Food Plants of Haiti




FOOD PLANT SOLUTIONS
ROTARIAN ACTION GROUP

Solutions to Malnutrition and Food Security

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

www.foodplantsolutions.org

Food Plants of Haiti

Dedication

This book is dedicated to the 3 billion hard working farmers and families around the world who cultivate these, and other, food plants for their own subsistence, and who help conserve them in their rich diversity for other people to enjoy.

Food Plant Solutions Guide – Haiti, Version 1,May, 2013

Preface

This guide is an extract from work originally created by Mary Wharton and Jean-Patrick Lucien. For access to the original article please contact Food Plant Solutions at info@foodplantsolutions.org

Information for this guide is from the Food Plants International (FPI) database developed by Tasmanian agricultural scientist Bruce French. The source material and guidance for the preparation of the book has been made possible through the support of Food Plants International, the Rotary Clubs of District 9830, particularly the Rotary Club of Devonport North who founded Food Plant Solutions, (previously the Learn♦Grow project), and many volunteers who have assisted in various ways.

Food Plant Solutions 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, well adapted to the prevailing conditions where they naturally occur, and how this resource may be used to address hunger, malnutrition and food security. For more information, visit the website www.foodplantsolutions.org. More detailed or specific information on plants, including references to material by other authors, is available on DVD on request.

Disclaimer: This Field 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:

- makes any expressed or implied representation as to the accuracy of the information contained in the database or the Field Guide, and cannot be held legally responsible or accept liability for any errors or omissions
- can be held responsible for claims arising from the mistaken identity of plants or their inappropriate use
- assume responsibility for sickness, death or other harmful effects resulting from eating or using any plant described in the database or this Field Guide
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Always be sure you have the correct plant, and undertake proper preparation methods, by consulting with specialist scientists or local users of the plant. The Food Plants International database, from which the information in this Field Guide is drawn, is a work in progress and is regularly being amended and updated.

Dear Friend:

This is a work that is clearly in progress, and we cannot finish it alone. We need people like you to help us. We invite you to help us along the way by making suggestions and also by contributing your own information, pictures, and photographs for inclusion. Unfortunately because we're both working for charitable organizations (Mary for Rotary International and Jean-Patrick for Ecole du Village/EDEM Foundation), we cannot pay you, but if we select your contribution we will give you credit in the final version of the document.

The final document that we're creating will not only include information on food plants that are adapted to grow in Haiti. It will also include nutritional information on each plant. We also plan to add a section which gives an overview on adult and childhood nutritional requirements. Hopefully, the resulting document will be of great benefit to everyone, not just to those working in the fields of agriculture and education.

Jean-Patrick has plans to take the information and translate it into Haitian Creole to create age-appropriate text books for use at the school called Ecole du Village which his organization runs in Ile-a-Vache. We have great reason to believe that other centers of education in Haiti will be eager to incorporate this information into their curricula.

As you look through our rough document, please note any errors you might see, and also note any information you feel we should include. If we have missed a plant please let us know. If you feel we should delete a plant, let us know. If you have photographs or drawings of the plants, please feel free to forward them to us for our review. If you have any recipes or tips for preparing any of the plants for use as food, beverage, sauce, or spice, feel free to let us know too. We cannot guarantee inclusion of everything that you might send us, but we do promise to give your work thoughtful consideration and send you a reply after reviewing it.

For more information about our project and the Food Plants International plant database we've used to help create the document on Haitian food plants, please check out www.foodplantsolutions.org Many thanks to Bruce French of Food Plants International, Buz Green and the Food Plant Solutions Committee of Rotary District 9830 for their help in getting us started. If you know of an organization or group that could benefit from this information, please feel free to contact either one of us at our addresses below.

Many thanks from both of us for your interest and your time!

Sincerely,

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Introduction

This book is designed as a simple introduction to the more common food plants of Haiti. It is hoped people will take greater pride and interest in these plants and become confident and informed about how to grow and use them. Many of the local food plants that occur in every country are very good quality foods. Unfortunately, people often reject traditional food plants and grow more of the introduced vegetables, such as ballhead cabbage. These do not have the same food value as many traditional, tropical, dark green, leafy vegetables.

Growing food

Growing food to feed a family is, without doubt, one of the most important things anyone can do. The more interest you take in your garden and the more you learn about plants and how to grow them well, the more interesting and fun food gardening becomes.

A country with very special plants

The local food plants of most countries have not been promoted and highlighted in the way they deserve. Visiting a local food market will quickly show what a rich variety of food plants can be grown in this country. Good information about these plants is often still in the minds and experience of local farmers, and has not been written down in books. This can make it hard for the next generation of young people to find out how to grow them.

In many countries, some of the traditional food plants are only harvested from the wild and others are only known in small areas. Others have hundreds of varieties and are the main food for people in different regions. Information on all these plants, their food value and the pest and diseases that damage them is available in the Food Plants International database.

Getting to know plants

People who spend time in gardens and with their food plants get to know them very well. It is a good idea to learn from someone who grows plants well. Each plant grows best in certain conditions and there are often special techniques in getting it to grow well. For example, sweet potato will not form tubers if the soil is too wet, but it may still grow lots of green leaves. Taro will grow in light shade, but sweet potato will not. Ginger can grow in fairly heavy shade. Pruning the tips of betel leaf or pepper vines will cause more side branches to grow and therefore, produce more fruit. Stored yam tubers need special treatment if you want them to put out shoots early. There are lots of unique things about every plant and learning about these helps a good gardener produce more food.

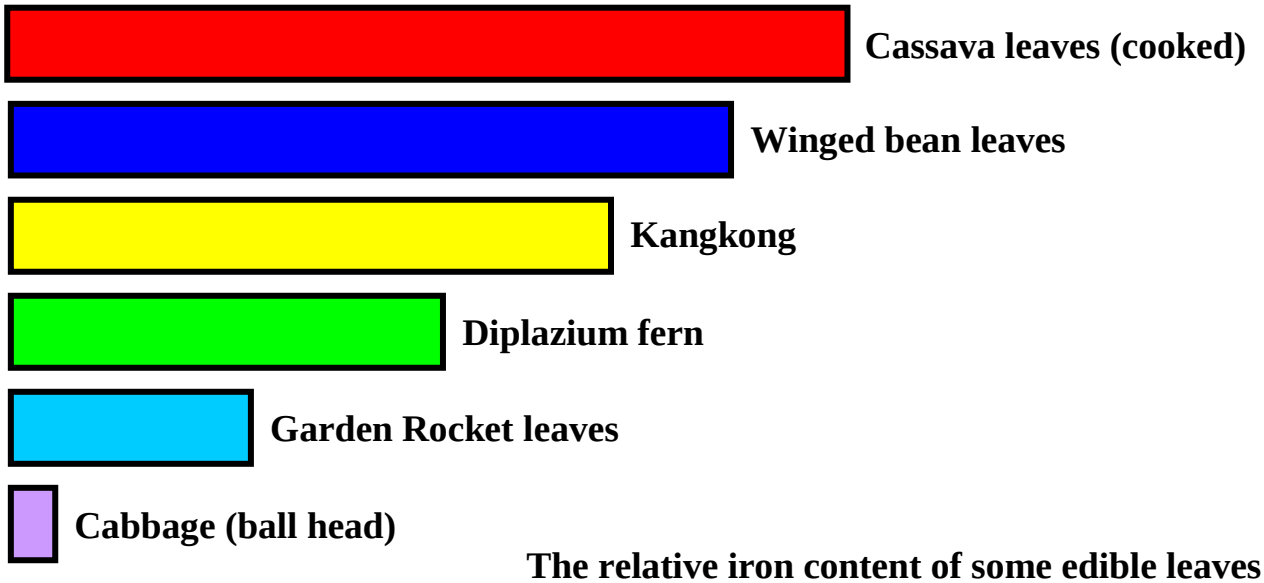
Naming of plants

Many food plants have local names, as well as a common English name. Every type of plant also has its own scientific name. Although the scientific name might not be widely recognised, this is the link by which people in different countries and with different languages can recognise the same plant. We know that many plants are grown in many different countries, but relying on local or common names, we might not recognise the same plant grown in different places. By using scientific names to accurately identify plants, we can get useful information from people in other countries. Wherever possible, plants in this book are named by their common English name and their scientific name.

Local food plants are often very good

People sometimes think that local food plants are not very special and that any food plant that is new or comes from another country must be a lot better. This is often not true. Many of the newer or introduced food plants, such as the round or ballhead cabbages, have very little food value. Many traditional tropical green, leafy vegetables and ferns have 10 times or more food value as ballhead cabbage or lettuce. It is important to find out more information about the food value of different foods if we want to eat well. Citrus fruit, such as lemons and oranges, are often grown for vitamin C that helps keep people healthy. These fruits do not grow well in the tropics - the common guava fruit has three times as much vitamin C and is loved by children. This is just one example that there are often much better choices of local foods with higher levels of important nutrients.

Our bodies need a variety of food plants to enable us to grow, stay healthy and have enough energy to work. Different foods are needed to provide energy, protein, vitamins and minerals. The following diagram highlights the iron content value of some traditional edible, tropical plant leaves, compared with cabbage. Iron is a nutrient that is very important for our bodies and especially our blood. People who are short of iron become anaemic and lack energy.



The relative iron content of some edible leaves

A healthy balanced diet

Good nutrition, or eating a healthy balanced diet, is really very simple. If people eat a wide range of food plants, their bodies will normally get a balanced amount of all the different nutrients they require. If a nutrient is lacking in one food plant, then they are likely to get it from another plant if they are eating a range of food plants. For this reason, everybody should eat a range of different food plants every day. The food group that is especially important for young people is the dark green leaves. Everyone should eat a good serving of dark green leaves every day. They have many vitamins and minerals, as well as protein. There are many spices or flavouring plants that can improve the taste of foods, but taste should be considered separately from food value.

Learning to cook well

Even though some nutrients in food can lose some of their value during cooking, it is normally much safer to cook all food plants, at least for a short time. Bacteria, which cause diarrhoea, can occur in gardens and on food plants. These are killed during cooking. Many plants in the tropics develop cyanide, a chemical that makes them bitter and poisonous. This happens often with cassava (tapioca, manioc) and beans, but can also occur in many other plants. Boiling the food for two minutes normally destroys cyanide and makes the food safe to eat. Some of the nutrients our bodies need (such as vitamin A for good eyesight) only become available when food is cooked in oil.

Learning to grow "wild" food plants

Many plants grow wild in the bush and are not cultivated by people. We can normally find someone who has taken an interest in them and has learned to grow them. This may be people from a different language group. It may be that in their area they have found better types than the ones that simply grow wild.

Saving better types of plants

If we simply allow plants to grow from seed, the improvements that have been made in finding sweeter or better types may get lost. Some fruit trees are like this and the fruit produced may not be sweet at all. It is often necessary to take cuttings from a tree to be sure the new plant is exactly the same as the old one. If the plants won't easily grow from cuttings simply by sticking a piece of the branch in the ground, there are other ways of helping these plants to form roots and start to grow. One good way is to make a small cut in the bark of a young branch and then wrap soil around the cut and cover it with plastic. With plants like guava, new roots will start to grow from this cut and grow into the soil wrapped around the branch. It can then be cut off and planted. This is called air-layering. A similar method is used with the roots of breadfruit. A shallow root is uncovered and a small cut made from which a new sucker will start to grow. This can be cut off and replanted.

Growing from cuttings and suckers

Many food plants are grown from cuttings and suckers. This is very important, as it allows all the different kinds of yams, taros, bananas, sweet potato and sugarcane to be continually grown and ensures the varieties are preserved. Each plant has its own special propagation method. It is important to use healthy planting material, as diseases can be spread in planting material.

Saving seed

Some food plants are grown from seed. Sometimes this is very easy as the seeds are large, store well, grow easily and grow the same as the original plant. It is more difficult with other plants. Many large fleshy seeds, such as breadfruit, need to be planted while still fresh as they do not store easily. Other seeds do not "breed true" or do not grow into new plants that are the same as the original plants. For example, the fruit may not be as large or sweet or have the same colour or taste. With many of these plants, it may be necessary to find ways of growing them from cuttings or other methods such as grafting. Some plants "inbreed" and get smaller or poorer. This happens when a plant self-pollinates or receives pollen from a close relative. Corn grown in small plots normally does this and the plants grown from seed grown in this situation get smaller and smaller each year. The seed needs to be saved from several different plants with different history and then mixed together before sowing. All the seeds on one cob are related and will inbreed. Some seeds develop a hard seed coat and need to be scratched, soaked in water, or even put into hot water, before they will start to grow. Saving local seeds is often a good idea as they are already adapted to local conditions. For example, seed saved from pumpkins grown locally will produce plants with less pest and disease damage than those grown from imported seed. *If you can't get seeds or planting material from local gardens – it is probably not a suitable local plant!*

Growing a garden of mixed plants

In nature, one variety of one plant never grows alone. There are always lots of different plants of different kinds and sizes, all growing together. Anyone who has ever walked into a tropical jungle will know this very well. The reason people all over the world want to save the rainforest is because it has so many different kinds of plants all growing together. Growing plants in a food garden in a way similar to how they grow in nature, as a mixed group of plants, is very good agriculture. Mixing plants in a garden usually gives more reliable food production, as any disease from one plant will wash off in the rain onto a different plant, where it cannot survive. Small plants fill the gaps and reduce the need for weeding.

Different types of plants for food security

There is another reason for growing a range of food plants in a local garden or around a village. If something goes wrong, like extreme insect damage to plants, some disease occurring in the garden, or a poor growing season, some plants will be more damaged than others. With a variety of plants, there will still be some food to eat until the other plants recover and grow again. Also, a wide variety of plants will mean that different ones will be maturing at different times, which helps ensure a continuous supply of food. There are shrubs that can be planted as edible hedges around houses, and fruit and nut trees that need to be planted as a gift for your children, several years before they will be able to enjoy them. Some nuts can be stored and eaten when other foods are not available. Most yams will store well for a few months.

Looking after the soil

Gardeners in traditional tropical agriculture usually move their gardens often by shifting to a new piece of land. There are usually three reasons for this:

- In the tropical lowlands, weeds can become a very big problem. There are usually a lot fewer weeds in the first year or two after clearing and burning the land, but weeds increase in the following years.
- Some of the nutrients in the soil are used each year and the soil becomes poorer and plants do not grow as well. There are ways of reducing this loss of nutrients.
- Very small worms called nematodes build up in the soil after a few years and get into the roots, especially of annual vegetable plants, and stop their roots working properly. For example, root knot nematode will cause the roots of plants like tomatoes and beans to become twisted resulting in poor growth of the plant.

Building up the soil

When a new garden has been cleared, it has lots of leaf mulch and other old plant material. This provides plant nutrients for new plants to grow. There is a simple rule for growing plants and improving the soil - "If it has lived once, it can live again." Any old plant material can provide nutrients for new plants to grow, but it must be allowed to rot into mulch or compost for this to happen. If this plant material is burnt, some nutrients, especially phosphorus and potassium ("potash"), get left behind in the ashes for new plants to use, although it also allows these important nutrients to be lost by being washed away by rain. But with burning other important nutrients, such as nitrogen and sulphur, get lost in the smoke and disappear from the garden and soil. These last two plant nutrients are especially important for growing green leaves and when their levels are low, plants grow small or pale green. When nitrogen is lacking, the old leaves of the plant go pale and fall off early, and when sulphur is lacking, the young leaves go pale. Wherever possible, old plant material should be covered with some soil to allow it to rot down and not simply dry out or get burnt.

Poor soils where crops won't grow
When soils are very acid (or sour), plants cannot get the necessary nutrients. Natural chemicals in the soil that are toxic to plants when present at higher levels become soluble, get into plants, and stop them growing. Adding limestone to these soils can improve them. Using compost will not make them less acid, but will keep the plant nutrients in the soil in a more readily available form that plants can use.

Soil nutrients
Plants need 16 different kinds of plant food or nutrients in different amounts to grow properly. A plant that has already been growing will have these nutrients in them and probably even have them in a balanced amount. That is why composting old plant material is so important. Plants usually show some signs or symptoms if any of these nutrients is running out.

One of the most common and important nutrients for plant growth is nitrogen, which actually comes from the air, but gets into plants through the soil. When plants are short of nitrogen, their older leaves often become yellow or pale. When grass family plants, like sugarcane and corn, are short of nitrogen, the centre of the oldest (lowest) leaves starts to develop a dry or dead V-shape. The plant cannot find enough nitrogen in the soil so it gets it from an old leaf to grow a new leaf. This causes the old leaf to die, forming a characteristic V-shape in the centre of the leaf. The plant does not get any bigger as an old leaf dies each time a new leaf is produced. Village farmers often walk through grassland before they clear it for gardens, looking to see if the grass leaves are dry and dead, because they know gardens on this soil won't grow well. It is necessary to use compost or legumes (such as beans) to put nitrogen back into the soil. Growing plants from the bean family (legumes) is the most efficient way to increase the level of nitrogen in the soil.

Corn is a good plant for indicating which nutrients are running short in the soil. If the older leaves go dry along the edges, the soil is running out of potash. If leaves that are normally green develop a bluish colour, the soil is short of phosphorus. Generally, leafy crops need lots of nitrogen, and root crops need lots of potash.

Making compost
Compost is old plant material that has been allowed to rot down into a fine, sweet smelling mulch that is full of nutrients that can be put back on the soil to grow new plants. Making good compost is very simple. A simple heap of plant material can be made in the corner of a garden or near a house. The composting process is carried out by small bacteria that live in the soil and feed on decaying plants. They break down old plant material into compost. These bacteria are living, so they need air, water and food. A good compost heap must have air, so don't cover it with plastic or put it in a container. This makes a foul smelling compost, as different bacteria that don't need air turn it into an acid mixture that preserves it. Good compost must have moisture, so keep the heap damp, but not too wet. The compost bacteria like a balanced diet, which means that both green material and dried material is needed to

balance the carbon and nitrogen in the compost pile. If the compost material gets too dry and brown, it will not break down, and if it gets too green, it will go slimy. Using a little bit of compost from an old heap will make sure the right bacteria are there to start the whole process off. As soon as the plant material is broken down to a fine mulch it can be put onto the garden. It is best if it is dug in, but if it is regularly put onto the surface of the garden, worms will mix it into the soil.

Pests

There are a large number of insects that enjoy sharing our food with us! We should not try to kill all these insects as they have an important role to play in keeping everything in nature in balance. What we need to do is to learn to manage these insects so we can all get some food to eat! Some insects are attracted to lights, and if the garden is near village lights some insects can cause a lot of damage. If large areas of one particular crop are planted, insects can breed more quickly and cause a lot of damage. As an example, insects called armyworms can breed up in large numbers on the shade trees of cacao and then move "like an army" into gardens. Some insects are large and breed slowly and can be picked off and removed. The large, green grubs with pointy tips that hide under taro leaves are best controlled by simply picking them off. Some insects, like taro beetles, can be a serious problem, but the young curl grubs of this insect are tasty if you catch and cook them. Some insects do not like sunlight. The very small moth than damages banana fruit is like this. Simply pulling off the leafy bracts over the banana fruit reduces the damage, as this lets sunlight in and the insect flies away. The best rule for reducing pest damage is to grow healthy plants, as they suffer less damage.

Diseases

The living organisms that cause disease are much smaller than insects. These disease organisms can often only be seen with a microscope. There are three main kinds of disease organisms - fungi, bacteria and viruses. Fungi are like the mushrooms we eat, only very much smaller. They usually make distinct dry spots on leaves and other plant parts. Fungi have spores that often blow in the wind. Bacteria are often smaller and live in damp places. They usually make plants go soft and squashy, and they may cause a smell. Bacteria are mostly spread with rain and in water. Viruses are very, very small and usually make irregular stripes and patterns on leaves and other plant parts. Viruses usually spread in planting material or in the mouths of small sucking insects. One common fungus disease on sweet potato causes the leaves to become wrinkled and twisted. It usually gets worse in old gardens and where soils are running out of nutrients. It doesn't affect all kinds of sweet potato to the same extent. The answer is not to stop the disease, but to improve the soil. The general rule is that healthy plants that are growing well will suffer less damage from disease.

