Important Food Plants for Lowland Nigeria

Bruce R French

Local food plants with high nutritional value for sustainable food security

LEARN GROW

" Helping the Hungry Feed Themselves"

A Project of the Rotary Club of Devonport North District 9830
& Food Plants International

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This publication has been produced for a Learn♦Grow™ project in Nigeria.

It is available as a pdf book on the Learn♦Grow™ website (www.learngrow.org) and the Food Plants International website (www.foodplantsinternational.com)

Learn♦Grow™

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

District 9600 & Food Plants International

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Nothing would have been possible without the commitment and support of the volunteers, some affiliated with Rotary Clubs, and some not, who have shared the vision, and unselfishly given their time and energy over several years to support the Learn♦Grow project.

About Learn♦Grow

Learn♦Grow 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, Learn♦Grow was established as a project of Rotary District 9830. Food Plants International is pleased to be working with the Rotary Club of Devonport and Rotary District 9830 in the Learn♦Grow project. 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, well adapted to the prevailing conditions where they naturally occur, and how this resource may be used to address malnutrition and food security. For more information, visit the website www.learngrow.org.

Learn♦Grow

The main aim of Learn Grow projects is to encourage people to use highly nutritious local or well-adapted food plants to meet their own daily food requirements. There are thousands of local food plants that meet these criteria and although known locally in villages have often been regarded as second rate and not received the attention they deserve. Many of these can be grown more productively and used more effectively.

In place of these attractive, well suited local plants, there has been a focus on "Western" or introduced food plants and this often results in less nutritious foods that need to be artificially supported with pesticides and sprays and fertilisers mainly because they are the wrong plant in the wrong place being grown by wrong methods.

Often traditional food plants can be grown in more ecologically sound and stable production systems and world wide there is growing excitement about re-discovering how nutritious and good these local foods are. Many of them not only have higher levels of nutrients for growth of healthy bodies but often have additional benefits for general health and these are now called "functional foods" by experts to indicate the other functions they perform as well as simply providing basic nutrients.

To go in this direction, progress is sometimes slow and many of these plants often do not even have a common name outside the local village language. This makes it hard to check what someone in some other country has already discovered about these plants. That is why a computerised database has been produced covering almost all the edible plants of the world (23,400 species) to enable people to find some of this information and start to make it better known and to put it into practice. This is available freely or cheaply on computer disk.

But at a more practical level we need to start to get attractive information available in printed form to help people to recognise and feel proud of these plants. This can then encourage people to share their own experience and wisdom as well as to find out new information from other places. Thankfully in Nigeria the International Institute of Tropical Agriculture has done lots of research and has good local information.

Good gardening

It has become popular to plant a large garden in rows using only one variety of plant. Unless large machines are used, where this method of production has to be used, it is much better to

grow a mixture of varieties or several different crops all grown together in the one garden bed. This is the way plants grow in nature and this method of farming is called agro-ecology. It is a very good method or cropping for small producers and usually there is less insect and disease damage giving ore stable production. It normally means fewer weeds grow as there are not spaces left between rows.

This system of gardening also helps protect the soil. Conservation agriculture is a method where people are encouraged to dig the soil less, not leave it bare where it is exposed to the sun and rain and to use mulches and cover crops to return nutrients and to protect soil and moisture.

Nigeria's weather

Most of the lowlands of Nigeria have a hot, humid, tropical climate. The two main seasons are wet and dry, with the wet season extending from April to October. Most gardens are planted at the beginning of the wet season and usually it is at the end of the dry season that food is in short supply. Using a range of plants and including trees and nut crops as well as having storable food can help bridge this food shortage at the end of the dry season. The rainfall is about 180 cm in the west and up to 430 cm in the east. Temperatures get colder and the rainfall gets less inland.

