Starchy staple foods


Corn


Banana


Lesser yam


Rice


Millet


Cassava


Taro


Sago


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

Hordeum vulgare

Tritosecale sp

Avena sativa

Triticum aestivum

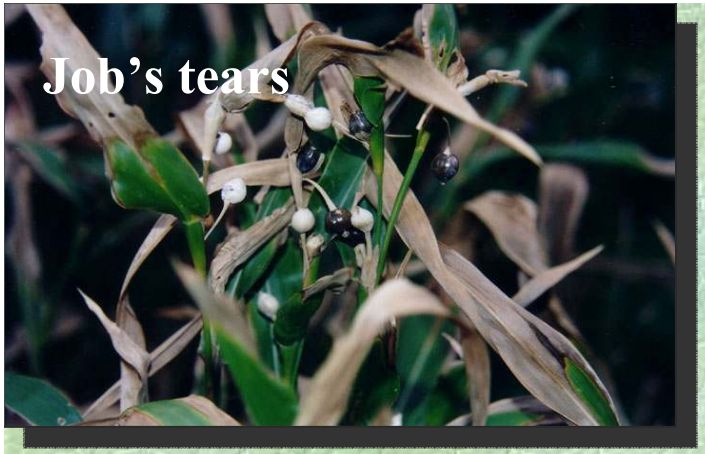
There are at least 800 Poaceae species used for cereals or edible shoots

These are temperate cereals

Secale cereale

Poaceae

- The grass family



Coix lachryma-jobi

Cymbopogon citratus

Setaria palmifolia

Saccharum edule

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

Zea mays

Saccharum officinarum

Some tropical food grasses

There are 230 edible bamboos

Bambusa oldhamii

Bambusa tulda

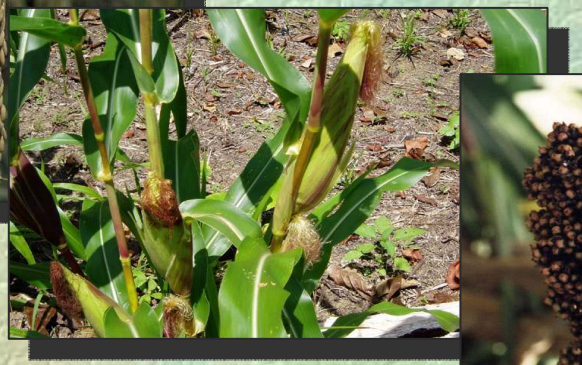
Bambusa vulgaris
cv Buddha

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

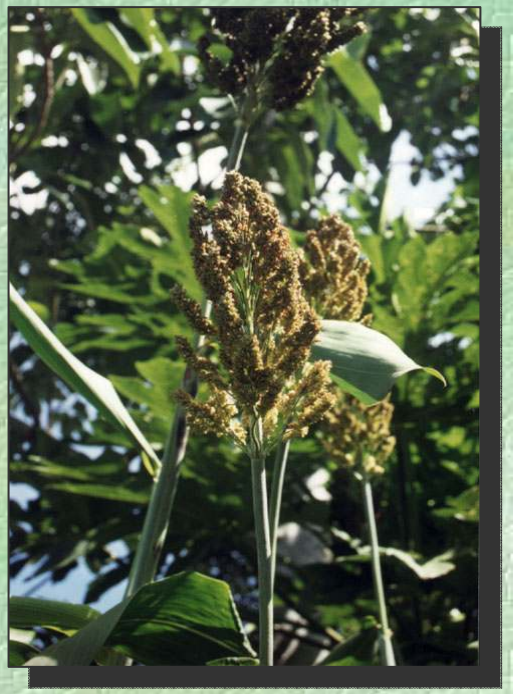
Malnutrition is a stomach full of rice!

Rice - the main subsistence crop of the monsoonal tropics

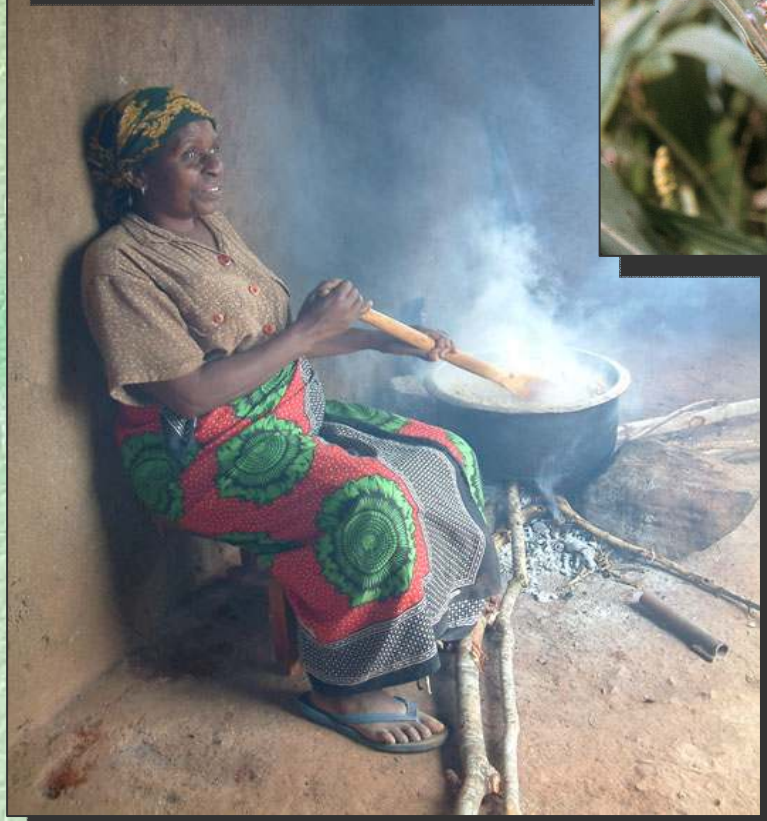
In a water short world we need to measure yields per water use not yields per area!

