

Food Plant Solutions Brief Guide to Food Plants in the humid tropics of Togo

Our bodies need nutrients to be healthy and strong - nutritious food provides these:

- Starch:** Starch provides sustained energy for the body.
- Protein:** Protein helps the body repair cells and make new ones. Protein is also important for growth and development in children, teens, and pregnant women. Symptoms of protein deficiency include wasting and shrinkage of muscle tissue, and slow growth (in children).
- Vitamin A:** Vitamin A is very important for eyesight and fighting disease, particularly in infants, young children and pregnant women. People who are short of Vitamin A have trouble seeing at night.
- Vitamin C:** Vitamin C helps us avoid sickness, heal wounds, prevent infections and absorb iron from food. Severe vitamin C deficiency increases the risk of scurvy with symptoms such as inflammation of the gums, scaly skin, nosebleed and painful joints.
- Iron:** Iron is important because it helps red blood cells carry oxygen from the lungs to the rest of the body. Low levels of iron cause anaemia, which makes us feel fatigued. Iron is also important to maintain healthy cells, skin, hair and nails. Iron is more available when Vitamin C is also present.
- Zinc:** Zinc is particularly important for the health of young children and teenagers, and to help recovery from illness. It is needed for the body's immune system to work properly. It plays a role in cell division, cell growth, wound healing, and the breakdown of carbohydrates. Zinc is also needed for the senses of smell and taste. Zinc deficiency is characterized by stunted growth, loss of appetite, and impaired immune function.



Starting a garden

PLAN:

Identify a suitable location for the garden. Factors to consider include:

A site that receives 6-8 hours a day of sunlight and is not shaded by buildings or trees.

Easy access – a garden that is difficult to get to will not be maintained.

Protection from predators like native animals. If this is an issue, consider what can be used as a barrier and install it before planting.

Adequate and easily accessed water, whether it be a garden hose or a watering can.

TOOLS AND EQUIPMENT:

What do you need to turn over the soil, to plant seeds and seedlings (e.g. spade, hand trowel, hoe) and to move the soil to cover seed (e.g. rake). Can you borrow tools to reduce your start-up costs?

SIZE:

Gardens can be all different sizes. Plan the size of your garden – what space is available and how much time do you have? Start small and increase the area as you become more confident. If space is limited, remember plants can be successfully grown in containers or pots.

BUILD:

Clear the area, removing any existing plants and large weeds (turn the soil – dig, lift and turn it over onto itself). Once the soil has been loosened,

spread compost and work it into the soil. Avoid stepping on freshly turned soil, as this will compact the soil and undo your hard work. Once the digging is complete, smooth the surface with a rake and water thoroughly. Allow the bed to rest for several days before planting. Use a good quality potting mix if using pots and containers.

PLANT:

Seeds and seedlings can be purchased from nurseries, garden centres and most hardware stores. A packet of seeds will grow a lot of seedlings but take longer to mature than transplanted seedlings. Plant seeds and seedlings in accordance with their specific directions and apply sufficient water to ensure the soil around the seeds and/or seedling roots is moist. Consider how tall and wide each plant will grow when planning the space between plants. Information on seed packets or seedling labels will indicate the appropriate distance between neighbouring plants. Add a thick layer of mulch around seedlings to help keep the soil moist. Make small signs to stick in the ground to show what you have planted.

MAINTAIN:

Plants need regular watering, which ideally should occur in the morning, never in the heat of the day. Weeds will compete with the plants for nutrients and water, so it is important to keep them to a minimum. Hand weeding and adding mulch around seedlings will help keep weeds under control.

Starchy Staples provide energy and dietary fibre

Common name: Greater yam

Scientific name: *Dioscorea alata*

Cultivation: For general food production, use top pieces of the tuber after they have sprouted for planting. Use a branched stick to support the vine and space plants about 1 m apart. Given the large diversity of cultivars of greater yam, for efficient production, varieties need to be chosen which have regular rounded tuber shapes for easier harvesting and preparation; also select varieties with a stable yield and less susceptibility to leaf spot and virus. Colour, cooking quality, storage ability, texture and other qualities need to be considered. The time to maturity ranges from 5 months in warmer climates to 9-10 months when cooler. Yams will store well for over 6 months in a dry, dark, well ventilated shed.

