# Basic Food Gardening in Zimbabwe

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*Helping the hungry feed themselves well*

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## Introduction

Zimbabwe is a land of diversity with different cultures, languages, plants and animals. This is also true of the food plants that people grow and eat. Because people move plants around and new food plants have been brought into the country, people can be unsure about some plants, and what they are called and how they are used.

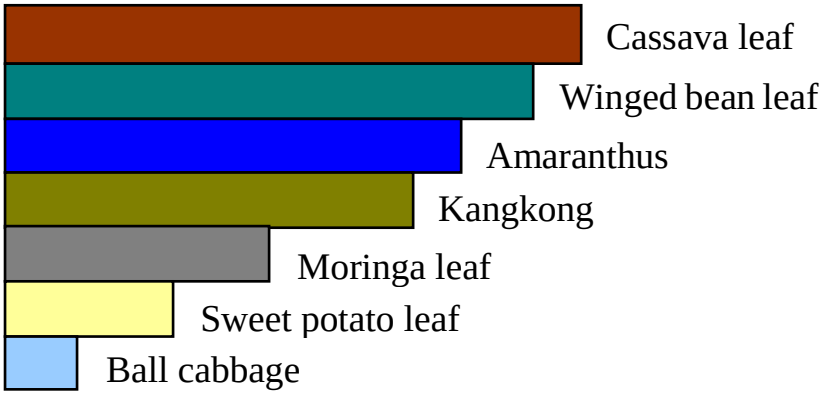

Free Zimbabwe map

This book is designed as a very simple introduction to the more common food plants seen around Zimbabwe. It is hoped people will take a greater pride and interest in these plants and become proud and informed about how to grow and use them well. Many of the food plants of Zimbabwe are very good quality foods. Unfortunately, people are often rejecting traditional food plants and growing more of the introduced vegetables such as cabbage. These do not have the same food value as many of the traditional, tropical, dark green leafy vegetables.

Zimbabwe has about 1,950 different species of edible plants. Some of these are only harvested from the wild and others are only known in small areas. Some have come from other countries and may not be used locally. Many others occur with hundreds of varieties and are the main food for people in the different regions.

The following diagram highlights the value of traditional leaves. Iron is a nutrient that is very important for our bodies and especially our blood. People who are short of iron become anaemic and lack energy. It is an example of how some foods are better for us than others.

**Bar graph of iron content of some Zimbabwe foods**




Information on all these plants, their food value and the pest and diseases that damage them is being made available in other publications such as the database and pdf book. This one is a simple introduction.

## Growing food in Zimbabwe

Growing food is one of the most important jobs in Zimbabwe. It may not be the easiest job and it may not be the most enjoyable, but growing food to feed a family well, is without doubt, one of the most important jobs anyone can do.

## A country with very special plants


Zimbabwe has a lot of very good food plants. They are God's gifts. The food plants of the country have not been promoted and highlighted in the way they deserve. Visiting one of the local food markets will quickly show what a rich variety of food plants can be grown in this country. But often, good information about these plants is still in the minds and experience of local farmers and has not been written about in books. This can make it harder for the next generation of young people to find out about how to grow them. Young people spend more time in school and less time in food gardens.

## Naming of plants

Many food plants in Zimbabwe still do not have standard commonly used names. This is sad. All these plants deserve a local name that is widely recognised. Often there are local language names for local plants, but in a country with so many plants and several local languages this can become confusing. Lists are included on this DVD of names in Shona and Ndebele along with the scientific name. Many of these plants also do not have a common English name. The scientists of the world have given every plant a scientific name. This is written in the Latin language but is often hard to spell and even harder to say. But it is important. This is the link by which people in different countries and with different languages can recognise the same plant. One common and popular vegetable, called "Okra", is slimy if you boil it, especially the leaves, and it is now grown in many tropical countries. It is a very important and very nutritious vegetable for the hotter regions in Zimbabwe. Scientists call it *Abelmoschus esculentus*. By using this link name we can then find out that many of the food plants grown and enjoyed in Zimbabwe are also grown in countries in Africa and around the tropical world. Sometimes people in these other countries have found out things about these plants that would be useful for us to know.

