GOOD GARDENING AND GROWING ROOT AND SEED CROPS IN ETHIOPIA

PRACTICAL WAYS OF GROWING LOCAL FOOD PLANTS AND DOING IT WELL

Rotary

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

N4ED
NUTRITION 4 EDUCATION & DEVELOPMENT

A project of the Rotary Club of Devonport North, District 9830 and Food Plants International

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N4ED NUTRITION 4 EDUCATION & DEVELOPMENT

Nutrition 4 Education & Development (N4ED) is an Ethiopian nonprofit whose mission is to improve children's nutrition and ensure their full cognitive and physical development. The main activities of the organization focus is on giving parents the knowledge, the desire, the self-confidence, and the financial capacity to provide nutritious and balanced food for their children. That is done through nutrition and health education, saving and loan programs, business, life-skill, and technical training, affordable child care services and gardening.

One of N4ED's program is gardening. This program is key to transforming in practice the nutritional concept that the organization teaches to communities with theoretical and demonstration classes. Food Plant Solutions will support N4ED by providing the most appropriate informative resources regarding plants that are full of nutrients and that are easy to cultivate in Ethiopia's environment. This information is about different plants, and describes which part of the plant is edible, the nutrient value of each plant and well as other important information. N4ED will use these guides to implement its gardening projects and also to disseminate it among other stakeholders, the important information on Ethiopian endemic nutritious plants.

For further details about the project please contact us at info@foodplantsolutions.org

We welcome and encourage your support.

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

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.

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.

Sweet potato

Energy food

Health food

Guava

African yam bean

Growth food

Local plants give a regular food supply

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

Taro

Flower-of-an-hour

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

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

Guar bean

Agro-ecology - growing plants a natural way

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

Agro-ecology - 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

Amaranth and maize mixed.

Yams, bananas & vegetables.

Information on gardening

Deficiencies

Seed-saving

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

Pests

Diseases

Are your plants healthy?

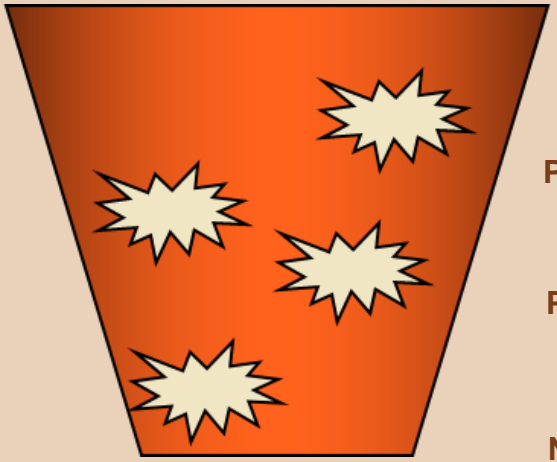
Plants show special signs when they are not growing well.

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 survives on poorer soils.

Sweet potato can grow on moderate 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 yam bean

Velvet bean

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

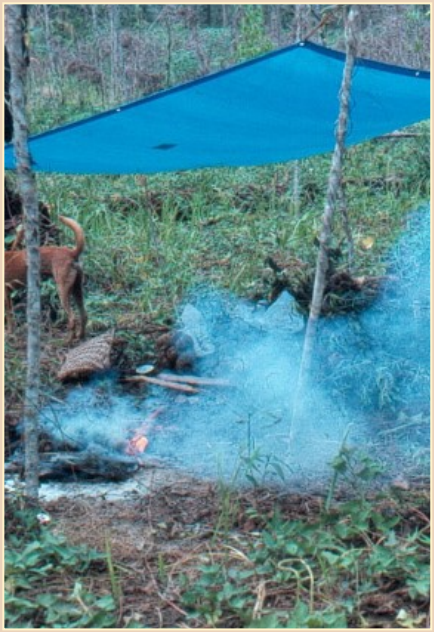
Burning loses nutrients and destroys soils

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 it 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.

Root and seed crops in Ethiopia

Japanese arrowroot

Root and seed crops are perfect plants for hot tropical climates.

Short staple cotton

Yeheb nut

Taro

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

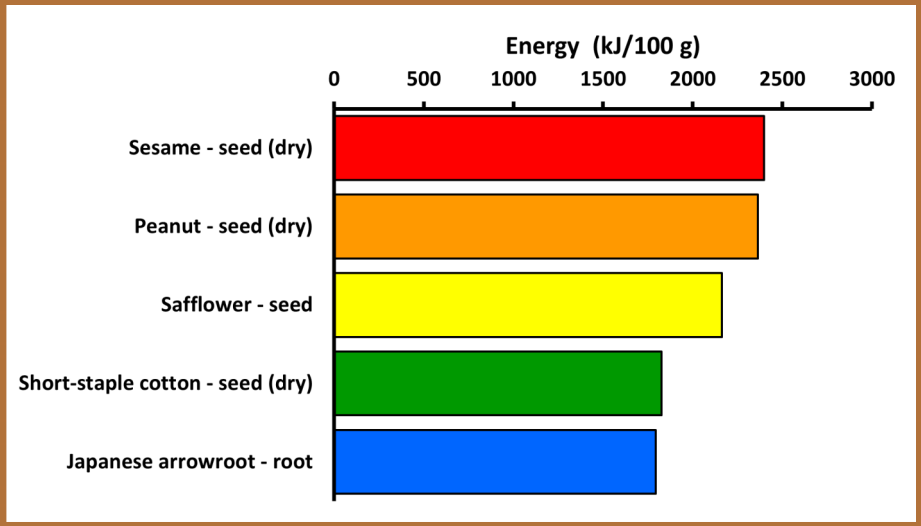
Climbing asparagus

Root and seed crops provide energy

Japanese arrowroot

Short staple cotton

Root and seed crops are important foods for energy.



Growing taro

Chinese 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.

Taro

Chinese taro is best grown from the top of the corm in soils that are not wet.

It takes about 9 months to be ready to eat.

It can grow in moderate shade.

Taro diseases

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

Alomae / Bobone virus

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

Taro blight - a devastating fungal disease.

Taro diseases

Taro shot hole - a minor fungal disease

Taro mosaic virus

Taro diffuse yellow leaf spot

Taro insect pests

White fly

Cluster caterpillar

Taro beetle

Taro insect pests

Aphids sucking sap

Taro hawkmoth

Grasshopper nymphs

Growing sweet potato

Sweet potato needs:

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

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

Growing arrowroot

The rhizomes are used for soups and sauces

Always eat other foods as well as arrowroot.

Plants are grown from rhizomes or suckers. They need a deep, fertile, well drained slightly acidic soil.

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