Use: The tubers are boiled or baked. They can be roasted, fried or mashed. The aerial tubers or bulbils are also cooked and eaten.

Nutrients: tuber: vit A, vit C, zinc

Common name: Cassava

Scientific name: *Manihot esculenta*

Cultivation: Cassava is planted from sections of the stalk. Sections about 15-20 cm long of the more mature woody stem are cut and stuck into the ground. They can be completely buried or put at almost any angle. Roots form and leaves start to sprout from the stalk. It can be planted at any time of the year but to get started it needs moisture so is often planted near the beginning of the wet season. Once established it can survive for several months without rain.

Use: The tubers are eaten after thorough cooking. They are boiled, roasted, or made into flour. The starch is used in puddings, soups, and dumplings. Young leaves are edible after cooking. They are also sometimes dried and stored. Seeds are also eaten.

Nutrients: tuber: energy, zinc; leaf: protein, vit A, vit C, iron.

Common name: Bullrush millet

Scientific name: *Pennisetum glaucum*

Cultivation: Plants are grown from seed. It is usually sown directly into the field. The plant density is adjusted to suit rainfall and soil fertility. The spacing is 45 cm apart up to 200 cm apart. It is also intercropped with other crops such as cowpea, sorghum and peanut. Crops are normally weeded 2 or 3 times.

Use: The seeds are eaten like rice. They are also ground into flour and made into bread and cakes and porridge. They are mixed with other grains and seeds to make fermented foods. Some kinds have sweet stalks that are chewed. The young ears can be roasted and eaten like sweet corn. The plant can also be infested by a fungus which is eaten.

Nutrients: seed: energy, protein, iron, zinc

Legumes provide protein for growth

Common name: Pigeon pea

Scientific name: *Cajanus cajan*

Cultivation: They are grown from seeds. It is best to sow seeds where the plants are to grow. Seeds normally germinate easily and well. Before sowing seed, it helps to soak them in cold water. A spacing of 1.5 m x 1.5 m is suitable. Plants can be cut back and allowed to re-grow. Plants can also be grown from cuttings.

Use: Young leaves, shoots and pods are eaten. The pods can be used in curries. The leaves and shoots are used as potherbs. Young seeds are cooked and eaten like peas. Ripe seeds are also cooked and eaten in soups and curries. Bean sprouts can be produced and eaten.

Nutrients: seed: energy, protein, vit A, iron

Common name: Lima bean

Scientific name: *Phaseolus lunatus*

Cultivation: Coloured seeds are often hard to get to grow but white seeded kinds grow easily. Sow 3-4 seeds in a hill and put a stick 2-3 m tall in the middle. Hills should be about 1 m apart. Seeds should be 2-4 cm deep.

Use: The leaves, young pods and seeds are all eaten. The seeds are eaten fresh or after drying and are fried in oil. Dried beans are boiled or baked and can be used in soups and stews. The seeds are sometimes grown as bean sprouts then cooked and eaten. **Caution:** Some kinds have poison (hydrocyanic acid). This is destroyed by thorough cooking. The beans contain a protein inhibitor but this is also destroyed by cooking.

Nutrients: seed (cooked): energy, protein, iron, zinc

Common name: Cowpea

Scientific name: *Vigna unguiculata*

Cultivation: It is grown from seeds. Seed collection is easy. Seeds remain viable for several years if carefully stored.

Use: Young leaves, young pods and ripe seeds are all eaten. They can be steamed, boiled & stir-fried. The leaves can be dried and stored. Dried seeds are used in soups or stews and ground into flour or fermented. Seeds are used for bean sprouts. Roasted seeds are used as a coffee substitute.