## Good quality food

As well, lots of information about these foods cannot simply be collected from village farmers but must be worked out by scientists and people with special equipment. For example, the food composition of these food plants is something that must be worked out by chemists in their laboratories. People in villages may know if a food has energy because when they eat it they can do a good days work. But it is not as easy to know about protein or growth food, and about vitamins and minerals and other foods called health foods. Our bodies need all of these groups to enable us to grow well and stay healthy and have energy to work.

## A healthy balanced diet

Good nutrition or eating a healthy balanced diet is really very simple. If we eat a wide range of food plants then out bodies will normally get all the different nutrients that they require and will get them in a balanced amount. If some nutrient is lacking in one food plant, then our bodies will find it, if we are eating a range of other plants. So everybody should eat a range of different food plants every day. The group that are especially important for young people, are the dark green tropical leaves as they have many vitamins and minerals as well as protein. If young children fall asleep before the evening meal, it is important to make sure they get some of these leafy vegetables next morning. There are lots of nice spices or flavouring plants that can improve the taste of foods. Everybody should eat a good serving of these dark green leaves every day. In countries with a long dry season it is important to know which dark greens leaves can be dried and stored. It is best to dry leaves in a shady, windy place as this helps keep their food value. Then they need to be kept in a dry sealed container.

**Local food plants are often very good**

Sometimes people start to think that some local food plants are not very special and that any food plant that is new or comes from another country must be a lot better. This is often very untrue. Many of the newer or introduced food plants such as the round or ball-headed cabbages have very little food value at all. Many of the local green leafy vegetables and ferns have 10 or 20 times as much food value as these cabbages. It is important to find out more information about the food value of different foods if we want to eat well. Citrus fruit such as lemons and oranges are often grown for Vitamin C that helps keep us healthy. They do not grow well in the tropics. But the common local guava fruit has 3 times as much Vitamin C and is loved by kids. Many leaves are also high in Vitamin C as well as local fruit.

**Different kinds of plants for food security**

There is another reason for growing a range of food plants in a local garden or around the village. If something goes wrong, like lots of insects damaging plants or some disease occurring in the garden, or the weather changing or a cyclone occurring, some plants will be more damaged than others. If we have a variety of plants, then there will still be some food to eat until the other plants recover and grow again. There are shrubs that can be planted as edible hedges around houses and fruit and nut trees that need to be planted as a gift for your children, several years before they will be able to enjoy them. Some nuts can be stored and eaten when other foods are not available. Most yams will store well for a few months. Grains can be stored if well dried and then put in sealed container to prevent attack by rats or insects.

**Learning to grow "wild" food plants**

There are still many plants in Zimbabwe that still simply grow wild in the bush and are not cultivated by people. If we look around we can normally find someone who has taken an interest in them and has learned to grow them. This may be people within a different language group than ours, and they have become the experts. It maybe that in their area they have found sweeter kinds or better kinds than the ones that simply grow wild. There is still a big need for people to collect these different plants and better kinds and to spread them around amongst other villages.

**Saving better kinds**

Sometimes if we simply allow plants to grow from seed then the improvements that have been made in finding sweeter or better kinds may get lost. Several local fruit trees are like this and the fruit produced may not be sweet at all. To stop this happening it is often necessary to take cuttings to be sure the new plant is exactly the same as the old one. If the plants won't easily grow from cuttings simply by sticking a piece of the branch in the ground, then there are some ways of helping these plants to form roots and start to grow. One good way is to make a small cut in the bark of a young branch then wrap dirt around this cut and cover it with plastic. With plants like guava, new roots will start to grow from this cut and grow into the dirt wrapped around the branch and it can then be cut off and planted. This is called air-layering. With breadfruit, a similar method is used but with the roots. A shallow root is uncovered and a small cut made and then a new sucker will start to grow. This can be cut off and replanted. There are also methods like rooting hormone and grafting that the agriculture officer may be able to help you with.