Food preparation in rice cultures

Sorghum - for the semiarid tropics



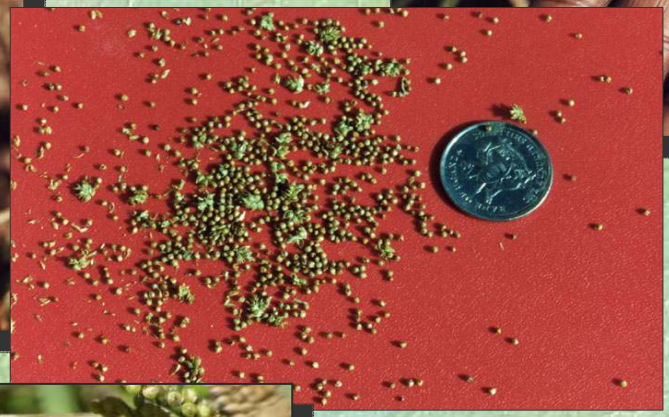
Sorghum bicolor



There are hundreds of cultivated varieties in Africa

Finger millet

Eleusine corocana



Suits arid regions

Finger millet suits drier grassland areas

Important in Africa and India

Pearl millet

Pennisetum glaucum

Suits very arid regions

Tef

Eragrostis tef

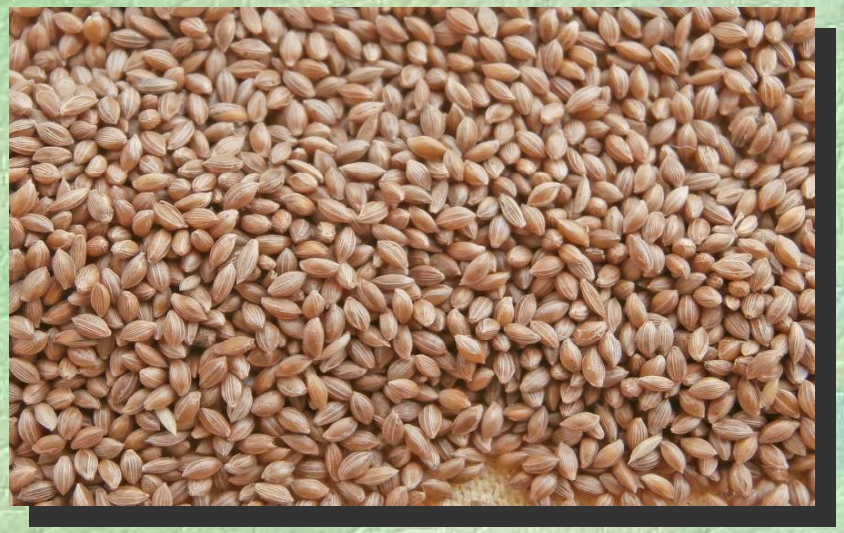
Commonly used in Ethiopia

Photo from Wikipedia

About one million tons a year are produced

Fonio

Digitaria exilis & D. iburua



White Fonio – *Digitaria exilis*

Proso millet *Panicum miliaceum*

Black Fonio – *Digitaria iburua*

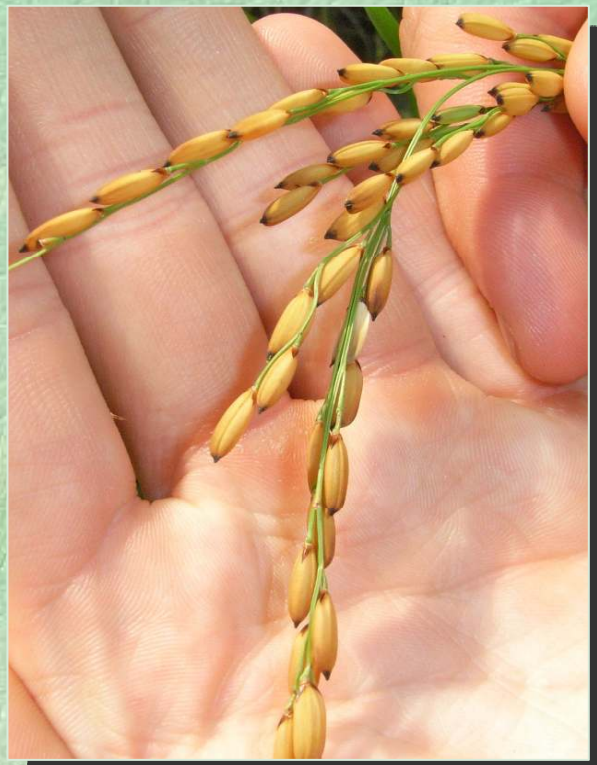
The main food of 3-4 million in the Sahel in Africa

