GOOD GARDENING AND GROWING ROOT AND GRAIN CROPS IN EAST SUDAN

PRACTICAL WAYS OF GROWING LOCAL FOOD PLANTS AND DOING IT WELL

Rotary

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

german cooperation
DEUTSCHE ZUSAMMENARBEIT

WELT HUNGER HILFE
WHH

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

REGISTERED CHARITY

www.foodplantsolutions.org

Good gardening and growing root and grain crops in East Sudan

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 developed by Tasmanian agricultural scientist Bruce French, AO.

Version 1, Feb 2025 (English)

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.

Sunflower

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

Sweet potato

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

Peanut

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

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

Amaranth and maize mixed.

Yams, bananas & vegetables.

Information on gardening

Deficiencies

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

Seed-saving

Pests

Diseases

Are your plants healthy?

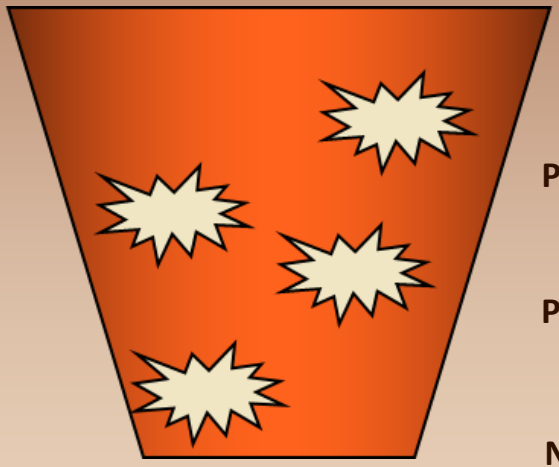
Plants show special signs when they are not growing well.

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

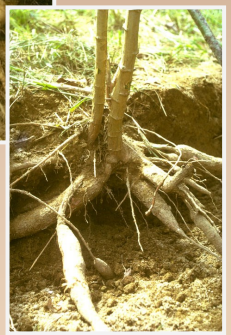
Different plants grow on different soils

Yams need fertile soil

Taros need good soil

Chinese taro can grow on moderate soils

Sweet potato grows on poorer soils



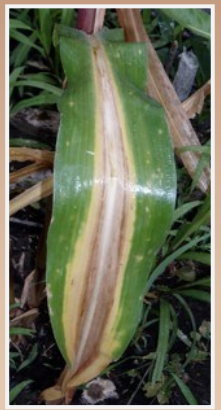
Cassava will produce on poor soils

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.

Legumes provide protein and restore soils

Legumes 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!

Soybean

White lupin

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

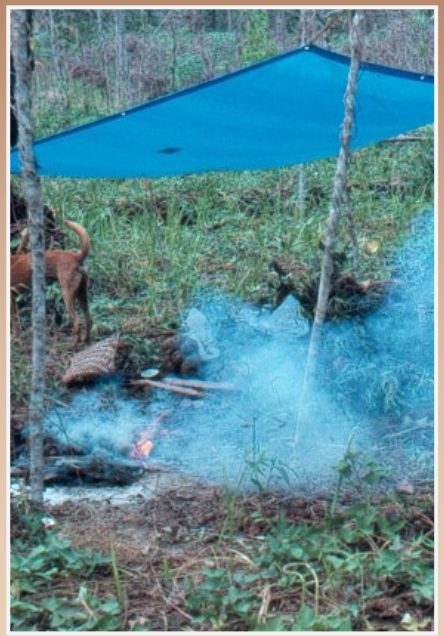
Burning loses nutrients and destroys soils

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 enough to kill weeds and pests.

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.

Save your own seed

Plants grown from seed that is saved locally usually get fewer diseases as they are adapted to the area.

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

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**

Reduce the risk by:

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

Root and grain crops in East Sudan

Many root and grain crops suit the climate of East Sudan.

Maize

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

Sorghum

Sweet potato

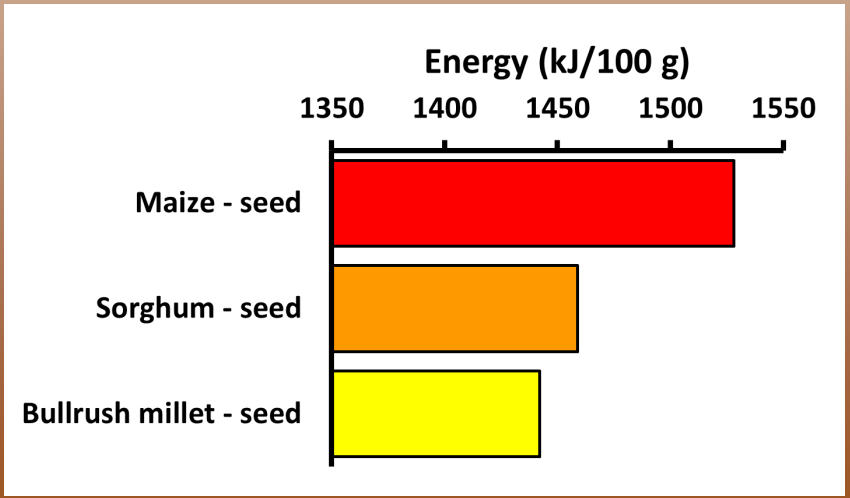
Bullrush millet

Root and grain crops provide energy


Sorghum


Maize

Root and grain crops are important foods for energy.



Growing sweet potato

Sweet potato needs:

- **Air in the soil. Plant them in mounds if the soil is wet or clay.**
- **A soil rich in nutrients, particularly potash (ashes).**
- **A position in full sun.**

There are many different types of sweet potato. Some grow quickly, but only give small amounts of food. Grow a mixture to make meals more interesting.

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.

Maize

- Plants are grown from seed.
- Seeds emerge 2-3 days after sowing in warm soil.
- Cobs are picked when the seeds are full and tassle starts to turn brown.
- The grain can be cooked or ground into flour.

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.

Acknowledgements

This publication was made possible through the generous support of the German Federal Ministry for Economic Cooperation and Development (BMZ) and Welthungerhilfe (WHH).

It would have not been possible without the commitment and support of the various volunteers who have shared the vision and unselfishly given their time to support this project.

Review, layout and formatting - Lyndie Kite, Tom Goninon, John McPhee

For further details contact us at: info@foodplantsolutions.org, website: www.foodplantsolutions.org

Notes

Notes

Notes

Rotary

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

www.foodplantsolutions.org