**Saving seed**

Some food plants are grown from seed. Sometimes this is very easy as the seeds are large and store well and grow easily and come up the same as the original plant. With other plants it is less easy. Many large fleshy seeds such as breadfruit and other tropical fruits, need to be planted while still fresh, as they will not store easily. Other seeds do not "breed true" or do not grow into new plants that are the same as the original plants. So the fruit may not be as large or sweet or have the same colour or taste. With many of these plants it may be necessary to find ways of growing

them from cuttings or other methods such as grafting, if this is possible. Some plants "inbreed" and get smaller or poorer. Corn seed grown in small plots normally does this and the plants get smaller and smaller each year. The seed needs to be saved from several different plants and then mixed together before sowing. (All the seed on one cob are related and will inbreed.) Some seeds develop a hard seed coat and need to be scratched or soaked in water or even put into hot water before they will start to grow. Often saving local seeds is a very good idea. Normally seed saved from pumpkins grown locally will get less pest and disease damage than imported seed in packets, as they are already adapted to local conditions.

**Growing from cuttings and suckers**

This is the way many of the food plants of Zimbabwe are grown. It is very important as it allows all the different kinds of yams and taros and bananas and sweet potato and sugarcane to be continually grown and the varieties preserved. Each plant has its own special techniques. Before simply dismissing the method used by a good and experienced farmer, it is important to think carefully and watch carefully. Often the village person has learned the methods by experience even though the reason for the explanation that they give you may simply sound like myth or "tradition". It is important to take healthy planting material, and several diseases can be spread in the planting material. By watching several different growers from different places you may be able to improve on the traditional way used in your area. You can of course try out other ways yourself.

**Growing a mixed garden of plants**

In nature, God never grows only one variety of one plant but always has lots of different plants of different kinds and different sizes, all growing together. Anyone who has ever walked into a piece of tropical jungle will know this very well. That is why people all over the world want to save the rainforest

because it has so many different kinds of plants all growing together. Growing plants in a food garden in a similar way that they are grown in nature, as a mixed group of plants, is very good agriculture. In "Western" countries where they want to grow a very large area of one plant using very large machines, it is not possible to grow plants as a mixture of plants, so they only use one variety of one plant, and put them in rows. But then they have to do lots of special things like spraying pests, diseases and weeds to keep it growing properly. That's why they need the rows! Mixing plants in a garden usually gives a lot more stable and reliable food production, as the disease from one plant will wash off in the rain onto a different plant, where it can't grow. And small plants will fill up the gaps reducing weeding. A plant that attacks corn and sorghum and that grows attached to their roots, called Striga, can be greatly reduced if other plants such as Celosia and cowpea are grown amongst the corn or sorghum.

**Getting to know plants**

People who spend time in gardens and with their food plants often get to know them very well. But different people know different amounts about different plants. It is a good idea to find someone who grows plants very well and to learn from their knowledge of the plants.

Each plant has its own special place where it grows best and there are often special techniques in getting it to grow well. For example, sweet potato won't form tubers if the soil is too wet, but is may still grow lots of green leaves. Taro will grow in light shade, but sweet potato won't. Ginger can grow in fairly heavy shade. Pruning off the tips of betel leaf or pepper vines will cause it to grow more side branches and therefore produce more fruit. Yam tubers in storage need special treatment if you want them to put out shoots early.

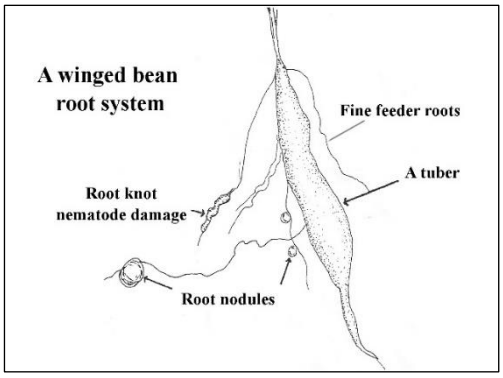
There are lots of special things about every plant and a good gardener tries to learn these things so they can produce food well.