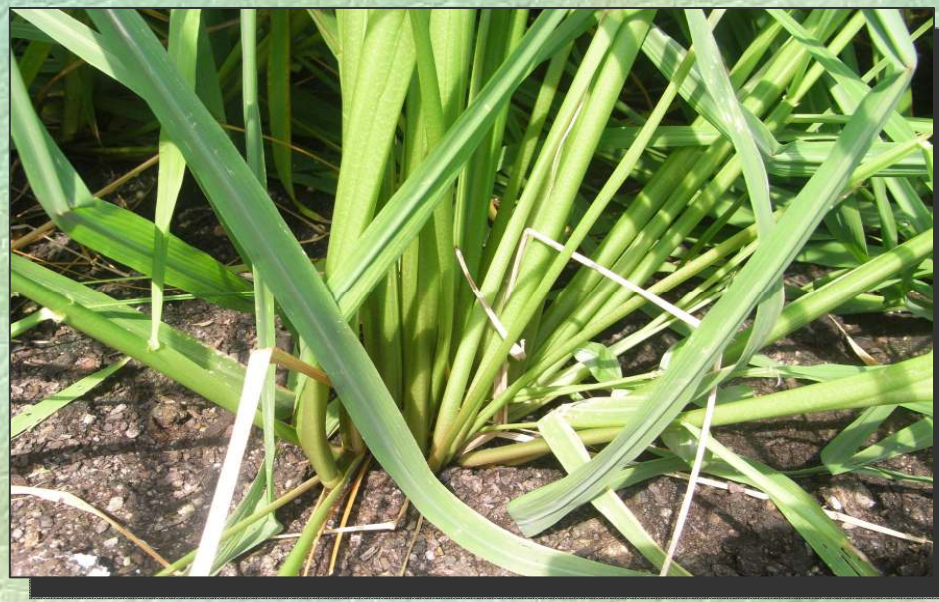
Proso millet – *Panicum mileaceum*

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

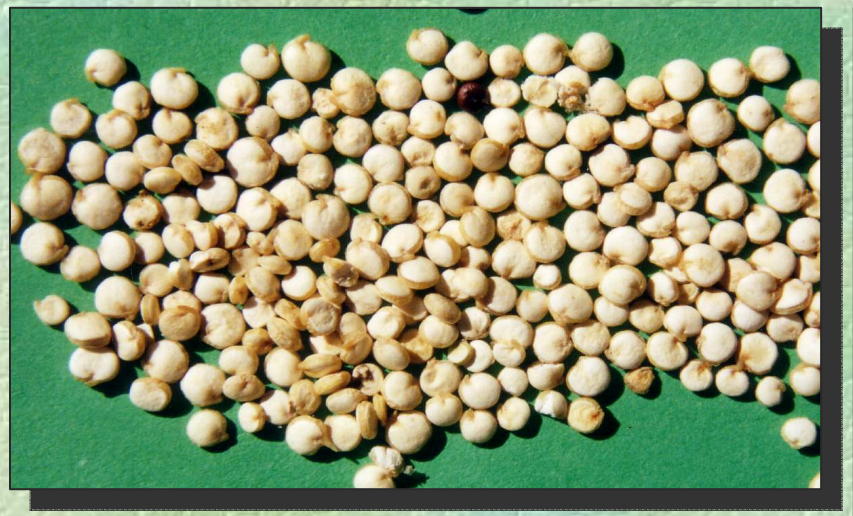
African rice

Oryza glaberrima





Quinoa – *Chenopodium quinoa*



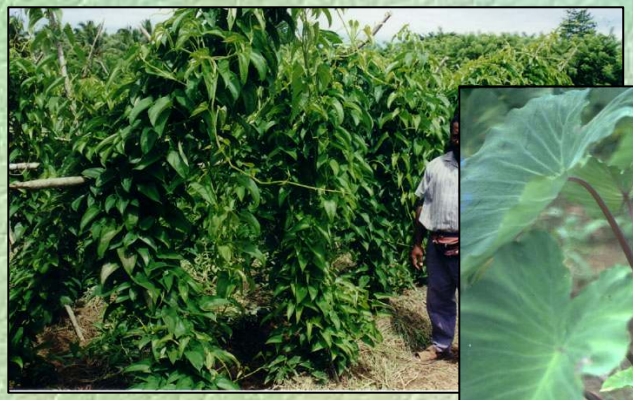
It suits high altitudes in the Andes and temperate areas