Annual food crops suitable for this climate

Starchy staple crops

English or common name	***Scientific name***
Great yam	*Dioscorea alata*
Yellow Guinea yam	*Dioscorea cayenensis*
White Guinea yam	*Dioscorea cayenensis var. rotundata*
Cassav*a*	*Manihot esculentum*
Banana	*Musa spp.*
Sweet potato	*Ipomoea batatas*

Leafy greens

English or common name	***Scientific name***
Okra	*Abelmoschus esculentus*
Amaranthus	Amaranthus spp.
Spiderplant	*Cleome gynandra*
Jute	*Corchorus olitorius*
Broad bologi	*Basella alba*
Lagos bologi	*Talinum triangulare*
Sierra Leone bologi	*Crassocephalum biafrae*
Okinawa spinach	*Crassocephalum crepidioides*
Nightshade	*Solanum americanum & S. nigrum*
Bitter leaf	*Vernonia amygdalina*
Kale	*Brassica oleracea var. acephala*
Cock's comb	*Celosia argentea*

Vegetables

English name	**Scientific name**
Smooth loofah	*Luffa cylindrica*
Angled loofah	*Luffa acutangula*
Eggplant	*Solanum melongena*
Snake gourd	*Trichosanthes cucumerina*
African eggplant	*Solanum macrocarpon*
Shallot	*Allium cepa var. aggregatum*
Fluted pumpkin	*Telfairea occidentalis*

Beans

English or common name	***Scientific name***
Snake bean	*Vigna unguiculata var. sesquipedalis*
Lima bean	*Phaseolus lunatus*
Cowpea	*Vigna unguiculata var. unguiculata*
Soybean	*Glycine max*
Bambara groundnut	*Vigna subterranea*
Pigeon pea	*Cajanus cajan*
Peanut	*Arachis hypogea*

Fruit

English or common name	***Scientific name***
Boabab	*Adansonia digitata*
Pawpaw	*Carica papaya*
Bush butter tree	*Dacryodes edulis*
African oil palm	*Elaeis guineensis*
Milk plum	*Englerophytum magalismontanum*
African mangosteen	*Garcinia livingstonei*
Mango	*Mangifera indica*
Mobola plum	*Parinari curatellifolia ssp. mobola*
Maroola plum	*Scleroycarya birrea subsp. caffra*
African orange	*Strychnos spinosa*
Sugar plum	*Uapaca guineensis*

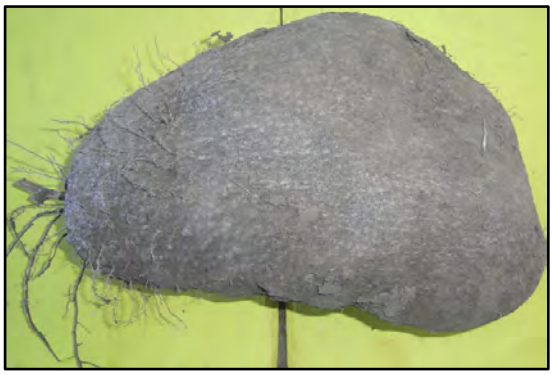
Nuts

English or common name	***Scientific name***
Gingerbread palm	*Hyphaene thebaica*
Bush mango	*Irvingia gabonensis*
African apricot	*Mammea africana*
Butter tree	*Pentadesma butyracea*
Awusa nut	*Tetracarpidium conophorum*

Yams

Greater yam (*Dioscorea alata*) is probably the most widely grown yam in the tropical world but is probably not the most important yam in Nigeria. Yams suit hot humid places with a season dry period because they store well.

White Guinea yam (*Dioscorea cayensis* var. *rotundata*) is the most popular yam in Nigeria. It takes about 8-10 months to grow and can be stored for about 2 months.



Lesser yam (*Dioscorea esculenta*) is an Asian species that takes about 9 months to grow and will only store for about 3 months but it produces several tubers under one vine and there are several attractive and very high yielding varieties. Vines have thorns near the ground.

Other starchy staple crops

Banana (Musa spp.) Cooking bananas or plantains suit seasonally dry tropical places are are very important in some areas of the lowlands of Nigeria.