Index of Plants

Scientific Name	Common Name	Family Name
Abelmoschus esculentus	Okra, Lady's Fingers	MALVACEAE
Acrocomia aculeate	Gru Gru Palm, Macaw Palm	ARECACEAE
Agave americana	Agave, Century Plant	ASPARAGACEA
Allium cepa var.	Shallot	ALLIACEAE
Allium ampeloprasum var.	Leek, Ramp	ALLIACEAE
Allium schoenoprasum	Chives, Onion Chives	ALLIACEAE
Allium schoenoprasum	Siberian Chives	ALLIACEAE
Aloe vera	Barbados Aloe	ALOACEAE
Aloysia triphylla	Lemon Verbena	VERBENACEAE
Anacardium occidentale	Cashew	ANACARDIACEAE
Annona squamosa	Sweetsop	ANNONACEAE
Annona muricata	Soursop	ANNONACEAE
Annona reticulata	Bullock's Heart	ANNONACEAE
Arachis hypogea	Peanut, Groundnut	FABACEAE
Argemone mexicana	Mexican Poppy	PAPAVERACEAE
Artocarpus alltilis	Breadfruit	MORACEAE
Artocarpus heterophyllus	Jackfruit	MORACEAE
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Averrhoa carambola	Carambola	OXALIDACEAE
Bactris plumeriana	Coco Macao	ARECACEAE
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Brassica napus	Canola	BRASSICACEAE
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Calyptronoma plumeriana	Manaca	ARECACEAE
Canna indica	Indian Shot	CANNACEAE
Canavalia ensiformis	Jack Bean	FABACEAE
Capsicum baccatum	Peruvian Pepper	SOLANACEAE
Carica papaya	Pawpaw, Papaya	CARIACEAE
Chrysophylium cainito	Star Apple, Caimito	SAPOTACEAE
Chrysophylium oliviforme	Satin Leaf, Damson Plum	SAPOTACEAE
Citrullus lanatus	Watermelon	CUCURBITACEAE
Citrus aurantium	Seville Orange	RUTACEAE
Citrus limon	Lemon	RUTACEAE
Citrus maxima	Pummelo, Pomelo	RUTACEAE
Citrus medica	Citron	RUTACEAE
Citrus sinensis	Orange	RUTACEAE
Coccothrinax argentea	Silver Palm, Silver Thatch Palm	ARECACEAE
Cocos nucifera	Coconut	ARACACEAE
Coffea arabica	Arabian Coffee	RUBIACEAE
Cresentia cujete	Calabash, Calabash Tree	BIGNONIACEAE
Cucumis sativus	Cucumber	CUCURBITACEAE
Cucurbita moschata	Pumpkin, Winter Squash	CUCURBITACEAE
Cynara scolymus	Globe Artichoke	ASTERACEAE
Daucus carota subsp.	Carrot	APIACEAE
Desmodium triflorum	Three-Flowered Beggarweed	FABACEAE
Dioscorea alata	Greater Yam	DIOSCOREACEAE

Scientific Name	Common Name	Family Name
Dioscorea trifida	Sweet Yam, Cush-Cush Yam	DIOSCOREACEAE
Drymaria cordata	West Indian Chickweed	CARYOPHYLLACEAE
Equisetum arvense	Field Horsetail	EQUISETACEAE
Eryngium foetidum	Sawtooth Coriander	APIACEAE
Geonoma interrupta var.	Chontilla	ARECACEAE
Ipomoea aquatica	Kangkong	CONVOLVULACEAE
Ipomoea batatas	Sweet Potato	CONVOLVULACEAE
Jatropha curcas	Physic Nut, Purging Nut	EUPHORBIACEAE
Limnocharis flava	Yellow Velvetleaf	LIMNOCHARITACEAE
Lonicera caprifolium	Italian Honeysuckle	CAPRIFOLIACEAE
Malpighia glabra	Barbados Cherry, Acerola	MALPHIGACEAE
Malva neglecta	Common Mallow, Dwarf Mallow	MALVACEAE
Mammea americana	Mamey Apple, Abricot, Mammea	CLUSIACEAE
Mangifera indica	Mango	ANACARDIACEAE
Manihot esculenta	Cassava, Manioc, Tapioca	EUPHORBIACEAE
Manilkara bidentata subsp. *surinamensis*	Black balata, Chicle, Ausubo	SAPOTACEAE
Melia azederach	Bead Tree, Cape Lily	MELIACEAE
Melicoccus bijugatus	Spanish Lime, Mamoncillo, Genip	SAPINDACEAE
Mirabilis jalapa	Four O'Clock Plant	NYCTAGINACEAE
Morus australis	Korean Mulberry	MORACEAE
Morus rubra	Red Mulberry	MORACEAE
Musa acuminata	Banana	MUSACEAE
Ophioglossum reticulatum	Adder's Tongue Fern	OPHIOGLOSSACEAE
Opuntia ficus-indica	Indian Fig, Sweet Prickly Pear	CACTACEAE
Papaver rhoeas	Shirley Poppies	PAPVERACEAE
Parietaria judaica	Pellitory of the Wall	UTRICACEAE
Passiflora edulis	Purple Passion Fruit	PASSIFLORACEAE
Passiflora laurifolia	Yellow Granadilla	PASSIFLORACEAE
Pennisetum glaucum	Bullrush Millet	POACEAE
Persea americana	Avocado, West Indian Avocado	LAURACEAE
Phaseolus polyanthus	Year Bean	FABACEAE
Phyla nodifora	Frogfruit, Lippia	VERBENACEAE
Prunus domestica	European Plum	ROSACEAE
Pseudophoenix vinifera	Wine Palm, Cherry Palm	ARECACEAE
Psidium guajava	Guava	MYRTACEAE
Punica granatum	Pomegranate	LYTHRACEAE
Ribes rubrum	Red Currant	GROSSULARIACEAE
Rollinia mucosa	Rollinia	ANNONACEAE
Nasturtium officinale	Watercress	BRASSICASEAE
Rosmarinus officinalis	Rosemary	LAMIACEAE
Roystonea borinquena	Puerto Rican Royal Palm	ARECACEAE
Saccharum officinarum	Sugarcane	POACEAE
Sambucus nigra subsp. *canadensis*	Canadian Elderberry	SAMBUCACEAE
Sechium edule	Choko, Chayote	CUCURBITACEAE
Sinapis arvensis	Charlock, Field Mustard	BRASSICACEAE
Solanum torvum	Pea Aubergine	SOLANACEAE
Sorghum bicolor	Sorghum	POACEAE
Tamarindus indica	Tamarind	FABACEAE

Scientific Name	Common Name	Family Name
Thrinax radiate	Guanillo	ARECACEAE
Tropaeolum majus	Nasturtium, Indian Cress	TROPAEOLACEAE
Vallisneria americana	Water Celery	HYDROCHARITACEAE
Viola odorata	Sweet Violet	VIOLACEAE
Xanthosoma brasiliense	Tannia Spinach	ARACEAE
Zea mays	Corn, Maize	POACEAE
Zingiber officinale	Ginger	ZINGIBERACEAE
Ziziphus mauritiana	Coolie Plum, Jujube Tree, Indian Jujube	RHAMNACEAE

English: Okra, Lady's Fingers
Local:

Scientific name: *Abelmoschus esculentus*
Plant family: MALVACEAE

Description: A tropical annual plant. It grows erect, often with hairy stems. It mostly grows about 1 m tall but can be 3.5 m tall. It becomes woody at the base. The leaves have long stalks up to 30 cm long. Leaves vary in shape but are roughly heart shaped with lobes and teeth along the edge. Upper leaves are more deeply divided than lower ones. The flowers are yellow with red hearts. The fruits are green, long and ribbed. They have 5-7 ribs. They are 7.5-15 cm long. The seeds are 4-5 mm across. They are round and dark green. Many varieties exist.

Distribution: A tropical plant. It suits the hot humid tropical lowlands but is unsuited to the highlands. It cannot tolerate drought. It is very sensitive to frost. They grow best where temperatures are between 20-36°C. It can grow well in dry climates with irrigation. It suits hot humid environments. It does best on well drained well manured soils but will grow on many soils. A pH or 5.5-7.0 is best. It suits plant hardiness zones 8-12.

Edible Parts: Pods, Flowers, Seeds, Leaves, Vegetable

Use: Pods are eaten cooked. They are slimy, but less so if fried. Dried powdered seeds can be used in soups. It thickens the soup. They can also be pickled. Young leaves can be eaten cooked. They can be dried and stored. Flowers can also be eaten. Okra is frozen and canned. The seeds are roasted and used as a coffee substitute.

Cultivation: Plants are grown from seeds. Seeds are easy to collect. They need high temperatures for germination (over 20°C) and a sunny position. Often seeds are soaked for 24 hours before sowing to give quick germination. Seeds are sown 1.5-2.5 cm deep with 2-3 seeds per hole. Later these are thinned out to one plant. Seeds can be sown in nurseries and plants transplanted. Pinching out the tops of plants when 30 cm high encourages branching. To select seed of a particular variety seed plants must be separated 400 m from other varieties. A spacing of about 90 x 45 cm is suitable. About 8-10 kg of seed are required for one hectare. Most kinds respond to fertilizer.

Production: Plants maintain production if the fruits are harvested regularly. Plants are ready to harvest 8-10 weeks after sowing. Seed yields of 500-800 kg per hectare are recorded. Pod yields of 4-6 tons per hectare occur. For young pods it takes 2-4 months from sowing. Pods develop 5-10 days after flowering. Pod harvests can continue for 1-2 months. Leaving pods on the plants stops new pods developing.

English: Gru-Gru Palm, Macaw Palm **Scientific name:** *Acrocomia aculeata*
Local: **Plant family:** ARECACEAE

Description: A single stemmed palm. It is spiny on the trunk. It grows 12 m tall. The trunk is stout and grey. It is 30 cm across. The leaves are feather like. They are 1-2 m long. The fronds are dark green but paler underneath due to whitish hairs. They have spines. The flowering stalk is about 1.5 m long. The bract is woolly and forms a sheath. The flowers are yellow. Single plants can produce fertile seed. The fruit are round and 5 cm across. They are greenish yellow. The flesh is thin and firm. It is orange. The skin splits when fully ripe.

Distribution: A tropical plant. It needs well drained soil and good sun. It grows in savannah and open woodland, usually at low altitude. In Bolivia it grows to 900 m altitude. It suits hardiness zones 10-12

Edible Parts: Kernels, Sap, Fruit, Nut, Seed, Cabbage, Young leaves, Palm heart

Use: The sap is used for palm wine. The kernels of the fruit are eaten. They have a coconut-like pulp. The palm cabbage is eaten. The outer husk is edible. The kernels contain cooking oil.

Cultivation: It is cultivated for its fruit. Plants can be grown from seed. Seed are difficult to germinate and this is improved by soaking in warm water or cracking the seed coat. Fresh seed should be planted. Seeds may take 1 year to sprout.

Production: Seedlings grow quickly and spines soon appear. The kernel contains 58% fat.

English: Agave, Century Plant
Local:

Scientific name: *Agave americana*
Plant family: ASPARAGACEA

Description: A perennial plant up to 7.5 m tall and 2.5 m wide. It does not have a trunk and has suckers. The plants have a very sharp and tough spine at the tip of each leaf. The leaves are grey-green and occur in rings at the base. There are spines on the edges of the leaves. There are 5-8 mm long and 2-6 cm apart. The leaves are word shaped and 1-2 m long. The flowers are tubular and yellow-green. These occur on stems 6 m high.

Distribution: It is a tropical plant. Plants are naturalized in the Mediterranean and it grows wild in Mexico. It requires a very well drained soil and a sunny position. Plants are frost tender. They need a temperature above 5°C. They suit warmer climates. In Brisbane Botanical Gardens.

Edible Parts: Flower stalk, Seeds, Shoots, Drink, Sap, Pith

Use: The heart of the plant can be eaten after baking. It is sweet but fibrous. The tender shoots are eaten raw. The seed is ground into flour and used to thicken soups. The flower stalk can be roasted and used like asparagus. They are also used to make wine. Sap from the cut flowering stems can be used as a syrup. This is called 'pulque' in Mexico.

Cultivation: Plants can be grown from seed. Seed should be sown on the surface and germinate in 1-3 months at 20°C. The seedlings should be grown in a sunny position until 20 cm tall. Plants can also be grown from offshoots. The flower lives for a number of years without flowering but dies once it does flower. It normally dies after 20 to 30 years. Suckers however continue to grow. Suckers flower after 15 years in warm climates.

Production: The young flower is removed creating a trough like depression in which sap collects. It is drained out daily over several weeks. The yield can be 3-5 litres per day and a total of 800 litres of sap.

English: Shallot
Local:

Scientific name: *Allium cepa* var. *ascalonicum*
Plant family: ALLIACEAE

Description: An onion family plant. A bulb plant. It grows to about 30 cm high. The bulb can be 6 cm across. The protective coat over the bulbs is purplish, brown or white. The leaves are 10-35 cm long by 3-10 mm wide. Prefers a pH in the range 6 to 7 but tolerates a pH in the range 4.5 to 8.3. It tolerates a range of soils but does best in light well drained soils.

Edible Parts: Flowers, Leaves, Roots, Herb

Use: The bulbs are eaten raw or cooked. The leaves are eaten raw or cooked. The flowers are used raw or to flavour salads.

Cultivation: Plants are grown from offsets. Bulbs are planted to half the bulb depth. The plant is easier to grow than onions, matures faster and keeps better, though yields are lower. Plants are very tolerant of high temperatures up to 30°C and bulbing only occurs at temperatures above 20°C.

Production: Plants rarely produce viable seed in temperate areas, they are usually propagated by means of their bulbs, each one dividing up in the growing season to produce from 2 to more than 12 new bulbs.

English: Leek, Ramp
Local:

Scientific name: *Allium ampeloprasum* var. *porrum*
Plant family: ALLIACEAE

Description: An onion like plant without a bulb and with flat leaves. It grows one year, then flowers the next. There is one bulb. There can be bulblets. The covering is white. The leaves are flattened and vary from 40-100 cm long by 1.2-2.5 cm wide. Many flowers are produced in a large flower head where small flowers are on equal length stalks forming a ball.

Distribution: A temperate plant. It does best with a day temperature below 24°C. So it is mostly over 800 m altitude in the tropics and grows up to 2600 m. It needs a fertile soil. It is very frost resistant. The soil needs to be well drained but retain moisture. It suits hardiness zones 5-10.

Edible parts: Flowers, Leaves, Root, Herb, Vegetable, Bulb, Sprouts

Use: The whole plant is boiled except for the tops of the leaves. They can also be eaten raw. Sprouted seeds are eaten.

Cultivation: They can be grown from seed. Seedlings can be transplanted. They are transplanted when 15-20 cm high. The base of plants or suckers are more commonly used for planting. It is difficult to save seed in the wet tropics. If plants are planted in a hole 10-15 cm deep they develop long white edible stalks. The soil should be mounded up around the base of the plant. A spacing of 15-20 cm between plants and in rows 30-36 cm apart is suitable.

Production: Plants are ready for harvest after 16-20 weeks. A yield of 20 kg per 10 metres square is average.

English: Chives, Onion Chives
Local:

Scientific name: *Allium schoenoprasum*
Plant family: ALLIACEAE

Description: An onion family plant. It is a herb which grows one year, then flowers the next. It is up to 30 cm tall. A narrow leafed onion which forms dense clumps. The leaves are hollow and narrow. They are 10-25 cm long by 0.1 cm in cross section. They are angular in cross section. Bulbs are not well developed. They can be 1-3 cm long by 0.5-1.5 cm across. The flowers are pink or purple. They are produced in a head where small flowers are on equal length stalks forming a rounded head.

Distribution: A temperate plant. It is tolerant of cold and suits the highlands in the tropics. It needs a well drained soil. They can tolerate drought and grow on a wide range of soils. Fertile loam soils are best. In China it grows in meadows and damp valleys along streams between 2000-3000 m altitude. It suits hardiness zones 5-10

Edible Parts: Flowers, Leaves, Root, Bulb, Herb, Spice

Use: The mild flavoured leaves are eaten raw or used to flavour food. They are used to flavour salads and meat. The flowers are eaten and used as flavouring and garnish

Cultivation: Plants are grown by division of the clump, or by seeds. Seeds are normally put in a nursery then transplanted. A spacing of 15-20 cm between plants is suitable. The leaves can be cut off several times.

Production: Shoots can be harvested 70-100 days from planting. The outer leaves are cut 2 cm from the base leaving the central clump intact. Clumps should be replanted every 2-3 years.

English: Siberian Chive
Local:

Scientific name: *Allium schoenoprasum* var. *sibiricum*
Plant family: ALLIACEAE

Description: An onion family plant. It is a herb. It grows 20-50 cm high. The leaves sheath the base. The bulb is oblong. The leaves are nearly round and hollow. The flowers are purple or pink and small. They are lily shaped and occur as several together is a tight erect cluster at the top of the stem. The fruit is a dry, few-seeded capsule.

Distribution: It grows naturally in low ground and depressions in grassland. It is a temperate plant.

Edible Parts: Flowers, Leaves, Root, Bulb

Use: The leaves are bulbs are pickled and also used for flavoring.

Cultivation:

Production:

English: Barbados Aloe
Local:

Scientific name: *Aloe vera*
Plant family: ALOACEAE

Description: A perennial succulent plant 80 cm high. It spreads to 1 m wide. It develops suckers. The leaves form a rosette or ring just above the ground. They are fleshy and long. They are curved outwards or rounded underneath. They taper to a blunt point. They are smooth and pale green. There are white blotches on the leaves and prickles along the edges. The flowers are yellow or orange. They are 25-30 mm long. They hang down. The fruit is a capsule with angular seeds.

Distribution: A tropical and subtropical plant. It grows naturally on seaside sands and amongst rocks in the Mediterranean. In Nepal it grows to about 1400 m altitude. It needs a temperature above 10°C. It suits hardiness zones 9-12.

Edible Parts: Leaf bud, Seeds, Gel

Use: The leaves are used as an emergency food only. The seed are used as an emergency food only. A gel in the leaves has been used in jellies.

CAUTION: NOT FOR REGULAR FOOD USE. POTENTIALLY POISONOUS IF CONSUMED IN LARGE QUANTITIES.

Cultivation: Plants can be grown from seed. The seed usually germinates in 1 - 6 months at 16°C. They need to be grown in a sunny nursery for 2 years. Plants can be grown by division or offsets.

Production:

English: Lemon Verbena
Local:

Scientific name: *Aloysia triphylla*
Plant family: VERBENACEAE

Description: A shrub to 1.5-3 m high. It spreads to 3 m across. It keeps growing from year to year. It loses its leaves during the year. The leaves are slender and green. They are 10 cm long. They smell strongly of lemon. Under the leaves there are oil glands which give a sticky, almost rough feel. The flowers are purple and white. They form in feather like groups are the ends of branches.

Distribution: It is a warm temperate plant. It requires a sunny sheltered position. It needs a moderately fertile well drained soil. It requires a warm damp climate. It suits hardiness zones 8-12.

Edible Parts: Leaves, Herb,

Use: The young leaves can be eaten cooked or used raw in salads for their lemon flavor. The leaves can be used for tea. The leaves can be used fresh to flavor fruit salads, punches and fruit cups. The leaves can be used fresh or dried.

Cultivation: It is a cultivated food plant. Plants can be grown from cuttings. Trees are best pruned to give a thick clumpy bush.

Production: The leaves are best harvested a couple of months after the new leaves appear. The leaves are normally dried.

English: Cashew
Local:

Scientific name: *Anacardium occidentale*
Plant family: ANACARDIACEAE

Description: A spreading evergreen tree up to 7-14 m tall. It has spreading branches. The canopy can spread 12 m. The roots grow deeply and spread widely. The bark is rough. The trunk is 15-20 cm across. The leaves are alternate. The leaves are pale green and large. They are 10-15 cm long by 6-8 cm wide. They have fine veins. They are narrow at the base. The leaf stalk is 1-2 cm long. The leaves are shiny. The flowers are produced on the ends of the branches. They are red in colour. About 14 % of the flowers are both male and female and the remainder are male. Many of the flowers which contain female flower parts do not form fruit. The nut is borne below the "apple" which is really a fleshy stalk. The nut is kidney shaped. It is about 3 cm long.

Distribution: It is a tropical plant. It suits the lowland tropics but will grow up to about 1200 m altitude. It only bears well in dry areas because of blight of the flowers. It needs warm frost free locations. It grows with temperatures between 22-26°C. A rainfall of 1750 mm per year is considered suitable but good yields have been obtained with rainfall of 750 mm. Wider spacing is needed in drier areas. It can grow on poor soils. It needs good drainage. It is drought resistant. In South India it grows up to 1000 m altitude. It suits hardiness zones 11-12.

Edible Parts: Nut, Leaves, Fruit pulp, Flavouring

Use: The fleshy "apple" is edible but acid until very ripe. It is used for jams and drinks. It is also candied, made into chutney and pickles. The nut is eaten after roasting. The young shoots and leaves are edible. The apple is used to make spirits

CAUTION: The oil of the nut can blister the skin till roasted.

CAUTION: The shell contains anacordolic which affects the salivary glands and can paralyse the jaw.

Cultivation: It is usually grown from seeds. Seeds germinate poorly and slowly. Only nuts which sink in water (or a solution of 150 g of sugar in a litre of water) should be planted. Seeds are sun dried for 2-3 days to improve germination. Seeds can be sown in a nursery then transplanted or more commonly are sown directly. Trees are spaced 7-10 m apart. The crop is cross pollinated mostly by insects. It can be propagated by air layering. For good production complete fertiliser or appropriate organic material should be applied. Pruning to shape the tree is often undertaken in the first 2 or 3 years. Cashews are often planted scattered in gardens or amongst other trees. Clearing under the tree prevents fire and makes finding nuts easier. Allowing nuts to fall before harvesting ensures only ripe nuts are collected. Resin in the cashew nut shell can damage hands and discolour the nuts. Roasting the nuts before removing the kernel avoids this.

Production: Trees commence bearing after 3 years. Fruit production is seasonal. The fruiting season is normally October to January. Mature nuts are produced in 2-3 months. Yields of 80-200 kg per hectare of nuts are normal. Trees produce maximum after 10 years and trees last for about 100 years.

English: Sweetsop
Local:

Scientific name: *Annona squamosa*
Plant family: ANNONACEAE

Description: A bushy deciduous tree up to 6 m high. It has irregular spreading branches. The leaves are oblong and narrow, often 12 cm long by 4 cm wide. The leaves have fine hairs underneath. The leaves are dull green and smell when crushed. The flowers droop or hang from branches either singly or in groups of 2 or 3. The flowers are greenish colour. The fruit are 8-10 cm across and greenish in colour. The fruit is covered with round fleshy scales which drop off as the fruit ripens. Inside the fruit are several shiny black seeds about 1.5 cm long. The fruit flesh is white and soft.

Distribution: A tropical plant. It suits lowland drier climates. It grows naturally in the dry hills around Port Moresby in Papua New Guinea. The trees will probably grow satisfactorily up to about 1000 metres altitude in equatorial zones. Sweetsops cannot stand frost but they are able to survive droughts better than many fruit trees. Trees do not like waterlogged soils. Sweetsops can grow on fairly poor, dry, stony soils. In Bolivia they grow in areas with rainfall or 500-1,000 mm per year. It suits hardiness zones 10-12.

Edible Part: Fruit

Use: The fruit is eaten raw. It is also used in ice cream. The juice is used for drinks.

CAUTION: The seeds, leaves and roots are poisonous. Both an alkaloid, and hydrocyanic acid have been shown to occur in these parts of the plant.

Cultivation: They are normally grown from seeds and the seeds retain their viability for several years. It is better to grow sweetsops from fresh seeds and it is best to soak seeds for 3 days before sowing. Seeds germinate and start to grow 50 to 70 days after planting. The fruit is borne on old and new wood. As the fruit is more commonly on new wood, pruning is an advantage. Trees can be budded or grafted. A small branch of a selected variety is grafted onto another seedling sweetsop. Plants are very hard to get to grow from cuttings. A spacing of 6 m apart is suitable for sweetsop trees. The fruit is eaten raw. The sweet soft fleshy layer around the seeds can be eaten raw. When the fruit is ripe it is easy to separate the different soft fleshy parts of the fruit. Often it is easiest and best to harvest the fruit when they are nearly ripe and then let them ripen in a warm place.