Nutrients: seed: energy, protein, iron; leaf: vit A, vit C, iron; pod: vit C



Leafy greens are a source of iron

Common name: Edible hibiscus

Scientific name: *Abelmoschus manihot*

Cultivation: It is grown from fresh green stems about 25 cm long that are stuck in the ground. Narrow leaf types compete poorly with weeds, so may be intercropped with sweet potato. Fertile soil is needed. Growth and colour of the leaves can be improved by spraying each 2-3 weeks with a 0.5% solution of urea dissolved in water. Picking out the tips of branches encourages the plant to produce more branches and leaves. Over picking will slow down growth. If the soil is very fertile, older bushes can be chopped off, leaving the stump to re-grow into a new bush.

Use: Young leaves are cooked and eaten. They are slimy unless steamed or fried. The root is boiled with pork to make a broth. Young fruit are cooked and eaten. They can be dried and ground to a powder. The fruit make dishes go slimy.

Nutrients: leaf: energy, protein, vit A, vit C, iron, zinc

Common name: Indian spinach

Scientific name: *Basella alba*

Cultivation: It can be grown from seeds or cuttings 20-25 cm long. A spacing of 1 m is suitable. Plants grown from seed are more productive than those from cuttings. Partial shade, rich fertile soil, and adequate moisture favour abundant leaf production. It is responsive to nitrogen fertiliser. Light shade gives bigger leaves. It requires a trellis to climb over. Frequent bud picking encourages branching.

Use: The leaves can be eaten raw in salads or cooked like a vegetable. They are also dried and stored. When fresh they can be stored for 4-5 days. The young shoots and leaves are eaten cooked. They are somewhat slimy. In soups and stews the mucilage can be used as thickening. The purple colour of fruit is harmless and is used to colour vegetables and agar-agar. Some lemon juice added to the dye enhances the colour.

Nutrients: energy, protein, vit A, vit C, iron, zinc

Common name: Jute, Bush Okra

Scientific name: *Corchorus olitorius*

Cultivation: Plants grow from seed, and they can be transplanted. Seeds are often broadcast into fine seed beds at the beginning of the wet season. Mixing the small seeds with sand makes it easier to sow them evenly. Often seeds are slow to start growing. This can be overcome by soaking them in hot water. A spacing of 20-30 cm between plants is suitable. For vigorous varieties this could be increased to 45-50 cm. Seeds are saved from pods for re-sowing.

Use: The young leaves and stem tops are eaten cooked. (They are slimy unless fried.) They are also used to make a thick soup. Leaves can be sun dried, pounded to flour, then stored for a significant time.

Nutrients: leaf (raw): energy, protein, vit A, vit C, iron

Fruit are an important source of vitamins and dietary fibre

Common name: Canteloupe

Scientific name: *Cucumis melo*

Cultivation: They are grown from seed. The seeds are planted about 1-4 cm deep. Plants need to be 1-2 m apart. Seedlings can be transplanted when about 10-15 cm tall.

Use: The ripe fruit are eaten raw. They are also dried, candied and made into jams, jellies and preserves. The seeds are sometimes eaten roasted. The seeds are blended with fruit juice to form a drink. Sometimes the immature fruit are cooked as a vegetable. The seeds contain an edible light oil. The young leaves are eaten as a potherb.

Nutrients: seed: energy, protein; fruit: vit A, vit C

Common name: Mobola plum

Scientific name: *Parinari curatellifolia*

Cultivation: Plants can be grown from seeds which should be collected fresh from fruit on the tree. The flesh is removed and the seeds dried in the shade. The seeds are sown shallow. The seedlings need to be transplanted carefully to avoid damage to the taproot. They can be transplanted after 2 years. Trees from seed can reach 3.9 m after 9 years. Fruit production often only occurs every second year. Fruit matures in 250 days.

Use: The fruit are gathered after they fall and eaten. The skin and seeds are discarded but the pulp eaten. The fruit are used to make drinks. The seeds are used for flavouring and as raw nuts. They are also pounded for soup.

