

Starchy staple foods



Corn



Banana



Lesser yam



Rice



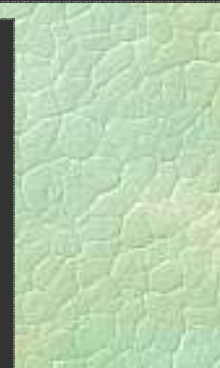
Millet



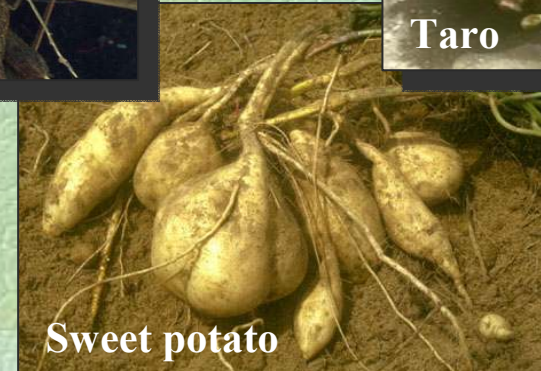
Cassava



Sago



Taro



Sweet potato

Food Plants International

“Helping the Hungry Feed Themselves...”

“...by being good stewards of God’s amazing natural resources”

Starchy staple foods

*Documenting the edible plants of the world and getting the
information back to those who need it most*

For more information see the www.foodplantsinternational.com
website



Compiled by Bruce R. French Dec 2013



Staple foods – a brief introduction

- Everybody has a diet based on a starchy staple food
This provides the energy for living
- The starchy staple can be a root crop like potato, cassava, yam, sweet potato or taro
- Or it can be a cereal like rice, corn, wheat, barley, sorghum, millet, tef, fonio or others
- For some regions the starchy staple is a palm such as sago, or a starchy fruit such as cooking bananas

Caution. Always treat wild or less well known food plants with caution until you are sure it is the correct plant and it has been properly processed.

Choosing a tropical cereal



Sorghum

Tropical medium rainfall



Corn

Tropical high rainfall



Bulrush millet

Tropical very arid



Tef

Tropical highlands



Rice

Monsoonal



Finger millet

Tropical arid

Poaceae

- the grass family



Barley

Hordeum vulgare



Triticale

Tritosecale sp



Oats

Avena sativa



Wheat

Triticum aestivum

There are at least
800 Poaceae
species used for
cereals or edible
shoots

These are
temperate
cereals



Rye

Secale cereale

Poaceae

- The grass family



Job's tears

Coix lachryma-jobi



Pitpit

Setaria palmifolia



Lemon grass

Cymbopogon citratus



Duku

Saccharum edule

Zea mays

There are at least 800
Poaceae species used for
cereals or edible shoots



Corn

*Saccharum
officinarum*

Some tropical
food grasses



Sugarcane

There are
230
edible
bamboos



Bambusa oldhamii

Bambusa vulgaris
cv Buddha



Bambusa tulda



Nastus elatus

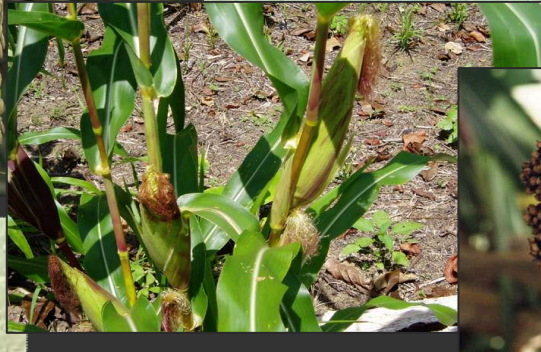
Dendrocalamus asper



Droughts and famines become more serious when people grow the wrong plants



Rice needs lots of water



Corn needs good rainfall



Sorghum needs less water



Finger millet less water



Bulrush millet suits dry areas

Decreasing rainfall

Tropical cereal grains

There are over 480 edible cereals in the Poaceae

Rice - *Oryza sativa*

a tropical monsoonal crop



Malnutrition is a stomach full
of rice!