Production: The tree is slow growing. Trees can start to produce fruit 2 years after they are planted. Fruit are often 200-300 g each. The pulp is 20% sugar.

English: Soursop
Local:

Scientific name: *Annona muricata*
Plant family: ANNONACEAE

Description: It is a low bushy tree 8-10 m high. The leaves are long (14 cm) and narrow (4 cm). The leaves are thick and slightly shiny on top. The flowers are large (2-3 cm), rounded and produced on short stems on the branches. They occur singly, or in groups of three. The flowers have two layers of thick fleshy petals. The fruit are 10-30 cm long. The fruit is spiny and the flesh is juicy. Many black seeds are embedded in the white flesh. Fruit are often distorted due to only some of the ovules being fertilised. Beetles are normally thought to do the pollinating. This means fruit end up heart shaped when unevenly pollinated. The flesh of the fruit is white. Several kinds with different sweetness, shape and juiciness occur.

Distribution: A tropical plant. It grows in tropical lowland areas below 1200 m altitude. It can tolerate quite poor soils and a humid climate. It cannot tolerate frost. The trees can withstand temperatures down to freezing (0°C) for a short time but salt laden winds from the sea can kill the trees. They need a well drained soil and cannot tolerate water-logging. The trees continue to grow and produce satisfactorily in fairly poor compact soil. But improving the fertility increases the amount of fruit. They can grow well in hot humid areas but a fungus disease called Blossom blight can cause flowers to fall off. It suits hardiness zones 10-12.

Edible Parts: Fruit, Leaves

Use: Fruit can be eaten fresh or used in ice-cream and for drinks. Young fruit can be cooked as a vegetable. Leaves are edible cooked. They are used for tea.

CAUTION The seeds are toxic, so should be removed before processing.

Cultivation: Trees are grown either as seedling trees or grafted plants. They can be grown from cuttings or air layering. Trees are easy to grow and maintain. Plants can easily be grown from seeds. Seeds can be planted fresh or stored. Seeds grow in about 15 to 20 days. Trees grown from seeds vary in the quality of the fruit. Seedlings are transferred to polythene bags when 15 cm tall. Trees can also be grown from cuttings or by grafting. This allows better trees to be selected and produced. Seedlings are suitable for grafting after 6 months. Trees need to be about 5m apart. Flowers are pollinated by insects. Hand pollination of flowers can increase the number of fruit that are produced. Fruit are soft and fleshy and difficult to transport.

Production: Trees grow quickly. Trees commence bearing by the third year. It bears fruit almost continually throughout the year, but there is normally one season when more fruit are getting ripe. Fruit can weigh up to 4-5 kg each. A tree can produce 12-24 fruit in a year. The fruit contain 11-14% sugars

English: Bullock's Heart
Local:

Scientific name: *Annona reticulata*
Plant family: ANNONACEAE

Description: A small tree up to 7.5 m tall. It has several branches near the base. Trees loose their leaves at some times of the year. New shoots have short brown hairs but older wood is smooth and shiny. The leaves are long and spear shaped with short leaf stalks. Around the edge of the leaf is a clear edge. The leaves smell when crushed. Flowers are greenish yellow. They occur in groups where the leaves join the stalk. Flowers occur on new wood growth. The fruit are reddish brown in colour and 10-12 cm across. There is a fine hexagonal pattern over the fruit. Inside there are large brown seeds. The fruit are edible but the seeds are not eaten.

Distribution: A tropical plant. It occurs in the tropical lowlands and grows up to at least 1200 m altitude. It can grow on poorer soils with different levels of acidity. It cannot stand water-logging. It suits humid climates. It is less suited to dry climates. In Brisbane Botanical Gardens. In Nepal it grows to 900 m altitude. It suits hardiness zones 10-12.

Edible Parts: Fruit

Use: The ripe fruit is eaten fresh. They are also used for preserves, drinks, ice cream, custards and other desserts.

CAUTION: The seed kernel is poisonous.

Cultivation: Plants are normally grown from seeds. Seedling trees vary quite a bit. Seedlings are easy to transplant. A spacing of 4-7 m is suitable. Better kinds can be grown using budding or grafting.

Production: Trees begin fruiting at 3-5 years. Fruit setting is often improved by hand pollination. Fruit can vary from 0.25 to 2.25 kg each. The fruit has 13% sugar. Fruit production is seasonal. The season is normally Dec. to March.

English: Peanut, Groundnut
Local:

Scientific name: *Arachis hypogea*
Plant family: FABACEAE

Description: A spreading bushy plant up to about 40 cm high. Leaves are made up of 2 pairs of leaflets arranged opposite each other. Flowers are produced in the axils of leaves. Two main kinds occur. They are often called runner and bunch types. The runner kind has a vegetative or leafy branch between each fruiting branch and therefore produces a more spreading type of plant. This is called "Virginia" peanut. The pods have 2 dark brown seeds. The other kind produces fruiting branches in a sequence one after the other along the branches. These are called "Spanish-Valencia" types. They grow as a more upright plant and grow more quickly. They have lighter coloured leaves and the pods have 2 to 6 seeds which are often white. Virginia types have the flowers in alternate pairs. Spanish and Valencia types have several flower branches one after another along the stem. Pods are produced on long stalks which extend under the ground. The stalk or peg from the flower grows down into the soil and then produces the pod and seed under the ground. The flower needs to be no more than 18 cm from the soil for the seed pod to develop under ground.

Distribution: A tropical and subtropical plant. Peanuts grow well from sea level up to about 1650 metres altitude in the equatorial tropics. They need a temperature of about 28°C and between 24°C and 33°C. The plants get killed by frost. They need a well drained soil and cannot stand water-logging. Therefore they are often grown on raised garden beds. They do better in drier areas but need 300 to 500 mm of rain during the growing season. Near harvest dry weather is needed. Short season cultivars are used in semi arid regions. It suits hardiness zones 8-12.

Edible Parts: Seed, Leaves, Flavouring, Spice, Pods

Use: The seeds can be eaten raw, or cooked. They are boiled, steamed, roasted, salted or made into peanut butter or flour for bread. The young leaves are edible, cooked. The unripe pods are cooked and eaten. Sprouted seeds are eaten. Oil is extracted from the seeds and is edible. It is often used for stir-frying. The remaining meal is also eaten. A very popular snack food in all areas where it can be grown. Seeds are also sold.

Cultivation: Peanuts require soil with good levels of calcium or they produce empty pods. Adding gypsum will improve this. If the nutrient boron is short then flowers won't flower and fruit properly. Because peanuts are legumes, they have root nodule bacteria which can fix their own nitrogen and this means they can still give good yields in grassland soils where nitrogen is at a lower level. The seeds or nuts are normally removed from the shell before planting and are sown 2 to 3 cm deep. The alternately branched or Virginia-type of peanuts have a dormancy period so that they must be stored before replanting. A suitable spacing is 10 cm between plants and 60 to 80 cm between rows. Often plants are grown in mixed cultures with other plants but where a pure stand is used up to 250,000 plants per hectare are used. The soil needs to be weeded and loose by the time the flowers are produced to allow the peg for the seed pods to penetrate the soil. Normally when the whole plant dies off the plant are ready to pull. They are left to dry in the sun for 3 or 4 days.

Production: Flowering may commence in 30 days. It takes from 3.5 to 5 months till maturity. They are harvested when the top of the plants die. The whole plant is pulled out. Virginia peanuts have a longer growing season and the seeds need to be stored for a while before they will start to re-grow. (30 days.)

English: Mexican Poppy
Local:

Scientific name: *Argemone mexicana*
Plant family: PAPAVERACEAE

Description: A spreading clump forming annual. It grows up to 1 m high and spreads to 30-40 cm across. The leaves do not have leaf stalks. The leaves have a green and white pattern. The leaves have deep irregular teeth along the edge. The flower has a very short stalk. It is at the end of the plant. It is yellow and has 6 petals. The fruit is a capsule and is prickly. This contains round, pitted, brown seeds which are sticky.

Distribution: A tropical to warm temperate plant. In Nepal it grows to about 1400 m altitude. It grows in semi arid regions. It can grow in areas with moderate moisture or which are seasonally dry. It can grow on poor, well-drained soils. It needs full sun. It suits hardiness zones 8-12.

Edible Parts: Leaves

Use: See warning below.

CAUTION: The seeds are poisonous. Their oil is not edible.
The plant contains some alkaloids and can have high levels of nitrate.

Cultivation: Plants are grown from seed.

Production:

English: Breadfruit
Local:

Scientific name: *Artocarpus altilis*
Plant family: MORACEAE

Description: A large tree up to 20-26 m in height. The trunk can be 6 m tall before branching. The trunk can be up to 1 m across. It is an evergreen tree but can lose its leaves in dry weather. The leaves are large and vary in the amount the leaves are divided. They can be entire or divided into 5 to 11 lobes. The leaves are bright green on the upper surface with yellow veins and are pale and dull on the under surface. They have very small stiff hairs underneath. Male and female flowers occur on the same tree. The male flowers are cylindrical spikes which droop and are 12-30 cm long. The female flowers are grouped in a round head. The flower head develops into the compound fruit. The fruit are large and green. They can be 20 cm across. Seeded kinds have spines, and seedless kinds have a more smooth surface. Seeded, small seeded, and non seeded types occur. There are a number of cultivars of each. Seed can be 2 cm across and with darker lines.

Distribution: A tropical plant. It occurs in the hot, humid, tropical lowlands. The plant is purely tropical and normally below about 650m altitude, but trees grow from sea level up to about 1150 m. Trees are killed by temperatures below 5°C. It probably requires an average temperature over 22°C to grow well. It tends to grow in the temperature range 16°C to 38°C. It grows on a range of soils providing they are well drained. There is some cultivar difference in drought tolerance and salt tolerance. Uniformly warm humid climates suit it best. An annual rainfall of 200-250 cm and a relative humidity of 70-80% suits. It suits hardiness zone 11-12.

Edible Parts: Fruit, Seeds, Leaves, Flowers, Vegetable

Use: The flesh of the fruit is eaten cooked. It can be boiled, baked, steamed, mashed, or turned into soups, puddings, cakes and pies. Dried fruit are made into flour. The young leaves are edible. The male and female flowers are edible.

Cultivation: Seeded forms are self sown by birds or bats, and also grown from seed. The presence or absence of seeds significantly affects the production. Seeded trees are mostly propagated by seed which needs to be sown fresh, without seed drying out. Seedless trees are propagated by root cuttings. Cuttings of roots 1.5 cm to 4 cm across and 25 cm long are suitable. Cuttings can be rooted during the wet season, in sand. They should be placed horizontally. They need to be kept moist and shaded. Using intermittent mist improves root formation and cutting establishment. Rooting hormones also assists. This process takes 10 weeks or more and then rooted cuttings should be hardened off in a sunny position for up to 3 more months before planting out into the field. Young plants do best with adequate sun and not shade. Root suckers produced naturally, or by damaging the roots, are a common method of production of new material. Marcottage or budding can also be used for propagation. The vegetatively propagated trees are therefore clones and the variation is presumably therefore somatic. Fruit set can be improved by dusting male flowers onto female flowers 3 days after they emerge.

Because trees often occur from natural seed dispersal by fruit bats and marsupials trees are often randomly spaced and common in secondary forest. A spacing of 10-13m is suitable between trees. Fruit can be 12-22 cm long and 9 - 17 cm wide. The fruit shape varies from round to oblong. Leaves vary from entire to deeply lobed and from rough to smooth and shiny. The central core and the skin are not eaten. Seeded fruit have projecting tuberances on the surface of the fruit. Seedless fruit have rounded or 5 to 6 sided processes on the surface.

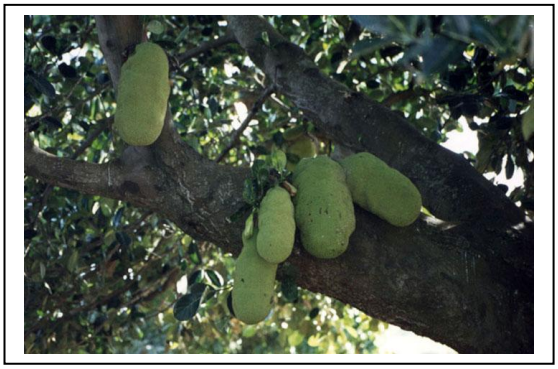
Male and female flowers grow separately on the same tree. Male flowers form an oblong catkin while female flowers form a globular head. The flowers are in the axils of leaves. Both flowers normally appear at the same time. Artificial pollination has resulted in increased yields in some places. This is both an increase in fruit size and more fruit retained on the tree to maturity. The pollen in the male flower is available 10 to 15 days after emergence. It is about 3 months from flowering to fruit maturity. Seeded fruit have 30 to 90 seeds per fruit.

Trees rarely receive much attention after establishment but pruning of branches to allow easier access to fruit is sometimes undertaken. Seedless fruit are picked before maturity when the fruit is eaten by boiling. Harvesting mature fruit can be sweeter fruit but they need to be cooked by baking or roasting. Seeded fruit are normally allowed to drop and are then harvested. Seeds are boiled in salted water or roasted. A mature tree can yield up to 700 fruit per year. The seeds are about 20 % of dry matter as protein with a good nutritional balance. The essential amino acid levels are high for vegetable protein. Fresh fruit are highly perishable and need to be handled carefully and efficiently.

Pit preservation of breadfruit involves lactic acid fermentation. The fermentation needs to be undergone for 2 to 3 months to produce a palatable product. Breadfruit slices can be stored under refrigeration in a fresh marketable state at 14°C for up to 10 days. Segments can be boiled for 2 to 5 minutes then frozen at minus 15°C for at least 11 weeks.

Production: Trees begin to bear after 3-6 years. Growth of the trees is vigorous, with fruiting starting after about 3 years. Trees grow to 10-15 m in 10-12 years. Mature trees can be 30 m high. Fruiting can occur over 5-8 months in some locations and this is partly due to varieties with overlapping fruit seasons. A tree can produce 50-150 fruit per year. A fruit can weigh 1-1.6 kg each. Large trees can give 700 fruit per year of 1-4 kg each. An average seed weighs 5 g. Fruit are harvested 65-95 days after flowering.

English: Jackfruit **Scientific name:** *Artocarpus heterophyllus*
Local: **Plant family:** MORACEAE



Description: An evergreen tree up to 20 m tall and in the breadfruit family. Trees form many branches but have one or two main trunks. The bark is smooth and dark green. Leaves of young trees have 1 or 2 lobes but mature leaves are long (15 cm) and entire. They are leathery, deep green and glossy. Flowers occur on spikes, on stalks from the trunk or main branches. Some stalks only have male flowers, others only have female flowers while some have both male and female spikes. Generally male flowers are on short stalks among the leaves, and female flowers are on trunks. Male flowers are 5 cm long by 2 cm wide and are dull green. Female flowers are bright green. The very large spiny fruit grow on main branches and the trunk. The fruit is a composite fruit made up from the many individual flowers of the flower cluster. Fruit can be 1 m long and weigh 36 kg. They have 6 sided fleshy spines. Each seed is surrounded by a yellow fleshy sheath. Seed are 2-4 cm long and 1-2 cm wide. There can be 100-500 seed in a fruit. Unlike breadfruit, there are no seedless Jackfruit. When ripe the unopened fruit has a strong smell.

Distribution: A tropical plant. It grows in the tropical lowlands and up to about 1200 m altitude. It grows in Nepal up to 800 m altitude. It can stand some drought, but not water-logging. Trees do best where there is year round rainfall. It yields poorly where humidity is low. It does best in a well drained, frost-free location that is warm and sunny. They are slightly more tolerant of cold than breadfruit. It suits areas with a temperature range 22-35°C. Trees can survive occasional frosts down to 0°C. It is best with a pH of 6-6.5. They have some wind and salt tolerance. It suits hardiness zones 10-12.

Edible Parts: Fruit, Seeds, Leaves, Flowers

Use: Unripe fruit can be cooked and eaten as a vegetable. They are fried in curries, preserved in syrup, dried, cooked in milk or made into alcoholic drinks. Unripe fruit are pickled. The seeds (5%) can be roasted and eaten. They are also boiled. (Some kinds have more seeds). The young leaves and flowers are edible. They are eaten mixed with chilis, fish paste, sugar, salt etc.

Cultivation: Trees are usually sown from seeds, but it is best to sow them in their final location as the plants don't transplant easily. They have a long delicate taproot which makes transplanting difficult. Fresh seed must be used (less than 4 weeks). If fresh seed are planted immediately they grow more quickly and more seeds germinate. It is better to use larger seed. The fleshy layer around the seeds should be removed. Seeds can be soaked in water for 24 hours to give better germination. It is best to sow seeds with the embryo pointing downwards and also with the narrow end pointing downwards. Seeds germinate in 3-8 weeks. A spacing of 12 m is suitable. Where trees are used as a wind break, trees are spaced 6 m apart. Air-layering can be used, and stem cuttings are also possible. Air layering is best done in the rainy season. Rooting hormones can be used to help roots develop. The shoots used for air layering should be 2-3 years old and brown in colour. To produce air layers, a small branch 3-4 cm across, is cut below a node and only part way around the stem. A ring 5-7 cm wide is cut and a layer of sand wrapped around the stem and covered with plastic. Using 1% IBA growth substances helps shoots to strike and form roots. Roots form in about 22 days and the stem can be cut off and planted after about 2-3 months. Because trees vary in their growth rate, how quickly they flower and fruit, and in the fruit quality, it is best to grow plants by using vegetative parts from good trees. This can be done by budding or grafting

onto 12 month old seedlings already established in the field. Budding and grafting are not easy with jackfruit. Because the fruit develops on the trunk, early pruning to allow 2-3 trunks to develop is helpful. As well, trees can be topped to prevent them becoming too tall and large.

Production: Jackfruit is a fast growing tree. They can be 7 m tall by 3 years old. Trees begin bearing after about 8 years. The fruiting season lasts about 4 months in subtropical places, but fruit can be produced year round in tropical places. Fruit take about 100 to 120 days from when the flower is pollinated until a fully mature fruit is developed but can take another 4 months to ripen. Trees tend to have heavy crops every second year. Pollination is by wind but hand pollination has been used to improve the amount of fruit set. Fruit can be up to 50 kg in weight. Fruit change from green to yellow when mature. Up to 250 fruit can be produced each year on large trees. Fruit do not store well but can be kept in a cool store for 4-6 weeks at 11°-12°C and with high humidity.

English: Carossier
Local:

Scientific name: *Attalea crassispatha*
Plant family: ARECACEAE

Description: A tall palm. It grows 20 m high. The trunk can be 25-35 cm wide. The crown is nearly rounded. There are 15-19 leaves. The leaves are 3.1-4 m long. There are regularly spaced leaflets. They grow in a single flat plane. The flowering stalk is borne among the leaves. They are crowded among the leaf bases. The fruit have one seed. They are oval and 3.5-4 cm long by 2 cm wide. They are reddish.

Distribution: A tropical plant. It grows in low limestone hills in dry savannas in Haiti. It is damaged by frost. It needs a fertile, well-drained soil. It needs shade when young but can then grow in full sun. It can tolerate drought once mature.

Edible Parts: Seeds, Fruit

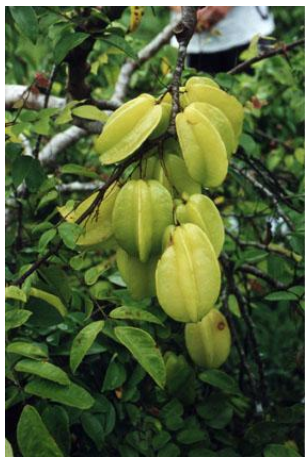
Use: The young seeds are eaten. They taste like coconuts. They are especially eaten by children. It is endangered in the wild.

Cultivation:

Production: It is slow to establish.

English: Carambola
Local:

Scientific name: *Averrhoa carambola*
Plant family: OXALIDACEAE



Description: A small evergreen tree up to 6-12 m high. The trunk of the tree is short and crooked and has branches near the base. The bark is smooth and dark grey. A leaf is made up of 2 to 11 leaflets with a leaflet at the end. The leaves are darker and more shiny on the top surface. The flowers are small (8 mm long) and red and white in clusters on the small branches. The fruit are star shaped with five or six angled ridges. They are yellow and up to 16 cm long and 9 cm wide. The flesh is white. There are one or two shiny light brown seeds about 1 cm long, in the bottom of each lobe. Some carambola have short styles (female flower parts) and these types need to be cross pollinated by insects. This means two types need planting. Long style types can fertilise themselves. Fruit flavour can vary from very acid to very sweet. There are several named cultivated varieties.

Distribution: A tropical plant. Five corners need a warm tropical climate so they are mostly seen in the coastal lowlands below about 500m altitude. They will grow up to 1200m in the equatorial tropics. Mature trees can tolerate slight frost. Five corner can grow on several different types of soil. The soil should be well drained. It will grow on alkaline soils but is better in acid soils. Plants cannot stand water-logging. It is suited to moist places but performs better in areas where there is some dry season rather than in places with heavy, constant rain. Trees are fairly wind resistant providing the winds are not cold. Trees are stressed by temperatures near 0°C as well as above 37°C. It grows in Nepal to about 300 m altitude. It suits hardiness zones 10-12.

Edible Parts: Fruit, Flowers, Leaves

Use: Fruit can be eaten raw or used for drinks. They are used in curries. They can be used for souring dishes. They are also used for jams, jellies, preserves and pickles. (They are also useful for cleaning brass.) The acid flowers are eaten in salads or made into conserves. Leaves have been eaten as a substitute for sorrel. They can be eaten with coconut milk sauce.

CAUTION The fruit contain soluble oxalates.