**Learning to cook well**

Even though a few of the nutrients in food can get a little spoilt during cooking, it is normally much safer and better to cook all food plants, at least for a short time. There are small bugs called bacteria that can occur in gardens and on food plants and which cause diarrhoea and these get killed during cooking. As well, many plants in the tropics develop a chemical called cyanide that makes them bitter. This happens often with cassava and beans but can be in many other plants. Boiling the food for 2 minutes during cooking normally destroys this poison and makes the food safe to eat. Some of the food nutrients our bodies need (such as Vitamin A for good eyesight) only become available when food is cooked in oil. Thankfully there are lots of local plants where oil for use in cooking, is easily extracted.

**Looking after the soil**

Gardeners in Zimbabwe usually move their gardens often, moving to a new piece of land. There are usually 3 reasons for this. In the tropical lowlands, weeds can become a very big problem. This is usually a lot less in the first year or two after clearing and burning the land, but weeds increase in the following years. As well, some of the plant food or nutrients in the soil get lost and the soil becomes poorer and plants will grow less well. There are ways of reducing this loss of nutrients. A third reason why soils often won't grow food plants well after a few years is because very small worms called nematodes build up and get into the roots especially of annual vegetable plants and stop their roots working properly. You can often see the roots of plants like tomatoes and beans twisted up as if they have been tied in knots. These worms are called "root knot nematode" for this reason.



**Building up the soil**

When a new garden has been cleared it has lots of leaf mulch and other old plant material. This provides plant nutrients for new plants to grow. There is a simple rule for growing plants and improving the soil. "If it has lived once, it can live again." This means that any old plant material can provide nutrients for new plants to grow. But it must be allowed to rot into mulch or compost, for this to happen. If this plant material is burnt, some nutrients, especially two called Phosphorus and Potassium ("pot ash"), get left behind in the ashes for new plants to use. But some, such as nitrogen and sulphur get lost in the smoke and disappear from the garden and soil. These last two plant nutrients are especially important for growing green leaves and when they get lost, plants can be small or pale green. With nitrogen, the old leaves of the plant go pale and fall off early, and with sulphur the young leaves go pale. So wherever possibly old plant material should be covered with some soil to allow it to rot down and not simply dry out or get burnt.

**Growing food on coral, limestone or atoll soils**

The soils along many coastlines and on coral atolls, is special, and needs special care when growing plants. Often when plants are grown amongst the coral and limestone rocks, the youngest leaves of the plants will be pale yellow and the plants will not grow properly. Sometimes these leaves will have unusual coloured or dead spots. This is because these soils can be very alkaline or bitter and the nutrients that the plants need get fixed in the coral, and things that are not supposed to get into plants, such as the aluminium in the soil, gets into the plants instead. Therefore these soils need to be treated with special care. If at all possible, compost or old plant material should be carefully preserved and allowed to rot into these soils. This plant material is acid or sour but makes the coral or limestone more sweet and better suited to grow plants. As well, this decaying plant material holds and protects the plant nutrients ready for plants to grow.

**Poor soils where crops won't grow**

In several places people recognise soils that are very poor and they avoid them during gardening. Sometimes people allow missions, clinics, churches or schools to use this land as they know nothing will grow properly there. One common reason that these soils won't grow crops, is because the soil is very acid or sour. Many tropical soils are acid or sour. But when they are very acid, plants cannot get their nutrients and things that are not supposed to get into plants become soluble and get

into plants poisoning them and stopping them growing. Adding limestone to these soils can improve them, and using compost won't make them less acid or sour but will keep the plant nutrients in the soil in a more readily available form that plants can use. Teachers and Health workers who may wish to set up a demonstration garden on land such as this may need to get special help and advice.

**Pests and disease**

There are a very large number of insects that enjoy sharing our food with us! We should not try to kill all these insects as they are equally a part of God's creation and have an important role to play in keeping everything in nature in balance. What we need to do is to learn to manage these insects so that we can all get some food to eat! Some insects get attracted to lights and if the garden is near village lights the damage from some of these insects can get worse. If we plant large areas of one particular crop that the insect likes, then the insect breeds more quickly and the damage gets worse. As an example, insects called armyworms can breed up in large numbers on the shade trees of cacao and then move across "Like an army" into gardens.