Rice – the main subsistence crop of the monsoonal tropics



In a water short world we need to
measure yields per water use not
yields per area!





Food preparation in rice cultures



Sorghum - for the semiarid tropics



Sorghum bicolor



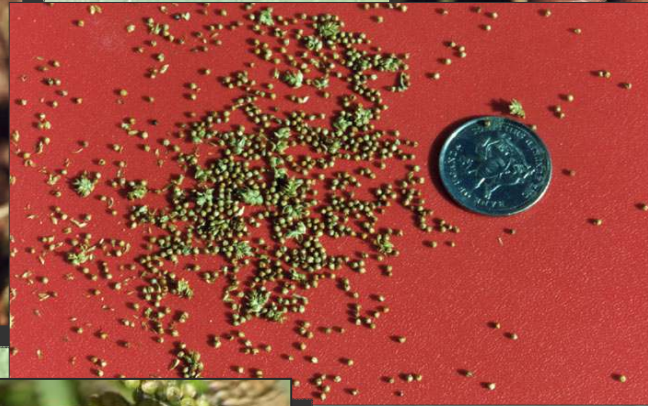
There are
hundreds
of
cultivated
varieties
in Africa



Finger millet



Finger millet suits
drier grassland
areas



Eleusine corocana

Suits arid regions



Important in
Africa and India



Pearl millet

Pennisetum glaucum



Suits very arid
regions



Tef

Eragrostis tef

Commonly used in Ethiopia

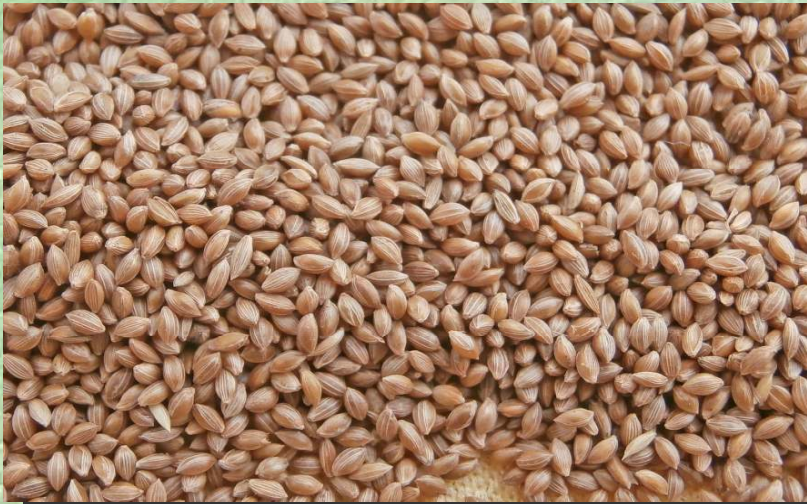


About one million tons a year are produced



Fonio

Digitaria exilis & D. iburua



White Fonio – *Digitaria exilis*



The main food of 3-4 million in the
Sahel in Africa



Black Fonio – *Digitaria iburua*



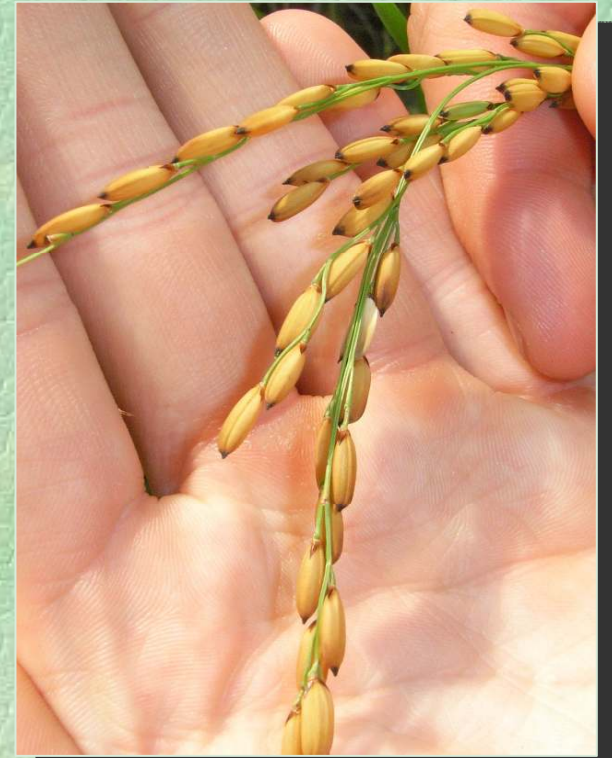
Proso millet — *Panicum mileaceum*



Proso millet or common millet suits warm temperate and subtropical places that are semi-arid

African rice

Oryza glaberrima



Quinoa — *Chenopodium quinoa*



It suits high
altitudes in the