Cassava (Manihot esculentum) is an easy to grow and popular root crop. It will grow in poor soils and can tolerate dry periods. It must be cooked to remove the cyanide poison and a virus disease has been reducing yields in many places to Africa so planting material should be chosen carefully.

Sweet potato (*Ipomoea batatas*) can grow very rapidly on the humid tropical lowlands and give good yields on moderately fertile soils. It is planted from runners and these need to be in mounds if the soil is likely to be flooded.

Cocoyams (*Xanthosoma sagittifolium*) is a taro family plant that suits hot moist places but it needs to be in a dry or well drained soil. It produces small corms around the side that are eaten.

Taro (*Colocasia esculenta*) is a root crop suited to hot climates but it can develop some serious diseases during the very wet season. It can grow in moist soils. The leaves are also good quality food.

Leafy greens

Okra (*Abelmoschus esculentus*) fruit are eaten but the leaves are also nutritious. They can be slimy but are less so is fried or steamed. They can be sued to thicken soups.

Amaranth (*Amaranthus spp.)* Several species of amaranth are common and popular in Nigeria and are also a very rapidly growing and nutritious leafy green vegetable.

Cleome or spiderplant (*Cleome gynandra*). This very common tropical plant is being re-discovered worldwide as a very easy to grow and highly nutritious leaf vegetable. Improved kinds are also being produced.

Jute (*Corchorus olitorius*). The leaves of this annual leafy plant are popular and nutritious. They are slimy unless fried and can be used to thicken soup. They can be dried and pounded and stored.

Broad bologi (*Basella alba*). This climbing plant has thick dark green leaves and purple berries. It can be grown as an annual plant or climb over trellises and last for a few years. The leaves are usually cooked and are slimy and used to thicken soups.

Lagos bologi (*Talinum triangulare*). This small leafy vegetable has a 3-sided flower stalk. It grows easily in damp places. They are slightly sour and turn a little brown during cooking. They are best steamed.

Okinawan spinach (*Crassocephalum crepidioides*). This leafy green and several other similar *Crassocephalum* species plants are used as vegetables in West Africa. This one is sometimes called thickhead and a similar but climbing one is called Sierra Leone bologi. They are steamed and eaten and also have medicinal benefits.

Nightshade (*Solanum americanum*). This small leafy plant with shiny black berries grows very quickly and the leaves are commonly cooked and eaten in many tropical countries. The berries should only be eaten once very ripe.

Bitter leaf (*Vernonia amygdalina*). This is a very popular leafy vegetable from West Africa that is also exported. It is a woody shrub that can be grown from seeds or cuttings. The leaves can be squeezed to reduce the bitterness and then used in soups.

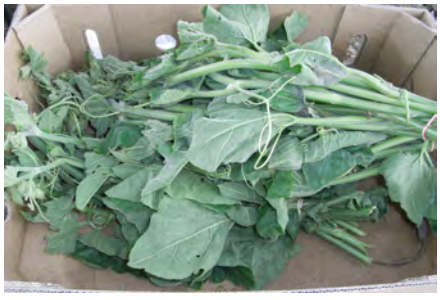
Internet photo from PROTA database

Vegetables

Several pumpkin family plants suit the tropics and can and should be grown from locally selected seeds to help avoid disease problems occur with seeds imported from a different environment. Often the leaves, fruit and seeds can be eaten.

Angled loofah

Smooth loofah



Pumpkin tips

Fluted gourd
Drawing
from
Wikepedia

Beans

Snake bean (*Vigna unguiculata* var. *sesquipedalis*)

This climbing bean suits the hot humid tropical lowlands and gets less pest and disease than some other beans.

Lima bean (*Phaseolus lunatus*). This tall climbing bean can keep growing for a few years. The pods, seeds and leaves can be eaten. It grows better at a slight altitude above sea level.