Nutrients: nut: energy, protein, iron, zinc; fruit: energy, vit C

Common name: Gumvine

Scientific name: *Saba senegalensis*

Cultivation: Plants are grown from seeds. It is a creeper or liana that grows over 40 m long. The fruit are oval with yellow pulp that is sweet-sour, soft and edible.

Use: The fruit are eaten raw. They are also used for drinks.

Nutrients: fruit: vit C, iron



Vegetables are an important source of vitamins and dietary fibre

Common name: Pumpkin

Scientific name: *Cucurbita moschata*

Cultivation: Plants are grown from seed. They can be grown as seedlings and then transplanted. Fruit matures in 70-180 days after sowing depending on variety.

Use: The fruit is eaten boiled, fried or baked. It can be mashed and used in pies, soups, bread and cakes. It can be dried, ground into flour and used for bread. The young leaves and flowers are edible. They can also be dried and stored. The seeds are eaten roasted either plain or in salt.

Nutrients: leaf: protein, vit A, vit C, iron; fruit: vit C; seed: energy, protein, iron

Common name: Sweet potato

Scientific name: *Ipomoea batatas*

Cultivation: Vine cuttings are used for planting. In grassland soils it is grown in mounds, ridges, or other raised beds. In bush fallow, it is mostly planted in undug loose soils. It needs a sunny position. Tubers will not form if the ground is waterlogged when tubers start to develop. Sweet potatoes are not tolerant to shading.

Use: Tubers are boiled or baked. They can be steamed, fried, mashed, or dried. They can be used in noodles. The chopped and dried tubers can be boiled with rice or ground into flour and mixed with wheat flour to make cakes or bread. The young leaves are edible.

Nutrients: tuber: energy, vit A

Common name: Mung bean

Scientific name: *Vigna radiata*

Cultivation: Plants are grown from seed. In some areas these are broadcast while for small plots often 2-3 seeds are sown in holes 50-60 cm apart. It normally requires phosphorus fertiliser for adequate growth. Seeds germinate in 3-5 days.

Use: Seeds are eaten ripe. They are eaten raw or roasted. They are added to soups and stews. They are also fermented. Young pods can be eaten. Young leaves can be eaten. The seeds can be germinated for sprouts. These are used in salads and stir-fried dishes.

Nutrients: seed: energy, protein, vit A, iron



Acknowledgements:

This guide is based on information from the Food Plants International (FPI) database, "Edible Plants of the World", developed by Tasmanian agricultural scientist Bruce French AO. "Food Plant Solutions Brief Guide to Food Plants in the humid

tropics of Togo" is a limited selection of food plants intended as a **Draft Guide only** to identify some local food plants that have high levels of nutrients that are important to human nutrition. This guide has been developed with the best intention to create interest and improve understanding of the important local food plants in the tropical region of Togo. It is not a comprehensive guide of food plants for Togo. Other important nutritious plants may be equally useful. Please contact Food Plant Solutions if you would like further information about these, or more detailed information about the ones selected.

Food Plant Solutions Rotary Action Group was initiated by the Rotary Club of Devonport North to assist in creating awareness of the edible plant database developed by Food Plants International, and its potential in addressing malnutrition and food security in any country of the world. In June 2007, Food Plant Solutions was established as a project of Rotary District 9830, the Rotary Club of Devonport North and Food Plants International. The primary objective of the project is to increase awareness and understanding of the vast food resource that exists in the form of local plants, which are well adapted to the prevailing conditions in which they are to be grown, and how this resource may be used to address hunger, malnutrition and food security. For more information, visit the website www.foodplantsolutions.org or email info@foodplantsolutions.org.

Disclaimer: This Guide has been produced using information from the "Edible Plants of the World" database compiled by Bruce French of Food Plants International. Although great care has been taken by Food Plants International and Food Plant Solutions, neither organisation, or the people involved in the compilation of the database or this Field Guide:

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- assume responsibility for sickness, death or other harmful effects resulting from eating or using any plant described in the database or this Brief Guide.

Always be sure you have the correct plant and undertake proper preparation methods.

Compost - if it has lived once, it can
live again.

