tr>
<th>Bed number</th>
<th>Row number</th>
<th>Vegetable planted</th>
<th>Date planted</th>
<th>Feeding and watering</th>
<th>Harvest</th>
<th>Pests or diseases</th>
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record-keeping
okukara nomatjangwa
xoamais
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tikolosho ya dipeo
When to plant and harvest

It is important to know at what time of year to plant your vegetables, and when they will be ready. Use this table to help you.

<table>
<thead>
<tr>
<th>Fruit or vegetable</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
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<tbody>
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<td>Cabbage</td>
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Your garden calendar

In our sample garden, we are growing tomato plants, beans, spinach beet, carrots, garlic, runner beans, sweet potatoes, watermelons, potatoes and sweetcorn. Harvest from last year’s planting is shown in yellow boxes, while this year’s harvest is in blue.
<table>
<thead>
<tr>
<th>Month</th>
<th>Work to do</th>
<th>What to plant</th>
<th>What to harvest</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>As the weather gets hotter, put mulch around vegetables to help keep moisture in. Give your tomato plants some manure. Pull out weeds. When beds are empty, they should be dug over and manure or compost added.</td>
<td>Onions</td>
<td>Spinach beet, carrots, garlic, runner beans, sweet potatoes, watermelon, potatoes and sweetcorn</td>
</tr>
<tr>
<td>February</td>
<td>Water in the late afternoon and try not to wet the leaves of your plants. Watch your tomato plants for pests and diseases.</td>
<td>Garlic; succession planting of carrots</td>
<td>Spinach beet, runner beans, sweet potatoes, watermelons, pumpkin, potatoes and sweetcorn</td>
</tr>
<tr>
<td>March</td>
<td>Take out crops that are no longer giving fruit or vegetables. If there is no disease on the plants, they can be cut up and used as mulch or put onto the compost heap. As the weather gets cooler, you can water your garden less. Mulch carrot plants. Transplant onion seedlings.</td>
<td>Spinach beet, peas and cabbage; succession planting of carrots</td>
<td>Runner beans, sweet potatoes, watermelons, pumpkins, potatoes and sweetcorn</td>
</tr>
<tr>
<td>April</td>
<td>Mulch used during January can now be dug into your soil. Weed any empty beds. If you are going to store your pumpkins then let them ripen on the plant. Transplant cauliflower seedlings.</td>
<td>Onion and garlic, some types of peas and beans; succession planting of carrots</td>
<td>Carrots, runner beans, sweet potatoes, pumpkins, tomatoes and cauliflower</td>
</tr>
<tr>
<td>May</td>
<td>Check all crops for signs of disease or pests. Take out crops that are no longer giving fruit or vegetables. Use all healthy plants as mulch or put onto compost heap.</td>
<td>Succession planting of cabbage and cauliflower</td>
<td>Spinach beat, carrots, tomatoes, cauliflower, carrots, and the last of the sweet potatoes and runner beans</td>
</tr>
<tr>
<td>June</td>
<td>This is a good time to clean, sharpen and fix all your gardening tools. When your winter crops are finished, take them out. Use all healthy plants as mulch or put onto your compost heap.</td>
<td>Succession planting of cabbage and cauliflower</td>
<td>Tomatoes, cauliflower, carrots, cabbage and spinach beet</td>
</tr>
<tr>
<td>July</td>
<td>Start planning your summer garden now, so that you have enough time to get all the seeds you need. Prepare beds for summer planting.</td>
<td>Spinach beet; succession planting of cabbage</td>
<td>Cabbage, cauliflower, and the last of the tomatoes and carrots</td>
</tr>
<tr>
<td>August</td>
<td>This is a busy month for planting.</td>
<td>Runner beans, spinach beet, pumpkin, tomatoes and potatoes; succession planting of cabbage, tomatoes and carrots</td>
<td>Cabbage, cauliflower and onions</td>
</tr>
<tr>
<td>September</td>
<td>Don’t water large seeds too much, because this might cause them to rot. Heap the soil up around potato plants.</td>
<td>Watermelon, sweet melon, sweetcorn; succession planting of tomatoes and carrots</td>
<td>Cabbage, cauliflower, spinach beet, onions and carrots</td>
</tr>
<tr>
<td>October</td>
<td>Watch for diseases and take out any infected plants immediately. Don’t put diseased plants onto your compost heap: it is better to burn them. Aphids might become a problem now, so make sure that you have a remedy ready. Draw up soil around potato plants. Transplant tomato plants.</td>
<td>Spinach beet, pumpkin and sweet potatoes; succession planting of tomatoes and carrots</td>
<td>Cabbage, spinach beet, onions, carrots and garlic</td>
</tr>
<tr>
<td>November</td>
<td>Be sure to water enough as it gets hotter. Put mulch between seedlings to keep the soil cool and moist. Weed and thin out seedlings. Draw up soil around potato and sweet potato plants. Mulch carrot plants. Transplant tomato plants.</td>
<td></td>
<td>Watermelons, sweet melon, runner beans, tomatoes, cabbage, spinach beet, onions, carrots and garlic</td>
</tr>
<tr>
<td>December</td>
<td>All plants will benefit from some manure. Take out old or diseased plants. Water your sweet potato plants less during this month. As your tomato plants get bigger, you will need to tie them to a stick.</td>
<td></td>
<td>Watermelons, runner beans, tomatoes, cabbage, spinach beet, carrots, garlic and pumpkin</td>
</tr>
</tbody>
</table>
Who can help you?