Cowpea (*Vigna unguiculata* subsp. *unguiculata*). This spreading bean plant is an excellent cover crop for old garden sites protecting and restoring the soil. The pods stick out at an angle. The young leaves, pods and seeds can be eaten.

Soybean (*Glycine max*). Varieties need to be chosen that will flower in the tropics and these are best grown at some altitude above sea level.

Bambara groundnut (*Vigna subterranean*). This African bean puts in seeds in pods under the ground. It can be a bushy or trailing plant. The seeds pods and leaves can be eaten. It can tolerate drier periods.

Pigeon pea (*Cajanus cajan*). This bean grows on a small tree like plant. The plant is excellent at putting down deep roots to find moisture during dry periods and also to restore nutrients to the surface. It suits drier areas and can be grown as a hedge plant. The young pods, seeds and leaves are edible.

Peanut (*Arachis hypogea*). These nuts are also called groundnuts because the pods and seeds are produced underground. They need to be on well-drained soils and preferable in flat beds so the pods properly form underground. Although tasty fresh, the nuts are better used by the body after being roasted.

Fruit

There are lots of local fruit that are enjoyed in Nigeria. Perhaps some of the favourites include:

Boabab (*Adansonia digitata*). This tree grows in the lowlands but suits dry areas.

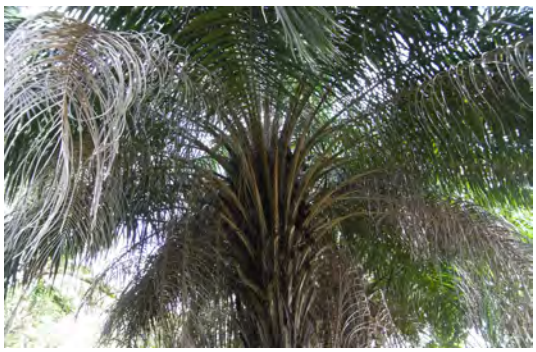
Pawpaw (*Carica papaya*) Pawpaws grow easily and well in the tropical lowlands. Fruit can be round or long. If long fruit are enjoyed, then the male trees that do not produce fruit are not needed as trees will set long fruit without them. The fruit are rich in Vitamin C.

Bush butter tree (*Dacryoides edulis*). This African fruit tree grows well in the lowland rainforest. The fruit can be softened in boiling water for a few minutes. Both male and female trees are needed for fruit.

No photo for

Dacryodes edulis

African oil palm (*Elaeis guineensis*). This important African palm tree produces an edible oil used worldwide. It suits the hot humid tropics.



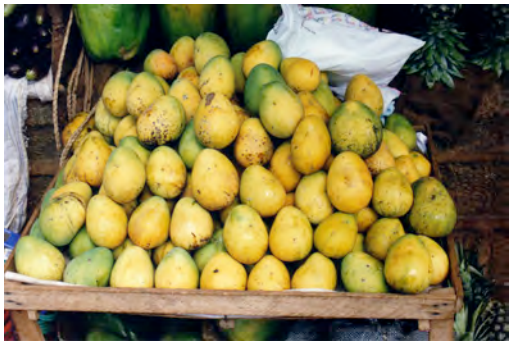
Milk plum (*Englerophytum magalismontanum*) . All the plants in this family have milky sap. It grows in lowland forest and can tolerate some cold. The tree can be grown from seeds or cuttings. Children especially enjoy the fruit.

No photo of

Englerophytum magalismontanum

African mangosteen (*Garcinia livingstonei*). This African member of the Asian mangosteen needs both male and female trees. Trees grow slowly. The fruit can be eaten or used for jams and drinks

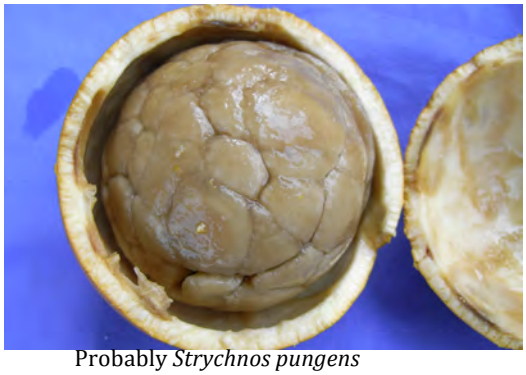
Mango (*Mangifera indica*). This Indian fruit is now grown worldwide in the tropics. If it is very wet at flowering time often fruit are not formed. By careful selection from the several shoots that develop from a seed it is possible to select asexual ones that come up the same as the parent tree.