Cultivation: Trees are grown from seed. Seeds grow easily but in fact only a small number of seeds are fertile. Well developed seeds should be chosen. Seeds are planted in a seed bed and planted out when 15-20 cm high. Because seeds are produced by cross pollination, variation is common. It is therefore better to use budding or grafting. Taking buds off good trees, or grafting twigs from them, onto 1 year old seedling roots, is the commonest method. Marcottage or air layering can also be used, although it is difficult. A spacing of 6 m x 6 m is suitable. Trees need to be grafted if sweeter kinds of fruit are to be selected. Because the seeds are covered by a fatty layer, washing them with soap improves the germination.

Production: Seedling trees fruit after 4-5 years. They can produce 400 fruit per tree. Flowers open after 14-21 days and fruit mature after 14-15 weeks. Trees live for a long time and some fruit is produced at most times of the year. Flowers and fruit can be found on the tree at most times, although there is often 2 or 3 main flushes of flowering and fruiting. Fruiting tends to be seasonal about March to May in the southern hemisphere. The tree does not require pruning or any special care once established. Flowers are cross pollinated by bees, flies and other insects. Hand pollination does not help fruit set much. Fruit once ripe will keep for 7-20 days but can be stored longer at 12°C.

English: Coco Macaco
Local:

Scientific name: *Bactris plumeriana*
Plant family: ARECACEAE

Description: A palm which forms clusters. The trunks are 8-10 m high and 12 cm across. The stems are dark. There are dark rings of long black spines. There are 7-12 leaves. The leaves are 2.6 m long. They are covered with black spines. The spines on the leaf stalk are in 3 rows. There are 50-70 leaflets on each side of the leaf. The leaflets grow at different angles. This gives the leaves a feathery appearance. The leaflets are spiny on the edges. The flowering stalk has 40-60 flowering branches. The bracts is black and spiny. The fruit are round and 1-1.6 cm across. They are orange-red.

Distribution: A tropical plant. It grows along the edges of hilly evergreen forest. It is usually below 500 m altitude.

Edible Parts: Fruit

Use:

Cultivation:

Production:

English: Akee
Local:

Scientific name: *Blighia sapida*
Plant family: SAPINDACEAE

Description: A small evergreen tree up to 9-13-20 m tall. It spreads to 3 m across. The stem is erect and branching. It has a spreading, open-textured crown. The leaves are dark green with 6, 8 or 10 curved leaflets. The flowers are greenish white in branched flowers stalks, in the axils of leaves. They extend upwards. The fruit is about 9 cm long and red when ripe. The fruit has five segments. It is roughly pear shaped. The fruit opens naturally when ripe and usually has 3 black seeds inside. These are covered with yellowish flesh called an aril. The aril is edible**. The pink tissue is toxic. Unripe fruit are toxic.**

Distribution: A tropical plant. It is native to tropical West Africa. It suits the humid tropics. It needs 2,000 mm of rain per year. It does best in moist, well composted soils in a sheltered, sunny position. It is drought and frost tender. It can grow in the subtropics and survive with temperatures near freezing. It suits hardiness zones 10-12.

Edible Parts: Fruit, Aril, Flowers – flavor

Use: The fleshy white aril around the seeds is edible after the fruit opens naturally. It is often cooked by boiling in salt water. It looks like scrambled eggs after cooking.

CAUTION The seeds are poisonous. The unripe aril is inedible. The pink tissue between the aril and seed is poisonous.

Cultivation: Trees can be grown by seeds or cuttings.

Production: It often bears two crops per year. It starts to produce after 4 years. Trees can keep producing for 50 years.

English: Canola
Local:

Scientific name: *Brassica napus*
Plant family: BRASSICACEAE

Description: A cabbage family herb. It is an annual plant. It grows 1.5 m tall. It usually has a strong taproot. The stem is erect. The leaves have blue-green colour. The lower leaves have leaf stalks. The leaf blade is 5-20 cm long. The veins have some bristles. The upper leaves clasp the stem. Its blade is oblong or sword shaped. The petals are pale yellow. The pod is 5-10 cm long and slightly 4 angled. There is a beak 5-20 mm long which does not have seeds. The seeds are 1.5-2.5 mm wide. They are blue-black. It suits hardiness zones 8-11.

Distribution: It suits hardiness zones 8-11.

Edible Parts: Leaves, Oil, Seed, Flower

Use: The seeds yield an edible oil. The leaves are cooked and eaten. The flower can be used like broccoli. The seeds can be sprouted and eaten in salads.

Cultivation:

Production:

English: Guinea Arrowroot, Sweet Corn Root, Tambu **Scientific name:** *Calathea allouia*
Local: **Plant family:** MARANTACEAE

Description: A herb. It keeps growing from year to year. It grows 1.5 m high. It has an underground rhizome or stem. There are several large leaves. The leaf is oblong and 20-60 cm long by 5-20 cm wide. The flowering stalk is 5-10 cm long. The flowers are in a spiral. They are white. The underground tubers are 1-5 cm long and 0.5-3 cm wide. They can be larger. They are covered with a yellowish-grey paper like skin. The tubers develop at the ends of the fibrous roots.

Distribution: It is a tropical plant. It requires a hot, even temperature. It does best with temperatures between 25-30°C. It needs a moderate rainfall. (1500-2000 mm). When there is plenty of humidity, nutrients and good soil drainage, plants do best in full sunlight. It is often grown in shade. They need soils rich in organic matter. In SE Asia it probably grows up to 600 m altitude.

Edible Parts: Tubers, Flowers, Leaves – flavor

Use: The tubers are cooked and eaten. It is used in salads, stews and fish dishes. Young flower clusters are cooked and eaten. The leaves are used to wrap food to add flavour.

Cultivation: Plants are grown from rhizomes, suckers or offshoots. Plants only occasionally flower and do not produce viable seed. The tuberous roots are stored in a cool, dry place until they are transplanted. Plants are spaced about 0.5 m apart. The rhizomes produce about 20 shoots around them.

Production: A crop of tubers is ready 10-12 months after planting. Yields of 10 tonnes per hectare are possible. Yields per plant vary between 100 and 2,200 g.

English: Manaca
Local:

Scientific name: *Calyptronoma plumeriana*
Plant family: ARECACEAE

Description: A solitary palm. It grows 4-10 m high. The trunks are 10-20 cm across. There are 12-16 leaves. The leaves have leaflets along the stalk. These are regularly arranged and spread in the same plane. Both male and female flowers occur on the one plant. The flowering stalks grow out from beneath the leaf crown. The flower stalk is short with flowers congested on it. There are 3-5 flowering branches 13-22 cm long. The fruit are small and brown or black when mature.

Distribution: A tropical plant. It grows in wet forests and along streams. They grow in low lying wet areas.

Edible Parts: Male flowers

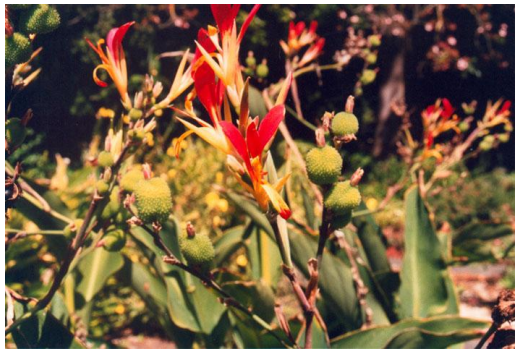
Use: The male flowers are eaten for their sweet nectar.

Cultivation:

Production:

English: Indian Shot
Local:

Scientific name: *Canna indica*
Plant family: CANNACEAE



Description: A herb which grows 1-2.5 m high. The leaves are large and smooth. They are dark green but can be reddish in some varieties. The leaf base forms a sheath around the stem. The flowers can have narrow petals but more often are large and colorful. They can be red, yellow or orange. The rhizome or underground stem has roots attached. The seeds are black and hard. They are 5-7 mm across.

Distribution: It grows in the tropics and subtropics. It grows in hardiness zones 8-12.

Edible Parts: Fruit, Root, Tubers

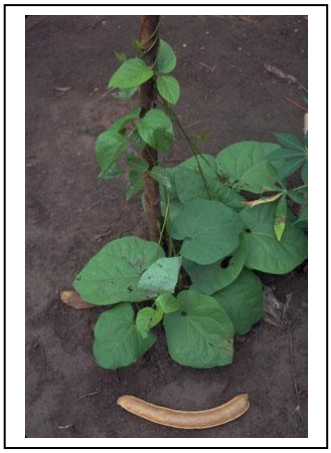
Use: The rhizomes are a source of starch. The rhizomes are eaten after cooking. They are boiled or baked. The leaves and rhizomes are used for animals. Starch can be wxtracted from the roots. This is achieved by rasping the tubers, then washing the starch out and straining out the fibres. The large starch grains are very digestible. The starch is used to make transparent noodles.

Cultivation: They can be grown from seed. It is more easy to grow them by dividing the plant. The crowns should not be planted too deeply. The end section of the rhizome is planted. Well developed tubers with one or two undamaged buds should be used. A spacing of 1 m x 1 m is suitable. Tubers are planted about 15 cm deep and need to be kept weed free during early growth. About 2.5 tons of tubers are required to plant a hectare. The tubers are dug from between 6 and 19 months. The tubers can be stored if cool and dry. For starch manufacture they need to be processed immediately.

Production: Harvesting occurs after about 8 months. Parts of the underground root are harvested as needed. High yields of tops and rhizomes are possible. Up to 38 tons of rhizomes and 50 tons of tops have been achieved.

English: Jack Bean
Local:

Scientific name: *Canavalia ensiformis*
Plant family: FABACEAE



Description: A perennial climber, although short kinds do occur. Often it is a more bushy plant than the sword bean. Plants up to 1.5 m long. Stems can be hairy. Leaves have 3 leaflets. The leaflets are oval and 5.7-20 cm long by 3.2-11.5 cm wide. The leaf tends to be wedge shaped at the base. The leaf stalks are 2.5-11 cm long. Flowers are red/purple. They occur on flower clusters 5-12 cm long and with flower cluster stalks which are 10-34 cm long. The individual flower stalks are 2-5 mm long. Pods are long and sword shaped. Pods can be 15-35 cm long. Seeds are white with a light brown hilum half as long as the seed. Seeds are 2 cm long, by 1 cm across.

Distribution: It grows in tropical and subtropical places. It requires a fairly high temperature (15°-30°C). It will possibly grow up to 900 m altitude. It is fairly drought resistant and also has some resistance to water-logging and salt in the soil. It can tolerate shade. It can tolerate pH from 4.5 - 8.0 but does best at about 6.1. The optimum mean annual temperature is 14.4°-27.8°C. Seed germinate between 24-27.5°C. It is a short day plant growing well with a daylength of 10-12 hours of sunlight.

Edible Parts: Seeds, Leaves, Young pods, Spice, Flowers

Use: The leaves and top shoots are eaten. The very young pods are boiled and eaten. The flowers can be eaten. The young seeds are eaten boiled, roasted, or peeled and cooked. The seeds are also fermented. The ripe seeds are roasted and used as a coffee substitute.

CAUTION The ripe seeds can contain poison and need to be well cooked and the water changed before eating. They are also often left under running water or fermented.

Cultivation: It is grown from seeds. Seeds need to be 2 cm deep. A spacing of about 60 cm is suitable. Plants preferably need a support to climb over. It benefits from a fertile soil but adding nitrogen depresses yield.

Production: Green pods are produced in 3-4 months, but ripe seeds need 6-9 months. Yield of seeds can range from 700 to 5,400 kg / ha.

English: Peruvian Pepper
Local:

Scientific name: *Capsicum baccatum*
Plant family: SOLANACEAE

Description: A spreading shrubby plant. It grows 3 m high and spreads 1.5-2 m wide. The flowers are white or yellow and 1 cm across. The fruit are small. They are green or red. There are several named cultivated varieties.

Distribution: A tropical plant. It grows from sea level to 1600 m altitude in Argentina. It needs a temperature above 4-13°C depending on cultivar.

Edible Parts: Leaves, Fruit

Use: The fruits are dried and become yellow. They are hot and spicy. They are used for seasoning.

Cultivation:

Production:

English: Pawpaw, Papaya
Local:

Scientific name: *Carica papaya*
Plant family: CARICACEAE

Description: Pawpaw is one of the very well known fruits of the tropics. The straight soft stemmed plant grows up to 3-5 metres tall and only occasionally has branches. The stem is softly woody and has scars from fallen leaves along it. At the top of the plant there are a clump of leaves. The leaves are large (50 cm wide) deeply lobed and on long leaf stalks. The leaf stalks are 90 cm long. There is a crown of leaves at the top of the trunk. Trees can be male, female or bisexual. The male flowers are small and white and on long stalks. Female and bisexual flowers are on short stalks. These have no fruit, round fruit and long fruit respectively. There are three forms of long fruit. The seeds are black.

Distribution: It is a tropical plant. Pawpaws will grow from sea level up to about 1700 m altitude in the equatorial tropics. In cooler regions they have to be planted but in humid tropical regions are commonly self sown. Sunlight allows germination when forest is cleared. Plants cannot stand frost. They need a night temperature above 12°C. Also they cannot stand water-logging. Plants die after 48 hours in standing water. It needs a pH between 5-8. It suits hardiness zones 11-12.

Edible Parts: Fruit, Flowers, Leaves

Use: Green fruit can be cooked as a vegetable. The young leaves can be eaten cooked, but are bitter. The flowers and the middle of the stem can be eaten. Papayas contain papain which is a meat tenderiser.

Cultivation: Pawpaw seeds grow easily and plants grow quickly. Fresh seeds can be used, or if dry seeds are used they should be soaked before planting. Seeds should be planted with a temperature of 24-30°C. To produce well they need a reasonably fertile soil. Seeds can be sown directly or the seeds can be put in a nursery and the seedlings transplanted. Seeds in a nursery should be about 1-2 cm deep. Seedlings can be transplanted when they are about 20 cm high. Plants should be about 3 m apart. Continuous fruit production depends on fertility, temperature and moisture being adequate to maintain active growth. The fruit is produced year round but the growth and development rate decreases with temperature. Also the size and quality of fruit declines at lower temperatures. Pollination is by wind and insects. Normally cross and self pollination both occur. Pollination is not normally limiting. Seeds are widely dispersed by birds, bats and people. Seeds remain viable for a few months and also germinate freely.

Production: Seeds emerge in 2 to 3 weeks. Vegetative growth before flowering is 4-8 months. Fruit is produced as one or more per leaf axil, about every 1-2 weeks, under good growing conditions. So with good growth 100 fruit can be produced from one plant in a year. Fruit development from pollination to maturity is about 2-3 months. On the coast in tropical equatorial regions, pawpaws start producing fruit after about 4 or 5 months but in the highlands this may not start for 12-18 months. The first fruit produced and ripe, are ready 6-11 months from planting. Practical tree life is about 2 to 3 years, although trees may live for 10-12 years.

English: Star Apple, Caimito
Local:

Scientific name: *Chrysophyllum cainito*
Plant family: SAPOTACEAE

Description: An evergreen tree up to 12-25 m high. It spreads 4-8 m across. The stem is erect but the branches hang down. Leaves are small, hairy, shiny and dark green on top and red/yellow underneath. Young parts of the plant are hairy, with soft silky rust coloured hairs. The flowers are mauve and small. They occur in clusters scattered among the mature twigs. The fruit are smooth skinned and 5-10 cm across. Fruit are oval shaped, yellow at first and light purple when ripe. When the fruit is cut crossways the star shape can be seen. The fruit pulp is white and sweet. The flesh can be purple in some kinds. It contains up to 10 shiny dark seeds.

Distribution: A tropical plant. It is native to tropical America. They are suitable for damp districts probably below 400 m altitude. It is drought and frost tender. It suits well drained soils, in a protected sunny position. Humid atmosphere and high temperatures throughout the year, suit the tree best. It has been grown up to 1,000 m altitude in South India. Young trees need cold protection but mature trees can survive cool temperatures. It suits hardiness zones 11-12.

Edible Parts: Fruit, Seeds

Use: The fruit is eaten fresh when fully ripe. The skin has a gummy substance so the flesh of the fruit should be spooned out. The seeds are sometimes eaten in confectionary. An emulsion of the kernels can be made into a sweets. The flesh of the fruit is sometimes added to salads and drinks. The fruit can be parboiled and also made into preserves. It is a cultivated food plant.

Cultivation: Trees are grown from seeds. Seed can be stored for several months. Seed germinate well if planted fresh. Germination takes about 6 weeks. Trees grown from seed, give a variation in fruit quality and size. Fruit need to ripen on the tree. Trees are not normally pruned. Budding and grafting have been used. Cuttings will grow if taken from well ripened small shoots and grown in strong moist heat. Plants can be grown by layering.

Production: It is a slow growing tree. Trees planted from seed come into bearing in 5-9 years. Grafted trees bear in 4-5 years. Yields of 70 kg or fruit per tree per year have been recorded. The fruit do not drop and must be picked.

English: Satin Leaf, Damson Plum
Local:

Scientific name: *Chrysophyllum oliviforme*
Plant family: SAPOTACEAE

Description: A tree that loses its leaves. It grows 10 m high. The bark is thin and reddish-brown. It is scaly. The tree yields a milky latex when cut. The leaves are small and leathery. They are 10 cm long and oval. They are dark green and shiny on top. They have velvety rusty hairs underneath. The fruit are olive-like and dark purple. They have one seed. The seed is narrowly oval and 1.5 cm long. The pulp is fairly dry. It is edible.

Distribution: A tropical plant. It suits hot humid climates.

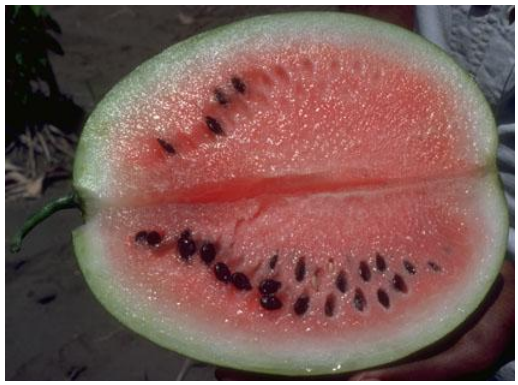
Edible Parts: Fruit

Use: The fruit are eaten. They can be used for jelly. The latex is chewed as a chewing gum.

Cultivation: Plants are grown from seed.

Production: It is fairly slow growing.

English: Watermelon **Scientific name:** *Citrullus lanatus*
Local: **Plant family:** CUCURBITACEAE



Description: An annual climber with deeply divided leaves and tendrils along the vine. It trails over the ground and has hairy, angular stems. The leaves are on long leaf stalks. The leaves are deeply divided along their length. These lobe are rounded and can themselves be divided. The leaves are 5-20 cm long by 2-12 cm across. The tendrils are divided. The plant has separate male and female flowers on the same plant. The flowers are pale yellow and smaller than pumpkins. The flowers occur in the axils of leaves. The male flowers appear first. Fruit are large and round or oval. They can be 60 cm long. Fruit have a hard smooth skin. Several fruit colours and shapes occur. Often they have a dark green mottle. The fruit has reddish juicy flesh and black or red seeds. The seeds are oval shaped and smooth.

Distribution: A tropical plant. They grow best on the coast in the tropics but will grow up to about 1000 m altitude. They will not stand water-logging and do well on sandy soils. Plants are frost sensitive. Seed will not germinate below 21°C. Temperatures between 24-30°C are suitable. Fruit are sweeter in arid warm areas. It suits hardiness zones 10-12.

Edible Parts: Fruit, Seeds, Leaves

Use: The fruit is eaten raw when ripe. Small unripe fruit can be cooked as a vegetable. Seeds are also eaten. They are dried, soaked in salt water then roasted. Oil is extracted from the seeds. Occasionally very young leaves are eaten. The skin is sometimes candied in vinegar then eaten with fish. The syrup from the fruit can be used in jams and cakes.

Cultivation: Plants are grown from seed. They are suitable mainly for the dry season. A spacing of 1.5 to 2 m is suitable. They grow easily from seed. They do best when fully exposed to the sun. Seed can be dried and stored. If too much vegetative growth occurs picking out the tip to produce side branches with more fruit.

Production: Plants grow quickly. Harvesting commences after 4-5 months. The main fruit season is November to January. The ripeness can be picked by tapping the fruit to get a dull sound, the part of the fruit on the ground changes from green to light yellow and the tendril near the base of the fruit becomes dry. Fruit yield can be 45-60 tons per hectare. There can be 4-6 fruit on each plant.

English: Seville Orange
Local:

Scientific name: *Citrus aurantium*
Plant family: RUTACEAE

Description: An evergreen tree up to 10-15 m high and with slender thorns. It spreads to 5 m across. The stem is stout and erect. It is covered with smooth greyish-brown bark. The leaf stalks have broad wings. The leaves are glossy green, oval and 10 cm long. The leaves taper towards the base and are paler under the leaf. There are spines in the axils of the leaves. The flowers are white and have a sweet smell. They are 2 cm across and there can be 1, 2 or a cluster, in the axils of leaves. The fruit is often green with a reddish tinge and fairly juicy but sour. The fruit are 5-7 cm long. The fruit is often rough skinned. The flesh is divided into segments with sour pulp.

Distribution: A tropical and subtropical plant. Mostly in coastal areas in the tropics. It is drought and frost resistant. It does best in a protected sunny position. It must have a temperature above 3-5°C to grow. It suits hardiness zones 9-11.

Edible Parts: Leaves - tea, Herb, Spice

Use: The fruit is bitter, therefore mostly used for marmalade or flavoring. The fruit are used for peel and for sherry and wine. The tree is used as a rootstock for budding or grafting other citrus on to. The oil from the flowers is used for flavoring. The flowers are used for flavoring tea. Immature fruit are pickled in salt or vinegar or fried in coconut oil.

Cultivation: It is mostly grown from seeds. It can also be grown by cuttings. The seeds often produce several shoots. Plants can be grown by grafting.

Production:

English: Lemon
Local:

Scientific name: *Citrus limon*
Plant family: RUTACEAE

Description: A small evergreen tree with short spines. It grows to 7 m high and spreads to 3 m across. It branches freely. Young branches are often reddish. Leaves are about 5-12 cm long. They are green and drawn out to a point, with notched edges. The leaf stalk is usually not winged. The leaves do not have much of a scent. The flowers are white, with 5 petals and have a strong sweet smell. They are 4-5 cm across. The fruit is oval shaped and with a knob at the end. Fruit can be 7-15 cm long. The skin is fairly thin, rough and light yellow. The flesh is sour and the seeds are oval.