Andes and
temperate
areas



Grain amaranth

Amaranthus caudatus
& *Amaranthus cruentus*



There are about 50 Amaranthus species that are used as food. The leaves and seeds of many are edible and nutritious.



Changing plants to grow on poorer and poorer soils is “mining” the ground



Yams need fertile soil



Taros need good soil



Xanthosoma taro survives on poorer soils



Sweet potato can grow on moderate soils



Cassava will still produce on poor soils

Decreasing soil fertility

Tropical root crops

Cassava - the most common tropical root crop



Nutritious
leaves



Needs cooking to remove cyanide



Virus affected
in Africa



Giant taro

Taro family

There are 212 edible
Araceae species



Elephant foot yam



Colocasia esculenta



Fruit salad fruit



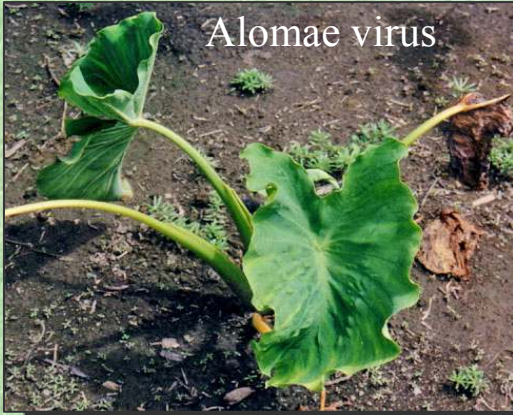
Xanthosoma taro



Swamp taro

Taro

Alomae virus



Taro beetle



Colocasia esculenta



Blight



Tannia

Xanthosoma sagittifolium



Giant taro

Alocasia macrorrhiza

Popular
in the
Pacific



Swamp taro

Cyrtosperma merkusii



A reserve
food in
swamps in
the Pacific



Elephant foot “yam”