Mobola plum (*Parinari curatellifolia* subsp. *mobala*). This tropical tree grows in the open forest. It is grown from fresh seeds. The flesh of the fruit is eaten after the skin and seed is removed.

Maroola plum (*Sclerocarya birrea* subsp. *caffra*). This African fruit is becoming well known as Maroola wine. The fruit are also eaten fresh and dried and processed into a range of products. It can be grown from seeds or cuttings.

African orange (*Strychnos spinosa*). Several Strychnos fruits occur in Africa. The flesh of the fruit around the seeds inside the hard shell is eaten. Trees can be grown from seeds or by root cuttings.



Probably *Strychnos pungens*

Sugar plum (*Uapaca guineensis*). Several Uapaca fruits occur in Africa. This one grows in the tropical rainforest along rivers. It needs to be grown from fresh seeds. The fruit are eaten and used for drinks.

Probably *Uapaca kirkiana*

Nuts

A range of plants in Nigeria have seeds and nuts that can be eaten.

Gingerbread palm (*Hyphaene thebaica*). This is a branched palm. It suits drier areas. The fruit and nut can be eaten as well as sap, starch from the trunk and the growing tip.

Bush mango (*Irvingia gabonensis*). The kernel of the seeds is crushed and eaten in a range of dishes. The pulp of the fruit is also eaten. Usually the plant is grown from seeds. It can be grown from cuttings using mist.

No photo of

Irvingia gabonensis

African apricot (*Mammea africana*). This large tree grows in tropical forest. The flesh of the fruit is eaten and the seeds are also eaten. Plants are grown from seeds.

No photo of

Mammea africana

Butter tree (*Pentadesma butyracea*). This evergreen tree grows in damp ground in tropical places. The young seeds are eaten and seeds are used to extract edible fat. The flesh of the fruit is also eaten.

No photo of

Pentadesma butyracea

Awusa nut (*Tetracarpidium conophorum*). This is a shrub or long creeper. It grows in secondary rainforest. It can be grown from seeds. The leaves and fruit are eaten and the nuts are boiled or roasted. They also produce oil.

No photo of

Tetracarpidium conophorum

For information on the many other useful food plants occurring in Nigeria see the Food Plants International database of edible plants of the world available on DVD and also other information on the websites

www.foodplantsinternational.com

and

www.learngrow.ÏòÇ

On the DVD use the "references" to find information in other books published about West Africa plants

In Nigeria there are at least 1,140 edible plant species. Not all of these are yet well known. Many need development as crops and often ways to cook and prepare them could be improved.

The ones above have been suggested as ones that suit the climate, are often already enjoyed, and often have good nutritional value. Both good nutrition and stable food production are achieved by using a range of local or well adapted food plants.