Distribution: A subtropical plant. Trees do not do well on the coast in the tropics but they grow well at about 1300 m and will grow up to 2200 m altitude in Papua New Guinea. They prefer a light to medium, well drained soil. They are drought resistant but most varieties are frost tender. They need a temperature above 3-5°C for growth. They suit warm temperate regions. It suits hardiness zones 9-11.

Edible Parts: Fruit, Herb, Spice

Use: The fruit is mostly too sour to eat fresh but the juice is used to make drinks. The juice is used in tea, ice cream, sauces, salads, salad dressings and marinades. It can be a coagulant in cheese making. The peel is used as seasoning in chocolate. The peel is candied in syrup. The inner parts of the peel and pulp are used for low-methoxyl pectins used for sugarless fruit jams and jellies. The dried leaves are added to teas for flavouring. The flowers are eaten in ice cream, fritters and jams.

Caution: Large doses can erode teeth enamel and cause dermatitis.

Cultivation:

Production: Many trees are seedlings. Better trees are grafted.

English: Pummelo, Pomelo
Local:

Scientific name: *Citrus maxima*
Plant family: RUTACEAE

Description: A spreading, spiny tree. It grows up to 15 m high. It is dome shaped. The leaves are very large. They are glossy and oval and downy underneath. The leaf stalks have broad wings. Young shoots and stems have fine hairs on them. Flowers are large (2 cm) and creamy white. The flowers are produced in bunches from woody shoots. The flowers have a sweet scent. The fruit are oval or pear shaped. The fruit is very large (20 cm) with a thick skin. The skin is dotted with oil glands. The fruit are green but become yellow when ripe. They contain 11-14 segments. The flesh can be pale yellow or pink. Each segment of the fruit is covered by a strong membrane. Some kinds have many seeds, while others are almost seedless. There are several named cultivated varieties.

Distribution: A tropical plant. They thrive in warm lowland areas in the tropics. They can grow from sea level up to 900 m. They are tolerant of brackish and salty conditions. They suit humid climates. In the Cairns Botanical Gardens. It suits tropical and subtropical locations. It suits hardiness zones 10-12.

Edible Parts: Fruit

Use: The fruit can be eaten fresh. They are used for desserts, jams and marmalades. The fruit pulp can be dried and candied. The skin can be eaten as a vegetable.

Cultivation: They are mostly grown from seed, but do not breed true. The seed only produce one seedling unlike many citrus. Trees are often produced by aerial layering, but budding or grafting can be used. Air-layered trees give sweeter fruit. Trees start producing after about 9 years. Trees need to be about 9 m apart. Trees grown away from other trees often produce almost seedless fruit.

Production: Fruit is produced almost all the year round. The time from flowering to ripe fruit, is about 6 months. Fruit can be stored quite well.

English: Citron
Local:

Scientific name: *Citrus medica*
Plant family: RUTACEAE

Description: A small evergreen tree. It grows up to 3-5 m high and spreads to 2 m across. The stem is stout, erect and thorny. The leaves are green and 20 cm x 10 cm. The tree has fat spines. The leaves have teeth along the edge. The leaf stalk does not have wings. The flowers are white, star shaped and with 5 petals. They have a scent. The fruit are large and long, with a rough skin. The fruit grows to 15-25 cm long by 10-15 cm wide. The flesh is white. The fruit does not have a lot of juice. There are several named cultivated varieties.

Distribution: A subtropical plant. It prefers rich, moist soils. The soils need to be well aerated and not waterlogged. They should be in a protected sunny position. They are drought and frost tender. It suits hardiness zones 9-11.

Edible Parts: Fruit, Herb, Spice

Use: The thick layer of inner white skin is used as candied peel. It is also added to salads and used in fruit cakes. The juice of some kinds is used for drinks. The fruit are used for marmalade.

CAUTION: The fruit contain coumarin that with sunlight can cause dermatitis in some people.

Cultivation: Trees can be grown by seed, cuttings or grafting. Seed should germinate in 21 days. Cuttings of 2-4 year old branches are used. Air-layering can be used. A spacing of 5-7 m is suitable.

Production: It is slow growing. It is fairly short lived. Trees begin to bear when 3 years old. Trees reach peak production when 15 years old and may live for 25 years. Trees can produce 2,000 fruit in a year.

English: Orange
Local:

Scientific name: *Citrus sinensis*
Plant family: RUTACEAE

Description: An evergreen tree up to 8-10 m high. It spreads to 4 m across. The stem is short, stout and spiny. It has a dense, rounded crown. The leaves are dark green, sword shaped and tapering towards the tip. They are 5-15 cm long. The leaves have a sweet smell when crushed. The leaf stalks have narrow wings and the stalk is jointed to the blade. The flowers are white and have a scent. The flowers have 5 petals and occur either singly or in clusters. The fruit often remain green colour and don't turn orange when ripened below 600 m altitude in the tropics. The fruit are about 9 cm across. They have 10-14 segments.

Distribution: A subtropical plant. Not suited to very wet areas. Not suited to high altitudes. Seeds won't grow below 13 °C. They need a well drained, fertile, sandy soil. They are drought and frost tender. Trees need temperatures above 3-5°C to grow. It suits hardiness zones 9-11.

Edible Parts: Fruit, Herb, Fruit skin, Spice

Use: The fruit is eaten fresh, and the juice used in drinks. They are also added to salads and made into wine. The juice is canned, bottled, and used in ice cream and jellies. The peel is candied and used for flavouring. It is made into marmalade. The flowers are eaten as a vegetable. The roots are used to flavour soup.

Cultivation: Trees are often grown from seeds but these do not breed true. Seeds grow most easily between 27°C and 32°C. It is better to use budded plants. Plants can also be grafted. Green fruit can be treated with ethylene to give an orange colour, if people think an "orange" fruit is not supposed to have green colour!

Production: Grafted trees produce in 2-3 years. Seedling trees take 3-5 years to fruit. Fruit take 6-8 months to mature after fruit set. A good tree can produce 100 fruit in a year. Fruit can be left on trees for several weeks after ripening for storage.

English: Silver Palm, Silver Thatch Palm **Scientific name:** *Coccothrinax argentea*
Local: **Plant family:** ARECACEAE

Description: A fan palm. The trunk is slender. It is 7 m high and 12 cm across. The upper part of the trunk is covered with woven fibres. The crown is sparse. It is 2 m wide and 2.6 m high. The leaf stalks are 60 cm long. The leaves are 1 m wide. The leaves are deeply divided. The segments are narrow and drooping. They are dark green and glossy on the upper surface and very silvery white underneath. The flowering stalk is 60 cm long. It is branched and born amongst the leaves. The flowers are white. The fruit are purplish-black. They are 1.2 cm wide.

Distribution: A tropical plant. They grow in exposed rocky situations. It is often on limestone hills. They need an open sunny position. They need a well drained soil. It does best in tropical and subtropical conditions. It often does best in seasonally moist and dry climates. They are salt tolerant. In Central America it grows below 500 m altitude. They are drought tolerant. It suits hardiness zones 9-12.

Edible Parts: Leaves, Cabbage, Palm heart

Use: The very young leaves (or cabbage) are cooked and eaten.

Cultivation: It is difficult to transplant.

Production: They are slow growing.

English: Coconut **Scientific name:** *Cocos nucifera*
Local: **Plant family:** ARECACEAE

Description: A palm with an unbranched trunk. The trunk has ring-like leaf scars along it. At the base it is swollen and surrounded by a mass of roots. They grow to about 25 m tall. Dwarf varieties have been produced. The fronds are 2-6 m long. They are divided along the stalk into strap shaped leaflets. The leaflets are 60-90 cm long. They are narrow and tapering. Clusters of large fruit develop beneath the fronds. Male and female flowers are separate on the one stalk. Female flowers are near the base. Flowers are cream. The flowers are covered by boat shaped bracts. About 10-12 fruit/stalk is a good crop. Leaves are up to 5 m long. Fruit can be 25 cm across. The fruit are fibrous. The hard shell inside is filled with coconut milk and the white copra layer.

Distribution: A tropical plant. Mainly in coastal areas but occasionally up to 1000 m in the tropics. In Fiji coconut palms rarely fruit above 400 m altitude. Temperatures of 27°-32°C are best with a daily range of 5-7°C. They need a minimum temperature of over 18°C to bear fruit. They need over 1000 mm of rain/year preferably 1500 mm. Soils need to be well drained. It requires plenty of sunlight. Sunlight of 1,800 hours per year gives good growth. It is salt tolerant. It can tolerate soils with pH between 5-8. In Nepal plants grow to 500 m altitude. Coconuts are normally confined to within 26° of the equator. It suits hardiness zones 12.

Edible Parts: Nut, Sap, Cabbage, Nut milk, Apple, Palm heart

Use: The liquid of fresh nuts is drunk. The flesh is eaten, and the "apple" in sprouting nuts is eaten. The flesh is grated and used in cooking as "coconut" milk. The young shoots at the top of the palm can be eaten. The sap from the flower stalk can be tapped for the sugary juice. The oil can be extracted from the kernel.

Cultivation: Seeds should be selected from regular bearing palms that produce more than 80 nuts per year. Selected nuts are sprouted in a nursery, then planted out. Seeds that have not germinated within 3 months are usually rejected. Seedlings are ready for transplanting when they have 3-4 leaves (about 1 year). The nut should be planted in a hole 0.6 x 0.6 m. A spacing of about 7-8 m is suitable. Temperatures need to be above 15°C for nuts to germinate.

Production: Early germinating nuts, give early production in the field. They can commence production after 6-8 years. The best yields are often produced between 12 and 60 years of age. Trees can live for 100 years. Palms can produce 15-100 nuts per year. Fruit take about 1 year to be mature. Tapping the flower stalk can give 1 kg sap/day for 6 months.

English: Arabian Coffee
Local:

Scientific name: *Coffea arabica*
Plant family: RUBIACEAE

Description: An evergreen shrub. It grows to 3-5 m high and spreads to 3 m across. The stem is slender and the branches are flexible. The leaves are glossy green, oblong, and tapering towards the tip. They occur opposite each other and have easy to see veins. The leaves are 10-15 cm long by 5 cm wide. The flowering stalks grow from these side branches and have 1-4 flowers. The flowers are white, with 5 petals. They have a scent. Flowers occur in clusters in the axils of leaves. The fruit are green but change to red when ripe. They contain 2 seeds. The seeds are grey-green. They are about 12 mm long. They are flattened on the side where they are pressed together. Coffee seeds are commonly called "beans".

Distribution: It is native to NE tropical Africa. A tropical and subtropical plant. It grows best in rich deep soils in a protected partly shaded position. It is drought and frost tender. It cannot stand flooding. It needs a temperature above 10°C. It suits hardiness zones 10-11.

Edible Parts: Seeds, Leaves, Herb, Spice, Leaves – tea

Use: The seeds are used for coffee. The seeds are roasted and then ground to make a drink. Coffee extract is used for flavouring ice cream, candies, pastries, and soft drinks. The roasted seeds are eaten as snacks. The red fruit and leaves are chewed for their stimulant properties. The leaves are used as a tea substitute.

Cultivation: Plants can be grown from seed. They can also be grown from cuttings. Budding and grafting can also be used. Seeds are planted in a nursery, under shade at first. They take 6-24 months before being ready to transplant. Plants are commonly pruned to produce a densely branched shrub, 3 m high. Two kinds of branches occur. The ones which stick upwards do not bear fruit but can produce buds for new branches. The branches which grow sideways then hang over, are the ones which fruit. Normally, only one, or up to four, of the upright branches are kept and others are pruned out.

Production: Plants normally self pollinate. The fruit develops over 9 months. Coffee bushes bear fruit after 3-4 years and can continue to do so for 50 or 60 years. For best quality the outer layer of the seeds is removed in a pulping machine then fermented while wet for 12-24 hours before drying in the sun and having the parchment removed in a hulling machine. Five kgs of fresh berries would yield about 1 kg of dried clean coffee.

English: Calabash, Calabash Tree **Scientific name:** *Crescentia cujete*
Local: **Plant family:** BIGNONIACEAE

Description: A shrub or tree. It grows to 10 m tall. It is evergreen. The leaves are arranged in spirals and are long and narrow. They are simple and dark green. They are 27 cm long. The bark is deeply cracked and corky. The flowers are round and bell shaped. They grow in long drooping heads. The fruit hangs like balls on long stalks. The fruit are 30 cm long by 18 cm wide. They are green. They have a hard outer rind and white pulp containing seeds.

Distribution: It is a tropical plant. It does best in warm moist conditions. It cannot stand frost while young. It suits hardiness zones 11-12.

Edible Parts: Seeds, Fruit, Leaves

Use: The young fruit are eaten cooked or pickled. The seeds are eaten, roasted. They are also roasted and mixed with wheat to make a coffee. The seeds yield an oil. The seeds are used to make a syrup. They are ground and mixed with sugar and water and boiled. The leaves are cooked in soups.

Cultivation:

Production: Plants are grown from seed or cuttings. It can also be grown by air-layering.

English: Cucmber
Local:

Scientific name: *Cucumis sativus*
Plant family: CUCURBITACEAE

Description: A pumpkin family plant. It is a hairy annual climber with tendrils and yellow flowers. It grows to 0.5 m high and spreads to 2 m wide. The stem is trailing and has bristles. The leaves are heart shaped and the lobes taper. Leaf shape varies with different varieties. The tendrils are not branched. The flowers are yellow and funnel shaped. They occur in clusters in the axils of leaves. Male and female flowers are separate but on the same plant. Male flowers are normally in groups of 2-3 and develop first and female flowers are borne singly and open later. Fruit are long and often with a slightly lumpy skin. The flesh inside is greenish white. The fruit are edible. The fruit contain many seeds. Fruit 20-100 cm long are called cucumbers and fruit which are much smaller and darker green are called gherkins.

Distribution: A subtropical plant. It occurs from sea level up to at least 2200 m in the tropics. It is a traditional vegetable in the highlands of Papua New Guinea. Protection from wind is needed. It is killed by frost. It needs a temperature above 10°C. In Nepal they grow to 1600 m altitude. It suits hardiness zones 9-11.

Edible Parts: Fruit, Leaves, Seeds, Vegetable, Seeds – oil

Use: Usually unripe fruit are eaten raw. Young stem tops and leaves are edible. The kernels of the seeds are edible. They are also roasted. The seeds can be pounded and added to other dishes. The seeds can be pressed for oil. Cucumbers are normally eaten fresh while gherkins are pickled in vinegar.

Cultivation: Batches of 2-3 seeds are normally sown together during the dry season and in new gardens. A spacing of 1 m apart per plant is suitable.

Production: Harvesting can commence 6-8 weeks after sowing. Up to 10 fruit per plant can be produced.

English: Pumpkin, Winter Squash **Scientific name:** *Cucurbita moschata*
Local: **Plant family:** CUCURBITACEAE

Description: A pumpkin family plant. It is a creeping plant with long creeping stems and softly hairy but without prickly hairs. The stem are rounded or 5 angled and moderately hard. They can grow 15-20 m long. The leaves are large and shallowly lobed and divided like fingers on a hand. Occasionally the leaves have white blotches. They have rounded lobes. They are 20 cm by 30 cm. The leaf stalk is 12-30 cm long. The flowers have male and female flowers separately on the same plant. The fruit stalk is distinctly expanded there it joins the fruit. The fruit are not hard shelled and are dull in colour. The flesh is yellow. Often the flesh has fibers through it. The seeds are plump and white to brown. They separate easily from the pulp of the fruit. The edge of the seed is scalloped and irregular in outline. There are a large number of cultivated varieties.

Distribution: A tropical plant. It suits the wet tropics. It will thrive in humid as well as in very hot climates. A temperature of 18-30°C is best. It can tolerate some shade. It can grow in soils with a pH of 5.5-6.9. In Bolivia it grows up to 2000 m altitude. It suits hardiness zones 8-11.

Edible Parts: Fruit, Leaves, Seeds, Vegetable

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

Cultivation: Plants are grown from seed. Seeds can be put in a nursery and transplanted.

Production: Fruit mature in 70-180 days after sowing depending on variety.

English: Globe Artichoke
Local:

Scientific name: *Cynara scolymus*
Plant family: ASTERACEAE

Description: A thistle like perennial plant. It grows 1-2 m high and spreads to 1 m across. It forms a clump. It has deeply lobed leaves. The leaves are 80 cm long. They are greyish green above. They have a woolly, white surface underneath. They do not have spines. The flower is purple and surrounded by green bracts. It forms a large head. The flower head is about 8-15 cm across. There are several cultivated varieties.

Distribution: A Mediterranean plant. It can be grown in the highlands in the tropics. It suits drier areas. It prefers deep, rich, alkaline soils in an open sunny position. It is frost resistant but drought tender. It suits plant hardiness zones 6-11.

Edible Parts: Leaves, Flower, Vegetable

Use: The fleshy bracts of the flower and the base of the flower head are boiled and eaten. They can be used in soups. They can be eaten raw, boiled, steamed, baked, fried, stuffed or marinated. The small side shoots are pickled, preserved in oil, or used in soups and stews. (To stop the cut artichoke turning brown in air, they can be dipped in lemon juice.) The tender inner portion of the flower stalk can be eaten raw or cooked.

Cultivation: It is best to grow the seeds in a nursery and then transplant them. It can also be grown by dividing up a mature clump. Suckers and offshoots produce uniform crops. Seedlings are transplanted when 15 cm high. A spacing of 120-200 cm is suitable.

Production: Plants from seeds produce flowers after 240 days and plants from suckers flower earlier. The flower buds can be produced over a 2 or 3 year period. The buds are harvested when full size but before the bracts open.

English: Carrot
Local:

Scientific name: *Daucus carota* subsp. *sativus*
Plant family: APIACEAE

Description: A root crop grown from seed. It normally grows a fattened root one year then forms a flower the next year. It can be 60 cm high and spread to 50 cm wide. The root is long in shape and orange in colour. The stem is erect, tough and furrowed. The leaves are feathery and divided 3 times. The leaves have a sheath clasping the stalk at the base. The flowers are white and lacy. They form a dense compound cluster at the top of the plant. Sometimes flowers are only produced into the second year of growth, depending on temperature.

Distribution: A temperate plant. In the tropics it is mostly grown in the highlands, but will grow from sea level to 2600 m altitude. Sometimes on the coast only leaves are produced. Carrots are frost resistant. In Nepal carrots are grown up to 1700 m altitude. It needs a deep loose soil. Seed germinate well in the temperature range 7-24°C. Plants grow well with a temperature about 15°C. It grows best with a pH of 6.0-7.0. It suits hardiness zones 3-9.

Edible Parts: Root, Leaves, Seed-flavouring, Vegetable

Use: Both the roots and the leaves are edible. The young leaves are used in soups. The roots can be eaten raw or cooked. They can be steamed, fried, pickled, made into jam, or used in stews. Carrot seed oil is used as a flavouring. The juice is used raw and fermented. The roots can be dried and the flour used to flavour and thicken soups.

Cultivation: They are grown from seeds sown directly. Because seed are very small, seed are mixed with sand before sowing to allow a more even distribution of plants. A spacing 5 cm apart in rows 15-20 cm apart is suitable. Often this spacing is achieved by thinning out plants. For seed production a low temperature of 4-9°C for 40-60 days is needed before flowering to break the dormancy.

Production: There are tropical varieties that mature within 90-110 days.

English: Three-Flower Beggarweed **Scientific name:** *Desmodium triflorum*
Local: **Plant family:** FABACEAE

Description: A prostrate herb which forms mats. It can re-grow each year or continue growing from year to year. The plant can be 10-20 cm tall. The stems are 8-20 cm long. The stems are much branched and covered with yellow-brown hairs. The plant can form roots at the nodes of the stem. The leaves have 3 leaflets. These are oblong and 0.4-1.4 cm long by 0.4-1.2 cm wide. They can be hairy underneath. The leaf stalk is 0.4-1.1 cm long. There are normally 1-3 flowers in the axils of leaves. They are about 5 mm long. The petals are blue, purple or red. The fruit is a pod 1.2-1.8 cm long and with 2-5 segments. These are like a half circle in shape. One edge of the pod is indented.

Distribution: A tropical plant. It grows in drier areas.

Edible Parts: Leaves

Use: The leaves are eaten as a vegetable.

Cultivation:

Production:

English: Greater Yam
Local:

Scientific name: *Dioscorea alata*
Plant family: DIOSCOREACEAE

Description: A yam with a long angular vine. The stems are square and twine to the right around support sticks. The stem does not have spines. It is often coloured green or purple. The leaves are heart shaped and borne in pairs along the vine. The leaves vary is shape, size and colour with different varieties. Leaves can be 10-30 cm long by 5-20 cm wide. The leaf stalk is 6-12 cm long. The flowers occur in the axils of the upper leaves. The male flowers are in small heads along branched stalks. These can be 25 cm long and green. The female flowers are in shorter spikes. Many cultivated varieties do not produce fertile seed. The fruit are 3-winged and 2.5 cm long by 3.5 cm wide. The seeds when they occur have wings right around them. One large but often irregular shaped tuber occurs under the ground. A very large number of different varieties occur. The tubers can vary in shape, size, colour, texture and other ways. Some varieties produce bulbils along the vine. Plants can vary in number of chromosomes.

Distribution: A tropical plant. It grows from sea level up to about 1800 m in the tropics. Yams are most important in seasonally dry areas. They need a well drained soil and it has to have reasonable fertility. The temperature maximum is >30°C while the minimum is 20°C. The optimum temperature range is 25-30°C. Rainfall is often seasonal in yam areas and the maximum

Edible Parts: Tubers, Vegetable
to be needs 14-20 weeks rain with an optimum of 1,150 mm during the growing season. Yams can tolerate drought but give maximum yields with high rainfall. The critical rain period is during the first 5 months. Light influences tuber growth. A continuous exposure of tubers to light significantly reduces tuber yields. Day length - Yams are influenced by photoperiod, or hours of sunlight. Short days (less than 10-11 hours of sunlight) favours tuber development. It suits hardiness zones 10-12.