Amorphophallus paenifolius



A taro family
plant

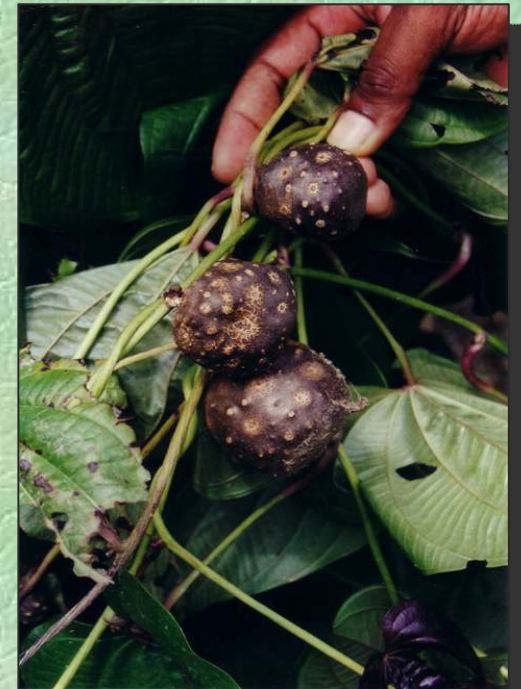




Greater yam

Yams

**There are 136 edible
Dioscoreaceae species**



Potato yam



Lesser yam



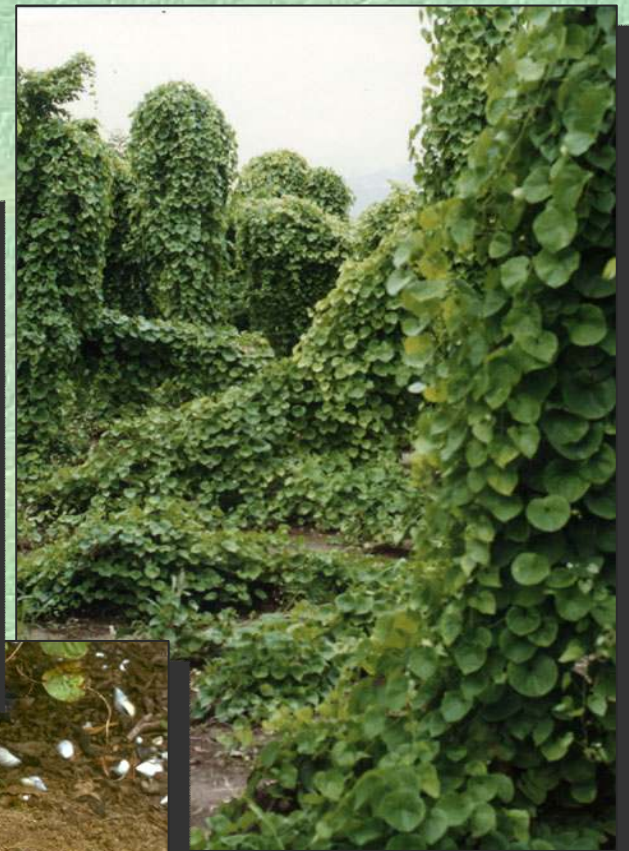
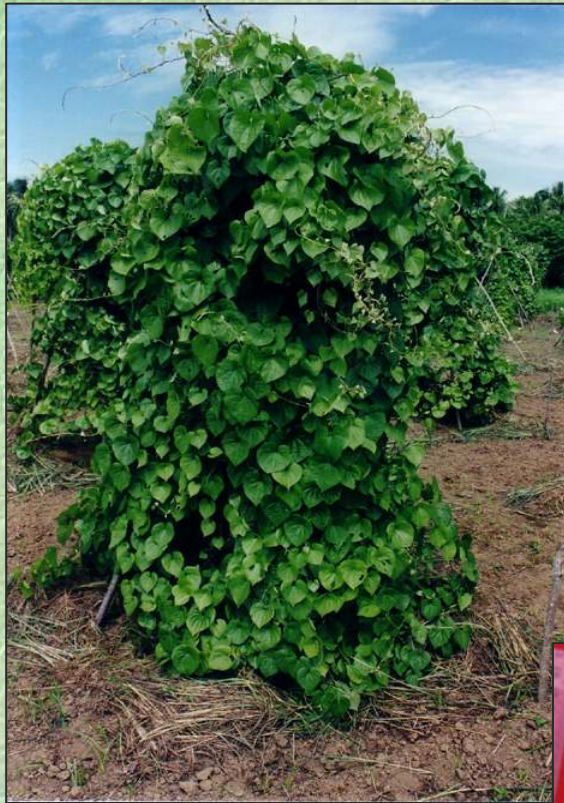
Five leaflet yam



