GOOD GARDENING AND GROWING ROOT AND GRAIN CROPS IN ZIMBABWE

PRACTICAL WAYS OF GROWING LOCAL FOOD PLANTS AND DOING IT WELL

Rotary

FOOD PLANT SOLUTIONS
ROTARY ACTION GROUP
Solutions to Malnutrition and Food Security

A project of the Rotary Club of Devonport North and District 9830

REGISTERED CHARITY

Good gardening and growing root and grain crops in Zimbabwe

Rotary FOOD PLANT SOLUTIONS ROTARY ACTION GROUP Solutions to Malnutrition and Food Security

Food Plant Solutions produces educational materials to enable people to understand the nutritional value of local food plants and increase awareness of highly nutritious plants that are adapted to the local environment. Some of these plants are under-utilised species and many are superior to imported foods and plants. Food Plant Solutions produces these materials because every minute of every day, five children under the age of five die from malnutrition.

We welcome and encourage your support.

Food Plant Solutions - A project of the Rotary Club of Devonport North & Rotary District 9830.

This booklet is based on information from the Food Plants International (FPI) database, "Edible Plants of the World", developed by Tasmanian agricultural scientist Bruce French.

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Good nutrition is simple

Grow and eat a wide range of food plants.

Then if a nutrient is missing from one plant, it will be included in other plants and produce a balanced diet.

Small leaved white raisin

Sweet potato

Healthy Diets

All people, and especially children, should eat a wide range of food plants to stay healthy. This should include some plants from each of the food groups – energy foods, growth foods and health foods. Then each of the nutrients required by our bodies will be met in a balanced manner.

Local plants give a regular food supply

Use a range of local or well adapted plants to get a regular supply of food.


Flower-of-an-hour

Because they are local, they will have already survived local conditions and pests.


Taro

They each have different ways to survive bad conditions or bad seasons.


African locust bean

Agroecology - growing plants a natural way

Growing foods in a mixed garden is a good and simple way to reduce pests and disease.

Agroecology - how plants grow in nature

Plants don’t grow in rows in nature.

Growing only one type of plant is not used in nature.

Lots of varieties are maintained in nature.

In nature, the right plant grows in the right place.

In nature, fruit is produced in season.

Nutrients are recycled in nature.

Natural systems are sustainable.

In nature, the soil remains alive and humus rich.

Mixed cropping is good

Yams, bananas & vegetables.

Amaranth and maize mixed.

Information on gardening

Deficiencies

We all need to learn together and share what we know.

Seed-saving

Pests

Diseases

Are your plants healthy?

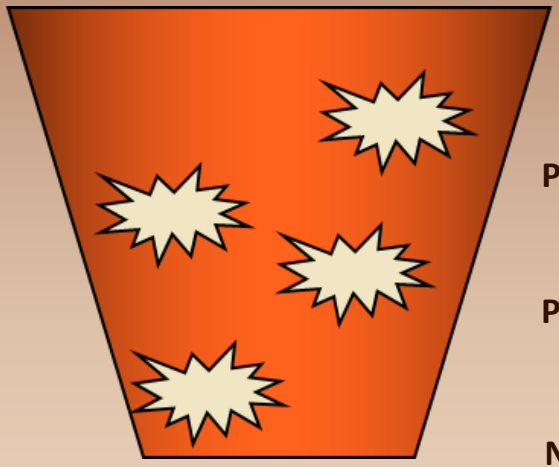
Plants show special signs when they are not growing well.

This maize leaf is indicating the plant is short of a nutrient called nitrogen. It shows a dry 'V' shape down the centre of the oldest leaves. Other grass plants show similar signs.

Nitrogen is in the air, but plants cannot use it unless small bacteria in the soil, and on the roots of bean family plants, change it into a form plants can use.

A bucket of nutrients!

If we imagine soil as being like a bucket of nutrients, then we need to fix the lowest hole, (or add the nutrient which is in shortest supply), before the bucket can carry anything more.



We can learn to recognize which nutrients are in shortest supply by looking at plants carefully.