Use: The tubers are boiled, baked or mumued. They can be roasted, fried or mashed. When they occur the aerial tubers of bulnils are also cooked and eaten.

Cultivation: Ceremonial yams have very specialised production techniques. For general food production, use top pieces of the tuber after they have sprouted, use a branched stick for support of the vine, space plants about 1 m apart and choose a smooth round cultivar. 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 selection needs to be made for varieties with less leaf spot and virus susceptibility and stable yield. Colour, cooking quality, storage ability, texture and other qualities need to be considered to suit the growers demands.

In most places the yam growth and maturation is integrated with seasonal rainfall patterns. They are mostly planted just before the first rains where a 8-10 month rainy season exists and give better yields in 6-8 month rainy season areas when planted 3 months before the rains. Earlier planting requires larger sett size to withstand desiccation. Pre germination of tubers which are cut and stored in shady places gives improved yields over tubers left whole then cut into setts at planting. Because yam tubers have a period of dormancy, tubers do not normally commence re-growth for up to 5-6 months. This enhances their storability but delays out of season replanting. Dormancy can be broken using Calcium carbide treatment for 5 hours or by covering tubers with leaves of Croton aromaticus or Averrhoea bilimbi. Yams are demanding in their nutrient requirements are are

therefore often planted first in rotations. They need a fertile free draining soil. They cannot tolerate water logging. It is normally grown from sections of the tubers especially top pieces. In some cultivars, it is also propagated by bulbils. Using staggered plantings of male and female plants and doing hand pollination it is possible to get viable seed set which can be used for establishing plants. It is common practice in many areas to plant the yam piece upside down. The probable reason for this is to give the shoot and roots time to develop and get established away from the sun and wind, so that the plant does not dry out. People in yam areas have their varieties classified as to whether they are planted at the top or the bottom of the hole, and whether the shoot is pointed up or downwards. This is a response to the diversity of tuber shapes and cultivars. A planting depth of 15 cm is optimum. Normally top pieces give higher yields than middle pieces of tubers and these are better than bottom pieces. Varietal differences in this occur. Top pieces give earlier and more reliable germination and mature earlier. They are also the less attractive part of the tuber for eating so are preferred for planting.

The larger the sett the earlier the germination and the greater the yield. Increasing the seeding rate and plant density gives greater total yield but the extra planting material required means yield of food available is less. Normally on lighter soils closer spacing is used.

Compact soil or hard pans or stones result in tubers being exposed which decreases the yield and needs to be avoided This is related to light as well as physical constraints. Good drainage is essential. Yams must have a well drained soil with plenty of air in the soil. So yams will not normally grow on heavy clay soils or in areas with a lot of soil moisture. The soil can be improved for yam growing by putting leaves and other plant material in the planting hole, by making a mound above the hole, or by planting on a hillside. In some very loose sandy soils yams can just be planted in flat unmounded soils without digging a special yam hole but these situations are not common.

Yams should also have sticks to climb up. It is best to have a stick that is twisted or branched because the vine can slip down a very straight stick. Normally a stick 2 metres tall is sufficient. It needs to be a strong stick, firmly fixed in the ground. Yam varieties vary on the type of vine growth they have. This affects where the stick needs to be placed.

The fat irregular yams can have the sticks near the mound as a thick clump of vines and leaves soon develops. But if the stick is put beside the mound of one of the long ceremonial yams the vine will often reach the top of the stick before it has produced more than a couple of leaves, and will then fall back down to produce its leaves on the ground. The stick often needs to be put at some distance from the yam hole. The tip can be picked off the vine if branching is wanted earlier.

It may be that the long vine yams are more common in forest areas and the shorter branched vines in grassland areas. In some areas yam vines are allowed to creep over the ground and do not have sticks to climb. This method only works satisfactorily in dry places because diseases of the leaves and vine can cause serious damage in wetter places. Where yams do not have sticks to climb plants need to be more widely spaced. Under most circumstances the amount of food produced can be doubled by allowing yam vines to climb up sticks.

In drier grassland areas mulching the mounds at planting has been found to improve establishment and yield.

Production: The time to maturity ranges from 5 months on the coast to 9 or 10 months at higher altitudes. Yams will store well for over 6 months if given a dry, dark, well ventilated shed.

English: Sweet Yam, Cush-Cush Yam **Scientific name:** *Dioscorea trifida*
Local: **Plant family:** DIOSCOREACEAE

Description: A yam vine. The stem is square in cross section and does not have spines. The leaves are 25 cm long. They are opposite. The leaf is divided like fingers on a hand into 3 or more segments. The male flower is on a long stalk and the female flower stalk is short. It easily produces seed. The underground tuber is irregular in shape. It can be 70 cm long.

Distribution: It is a tropical plant. It is indigenous to Central America. It suits a cooler climate than other yams. It grows in areas with temperatures between 25-30°C. The rainfall is 1,500-2,000 mm per year.

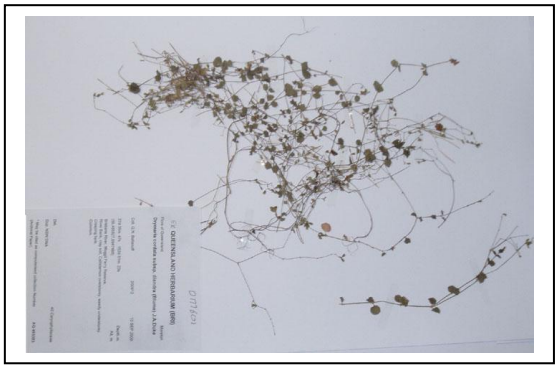
Edible Parts: Tubers, Vegetable, Root

Use: The tubers are cooked and eaten. They can be baked or boiled.

Cultivation: Normally whole tubers are used for planting. It can be grown from seed in a nursery and the seedlings transplanted.

Production: Plants take 9-10 months to mature. Tubers will store in cool, dry, well-ventilated places for a while. Yields of 15-20 tonnes per hectare have been achieved.

English: West Indian Chickweed **Scientific name:** *Drymaria cordata*
Local: **Plant family:** CARYOPHYLLACEAE



Description: An annual herb. It climbs. The leaves are 0.8-2 cm long by 0.5-2 cm wide. The flowers are small and white. The fruit is a capsule.

Distribution: A tropical plant. It grows in damp shaded sites, often near streams or under shrubs, disturbed areas between 200–1900(–2400) m altitude in China. It grows in Nepal between 2200-4300 m altitude. It grows in open areas.

Edible Parts: Leaves

Use: The tender shoots and leaves are cooked as a vegetable.

Cultivation: Plants are grown from seed.

Production:

English: Field Horsetail
Local:

Scientific name: *Equisetum arvense*
Plant family: EQUISETACEAE

Description: A rush like plant. It keeps growing from year to year. It grows 40-60 cm high and spreads 30-45 cm wide. The stems are in rings which are tightly packed. They are 60 cm tall. They are slightly rough and have furrows along them. There are also branching stems which are short lived. The leaves are fine and feathery and light green.

Distribution: They grow in wet places. They spread by branching rhizomes. It suits hardiness zones 2-9.

Edible Parts: Root, Stem

Use: The shoots have been eaten as a vegetable and also used to make tea. It is the young spore bearing stems that are used.

CAUTION: It should probably only be used in small amounts or for short periods of time.

Cultivation: Plants can be grown by division.

Production:

English: Sawtooth Coriander
Local:

Scientific name: *Eryngium foetidum*
Plant family: APIACEAE

Description: A herb. It grows 15-50 cm high. It has one stem. The leaves are all near the base of the plant. The leaves are 7-15 cm long by 1-2 cm wide. The leaves have teeth along the edge. The flower head is oval. It is 5-8 mm long by 3-4 mm wide. The flowers are greenish-white. The fruit is almost round and 2 mm across.

Distribution: It is a tropical plant. In Nepal it grows from 700-1200 m altitude. It grows in open rocky places. It is widespread in the tropics. It needs a temperature above 15-18°C. It can grow in shady, moist soils. It goes to flower in hot summers and with long day length.

Edible Parts: Leaves, Fruit

Use: It is used in curries. The leaves are chopped and eaten raw in some dishes. They are mostly used to flavour cooked dishes. The leaves are pickled and used to make chutney. The roots are used as a flavouring in soups and meat dishes. The seeds are used as a flavouring. It is sold in markets. It is sold internationally.

Cultivation: Plants are grown from seed. They can also be grown by division of the crown.

Production:

English: Chontilla
Local:

Scientific name: *Geonoma interrupta* var. *interrupta*
Plant family: ARECACEAE

Description: A palm. It can have a single stem or up to 10 stems. They can be 0.1-7 m tall and 2-12 cm wide. They are light brown. There are 6-23 leaves and the blades are 2 m long. The leaflets may be regular or irregular. There are 3-41 curved leaflets on each side. There are usually narrow leaflets among broad leaflets. The flowering stalk is among the leaves. The flowering stalk has 1-3 orders or branching. There are 8-32 flowering branches. The lower ones are branched again and 9-25 cm long and 1-3 mm thick. The fruit are round and 3-6 mm long.

Distribution: A tropical plant. It is an understorey plant in lower mountain rainforest. It need well drained soil. It grows up to about 1000 m altitude.

Edible Parts: Young flower, Palm hearts, Cabbage

Use: The young tender flowers are cooked and eaten.

Cultivation:

Production:

English: Kangkong
Local:

Scientific name: *Ipomoea aquatica*
Plant family: CONVOLVULACEAE

Description: Kangkong is a creeping sweet potato like plant. It has hollow stems and can float on water. The leaves are green and are normally not divided like some sweet potato leaves, but the shape and size varies a little between different kinds. The trumpet shaped flower looks like a sweet potato flower and is normally white. The runners develop roots at the nodes and also branch. This branching increases when tips are picked off. Some variation in leaf shape can be observed. Leaf shape is less variable than in the related sweet potato, but narrow and broad leafed kinds occur. White and green stemmed kinds occur. Green stemmed kinds have more cold tolerance than white stemmed.

Distribution: A tropical plant. It grows best in short day stable high temperature, moist conditions. Temperatures need to be above 25°C for satisfactory growth. In equatorial region plants probably grow up to 1000m altitude. Below 23°C the growth rate is too slow for economic production. So production is mainly in the lowland tropics. Optimum pH is between 5.3-6.0. It suits damp places and grows well in swamps. It can grow as a partly floating plant in swamps and lagoons behind the beach along the coast. Kangkong is grown in a number of other tropical countries including Malaysia, Indonesia, Egypt, Fiji and especially Hong Kong and Taiwan. In some of these countries they grow the dry land form in gardens.

Edible Parts: Leaves, Vegetable

Use: The young tips are cooked and eaten. They can be boiled, steamed, stir-fried, or added to soups, stews or curries. The young stems can be used in pickles. The young tips can be eaten raw in salads. The roots are occasionally cooked and eaten. Common in most swampy coastal areas in the tropics. It is an important cultivated food crop.

Cultivation: Dryland kangkong is normally grown from seed. Sometimes seed are pre-soaked for 12-24 hours prior to sowing. Plants can also be grown from cuttings and establishment is rapid. Top cuttings 25-40 cm long can be planted beside a pond.

Production: Young tips can be taken 30 days after planting, and subsequent harvests every 7 to 10 days. Production of new shoots probably declines at flowering. Yields up to 60,000 kg/ha have been recorded in other countries.

English: Sweet Potato
Local:

Scientific name: *Ipomoea batatas*
Plant family: CONVOLVULACEAE

Description: This is a root crop which produces long creeping vines. The leaves are carried singly along the vine. Leaves can vary considerably from divided like fingers on a hand to being entire and rounded or heart shaped. At the end of the vine, trumpet shaped flowers grow. They are purple. Under the ground fattened tubers are produced. There are a large number of varieties which vary in leaf shape and colour, tuber shape, colour, texture and in several other ways.

Distribtuion: A tropical and subtropical plant. They grow from sea level up to some of the highest gardens at about 2700 m altitude in the tropics. Plants can grow with a wide range of rainfall patterns and in different soils. Plants are killed by frost and can't stand water-logging. Plants grow well with temperatures between 21-26°C. It can grow with a pH between 5.2-6.8. Sweet potato are not tolerant to shading. Under shaded conditions, both foliage growth and storage root production are decreased. Some cultivated varieties can be selected for increased production under mild shade but not heavy shade. The survival of cuttings at planting is also reduced under shaded conditions. Under shaded conditions plant become more climbing and with fewer leaves which are however larger. With increasing shade less tubers are produced and these grow more slowly. Sweet potato tends to be responsive to potassium fertiliser. cultivated varieties are often selected for yield under low fertility conditions. Under lowland conditions in the tropics sweet potato tubers undergo active tuber enlargement from 6 to 16 weeks. Weed control is essential especially during early stages of growth. The rate of ground coverage by foliage varies greatly with growing conditions and cultivar but once ground coverage has occurred weed control is less of a problem. Sweet potato tuber initiation is subject to aeration in the soil. Either heavy clay soils, waterlogged conditions or other factors reducing aeration can result in poor tuber production. For this reason sweet potatoes are often grown on mounded beds. It suits hardiness zones 9-12.

Edible Parts: Tuber, Leaves, Vegetable

Use: Tubers are boiled or baked. They can be steamed, fried, mashed or dried. They can be fermented into alcoholic drinks. They can also be used in pies, cakes, puddings and candies and jams. 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.

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 won't form if the ground is waterlogged when tubers start to develop. Sweet potato is grown by cuttings of the vine. About 33,000 cuttings are required per hectare. These weigh about 500 kg. Vine lengths of about 30 cm are optimum. As long as the vine is adequately inserted in the soil, the length of vine inserted does not significantly affect yield. Fresh sweet potato seeds germinate relatively easily and lead to continuous production of new cultivars under tropical conditions. Excess nitrogen restricts storage root initiation and therefore excess leaves are produced without significant tuber yield. Dry matter percentage increases with increasing age of the crop. Higher dry matter tubers are normally preferred.

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conditions. Under shaded conditions plant become more climbing and with fewer leaves which are however larger. With increasing shade less tubers are produced and these grow more slowly. Sweet potato tends to be responsive to potassium fertiliser. Cultivars are often selected for yield under low fertility conditions. Under lowland conditions in the tropics sweet potato tubers undergo active tuber enlargement from 6 to 16 weeks. Weed control is essential especially during early stages of growth. The rate of ground coverage by foliage varies greatly with growing conditions and cultivar but once ground coverage has occurred weed control is less of a problem. Sweet potato tuber initiation is subject to aeration in the soil. Either heavy clay soils, waterlogged conditions or other factors reducing aeration can result in poor tuber production. For this reason sweet potatoes are often grown on mounded beds. In well drained or high organic matter soils digging or mounding is not as essential. Leaf scab (Elsinoe batatas) can significantly reduce yield especially in sites where leaf production is low due to low soil fertility. To reduce sweet potato weevil damage plants need to be hilled or have the tubers well covered with soil. Cracking soils can allow the weevil access to tubers.

Production: The time to maturity ranges from 5 months to 12 months depending on the variety planted and the altitude at which it is being grown. Yields range from 6-23 t/ha.

English: Physic Nut, Purging Nut **Scientific name:** *Jatropha curcas*
Local: **Plant family:** EUPHORBIACEAE

CAUTION! DO NOT ATTEMPT TO EAT FRUIT AND SEEDS!
Fruit and seeds are very poisonous!

Description: A high shrub or small tree. It is deciduous and has a thin crown. It is up to 5-8 m high. It has milky sap. The leaves have 3-5 lobes. They are 6 cm long by 15 cm wide. Flowers are separately male and female on the same plant. They are small and yellowish-green. They are at the ends of the branches. The fruit is a yellow capsule. Plants are pollinated by insects. Seeds are black and 2 cm long by 1 cm wide. They are rich in oil.

Distribution: It is native to tropical America. It is a tropical and subtropical plant. It is drought resistant. It sheds its leaves during the dry season making it suitable for arid and semi arid regions. It can grow well in areas with annual rainfalls of 300 to 1,000 mm. It is mostly in lower altitudes below 700 m and with annual temperatures above 20° to 28°C. It needs well drained soils but can grow in poor nutrient soils. It suits hardiness zones 10-12.

Edible Parts: Leaves

CAUTION: Fruit and seeds are very poisonous!

Use : The nut has been reported as being eaten in Mexico after being boiled and roasted. **This however is not recommended. Some kinds have less poison and the embryo should ALWAYS be removed.** The young leaves have been reported as being eaten after cooking. They act as a purge.

Cultivation: Plants can be grown from seed or cuttings. Seedlings can be transplanted but it is best to plant cuttings directly where they are to grow. Using cuttings is very easy. Large cuttings should be used.

Production: Seeds germinate in 10 days. In humid regions near the equator flowering occurs throughout the year. Plants are not affected by daylength. It takes 90 days from flowering to fruit maturity. The tree can continue to produce nuts for 50 years.

English: Yellow Velvetleaf
Local:

Scientific name: *Limnocharis flava*
Plant family: LIMNOCHARITACEAE

Description: A herb which grows in water. The leaves form tufts. They are oval and 15-18 cm long by 12 cm wide. The leaf stalk is angular and 30 cm long. The flower head in at the end of the shoot and has a long flower stalk. There is a sheath like a membrane near the base. There are 5-10 flowers together. They are yellow.

Distribution: A tropical plant. It grows in wet places in tropical countries. It is found in ditches and ricefields. It needs water less than 15-20 cm deep.

Edible Parts: Leaves, Flowers

Use: The young leaves and flowers are cooked and eaten as a vegetable. The leaf and flower stalks are blanched and steamed. They are sold in markets.

Cultivation: Plants can be grown from seed or by division of the rhizome.

Production:

English: Italian Honeysuckle
Local:

Scientific name: *Lonicera caprifolium*
Plant family: CAPRIFOLIACEAE

Description: A deciduous climber. It grows 4.5-6 m long. It can be grown as a ground cover. The leaves are in fused pairs 5-10 cm long. The flowers are creamy-white to yellow. They can have pink tints. The flowers are 5 cm long. They are cupped by the blue-green uppermost leaves. The fruit are orange-red berries.

Distribution: It is frost hardy. It suits hardiness zones 5-9.

Edible Parts: Flowers

CAUTION: The fruit may be poisonous.

Use: The flowers are eaten as a snack**.**

Cultivation:

Production:

English: Barbados Cherry, Acerola **Scientific name:** *Malpighia glabra*
Local: **Plant family:** MALPIGHIACEAE

Description: A small evergreen tree or shrub. It grows up to 5-7 m high. It often has several trunks. The branches are spreading and often drooping. The leaves are opposite and oval to sword shaped. They are 2-8 cm long by 1-4 cm wide. They can be wavy along the edge. They are dark green and glossy. The leaf stalk is short. The flowers have both sexes. The flowering stalks are short with 3-5 flowers. The flowers are 1-2 cm across. They are pinkish red. The fruit is bright red. It is 1-2 cm across and has several small seeds. The fruit resemble a common cherry. But is has 3 grooves and 3 seeds. The fruit are carried on the outside of the tree. The seeds are triangle shaped.

Distribution: A tropical and subtropical plant. It grows on sandy soils and in drier regions. It is a tropical plant. Rainfall during flowering and fruiting improves fruit quantity and size. They do best in a frost free site. They need a well drained soil. They can tolerate frost and drought. They do best in warm to hot climates with temperatures of 30-32°C. It suits hardiness zones 9-12.

Edible Parts: Fruit

Use: The fruit are eaten fresh or used in juice. They can be used for wine. They can be used in jellies, jams and preserves. The sauce or puree can be used as a topping for cakes, puddings, ice cream or sliced bananas.

CAUTION: Acerola (also known as Barbados Cherry) can produce an allergic reaction similar to that of latex.

Cultivation: They can be grown from hardwood cuttings or budded onto seedlings. They can also be grown by ground layering. Plants can be grown from seed. Seed germinate poorly. A spacing of 3-4 m is suitable.

Production: Trees bear in 3-4 years. They continue for 15 years. Flowering normally follows periods of rainfall. There can be several flowering and fruiting periods per year. Flowers are pollinated by insects. Fruit can ripen in 3-4 weeks. Fruits loose their flavour and nutritional value rapidly after harvest. They should be picked and eaten within a few hours. Individual trees can yield 15-30 kg of fruit per year.

English: Common Mallow, Dwarf Mallow **Scientific name:** *Malva neglecta*
Local: **Plant family:** MALVACEAE

Description: An annual plant about 0.5 m high. It is mostly low lying. The leaves are round or kidney shaped and 2-5 cm across. They have shallow lobes and a wavy edge. There are fine teeth around the edge. The flowers are pale lilac with darker veins. They are small and in stalked clusters in the axils of leaves. The petals are deeply notched on the outer edges. The fruit are nutlets which are brownish-green when ripe. They have smooth hairy backs.

Distribution: It grows in neglected pasture. It will grow in most soils and in most positions. It is resistant to frost and drought.

Edible Parts: Leaves, Seed

Use: The young leaves are eaten raw or cooked. Young seeds can be eaten raw or cooked. The leaves can be used to thicken soup and stews. A decoction of the roots can be used as an egg substitute for meringue pies. The dried leaves are made into tea.

Cultivation: It can be grown by seed.

Production:

English: Mamey Apple, Abricot, Mammea **Scientific name:** *Mammea americana*
Local: **Plant family:** CLUSIACEAE

Description: A medium sized evergreen tree. It grows 20-25 m tall. The leaves are glossy and oval. They are 10-20 cm long by 5-10 cm wide. The leaves are thick and have many parallel veins. Trees may have male and female flowers. The flowers are showy and white. They are 5 cm across. The fruit is large, round, brown and sweet. They are 10-20 cm across. The skin is rough and leathery. It is about 3 mm thick. The flesh is deep orange. There are 4 seeds.

Distribution: It is a tropical plant. It can grow in the subtropics. It grows in areas with 1,500 mm of rain per year. It is damaged by frost. They will grow in a range of soils. It cannot tolerate poor drainage. It suits hardiness zones 10-12.