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

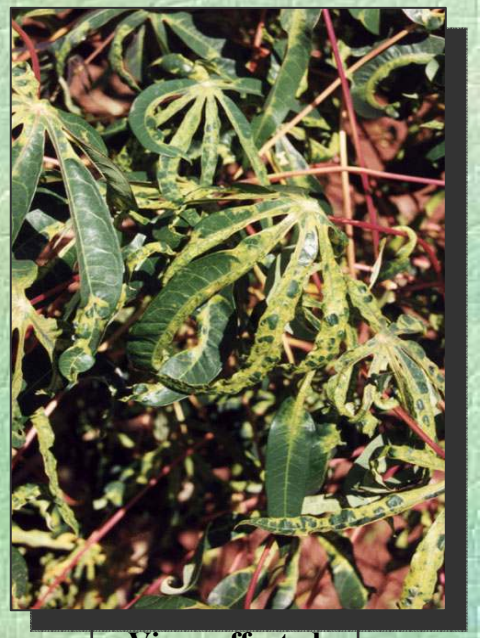
Decreasing soil fertility

Tropical root crops

Cassava - the most common tropical root crop

Needs cooking to remove cyanide

Nutritious leaves



Virus affected in Africa

Taro family

There are 212 edible Araceae species

Giant taro

Elephant foot yam

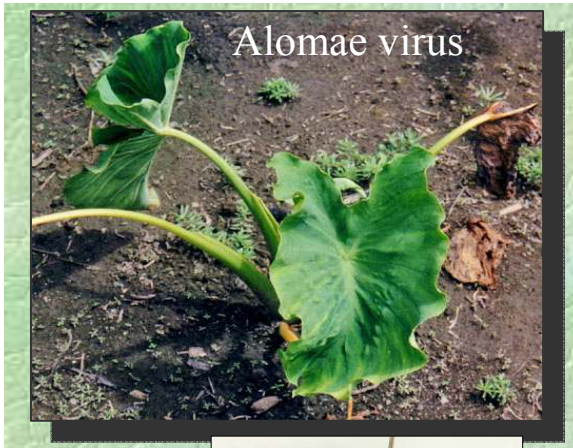
Fruit salad fruit

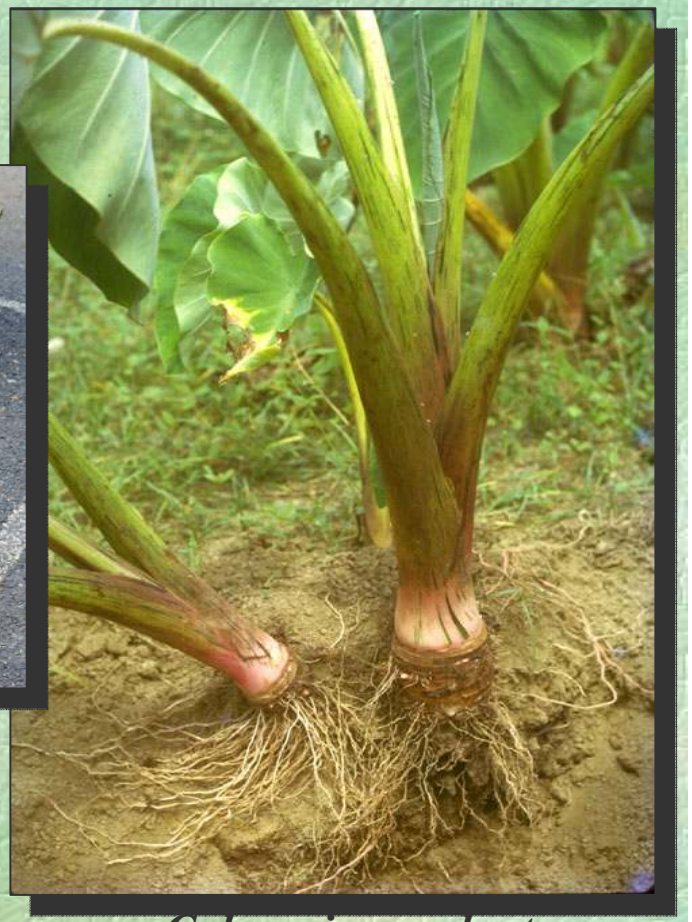
Colocasia esculenta

Xanthosoma taro

Swamp taro

Taro





Colocasia esculenta