Some insects are large and breed slowly and can be picked off and removed. The large green grubs with pointy tips that hide under taro leaves, are like this and are best simply picked off and removed. Some insects have young curl grubs that are nice and tasty if you can catch and cook them! Some insects do not like sunlight. The very small moth than damages banana fruit, is like this. Simply pulling off the leafy bracts over the banana fruit reduces the damage, as it lets sunlight in and the insect flies away! The best rule for reducing pest and disease is to grow plants as healthily and well as possible. Healthy plants get less damage.

**Diseases**

The living organisms that cause disease are much smaller than insects and therefore are less well understood by village people. Sometimes these disease organisms can only be seen with a microscope or even an electron microscope. There are 3 main kinds of these disease organisms. They are fungi, bacteria and viruses. Fungi are like the mushrooms we eat but only very much smaller. They usually make distinct dry spots on leaves and other plant parts. These fungi have spores that can often blow in the wind. Bacteria are often smaller and live in wet damp places. They usually make plants go soft and squashy and they may cause a smell. Bacteria mostly spread with rain and in water. Viruses are very, very small and usually make irregular stripes and patterns on leaves and other plant parts. These viruses usually

spread in planting material or in the mouths of insects, often the small sucking insects that we ignore. A is caused by a virus, and makes the leaves go blotchy and wrinkled. Some viruses are spread between plants by very small sucking insects. Some diseases get worse in old gardens and where soils are running out of nutrients. The answer is not to stop the disease, but to improve the soil! The general rule is that plants that are healthy and growing well, will get less damage from disease.

**Soil nutrients**

Plants need 16 different kinds of plant food or nutrients to grow properly. They need them in different amounts. A plant that has already been growing, will already have these nutrients in them and probably even have them in a balanced amount. That is why composting old plant material is so important. But plants usually show some signs or symptoms if one of these nutrients is running out. One of the commonest and most important nutrients for plant growth is one called nitrogen which actually comes from the air but gets into plants through the soil. When plants, but especially grass family plants like sugarcane, sorghum and corn, are short of nitrogen the oldest (lowest) leaves start to develop a dry or dead V-shape up the centre of these leaves. The plant can't find enough nitrogen in the soil so it is pulling it out of an old leaf to grow a new leaf. This makes the leaf go dry or dead with a V-shape. The plant doesn't get any bigger as an old leaf dies each time a new leaf is produced! Village farmers often walk through grassland before they clear it for gardens, looking to see if the grass leaves are dry and dead, because they know gardens on this soil won't grow well. To put nitrogen back into the soil it is necessary to use compost or plants from the bean family (legumes and also Casuarinas) as they can do this important job for us. There are tree legumes, as well as small garden plants like peanut.

**Making compost**

Compost is old plant material that has been allowed to rot down into a fine, sweet smelling mulch that can be put back on the soil to grow new food plants. The rules for making good compost are very simple. This is how it works. The composting process is carried out by very small bacteria that live in the soil and that feed around decaying plants. They break down plants into compost suitable for plant food. These bacteria are living things, so they need air, water and food! A simple heap of plant material can be made in the corner of a garden or near a house. It must have air – so don't cover it with plastic or put it in a container (this makes pickles not compost, as different bacteria that don't need air turn it into an acid mixture that preserves it.). It must have moisture, so keep the heap damp, but not really wet. And the bacteria like a balanced diet, which means you need some green material and some dried material, to balance the carbon and nitrogen in the bacteria's diet! If it gets too dry and brown it won't break down and if it gets too green it will go slimy! Using a little bit of compost from an old heap will make sure the right bacteria are there to start the whole process off. As soon as the plant material is broken down to a fine mulch it can be put onto the garden. It is best if it is dug in but if it is regularly put onto the surface of the garden, bugs and worms in the soil will themselves mix it into the soil.

The more interest you take in your garden and the more you find out about plants and how to grow them well, the more interesting and fun food gardening becomes.