Edible Parts: Fruit

Use: The fruit is eaten fresh or cooked or used in jams. The fruit are best if sliced and left in water for a few hours. They are used to make ice-cream, drinks and preserves. The fruit can also be eaten with sugar and cream. The flowers are used to make an aromatic liqueur. The sap of the tree is used to make a fermented toddy.

Cultivation: Plants are normally grown from seed. Seed take 2 months to germinate. Cuttings and grafting are sometimes used.

Production: Seedling trees produce in 6-10 years. A fruit can weigh 600-700 g.

English: Mango
Local:

Scientific name: *Mangifera indica*
Plant family: ANACARDIACEAE

Description: An erect, branched evergreen tree. It can grow to 10-40 m high and is long lived. (Trees grown by vegetative means are smaller and more compact.) Trees spread to 15 m across. It has strong deep roots. The trunk is thick. The bark is greyish-brown. The leaves are simple and shaped like a spear. Some kinds of mangoes have leaves with a wavy edge. They can be 10-30 cm long and 2-10 cm wide. They are arranged in spirals. The leaf stalk is 1-10 cm long and flattened. Leaves are often brightly coloured and brownish-red when young. These tender leaves which are produced in flushes become stiff and dark-green when mature. The flower stalks are at the ends of branches. They are 10-50 cm long and branching. Up to 6,000 flowers can occur on a stalk. Most of these are male and between 1 and 35 % have both male and female flower parts. Fruit are green, yellow or red and 2.5 to 30 cm long. The fruit hang down on long stalks. The outside layer of the seed is hard and fibrous and there is one seed inside. Several embryos can develop from one seed by asexual reproduction. The fruit shape and colour vary as well as the amount of fibre and the flavour. India has many varieties and they cannot tolerate humidity.

Distribution: A tropical and subtropical plant. It grows from sea level up to 1300 m altitude in the tropics. It does best in areas below 700 m and with a dry season. Rain and high humidity at flowering reduces fruit set. It thrives best where temperatures are about 25°C but will grow with temperatures between 10 and 42°C. Temperatures of 0°C will damage young trees and flowers. Low temperatures (10-20°C) at flowering time will reduce fruiting. As temperatures get lower due to latitude or altitude, fruit maturity is later and trees become more likely to only have good crops every second year. Mangoes can grow on a range of soils. In wetter areas soils with less clay are better. They can withstand occasional flooding. A soil pH of 5.5 to 6.5 is best. Soils with pH above 7.5 cause plants to develop iron deficiency. It suits hardiness zones 11-12.

Edible Parts: Fruit, Seeds, Leaves

Use: Ripe fruit are eaten raw. Unripe fruit is pickled. Seeds can be eaten cooked. They are boiled or roasted. They are made into meal by powdering. Young leaves can be eaten raw or cooked. Amchur is made from the dried unripe fruit. This is used in curries, and pickles and chutneys. The seed kernels are used for famine food in India. They are boiled, roasted or soaked to remove the bitterness.
Caution: The sap from the tree or fruit can cause skin problems with some people.

Cultivation: Trees are grown by planting fresh seed and they can be transplanted. Mangoes vary in their ability to breed true from seed. When more than one seedling emerges from the seed some of these are asexual and breed true. Clean seed germinate best if they are treated at 50°C for 20 minutes, then planted on their edge with the round bulge upwards and near the soil surface. The husk around the seed should be removed. Seeds germinate in 3-6 weeks. The strongest growing seedlings from this seed are used and the others thrown away. The seedlings from the folds of the seed are vegetative while the seedling from the centre of the seedling near the stalk end may be sexual and show variation from type. Other seeds only produce one seedling and these normally vary and can be different from the parent tree. Plants can be propagated by budding, or by grafting using in-arching. This is not easy. Cuttings grow with care. In wetter places flowers need to be protected with fungicides to enable fruit to form. If organic manure is used this should not be directly in the planting hole nor immediately against the new plant. Young transplanted seedlings

need regular watering. A spacing of 6-12 m between plants is used. Wind protection is advisable to prevent fruit rubbing and getting damaged. Trees should only ever be lightly pruned as fruit develop on new growth and heavy pruning can reduce flowering. Flowering can be brought about by foliar sprays of potassium nitrate.

Production: Seeds germinate after about 20 days. Seedling trees produce after 4-6 years and increase in production up to 20 years. Trees often bear better each second year. Rain at flowering reduces fruit setting. Fruiting is at the end of the year. Fruit take 4-5 months to mature. Fruit vary in weight from 200 to 1,000 g. Trees can produce one million flowers but only 500 fruit. Trees last for many years.

English: Cassava, Manioc, Tapioca **Scientific name:** *Manihot esculenta*
Local: **Plant family:** EUPHORBIACEAE

Description: A plant which can re-grow year after year from the thickened roots. It has several stems. The stems are woody and have some branches. Plants grow up to 2 or 3 metres high. Stalks have distinct scars where leaves have fallen. The leaves tend to be near the ends of branches. The leaves are divided like the fingers on a hand. The leaves have long leaf stalks. The leaves have 3-7 long lobes which can be 20 cm long. These are widest about 1/3 of the distance from the tip and taper towards the base. The colour varies. It produces several long tubers. These can be 50 cm long by 10 cm across. The flowers are on short stalks around a central stalk. They are produced near the ends of branches. The female flowers are near the base of the flower stalk and the male flowers higher up.

Distribution: A tropical plant. Plants grow from sea level up to about 1650 m. In Fiji they grow to 900 m. They can grow in poor soil. They can survive drought. It is native to tropical America. It suits hardiness zones 10-12.

Edible Parts: Root, Leaves, Vegetable

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. Seeds are also eaten.

CAUTION Bitter kinds of cassava contain poison but this is destroyed on heating. This kind of cassava should be cooked, sun dried, soaked and cooked again.

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 and it affects the growth little. Soon roots form and leaves start to sprout from the stalk. Cassava seeds need a soil temperature of 30°C for their germination. Flower and fruit production is more common under lower temperatures such as in highland or less equatorial conditions.
It is not necessary to dig a hole to plant cassava and on many soils where the soil is loose it can be planted without digging the soil first. Cassava does not suit waterlogged soils and preferably they should not be too shallow or stony.
Cassava 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. The crop once established can survive for several months without rain. The ability to tolerate drought varies significantly with cultivar. During drought less and smaller leaves are produced and leaves die off more quickly but storage roots can be increased in the short term.
Because cassava can still grow satisfactorily in poorer soils it is often put last in a rotation after others crops have already been grown on the piece of land. Cassava is more responsive to nitrogen and potassium than phosphorus under many field situations. Nitrogen can increase cyanide levels. Under very acid conditions with high soluble aluminium levels, cassava has been able to achieve and maintain top growth but with significantly reduce root yields. When drainage is good and soil moisture is adequate, cassava stalks can be planted at any orientation from horizontal to vertical, but in very sandy soils horizontal planting is best and and in heavy clay soils vertical planting is best. Because of the slow growth in early establishment stages, soil loss from erosion with heavy rains can be significant. To avoid this planting should be timed so that the maximum vegetative growth

is occurring during the heaviest rains. A leaf area index between 2.5-3.5 is optimal for cassava yield. The critical period for weed control is the time from 2-8 weeks after planting. Cassava tuber bulking is delayed under shaded conditions. Yields are also reduced. In mixed cropping situations using crops which mature early, allowing the cassava time to recover, is one possible strategy. For optimum production shading should be avoided. Cassava takes about 10 to 12 months to produce mature tubers in the lowlands tropics although some varieties produce a smaller yield earlier. Yields in the range of 20-45 t/ha have been recorded for 12-14 month crops. The plants can be left growing and the tubers stored in the soil for considerable time. Crops of 24 months duration occur. Once the tubers have been dug they do not keep for more than a few days. Pre-harvest pruning of plants increases the storage time of tubers after harvest. Spacing and plant density varies with soil climatic conditions and variety. Plant densities from 10,000 to 30,000 plants per hectare are used. Plants from the higher density crops have been shown to have quick post harvest deterioration. Mulching has given significant yield increases in some conditions. It also reduces the incidence and damage of some root boring insects.

Production: Plants can be harvested after 10 months in the lowlands. There are some faster growing varieties. Yields in the range of 20-45 t/ha have been recorded for 12-14 month crops.

English: Black Balata, Chicle, Ausubo **Scientific name:** *Manilkara bidentata* subsp. *surinamensis*

Local: **Plant family:** SAPOTACEAE

Description: A shrub or small tree. It is sometimes 1-2 m high. In the rainforest it can grow 40 m high. It then often has buttresses. The bark is greyish brown and deeply cracked. The plant has lots of sticky white sap. The leaves are 7-21 cm long and usually sword shaped and rounded at the tip. The leaf stalk is 2.5 cm long. The tree loses its leaves for a short period of time just before flowering. The new leaves and flowers develop together. The flowers are greenish-white. The fruit ripens reddish-purple to black. The fruit are edible.

Distribution: A tropical plant. It is native to the southern Caribbean. It grows from sea level to 1500 m altitude. It grows in lowland forests which are occasionally flooded. It can grow in dry forest in white sand. It suits hardiness zones 11-12.

Edible Parts: Fruit, Latex

Use: The latex has been used as a source of chicle for chewing gum. The fruit is oily and eaten. The fruit is eaten especially by children.

Cultivation:

Production:

English: Bead Tree, Cape Lily
Local:

Scientific name: *Melia azederach*
Plant family: MELIACEAE

CAUTION: The fruits are very poisonous!

Description: A moderate sized tree. It grows 6-16 m high. It can spread 3-12 m wide. The trunk is round and the branches spread out widely. The bark is greyish-brown. The bark has long shallow cracks along the length. The leaves are alternate. They are twice divided and bright green. The leaflets are sword shaped and have teeth along the edge. They are 7-8 cm long by 2 cm wide. The leaf base has unequal sides. The flowers are lilac and have a honey scent. They occur in long open clusters in the axils of leaves. These are about 18-20 cm long. The fruit is fleshy and round. It is about 1-1.5 cm across. It is smooth and yellow. There are 4 tiny seeds in a very hard shell.

Distribution: A tropical plant. It is naturalized all over India and in many tropical countries. It can grow from tropical to temperate places. It needs well drained soil. It needs to grow in full sun. It can stand light frosts. It is very drought tolerant. In East Africa it grows from sea level to 2,000 m altitude. It suits hardiness zones 8-12.

Edible Parts: Gum, Leaves

Use: CAUTION: The fruits are very poisonous. (Six can kill a person) The berries are occasionally eaten sparingly. The leaves are used in medicine. A kind of toddy is made by tapping the tree.
Many parts of the tree are dangerously narcotic.

Cultivation: Plants are grown from seed. Seed need to be planted fresh. They can also be grown from cuttings.

Production: It is a fast growing tree.

English: Spanish Lime, Mamoncillo, Genip
Local:

Scientific name: *Melicoccus bijugatus*
Plant family: SAPINDACEAE

Description: A large evergreen tree. It grows up to 20 m tall. The trunk is smooth and pale grey. The inner bark is orange-brown. The crown is dense, round and compact. Trees are separately male and female. Where bisexual flowers occur these normally do not set fruit unless cross pollinated. The flowers are small and greenish. They are in crowded, long stemmed clusters. The fruit is medium sized with green skin and white or yellow pulp. They are 3 cm across. The skin is tough. There is one seed inside. Fruit hang in clusters near the end of branches and look like grapes. There are several named cultivated varieties.

Distribution: A tropical plant. It is native to tropical America. It is sensitive to cold. Plants are damaged by temperatures near freezing. It can grow on a range of soils. It is more common in dry areas. It can weather strong tropical storms.

Edible Parts: Fruit, Seeds

Use: The fruit is eaten fresh. It is also made into drinks and cooked. They are used in pies, jams, jellies, marmalades and drinks. The seeds are roasted and eaten.

CAUTION: Because of the size of the fruit and the fact that they are very slippery, care should be taken that they are not swallowed and block the wind pipe of children.

Cultivation: Plants are grown from seed. The plants vary in quality and yield. Better varieties are airlayered or grafted.

Production: Trees develop slowly. They take 7-10 years to produce fruit from seed. They can take 4-5 years to fruit from layers. The fruit take 90-150 days to mature.

English: Four O'Clock Plant **Scientific name:** *Mirabilis jalapa*
Local: **Plant family:** NYCTAGINACEAE

Description: A bushy plant. It can grow as an annual plant but it can keep growing from year to year from the thick tuberous root. It grows to 60-200 cm high and spreads to 60 cm wide. The stem is short, thick and branching. The leaves occur opposite one another. They are green and oval or sword shaped. They taper to the tip. They are 6-9 cm long by 1-4 cm wide. The lower leaves have leaf stalks while the upper leaves do not. The flowers are like tubes and expand towards the top forming a funnel shape. They are 6 cm long by 3 cm wide. They are red, white, yellow or purple. They have a scent. The flowers open in the afternoon. The flowers occur in clusters at the ends of branches. The fruit are almost round, black nuts.

Distribution: A tropical and subtropical plant but also in warm temperate areas. It will grow on most soils. It needs an open, sunny position. It is damaged by drought or frost. In Nepal it grows up to 1800 m altitude. It suits hardiness zones 8-11.

Edible Parts: Leaves, Seeds - spice, Flowers – coloring

Use: The leaves are cooked and eaten as an emergency food only. The flowers give a red dye used for food colouring. It is used with seaweed cakes and jellies. The seeds are crushed and used as a pepper substitute.

Cultivation: Plants are grown from seed. Seed should be soaked in warm water overnight before planting. Seedlings can be transplanted. Plants can also be grown from the thick root tuber or by splitting the roots. Plants should be spaced 30-45 cm apart.

Production:

English: Korean Mulberry **Scientific name:** *Morus australis*
Local: **Plant family:** MORACEAE

Description: A shrub. It grows 3-6 m high. It loses its leaves during the year. The bark is greyish brown. The winter buds are large. In cultivation plants are 1-2 m high. The leaves have stalks. The stalks are 1-1.5 cm long. The leaves are oval to sword shaped. They taper to the tip. They are 5-14 cm long by 3.5-12 cm wide. They have 3-5 lobes. There are teeth around the edge. Flowers are of one sex. They are yellow. The fruit are red but turn almost black near maturity. They are about 1 cm across. Some varieties are described which vary on the shape of the leaves.

Distribution: It is native to temperate SE Asia. In Nepal plants grow between 900-2400 m altitude. In China it grows in limestone areas and near the edges of forests on mountain slopes between 500-2000 m altitude. It suits hardiness zones 6-9.

Edible Parts: Fruit

Use: The ripe fruit are eaten fresh. They are also used for wine.

Cultivation:

Production: Plants can be grown from seed or root off shoots.

English: Red Mulberry
Local:

Scientific name: *Morus rubra*
Plant family: MORACEAE

Description: A very small tree. It grows up to 9 m high. The trunk is 40 cm across. The trunk is short and soon divides into stout spreading branches. The crown is dense and rounded. It loses its leaves during the year. The leaves are alternate and simple. Leaves are oval but can vary in shape on the one tree. They are 8-24 cm long. It tapers to a long tip. The base is broad and heart shaped. There are 3 prominent veins and teeth around the edge. The upper surface is yellowish-green and rough. It is softly hairy underneath. Leaves turn yellow in autumn. The flowers are small and yellowish. The male and female flowers can be in mixed catkins but usually are in separate catkins either on the same tree or different trees. They are produced in the axils of the leaves. The fruit are small and fleshy. They are in compact groups in fruits like raspberries. These are 22-30 mm long. They are red or dark purple and sweet, juicy and edible.

Distribution: Plants grow well on deep moist soils. They are shade tolerant. It suits hardiness zones 5-10.

Edible Parts: Fruit, Leaves

Use:: The ripe fruit can be eaten fresh with cream and sugar. They are also made into pies, jams, jellies, juice, muffins, fruit cakes and other foods. They are dried and mixed with almonds and other nuts. Young leaves are eaten raw or boiled. They are served with butter and salt.

Cultivation: Occasionally plants are grown from sprouts of the stumps.

Production:

English: Banana
Local:

Scientific name: *Musa acuminata*
Plant family: MUSACEAE

Description: These are the main group of cultivated bananas. They can be classed into diploid, triploid and tetraploid kinds with various amounts of the A or B parents. They grow 2-9 m high. They are large non woody herbs with broad long leaves. Most kinds have several suckers. Bananas grow a soft firm false stem from an underground corm. The fruiting stalk eventually emerges from the top of this false stem and normally curves over pointing towards the ground. Fruit occur in clumps or hands along this stem. The male flowers are in a red bud at the end of the flower stalk. The colour of the stem, bracts, bud and fruit varies considerably depending on the variety. The fruit can be 6-35 cm long depending on variety. They can also be 2.5-6 cm across.

Distribution: A tropical and subtropical plant. They grow from sea level up to about 2000 m altitude in the tropics. They are rarely an important food above about 1600 m. In Nepal they grow to about 1800 m altitude. They do best in warm and humid tropical climates. Temperatures need to be above 15°C. The best temperature is 27°C. The maximum temperature is 38°C. Bananas grow best in full sun. For best growth, a rainfall of 200-220 mm per month is needed. A deep friable soil is best. They can tolerate a pH between 4.5-7.5. It suits hardiness zones 10-12.

Edible Parts: Fruit, Flowers, Vegetable

Use: Fruit are eaten raw or cooked depending on variety. Male buds and flowers are eaten on some varieties. They are cooked as a vegetable. The central pith of the false stem and the underground rhizome are also sometimes eaten. The major food in many areas of the moist lowland tropics and an important supplement in most areas.

Cultivation: They are planted from sword suckers. Diploids need re-planting annually but many triploids can be re-suckered from the base on the same site. Spacing depends on variety. A spacing of 1000-3000 plants per hectare is used depending on variety. Suckers are usually put 30 cm deep.

Production: Time to maturity varies from 6 to 18 months depending on variety and altitude. Triploids have larger bunches than diploids. Tetraploids are very large plants.

English: Adder's Tongue, Fern
Local:

Scientific name: *Ophioglossum reticulatum*
Plant family: OPHIOGLOSSACEAE

Description: A fern. It is a herb. It grows 5-35 cm high. The rhizome is like a cylinder with many thin roots. The stalk of the frond is 3-8 cm long. The fronds are distinct. The sterile fronds are 3.5 cm long by 2 cm wide. They are oval and the base is heart shaped. The fertile frond is 2-2.5 cm long and on a slender stalks coming from the base of the sterile frond.

Distribution: A tropical plant. It grows amongst grass in open forest. In Nepal it grows up to 1400 m altitude. It grows in moist, shady places.

Edible Parts: Fronds, Leaves

Use: The fronds are cooked as a vegetable. They are also used in salads.

Cultivation: Plants are grown from spores. They can also be grown from parts of the roots.

Production:

English: Indian Fig, Sweet Prickly Pear **Scientific name:** *Opuntia ficus-indica*
Local: **Plant family:** CACTACEAE

Description: A tree like cactus. It grows to 2-5 m tall. It has many branches. It is spreading and bluish-green. It has succulent pads. The joints are 20-40 cm long by 10-20 cm wide. The spines are 2-3 cm long. Spineless kinds also occur. The flowers are large and yellow. They grow on the borders of the pads. The flowers open in the daytime. They are 70-100 mm long. The filaments are pale yellow. The fruit are barrel shaped. They are 50-90 mm long. They turn yellow when ripe. There are several seeds. There are several cultivated varieties.

Distribution: It is native to Mexico. It suits drier places. It needs full sunlight. It needs a temperature above 10°C. It is grown in tropical and subtropical areas. It suits hardiness zones 9-11.

Edible Parts: Fruit, Seed, Stems, Vegetable

Use: The ripe fruit are eaten. Dried fruit are used in sweetmeats. The young stems are used as a vegetable or in pickles. The fermented pulp is mixed with flour and nuts to make and Italian dish. It is sold in local markets.

Cultivation: Plants are grown from stem pads. They can grow easily from sections which fall onto the ground. It can be grown from seed.

Production:

English: Shirley Poppies
Local:

Scientific name: *Papaver rhoeas*
Plant family: PAPAVERACEAE

Description: An annual plant which grows up to 60 cm high. It is 15 cm across. The leaf shape and flower colour can vary. The leaves are soft and hairy and deeply divided. The leaves are 5-20 cm long. The leaves are green, not blue-green. The flowers occur singly in the axils of leaves. The flowers are 6-10 cm across. The flower petals have a dark spot at the base. The seed capsules are 0.8-1.5 cm wide. They are smooth.

Distribution: It is a temperate plant. It does not do well on acid soils. It prefers a well drained sandy soil in a sunny position. It suiits hardiness zones 5-9.

Edible Parts: Seed, Leaves

Use: The seed is eaten raw or cooked. They are used in caked, breads and rolls. The young leaves are eaten raw or cooked. They are used in soups. An edible oil is obtained from the seed. A syrup can be prepared from the scarlet flower petals. A red dye from the petals is used to flavour wine.

Cultivation: Plants are grown from seed. They are planted where they are to grow. The fine seed are scattered over the soil surface. Plants should be spaced 15-20 cm apart.

Production:

English: Pellitory of the Wall
Local:

Scientific name: *Parietaria judaica*
Plant family: URTICACEAE

Description: A perennial plant which grows 60 cm tall. It spreads to 60 cm across. Male and female plants must be grown if seed is required. The leaves are oval and have hairs on the veins underneath. The flowers are green and in clusters in the axils of the leaves. The flowers are either male or female and borne on the same plant.

Distribution: It grows on hedgebanks and dry walls. It does best in an alkaline soil. It grows in well drained to dry soils and can grow in full sun or light shade. It suits hardiness zones 5-10.

Edible Parts: Leaves

Use: The young shoots are eaten raw or cooked.

Cultivation: Plants can be grown from seed. They are easily grown by division of the clump in spring.