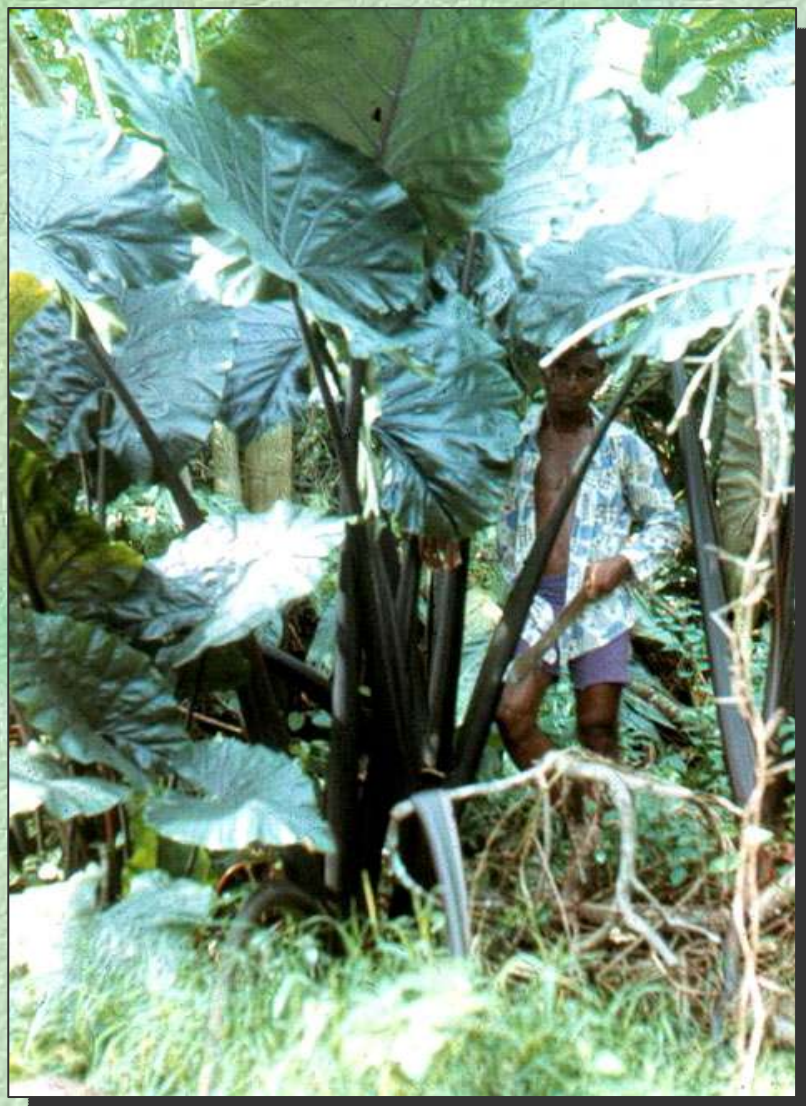
Taro beetle

Tannia

Xanthosoma sagittifolium

Giant taro

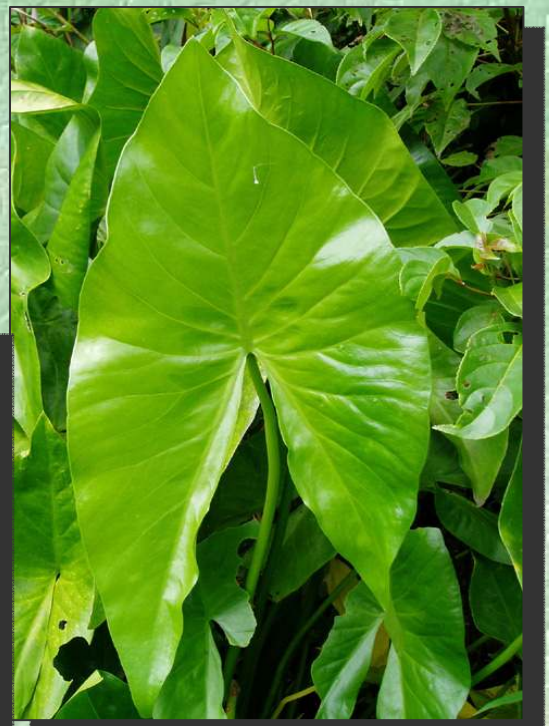
Alocasia macrorrhiza



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

Yams

There are 136 edible Dioscoreaceae species

Greater yam

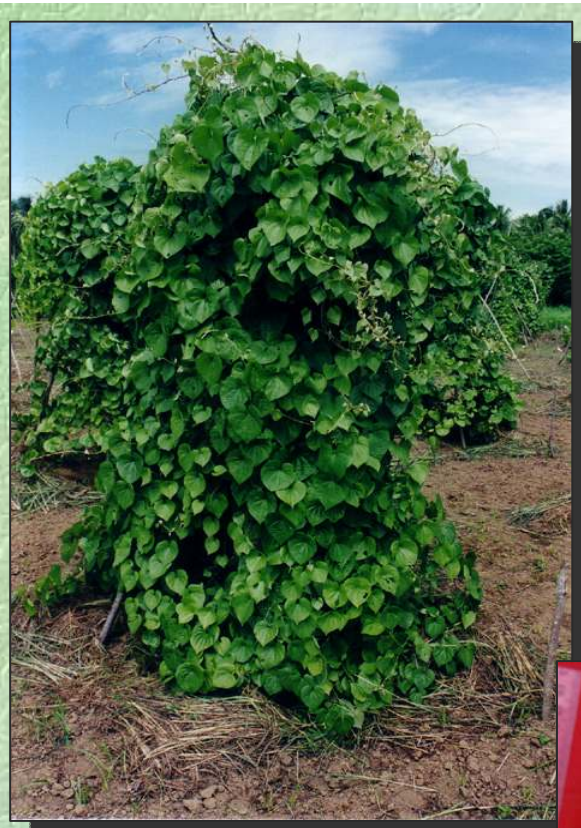
Potato yam

Lesser yam

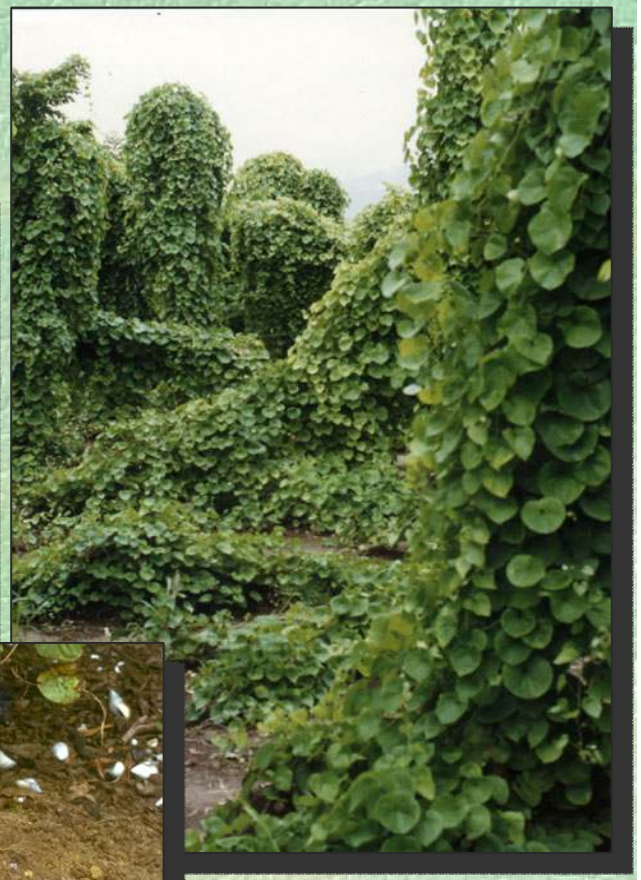
Five leaflet yam

Nummularia yam

Lesser yam



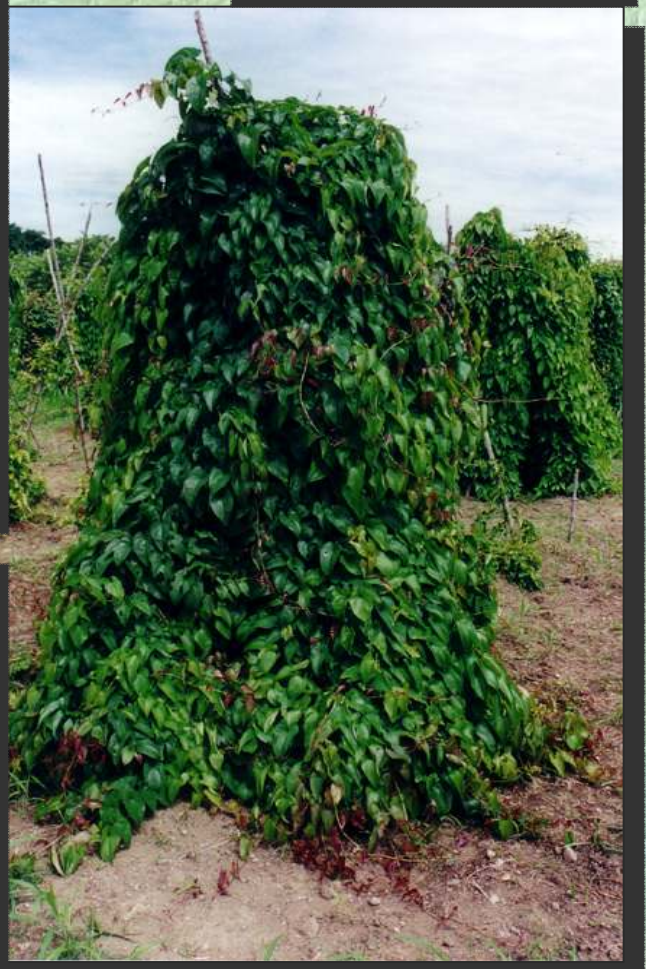
The most useful and productive kinds are in PNG