KAKAHO
Ministry of Agriculture, Water and Forestry – Okakarara Extension Office, Tel: 067 – 317 034
Ministry of Agriculture, Water and Forestry – Okamatapati Extension Office, Tel: 067 – 274 519
Ministry of Agriculture, Water and Forestry – Grootfontein Extension Office, Tel: 067 – 242 349

Ministry of Agriculture, Water and Forestry – Otjiutuuo Extension Office, Tel: 067 – 243 615
Ministry of Agriculture, Water and Forestry – Okahandja Extension Office, Tel: 062 – 501 564
Ministry of Agriculture, Water and Forestry – Ovitoto Extension Office, Tel: 062 – 503 955
Ministry of Agriculture, Water and Forestry – Tsumkwé Extension Office, Tel: 067 – 244 021

Women Action for Development – Okakara, Tel: 067 – 317 041
Namibia Red Cross Society – Grootfontein (Tel: 067 – 243 909), Tsumkwé (Tel: 067 – 244 000) and Okakarara

HARDAP
Ministry of Agriculture, Water and Forestry – Mariental Extension Office, Tel: 063 – 242 197
Ministry of Agriculture, Water and Forestry – Rehoboth Extension Office, Tel: 062 – 522 527

KARAS
Ministry of Agriculture, Water and Forestry – Bethanie Extension Office, Tel: 063 – 283 117
Ministry of Agriculture, Water and Forestry – Maltahohe Extension Office, Tel: 063 – 293 052
Namibia Red Cross Society – Luderitz, Tel: 063 – 202 659

OSHIKOTO
Ministry of Agriculture, Water and Forestry – Onathinge Extension Office, Tel: 065 – 248 850
Ministry of Agriculture, Water and Forestry – Tsumeb Extension Office, Tel: 067 – 220 263
RISE – Tsintsabis
Namibia Red Cross Society – Onandjokwe, Tel: 065 – 248 101
Background

Desert Soul Health and Development Communication was registered as an NGO on 13 May 2008. As its mission, the organisation strives to be “a leading and reputable edutainment mass media organization that empowers all Namibian communities through the production of health and development media materials which enable them to make informed choices about their health, and thus facilitate positive social behavioural change.”

Initially, Desert Soul: HDC was established in 2002 as a project of the Namibia Red Cross Society, in partnership with Soul City Institute for Health and Development. The aim of the project was, and still is, to provide the public with correct health and development information. This is being done through the use of TV and radio programmes as well as booklets.

Desert Soul is situated at:
c/o Mandume Ndemufayo and Sam Nuuyoma Drive
Atlas House – First floor
Tel: 061 387 450
Fax: 061 309 763
back cover