Phosphorus

Potash

Nitrogen

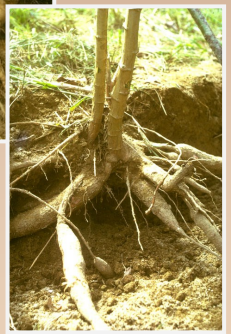
Different plants grow on different soil types

Yams need fertile soil

Taros need good soil

Chinese taro can grow on moderate soils

Sweet potato grows on poorer soils



Cassava will produce on poor soils

Decreasing soil fertility

When nitrogen is short…

Pineapple plants turn red.

Nitrogen is important for plants to grow healthy leaves.

Grass plants have a dead ‘V’ shape in the old leaves.

Old leaves go yellow.

Beans provide protein and restore soils

Beans have special bacteria attached to their roots that allow them to take nitrogen from the air and put it into the soil for plants to use. It is free fertiliser!

African locust bean

Marama bean

Climbing beans can be allowed to climb up corn in gardens and still get good crops of both beans and corn.

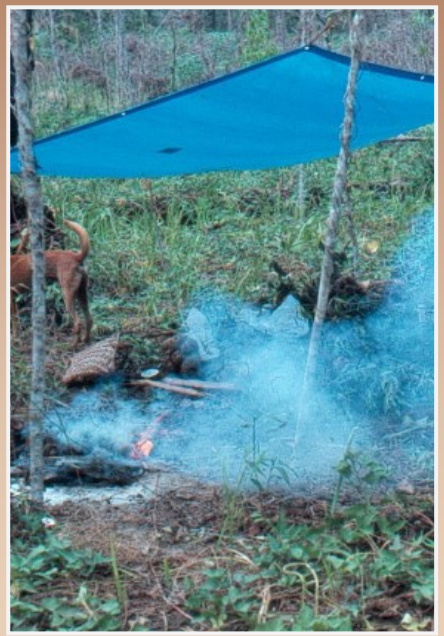
Burning loses nutrients and destroys soils

Burning is a quick and easy way to clear up a garden site, but wherever possible, plant material should be left to rot back into the soil.

This provides nutrients and helps the bacteria and other living things in the soil that are so important for plant growth.

A soil with humus, or rotted plant material, does not lose nutrients during heavy rain.

Nitrogen (and Sulphur) get lost into the air as plant material is burnt. Other plant nutrients, like potash, remain in the ashes.



Making compost

Don’t burn rubbish - compost it!

Compost is perfect for small backyard gardens.

How to make compost

The rules for compost making:

- **Build a simple, open box to keep animals out.**
- **Add some old rotting material to start the process.**
- **Mix green leafy and dry plant material.**
- **Allow air to get into the compost.**
- **Keep the compost bed moist.**
- **Add anything that has been living before.**
- **If possible, turn the heap to allow it to heat up and break down properly.**

The reasons for compost

Small bacteria and other living things work hard to break down old plants and other living things into compost.

Because the bacteria are living, they need continual air and water, and a balanced diet of green and dry waste, or they die.

Living things already have plant nutrients in perfect balance for new plant growth, so compost is the perfect fertiliser.

To stay healthy, soil needs lots of compost and organic matter to do all the amazing work that goes on unseen within the soil.

Compost should become hot to kill weeds and pests.

Save your own seed

Plants grown from seed that is saved locally usually get a lot less disease, as they are adapted to the area.

Air-layering

Air-layering is a special way of taking cuttings. A shallow cut is made around a small branch while it is still on the tree. Some soil and mulch is wrapped around this and covered with plastic. It soon forms roots. It can then be cut off and planted.

If a sweeter or preferred fruit or nut is found, it is best to grow it from cuttings, or air-layering, so the new tree is the same as the old.

Some diseases tell a story

The first rule in managing pests and diseases is to grow the right plant in the right place, and to grow it well, so it can stay healthy.