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

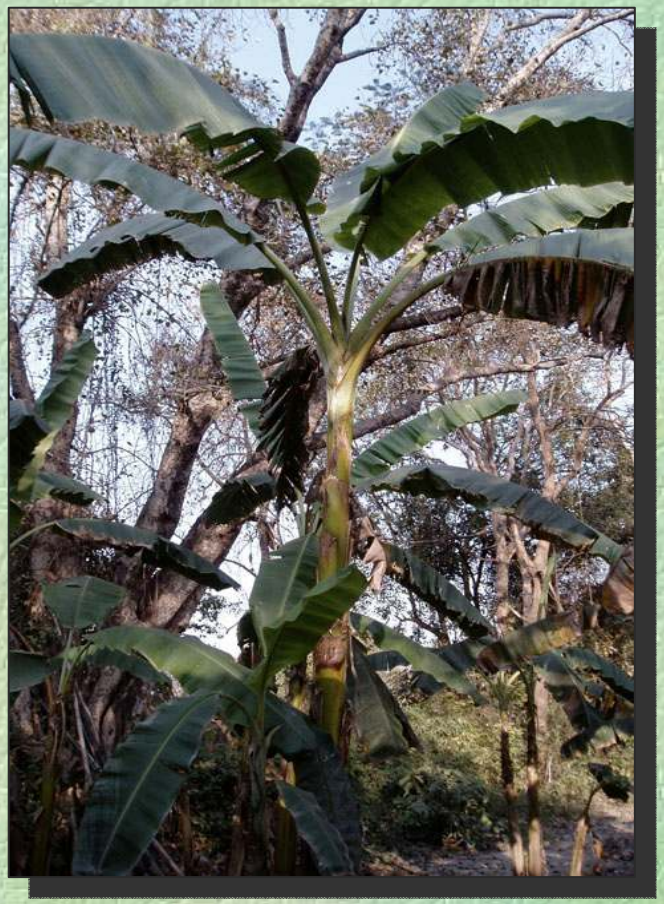
It is grown from tops of tubers and produces long starchy tubers

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

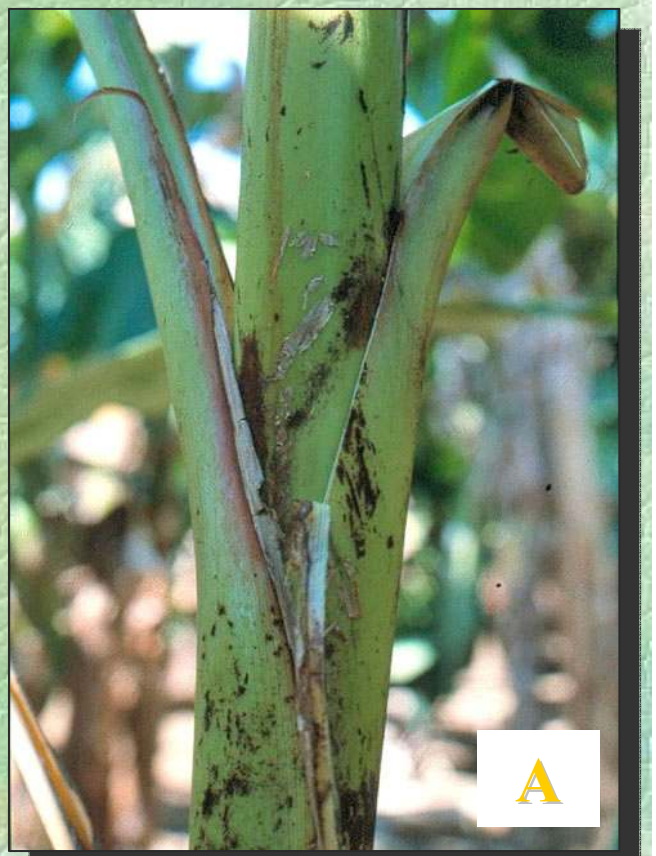
A polyploid series – different numbers of chromosomes

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

Bananas with seeds and seedlings

For breeding and crossing, seeded varieties are needed

Re-discovering the lost “BB” parent!

Musa sp AA wild

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

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

Musa sp BB wild

Other banana species

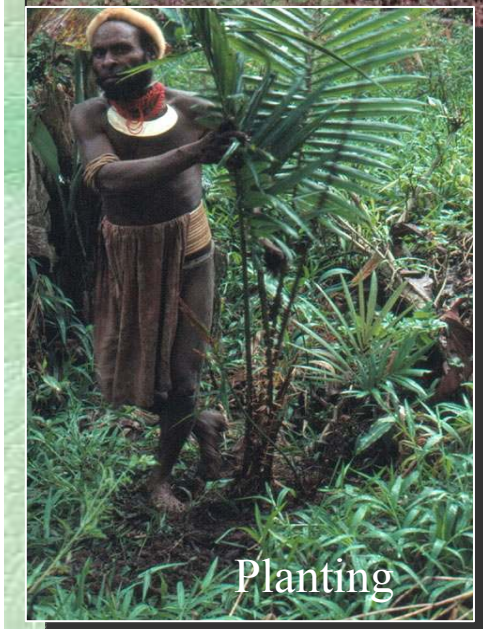
Musa basjoo

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

Musa schizocarpa

Musa maclayi

Sago for tropical swamps



Good energy food but almost no protein or other nutrients

Other *Metroxylon* or sago species

Sago – *Metroxylon sagu*

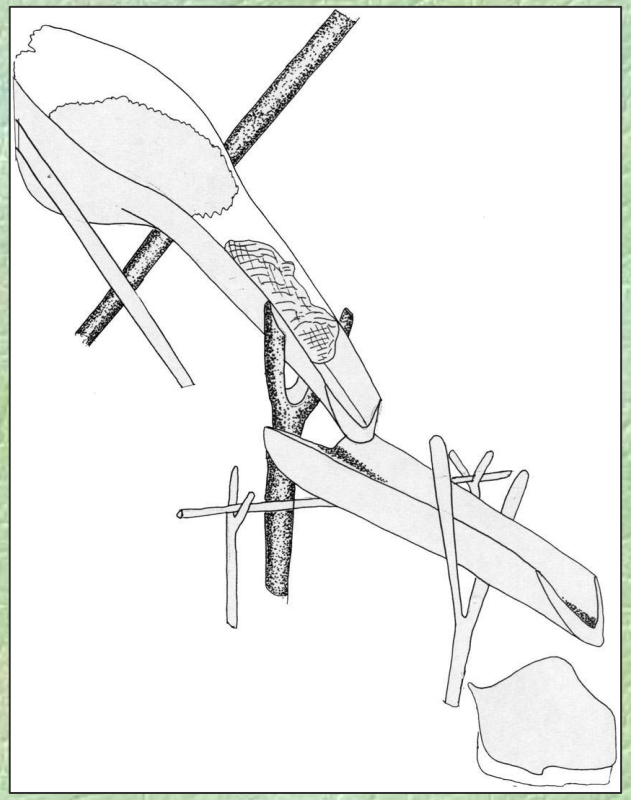
Bougainville sago
Metroxylon salomonense