Nummularia yam

Lesser yam

The most
useful and
productive
kinds are in
PNG



Dioscorea esculenta



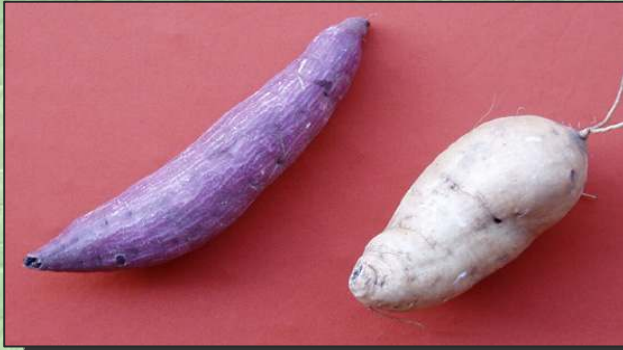
Greater yam

Dioscorea alata



Suits seasonally
wet and dry
tropical climates

Sweet potato



About 90 million
tons produced
globally each year in
the tropics and
subtropics



5,000 different kinds
in PNG



Ipomoea batatas



Ipomoea tuba



**A minor root
crop on the
Papuan
plateau**



**It is grown from
tops of tubers
and produces
long starchy
tubers**



**650 kinds
of bananas**



**A polyploid
hybridised series**



Diploid

Or 2 sets of chromosomes



Triploid

Or 3 sets of chromosomes



Tetraploid

Or 4 sets of chromosomes

A polyploid series – different numbers of chromosomes

AA

AAB

AAAB

Crosses between “A” and “B” parents



By looking at 15 key characteristics it is possible to work out which parents have been involved

A hybrid series



**Bananas are normally
grown from suckers**



**For breeding and
crossing, seeded varieties
are needed**



**Bananas with seeds
and seedlings**



Re-discovering the lost “BB” parent!

For many years the original seeded ‘BB’ parent of bananas was considered lost to history until re-discovered in gardens near Rabaul in Papua New Guinea



Musa sp AA wild

These two seeded species have crossed to give the variety of modern bananas



Musa sp BB wild

Other banana species

There are about 30 Musa or banana species used for food and some have many varieties

Musa schizocarpa



Musa basjoo



Musa maclayi

Sago for tropical swamps



Processing



Planting



Grubs



**Good energy food
but almost no protein
or other nutrients**

Other *Metroxylon* or sago species



Sago – *Metroxylon sagu*



Bougainville sago
Metroxylon salomonense

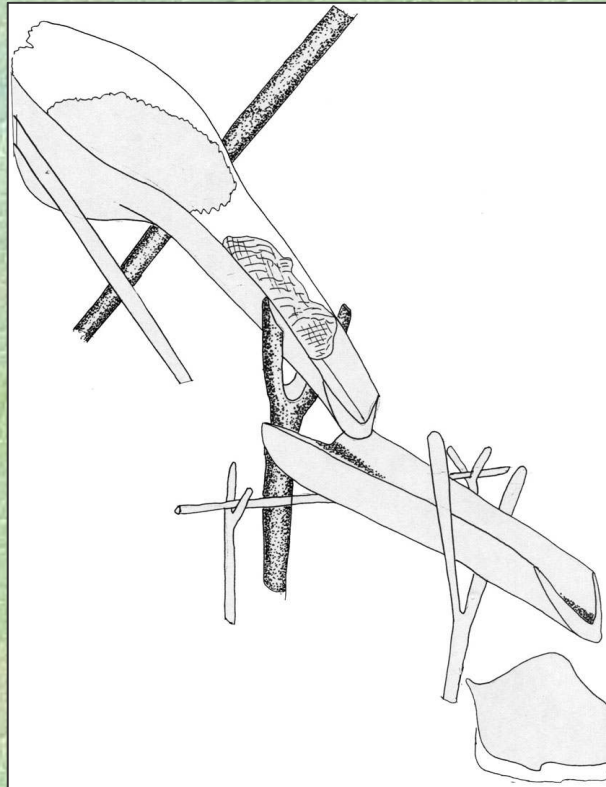


Polynesian sago –
Metroxylon amicarum

There are 6 *Metroxylon* species used for sago starch from their trunks.
Metroxylon sagu and *Metroxyon rumphii* are the same species.