Peanut rust

Leaf spot in bananas

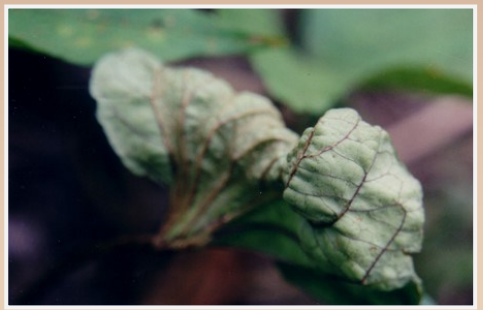
Some diseases tell a story

Elsinoe scab on sweet potato usually tells us three things:

- **The soil is getting poor and low in nutrients.**
- **The sweet potato is a variety that gets the disease more easily.**
- **The variety of sweet potato may have come from another country without the disease, so it has no resistance.**

Reduce the risk by:

- **Improving the soil.**
- **Choose a local, resistant variety.**



Banana diseases

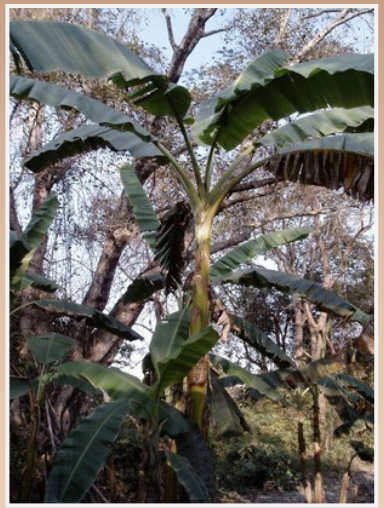
Several different fungi cause leaf spots on banana leaves, especially in wet seasons.

Black spot

Choose banana varieties that show less of these diseases.

Banana pests

Using a range of crops and a mix of varieties are normally a good safeguards against insect pest damage.

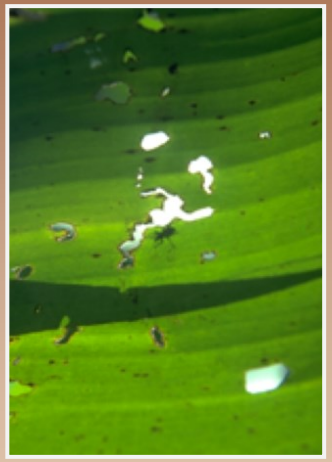


Banana insect pests

Some rhinoceros beetles and taro beetles can dig into banana stems and roots and make plants weak.

Several caterpillars, grasshoppers and weevils chew banana leaves.

Grow plants well so that new leaves grow quickly.



Banana weevil borer can dig into the roots of banana plants causing them to fall over.

Taro diseases

Alomae / Bobone virus

Use a mix of varieties and mixed cropping to reduce damage.

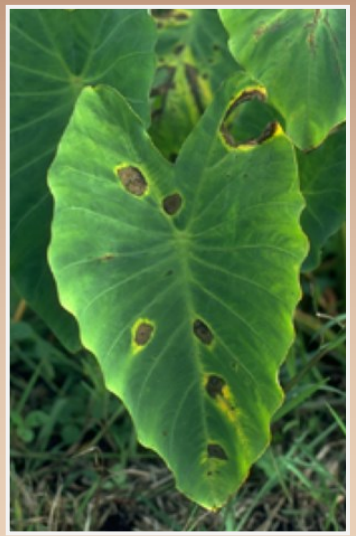
Taro blight - a devastating fungal disease. The fungus washes in the rain on hot, wet nights.

Taro blight and Alomae / Bobone virus are the most serious taro diseases.

Taro diseases

Taro mosaic virus

Taro shot hole - a minor fungal disease



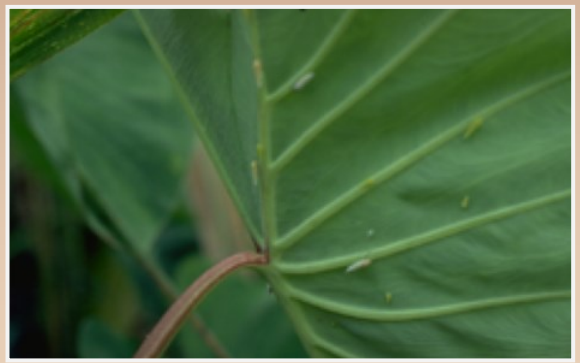
Taro diffuse yellow leaf spot

Taro insect pests

Aphids sucking sap

Taro hawkmoth

White fly



Grasshopper nymphs

Sweet potato diseases

Wrinkled sweet potato leaves.

This fungus scab gets bad when soils are poor, and also occurs on varieties that are not resistant.