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

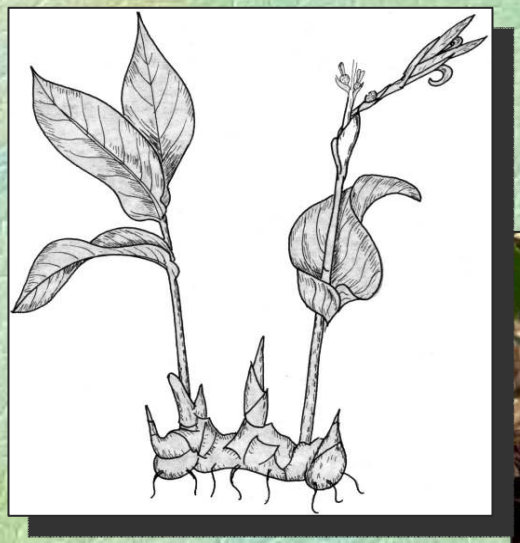
Great leaves for houses and no suckers

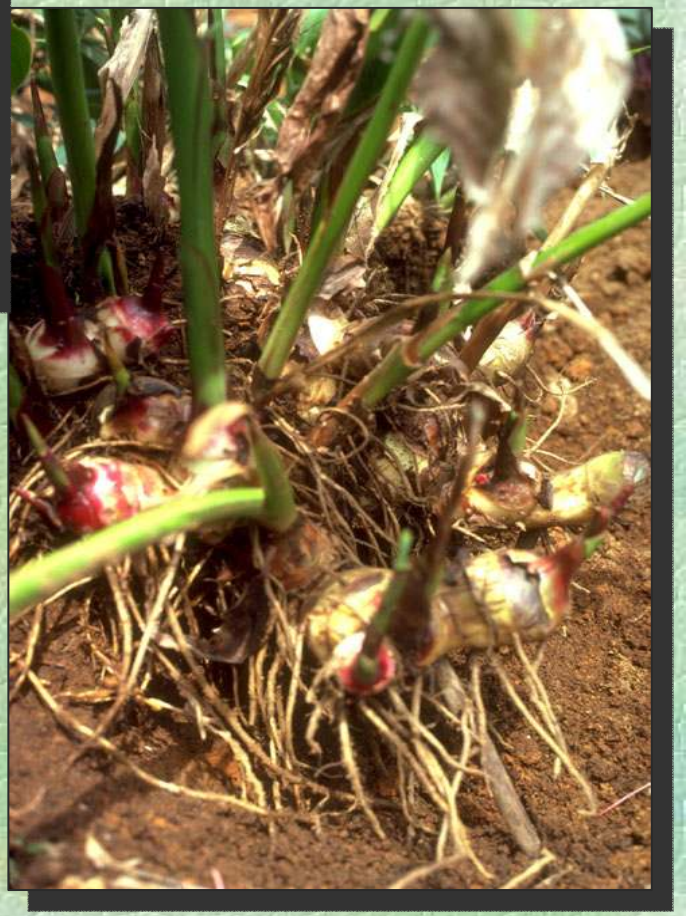


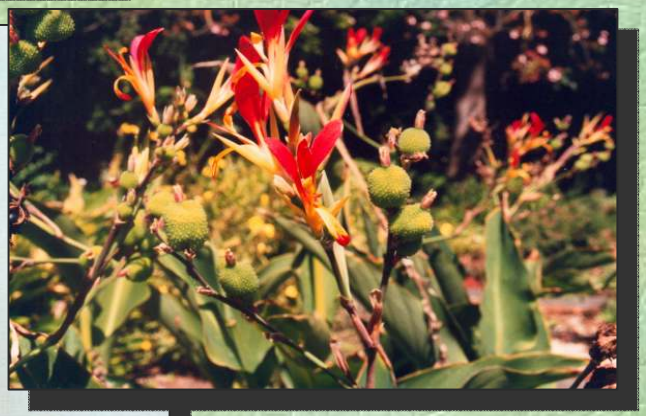
It is grown from seeds and suits drier ground than sago

Metroxylon salomonense

Queensland arrowroot





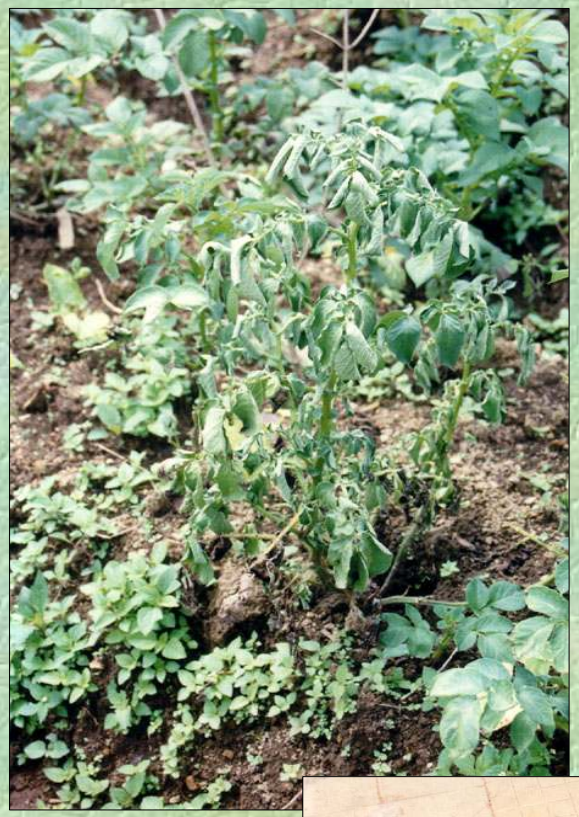


Canna edulis

Potatoes - a high altitude tropical crop

Solanum tuberosum

In the tropical lowlands potatoes won't form tubers



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.