**Including trees**

Trees should be introduced and maintained within a gardening property. There are over 600 trees that have parts useful for food that grow in Zimbabwe. These should obviously be maintained. Additional productive trees could be introduced without doing this as a small tree orchard but preferably dispersed across the property. The most likely suitable fruiting trees would be avocado, guava, tamarind, and Moringa. I would avoid Citrus as they don't suit hot

tropical climates and get lots of pest and disease damage. But plants such as pawpaw and selected bananas could be used as short-term crops. Be careful to select green-stemmed (without black marks) drought tolerant varieties of bananas. The fruit trees mentioned are tropical plants that suit this type of climate, but they are not the local traditional ones. So as well as these it would be lovely if some of the local fruit and nut trees that God has especially provided for this region could also be included. Often these local food trees still need to be domesticated from the wild. Sometimes with these it is necessary to look around for bigger or better or sweeter kinds and then perhaps even try new ways of growing them – using for example cuttings or "air-layering" to preserve these better selected kinds. It is good for Christian people to take a special pride and interest in the unique local food plants as a part of our care for God's creation.

**Maize and sorghum**

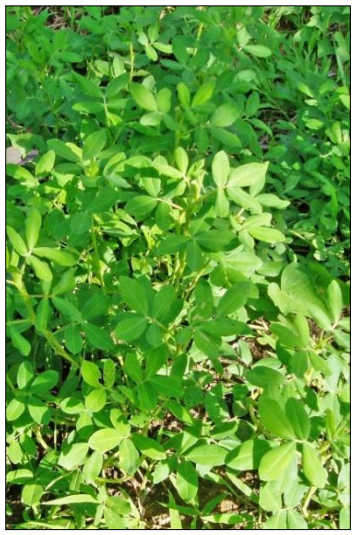
Maize and sorghum should be intercropped with beans and edible leafy green such as amaranth, cockscomb and cowpea to reduce striga problems and give better yields. After harvest old maize and sorghum plants should not be burnt but be slashed into the rows between the ridges. By adding some green leguminous material (eg pigeon pea, cowpea or velvet bean) this can then be covered with soil from the ridges to become next season's ridges for planting maize. In the first year or so the benefits of this approach may not seem obvious but within 2-3 years I believe the soil could become much more productive and the millions of small soil organisms that can do an amazing job at breaking down old plant materials and enriching the soil will start to build up into significant numbers to make the whole process more effective. In areas where the rainfall is less reliable, some finger millet and bulrush millets can tolerate droughts better.

**Conservation Agriculture**

Soil becoming denuded is a common problem throughout Africa and steps need to be taken to overcome this. It is often called "Conservation agriculture" where every attempt is made to keep the soil covered with plant material and to reduce the amount of digging of the soil to allow the humus and moisture to be saved and increased.

God has made a world and gardening system that works. All green leaves need a nutrient or plant food called nitrogen. When we burn old plants the nitrogen (and sulphur) simply returns to the air and is lost along with the smoke from the fire. Then we go to a shop and buy it back as a chemical called urea. This has usually been produced in some other country and they get our money whereas we should not have wasted it sending our own God-provided nitrogen up in smoke as we burnt the old plants.

**Using beans and legumes**



There are a group of plants called legumes of which beans and peanuts are examples, but there are many other natural and locally occurring ones. A group of plants called Acacias also occur across Africa and are in this group of plants. The amazing thing about this group of plants is that on their roots they have small lumps called "root nodules" and inside these there are millions of very small bacteria that can take nitrogen back out of the air and turn it into the sort of nitrogen plants need to grow new leaves. God's world is an amazing place. You can pull up a bean family plant and look to see if these small lumps occur along the roots. You can break them open and they should be pink or red inside if they are doing their work properly. If they are green inside then they are not working properly. They have a chemical similar to that in our own blood that makes them red coloured when they are working properly. When these small bacteria in these nodules are doing their work properly, not only can they make the plants grow better by producing the natural nitrogen fertiliser but they also make the food more nutritious because the nitrogen helps the plant produce more protein and this makes the food more nutritious for us

to eat. (If the nodules are green inside it may need some special soil fertiliser added but one way to try to fix the problem is to find some similar plants from somewhere else where the nodules are red and to crush up the small nodules and spread them around the plants in your own garden.) Beans and legumes are vital for all good farming and for all good diets.

Bruce French 2015