Some problems with cassava

Like most root crops, cassava produces more food if the soils are rich in potash. Ashes from fires have potash.

Older leaves going yellow means the soil is short of nitrogen.

Leaves often get brown spots due to a fungus. It does not normally get too bad in good soils.

Young leaves turn yellow when the soil is sour - e.g. in limestone and coral sites.

Root and grain crops in Zimbabwe


Tef

Many root and grain crops suit hot tropical climates.

These foods are the backbone of the country, so we need to get to know them very well.


African rice


Taro


Common millet

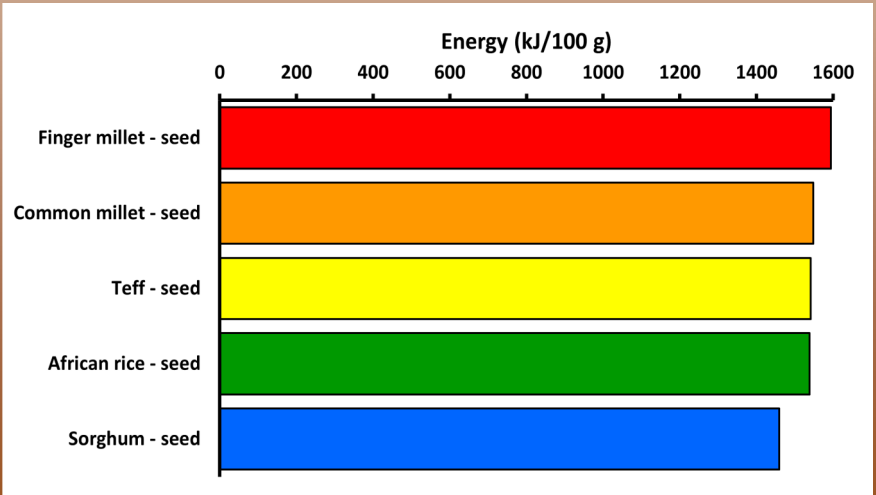

Sorghum

Root and grain crops provide energy

Common millet

Finger millet

Grain crops are important foods for energy.



Taro

Taro

- Taro grows best from the top of larger corms.
- It can grow in moving water and light shade.
- It takes 6-9 months to be ready to eat.
- The corms, flowers and leaves are all edible after cooking.

Sorghum

- Sorghum seeds are eaten as a cereal.
- The flour is often used for porridge.
- Sorghum does not contain gluten.

The seeds will germinate soon after harvest but can be stored for a long time if kept dry and protected from insects.

Tef

- The seeds of tef are ground into flour.
- It can be used in stews and for making unleavened bread.

- Early varieties of tef mature in 90-120 days, later varieties take 120-160 days.
- Seeds can be stored for many years.

African rice

- The grain can be cooked or ground into flour for making bread.
- Plants are grown from seed.
- Seeds usually emerge 4-5 days after sowing.
- African rice is grown in wetland and flood plain areas.

Bullrush millet

- The seeds are eaten like rice.
- They can be ground into flour for bread and porridge.
- The young ears can be roasted and eaten like sweet corn.
- Some varieties have sweet stalks that are chewed.

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Image acknowledgements

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Scientific name	Common name	Image URL
Hibiscus trionum	Flower-of-an-hour	https://i.pinimg.com/originals/29/a5/c2/29a5c2c4457308d0fc36439ee5e26310.jpg
Parkia filicoidea	African locust bean	http://www.westafricanplants.senckenberg.de/images/pictures/fabmimo_parkia_filicoidea_cbch_6118_4049_b8ed36.jpg
Oryza glaberrima	African rice	https://i.pinimg.com/474x/77/48/1f/77481fb8134243595c851b56ac63ea4c--natural-resources-mali.jpg
Tylosema esculentum	Gemsbok bean	https://upload.wikimedia.org/wikipedia/commons/thumb/8/8d/Tylosema_esculenta_pod.PNG/220px-Tylosema_esculenta_pod.PNG
Tylosema fassoglensis	Marama bean	http://palkowitschia.cz/sukulenty/img/travelling/kenya/flora/Tylosema%20fassoglensis%20Ghazi%20Kenya%202014_0192.jpg

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