Scientific name	Common name	Edible part	Moisture	Energy KJ	Energy kcal	Protein	Provit A	Provit C	Iron	Zinc
Dioscorea alata	Greater yam	tuber	76.6	323	77	2	18	10	0.8	0.39
Dioscorea cayenensis	Yellow Guinea yam	tuber	80	298		1.5			5.2	
Dioscorea rotundata	White Guinea yam	tuber	80	298		1.5	0.8	10	5.2	0.4
Manihot esculenta	Cassava	leaves	82	382		7.1	57	275	7.6	
Musa sp (A &/or B genome) cv.	Cooking banana	fruit	65.3	510	110	2	113	18.4	0.6	0.1
Ipomoea batatas	Sweet potato	tuber	72	363		1.1	1705	15	0.6	0.3
Abelmoschus esculentus	Okra	leaves	81	235	56	4.4	116	59	0.7	
Amaranthus tricolor	Joseph's coat	leaves	91.7	96	23	2.5	292	43.3	2.3	0.9
Cleome gynandra	Spiderplant	leaves	86.6	142	34	4.8		26	6	
Corchorus olitorius	Jute	leaves	87.2	155		3.4	519	33	3.1	0.8
Basella alba	Broad bologi	leaves	85	202		5	56	100	4	
Talinum triangulare	Waterleaf	leaves	91	105	25	2.4	30	31	5	
Crassocephalum biafrae	Sierra Leone bologi	leaves	79	269		3.2				
Crassocephalum crepidioides	Okinawa spinach	leaves	93.1	76		2.5		10		
Solanum nigrum	Blackberried nightshade	leaves	87	160	38	4.3	70	20	1	
Vernonia amygdalina	Bitterleaf	leaves	83.6	218	52	5.3		50	5	
Gnetum buchholzianum	Okok	leaves	69.8	432	103	6		100	5.6	
Moringa oleifera	Horse radish tree	leaves	87	189	45	4.7	883	31	2	0.2
Luffa cylindrica	Smooth luffa	fruit	94.3	79	19	1.1			0.7	
Luffa acutangula	Angled luffa	fruit	94.6	71	17	0.7			0.5	
Solanum melongena	Eggplant	fruit	91.8	117		0.83	6	1.3	0.4	0.2
Trichosanthes cucumerina	Snake gourd	fruit	95	76	18	0.9	810	6	1	
Solanum macrocarpon	African eggplant	fruit	89	168	40	1.4				
Telfairia occidentalis	Fluted pumpkin	seeds	6	2280	546	20.5				
Vigna unguiculata ssp. sesquipe	Yardlong bean									
Phaseolus lunatus	Lima bean	seed	67.2	515		6.8	37	10.1	2.5	0.8
Vigna unguiculata ssp.unguicula	Cowpea	seeds	75.5	406		3.2	79	2.2	1.1	1
Cajanus cajan	Pigeon pea	seeds	71.8	464		6	13	28.1	1.6	0.8
Vigna subterranea	Bambara groundnut	seeds		1572		18.4				
Arachis hypogea	Peanut	seed dried	4.5	2364		24.3	0	0	2	3
Adansonia digitata	Boabab	fruit	16	1212	290	2.2		360	7.4	
Carica papaya	Papaya	fruit	88	163		0.5	290	54	0.4	0.18
Dacryodes edulis	Bush butter tree	fruit	56.2	1099	263	4.6			0.8	
Elaeis guineensis	African oil palm	seed	28	2247		1.6	18	9	4	
Englerophytum megalismontanu	Milk plum	fruit		404		0.9				
Mangifera indica	Mango	fruit	83	253		0.5	1200	30	0.5	0.04
Garcinia livingstonei	African mangosteen	fruit		254		0.8				
Parinari curatellifolia ssp. mobol	Mobola plum	fruit		535		1.6				
Sclerocarya birrea ssp. caffra	Maroola plum	fruit	91.7	125	30	0.5			0.1	
Parinari curatellifolia ssp. mobol	Mobola plum	seeds		2738		28.7				
Strychnos spinosa	African orange	fruit	79.7	301	72	1.6			0.7	
Uapaca guineensis	Sugar plum	fruit raw	73.4	385	92	1.8				
Hyphaene thebaica	Doum palm	nut dried	6	1651		3.9				
Irvingia gabonensis	African wild mango	nut	4	2918	697	8.5			3.4	
Mammea africana	African apricot	nut dried	5.8	1735		2				
Pentadesma butyracea	Butter tree	seed dried	5.6	2253	539	2.3				
Tetracarpidium conophorum	Awusa nut	seed dried	8.1	1751		28.7				

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