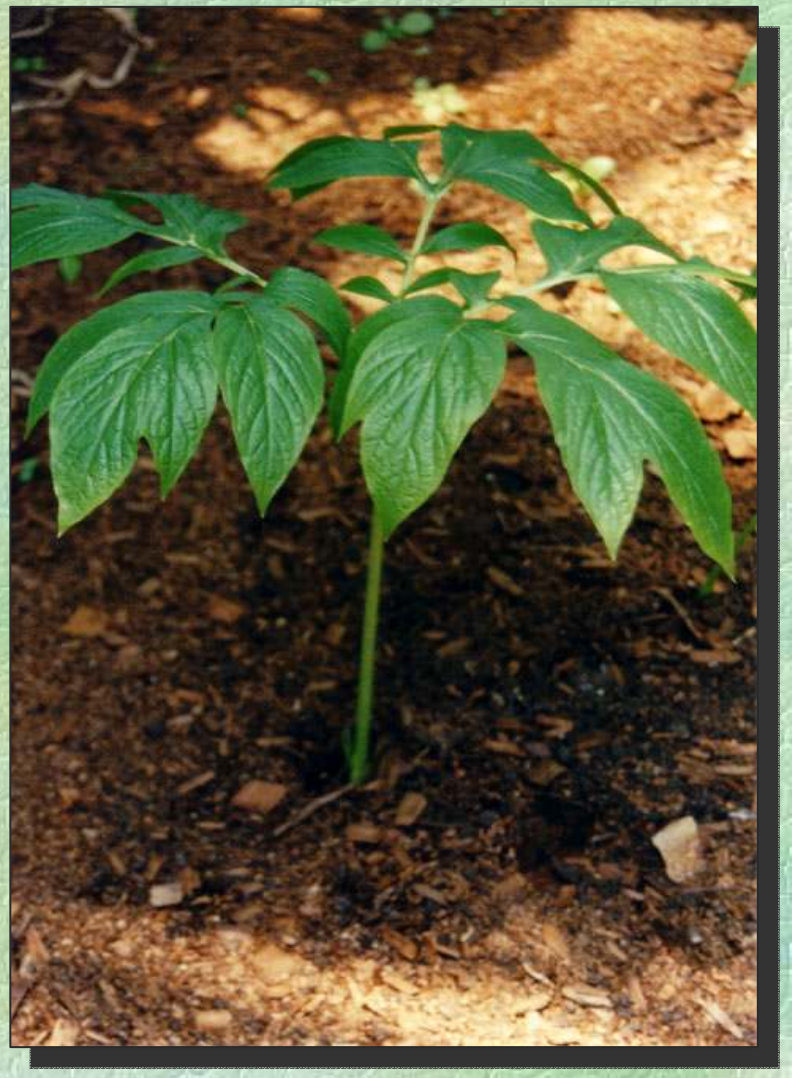
Some varieties of winged bean, when grown in the hills and with flowers picked off, will form fattened roots. These are good quality eaten roasted.

Winged bean

Polynesian arrowroot

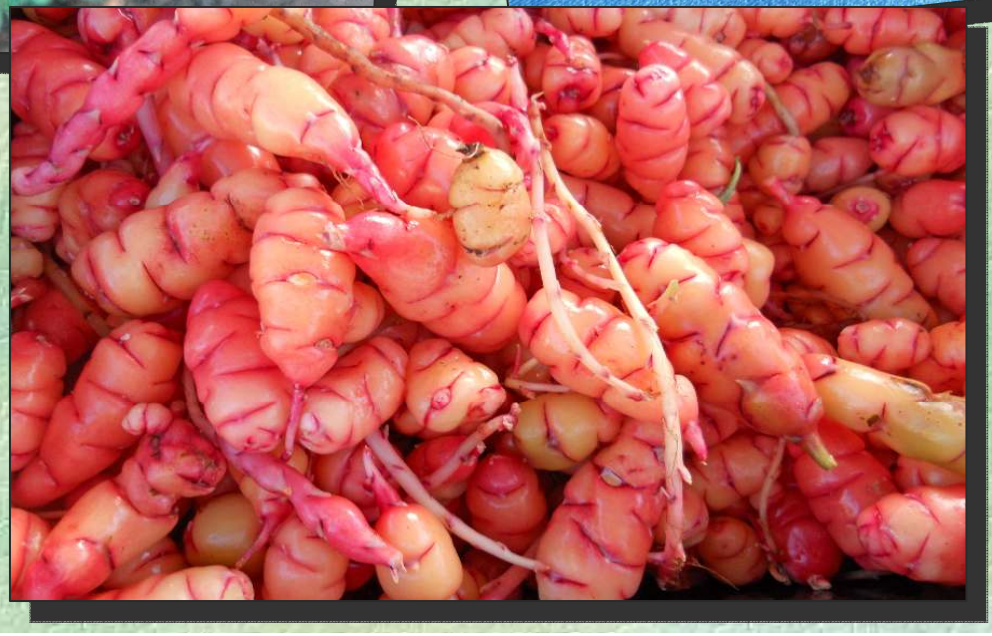
- ***Popular along tropical coasts***

Tacca leontopetaloides

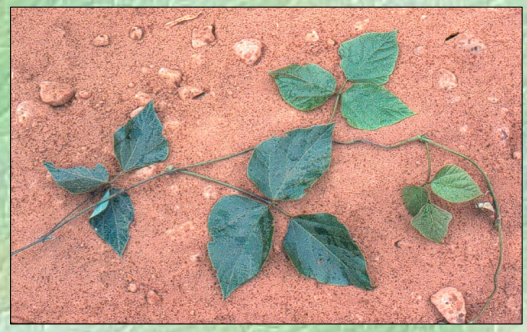


Oca

❖ *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

They can be downloaded free