Solomon sago - for feast and famine

Great leaves for houses and no suckers



It is grown from seeds and suits drier ground than sago

Metroxylon salomonense



Queensland arrowroot



Canna edulis



Potatoes - a high altitude tropical crop



In the tropical
lowlands potatoes
won't form
tubers

*Solanum
tuberosum*



**Bacterial
wilt**

To control this
disease potatoes
should not be
planted in rows
and should be
intercropped



Rotting potatoes

Other starchy crops



Fei banana

This banana plant has fruit that stick upwards. The fruit are large and yellow inside. They are cooked. They colour the urine and faeces red.

Some varieties of winged bean, when grown in the hills and with flowers picked off, will form fattened roots. These are good quality eaten roasted.



Winged bean



Polynesian arrowroot

❖ *Popular along tropical coasts*

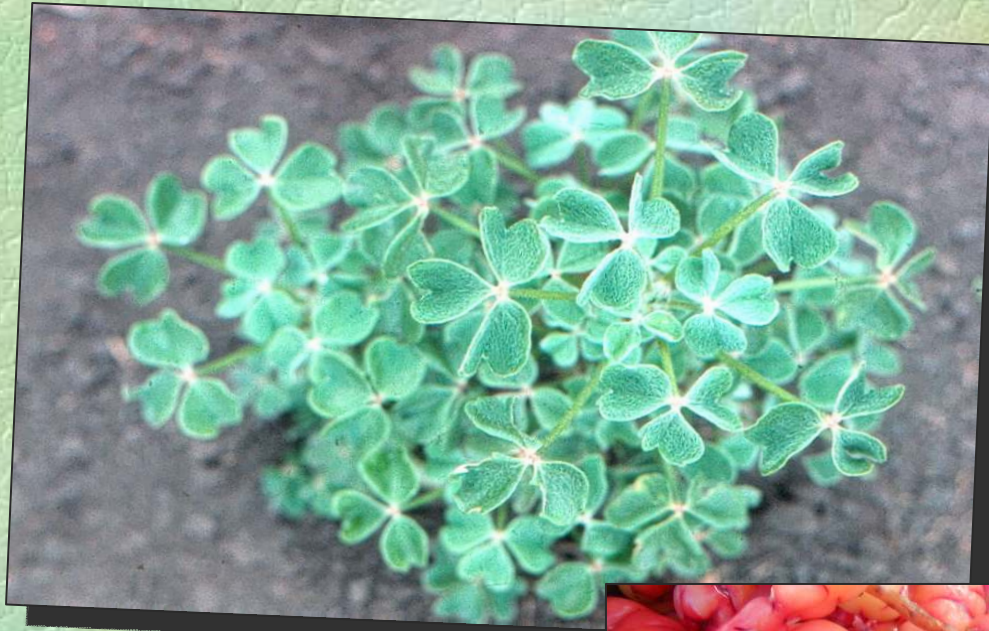


Tacca leontopetaloides

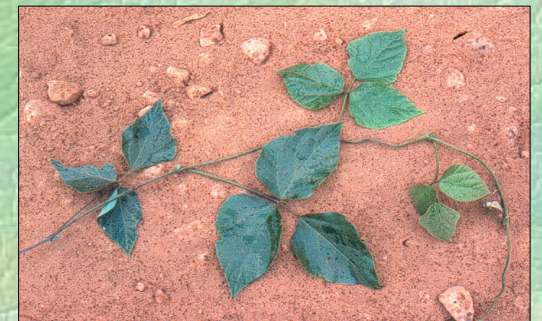


Oca

❖ *A high Andes root crop*



Kudzu - an old bean root crop



Pueraria lobata

Additional information

**For additional information about these plants and the many other staple foods or for publications as pdf books see the Food Plants International website
[www:foodplantsinternational.com](http://www.foodplantsinternational.com)**

They can be downloaded free

Creative Commons Copyright: This licence means you can share it freely as is and with acknowledgement.
Not for commercial use.