Production:

English: Purple Passion Fruit
Local:

Scientific name: *Passiflora edulis*
Plant family: PASSIFLORACEAE

Description: A vine which continues to grow for several years. The main vine becomes woody. Vines can be 6-7 m long. It climbs by tendrils. The leaves are shaped like the fingers on a hand with three lobes. They are 5-10 cm long. The vine can set flowers at each leaf. The flowers are white and often tinted purple. They are 5 cm across. The fruit are oblong and thickly dotted with purple when ripe. The skin is hard and they have a sweet smell. The flesh is orange. The seed occupy most of the inside with a small amount of flesh. The flesh is edible. The seeds are black. The flowers open in the morning. There are many named cultivated varieties.

Distribution: A subtropical plant. They are cultivated up to 2000 m altitude in the tropics. The purple variety grows in the highlands up to 3000 m. It can stand very light frosts. The yellow one grows in the lowlands. Its normal range is 700 to 2300 m. Often fruit set is poor in wet conditions. Wind breaks are important. Vines can tolerate very light frosts. If frosts are likely wrapping the stems near ground level with insulation paper can help protect the plant. Heavy rain at flowering can reduce fruit set through poor pollination. Soils should be fertile, moist and well drained. Plants cannot tolerate water-logging. A pH in the range 5.5-6.5 is best. In Nepal they grow between 1200-1700 m altitude. It grows satisfactorily between 20-30°C. It suits hardiness zones 8-11.

Edible Parts: Fruit, Seeds – oil

Use: The fleshy portion of the fruit is eaten raw. Passionfruit are also used for flavouring in juices, and with other foods. It is used in sherberts, custards, cakes, sauces, pies, fruit soups, candies and ice cream. The seeds are edible. They also yield an edible oil. It is a commonly cultivated food plant.

Cultivation: Plants are grown by seeds or cuttings. Seeds germinate in 15-45 days. Seedlings can be grafted. When the end shoots of the mother plant are the same thickness as the seedling stem, shoot tips 8 cm long can be used. The leaves should be removed from the cutting being used in the graft. An even light and high humidity allows these grafted plants to be ready in a few weeks. Plants are put in a hole 30 cm deep and which has had organic matter added. A spacing of 3-4 m apart is suitable. Plants need a trellis to climb over. Often a trellis 2 m high is used. Normally the side shoots are picked off until the vine reaches the trellis height. Then the tip is picked out to promote branching. Normally later pruning is not done. Putting mulch around the plant helps retain moisture and adds nutrients as well as controlling weeds. Hand pollination can improve fruit set. The fruit turns purple, wrinkles then drops off when ripe. Balanced fertiliser to promote healthy growth is important. Deficiencies of magnesium, iron, zinc, copper and boron can occur in some places. Pruning is important to keep vines vigorous.

Production: Plants produce after about 12-18 months and keep producing well for 4 or 5 years. Good production is related to keeping the vine growing well by avoiding low temperatures and lack of water. Plants are pollinated by insects, so it is important to not kill these with insecticides. They can also self pollinate. Fruit mature between 60 and 100 days from pollination.

English: Yellow Granadilla
Local:

Scientific name: *Passiflora laurifolia*
Plant family: PASSIFLORACEAE

Description: A perennial climbing vine. It can be up to 10 m long. Leaves do not have lobes and stems are round. Leaves are rounded (10 cm x 5 cm), hairless and rough. Flowers are large (6 cm across) and have a pleasant smell. Fruit are oblong and taper at both ends. They are about 8 cm x 5 cm smooth and yellow or orange when ripe. They have tough yellow skins and paler orange pulp. The fruit are edible.

Distribution: A tropical plant. It grows naturally in the Amazon in Brazil. It grows in lowland areas in the tropics. It does best in slightly drier, humid climates. It is damaged by frost. It can grow on a variety of soils. It suits plant hardiness zones 11-12.

Edible Parts: Fruit

Use: Fruit are eaten raw. They are also used in drinks.

CAUTION: The leaves are poisonous.

Cultivation: Plants are mostly grown from seed. They can be grown from cuttings. Bottom heating the seeds at 20-26°C can result in germination at 1-2 weeks, at lower temperatures seeds can take up to 10 weeks to germinate.

Production:

English: Bullrush Millet
Local:

Scientific name: *Pennisetum glaucum*
Plant family: POACEAE

Description: A millet grass. It is an annual grass. It grows to 3 m tall. The leaf blades are 20-100 cm long by 2-5 cm wide. The flower is dense and 40-50 cm long by 1.2-1.5 cm wide. They also vary a lot in shape and size. Plants that tiller produce smaller heads. The species varies a lot. There are 13 cultivated, 15 weed and 6 wild races of this grass. It has a cylindrical ear like a bullrush. The grains are small and round and have a shiny grey colour like pearls.

Distribution: A tropical plant. It suits regions with a short growing season. It grows in areas with less than 600 mm of rainfall. It is often in hot places. (It is replaced with sorghum between 600 and 1200 mm rainfall and then by finger millet or maize above 1200 mm rainfall.) It is important in the drier areas of India and Pakistan.

Edible Parts: Seed, Cereal

Use: The seeds are eaten like rice. They are also ground into flour and made into bread and cakes. They are used to make alcoholic drinks. 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. It is cultivated for its grain.

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.

Production: It takes from 75-180 days to maturity. The heads can be picked by hand or the plant removed. Some types need to be picked 2 or 3 times as heads mature.

English: Avocado, West Indian Avocado **Scientific name:** *Persea americana*
Local: **Plant family:** LAURACEAE

Description: A small to medium sized tree. It grows 8-10 m high. Trees can grow to 25 m high. The leaf stalk is 1.5-5 cm long. Leaves are entire, oval and 5-40 cm long. Flowers are greenish, small and on the ends of branches. Clusters of flowers may contain 200-300 flowers. Normally only 1-3 fruit develop from each cluster. The fruit is pear shaped or round. It can be 7-20 cm long. The fruit are greenish-yellow with some red coloration. The fruit has greenish yellow flesh and a large round seed. There are 3 named races - West Indian, Guatemalan and Mexican.

Distribution: A subtropical plant. Trees grow from sea level up to 2250 m altitude in the tropics. It cannot stand water-logging. Branches are easily damaged by wind. It needs to be in a frost free location or where frosts are rare. West Indian varieties thrive in humid, tropical climates and freeze at or near O°C. It does best with neutral or slightly acid soil. West Indian avocadoes can stand some salinity. They need a well aerated soil. Growth is disrupted when soil temperatures are below 13°C. It needs high humidity at flowering and fruit set. It suits hardiness zones 9-11.

Edible Parts: Fruit, Vegetable

Use: The pulp of the fruit is eaten raw or cooked. It is eaten in salads, soups, sandwiches, spreads, ice cream, and also in tortillas and in wine. The fruit are mixed with sugar and water to make a drink. Oil is extracted from the flesh. It is used in salad dressing. The leaves can be used for tea sweetened with sugarcane juice. Toasted leaves are used to season stews and bean dishes.

Cultivation: Plants are often grown from seed. Seeds remain viable for 2-3 weeks. Fresh seed held at 25°C day to 15°C night will germinate in 3 weeks. It is best to propagate vegetatively. Tip cuttings, layers and grafts can be used. Because different types have pollen at different times of day, for best pollination a mixture of trees which have pollen and flowers receptive at different times gives bet fruit set. Although trees will grow in shade, they need sun for fruiting. The leaves do not rot easily and can accumulate under trees. Other plants cannot be grown under avocado trees.

Production: Seedlings grow quickly and continuously in warm, moist conditions. Seedlings bear after 5-8 years. Grafted trees can fruit in 1-2 years. A good tree produces 400-600 fruit each year. A fruit can weigh 50 g to 1 kg. In the subtropics trees often produce 2 main flushes of fruit per year. From fruit set to maturity can take 6-12 months. Fruit ripen off the tree in 4-14 days.

English: Year Bean
Local:

Scientific name: *Phaseolus polyanthus*
Plant family: FABACEAE

Description: Plants can live for 2-4 years. The flowers have 6-16 fruit bearing stems. The flowers are white or lilac. Seed weigh 0.7-1 g each. Seed can be yellow or brown.

Distribution: A tropical plant. It suits a humid climate and medium altitudes. It grows between 800-2600 m altitude. It suits cool, damp regions with one dry period per year. It prefers deep, organic, damp but well drained soils. It is best with a pH of 6.2-6.5. It can tolerate some shade.

Edible Parts: Seed

Use: The green seed is eaten. The dry seeds is eaten in soups and stews.

Cultivation: Plants are grown from seed.

Production: The flowering time is 2-5 months.

English: Frogfruit, Lippia
Local:

Scientific name: *Phyla nodiflora*
Plant family: VERBENACEAE

Description: A plant which forms a tight mat. It spreads by runners or stolons. It grows 3-15 cm high. These can be woody near the base. They produce many roots. It can spread 2-5 m wide. The leaves are small and opposite. The are oblong or sword shaped and narrow to a leaf stalk at the base. There can be some teeth near the end of the blade. The leaves can be smooth or covered with hairs. The flowers heads are round or oval and 1.25 cm across. They are on long flowering stalks. The flowers are pink and like clover flowers.

Distribution: It grows in temperate places but will grow in the subtropics and in semi-arid places. It needs well drained soil. It needs to grow in full sun. It can stand heavy frosts. It suits hardiness zones 9-10.

Edible Parts: Leaves - tea, Leaves

Use: The leaves are eaten. They are also used to brew a herbal tea.

Cultivation: It can be grown by small cuttings.

Production:

English: European Plum
Local:

Scientific name: *Prunus domestica*
Plant family: ROSACEAE

Description: A small deciduous tree. It grows 6-10 m high. The young twigs are hairy. The bark is grey-brown and becomes cracked with age. The leaves have stalks. They are alternate. The leaves are 2-7 cm long by 0.7-3.5 cm wide. They are oval and taper to the tip. They have fine teeth. The base is rounded. The flowers are white. The fruit are round. They are golden yellow, green, red or dark purple. They have a waxy bloom. Fruit can be 7.5 cm long. The stone is large and rough or pitted. There are many cultivated varieties.

Distribution: Temperate. In Nepal it grows between 1200-2000 m altitude. It needs 1,000-1,200 hours of chilling below 7°C during the dormant period. They do best with 90-110 cm annual and well-distributed rainfall. A well drained soil and a pH of 5.5-6.8 is best. It suits hardiness zones 5-9.

Edible Parts: Flowers, Fruit, Gum, Oil, Seed, Flowers – tea

Use: The ripe fruit are eaten raw. They are also stewed, and made into jelly and jam and juice. Dried fruit are called prunes. They are used in baked muffins, cookies, cakes and some breads. They are cooked for plum puddings. They are distilled for alcoholic drinks. The flowers are eaten as a garnish for salads and also brewed into tea.

Cultivation: Plants are grown from seed or stem cuttings. It does not need pruning to produce fruit each year. They are often grafted. Plants can be spaced 6 m apart. Fruit develop on spurs and side shoots one year old. Trees are pruned to renew spurs.

Production: A tree starts to bear after about 5 years and produces for about 20 years. A tree may produce 65-70 kg of fruit.

English: Wine Palm, Cherry Palm
Local:

Scientific name: *Pseudophoenix vinifera*
Plant family: ARECACEAE

Description: A palm with a swollen trunk. It grows 25 m tall. The trunk is 30 cm across. It bulges about the mid point and narrows near the crown. The trunk is deep grey and has closely set dark rings of leaf base scars. These become less distinct with age. The leaf crown is 5 m wide. The crown-shaft is 60 cm long. It tapers from the base to the tip. The leaves are stiff and upright and silvery grey. They are 3.3-4 m long. They arch over and are feathery. The leaf stalks are 30-60 cm long and silvery white. All parts of the tree have a thin layer of whitish wax. The fruit clusters hang down among the leaves. They hang close to the trunk. They are bright red when ripe. The fruit are covered with a layer of wax when mature. They are edible.

Distribution: It is a tropical plant. It grows on limestone foothills. It grows in regions with low rainfall. It suits seasonally moist and dry climates. It is hardy. It suits plant hardiness zones 10-11.

Edible Parts: Fruit - wine, Sap

Use: The plant has been used to make palm wine. The trunk is cut and the sugary sap squeezed out and then fermented.

Cultivation: Plants are grown from seed. Seed germinate and grow very slowly.

Production:

English: Guava
Local:

Scientific name: *Psidium guajava*
Plant family: MYRTACEAE

Description: A small tree or shrub 8-10 m high. It is evergreen. It has smooth bark which is mottled. The bark peels off in smooth flakes. The plant branches close to the ground. The branches are four angled. Trees are shallow rooted. The leaves are opposite, dull green and somewhat hairy. They are oval and somewhat pointed at both ends. They are 15 cm long by 2-5 cm wide. The leaves have short leaf stalks. The flowers are white and showy and borne in loose irregular types of arrangements of one to three flowers. The petals are 1.5 to 2 cm long. Both self and cross pollination occurs due to insects. The flowers grow in the axils of leaves on new growth. The fruit are rounded and 4 to 5 cm long. They are green but turn yellow when ripe. The outer covering is firm and encloses a pink or nearly white sweet smelling edible pulp. This contains many seeds. It better selected varieties both the skin and the seeds are fully edible. Fruit vary from very acid to very sweet.

Distribution: A tropical plant. It is native to C and S America. Guavas thrive in both humid and dry tropical climates. They do best in sunny positions. They grow wild and are also cultivated. In Papua New Guinea it grows well from sea level up to 1600 m and occurs up to 1900 m. In Nepal it grows up to 1400 m altitude. It is killed by frost. They fruit better where there is a cooler season. Temperatures near 30°C give best production. They are very widely distributed in open places and secondary forests throughout the islands of the Philippines and Papua New Guinea and can become weedy under some conditions. They produce better in soils with good organic matter. They prefer a well drained soil but can stand some water-logging. A pH of 5 to 7 is suitable. It can tolerate a pH from 4.6-8.9. Trees cannot tolerate salty conditions. It suits hardiness zones 9-12.

Edible Parts: Fruit, Seeds, Leaves, Seeds – oil

Use: The young leaves are eaten raw or cooked. The fruit are eaten raw. The fruit can be used for jams and jellies. Half ripe fruit are added to help the jelly set. The liquid from boiled guava seeds is used to flavour cheese. The seeds are the source of an edible oil. The trees are widely spread throughout the country and fruit are popular particularly with children. Trees mostly grow naturally in coastal areas.

Cultivation: They are mostly grown from seeds but seedling trees vary in quality. Seeds remain viable for a year or longer. Seeds germinate in 2-3 weeks but can take 8 weeks. Selected trees can be propagated by budding or grafting. They can also be propagated by layering, root cuttings or stem cuttings if hormones are used. For stem cuttings the tips are used and grown under mist at 28-30°C with bottom heat. Suckers can also be used. Using vegetative methods of propagation enables better fruit kinds to be preserved. In the lowland tropics trees are self sown. As fruit are produced on new season's growth, pruning does not affect fruiting greatly. Trees should be managed to give the maximum number of new vigorous new shoots. Trees can be pruned for shape. Trees can be grown at 2.5 m within rows and 6 m apart between rows.

Production: Seedling trees may begin to bear 2-3 years after transplanting. Pruning back the tips slightly increases fruit production. Fruit taste best if ripened on the tree. Ripening can be hastened by placing them in a brown paper bag with a banana or apple. Mature fruit which have not changed colour can be stored 2-5 weeks at temperatures of 8-10°C and relative humidity of 85-95%. Mature fruit ripen in 2-3 days at normal temperatures and will keep for 7 days.

English: Pomegranate
Local:

Scientific name: *Punica granatum*
Plant family: LYTHRACEAE

Description: A shrub. It grows up to 2-6 m tall. It has short thorns. It can grow up to 10 m tall. Usually trees lose their leaves at one season during the year. The trunk is covered by reddish-brown bark. Trees often sucker near the base. The leaves are opposite, entire and 8 cm x 1.5 cm. Leaves narrow towards the base. It has large scarlet flowers. These are at the ends of branches. 1-3 flowers occur together. The fruit is round, leathery skinned and up to 10 cm across. It is yellow brown in colour. Inside there are angular hard seeds in a juicy yellow pulp. The seeds are 10 mm long. There are many named varieties.

Distribution: A Mediterranean climate plant. It is native from SE Europe to the Himalayas. It suits drier subtropical climates. It suits areas with a long hot dry summer and cool winter. A temperature of 35-38°C is best for good fruit development. A humid climate affects fruit formation. They can tolerate some salinity. They have borne fruit in Papua New Guinea at 1620 m altitude. They are mostly coastal up to 500 m in the tropics. Trees are severely damaged by temperatures below -11°C. It suits hardiness zone 8-11.

Edible Parts: Fruit, Seeds, Spice

Use: The juicy pulp around the seeds is eaten. The juice can be used for a drink. It provides a red colour. The seeds are dried with their aril and used in the Indian condiment Anardana. The fruit are used in sauces, soups, meat dishes, salads and other dishes. The flowers are eaten. Boiled leaves are also reported as eaten.

Cultivation: They are easily raised by seed. They are best propagated by layering or grafting but cuttings or root suckers can be used. Cuttings root easily. Cuttings 30 to 50 cm long of one year old wood can be used. Pruning of sucker growth and surplus branches is needed. A spacing of 4-5 m is suitable.

Production: Trees bear after about 2-3 years. Fruiting is seasonal. The season tends to be Dec to May. The tree loses its vigour after about 15 years but trees can live for many years. The pomegranate is self-pollinated as well as cross-pollinated by insects. Cross-pollination increases the fruit set. Fruit matures 5 to 7 months after flowering. Fruit need to be picked when mature to prevent splitting. Fruit do not ripen further after harvesting. Fruit develop a distinctive colour and have a metallic sound when tapped, when they are ripe. A well maintained tree can produce 150-200 fruit in a year.

English: Red Currant
Local:

Scientific name: *Ribes rubrum*
Plant family: GROSSULARIACEAE

Description: A small bushy shrub. It grows 1.5 m tall. It spreads 1.5-2 m wide. It loses its leaves during the year. The stems are smooth. The leaves have 3-5 lobes. They are 10 cm across. They can be downy underneath. The flowers are green with some red colouring. They can be upright or hang down. The fruit allow light through.

Distribution: It needs light well-drained soil. It requires full sunlight and shelter from wind. It suits hardiness zones 3-9.

Edible Parts: Fruit

Use: Fruit can be eaten fresh. They are also used in jams and jellies, puddings, pies, tarts, syrups and sauces. They are also made into wines.

Cultivation: It can be grown from cuttings of one or two year old wood. It should be cut back to a short single trunk then allowed to develop a sturdy open bush with about 10 main canes. These should be removed and others allowed to regrow about each 6 years.

Production: Fruit are produced after about 2 years.

English: Rollinia
Local:

Scientific name: *Rollinia mucosa*
Plant family: ANNONACEAE

Description: A medium sized evergreen tree. It grows 4-15 m high. The leaves are simple and rich green. They are oblong and 28 cm long. They are softly hairy underneath. The flowers are yellow-green and 2.5 cm across. They have 3 thick petals which have wings. The fruit are large and yellow with brown protuberances. The fruit is soft. The pulp is white, juicy and sweet. The fruit can be 15 cm across and up to 20 cm long. There is a brown oval seed in each section of the fruit.

Distribution: A tropical plant. It is native to tropical America. It grows in warm, wet regions of the tropics. It often grows on limestone. It needs full sun. It cannot tolerate frost. It will tolerate very wet soils. It will grow in regions that are flooded for part of the year. It grows in areas with 1500 mm of rain each year and temperatures of 24°-26°C. It suits hardiness zones 10-11.

Once mature they can stand temperatures down to freezing for short periods. The soil needs to be free draining. Shelter from wind is important. It can grow in full sun of light shade.

Edible Parts: Fruit

Use: The fruit is eaten fresh. They are also made into juice. It is a cultivated fruit tree.

Cultivation: Plants are grown from seed. They can also be grown by layering and by using grafts. To maintain the sweetest varieties, grafting is used. For seed, the ripe fruit are harvested and the seeds removed and washed. Fresh seed should be planted and as they have a hard seed coat they need to be scratched or treated with chemicals to help them germinate.

A spacing of 4 m is suitable. Mulching is useful as long as it is kept away from the trunk. Thin hanging branches can be pruned back. The fruit is harvested when it just begins to turn yellow. When the fleshy spines start to turn black is the best time to eat the fruit. Fruit can be stored at 15-17°C.

Production: The tree is fast growing. The fruit matures in 90 days. Mature fruit can weigh 1.4 kg.

English: Watercress
Local:

Scientific name: *Nasturtium officinale*
Plant family: BRASSICACEAE

Description: A cabbage family herb. It is a small leafy plant that grows in water and lasts for several years. It grows 30 cm high and has runners 2.5 m long. It has hollow stems and roots freely from the nodes. It branches freely. The leaves consist of 3 to 7 pairs of small leaflets then a larger leaflet at the end. The flowers are small and white and grow grow in a cluster. Flowers are not always produced and need days with more than 12 hours of sunlight to form. A small narrow curved seed pod about 2 cm long can develop. It grows attached to the banks of streams.

Distribution: This is a temperate climate crop. It is common in tropical highland creeks especially those flowing off limestone hills. (pH 6.5-7.5) It needs to be in running water. In the tropics it occurs from about 1000 m up to at least 2900 m altitude. It grows in streams, ditches, lakes, swamps, marshes from near sea level to 3700 m altitude in China. It suits plant hardiness zones 6-10.

Edible Parts: Leaves, Seed, Herb, Spice, Vegetable

Use: The leaves and stems are eaten raw or cooked and have a spicy flavour. Cooking should be used if the water in the stream is not pure and clean. The seed can be germinated to produce sprouts. The seeds can be ground to make a mustard flavouring.

Cultivation: It is grown from cuttings planted along the edges of clear running water. Cuttings of 10-15 cm long are suitable. The plant has roots along the stem at the node and cuttings quickly form roots in water. A spacing of 30 cm is suitable. This small plant keeps living for many years once established. It can also be grown from seeds. Plants can float on the water. It will not tolerate drying out. Watercress has a high phosphate requirement.

Production: Harvesting can occur 4 to 6 weeks after planting. Regular picking encourages branching and increases production. Tips 5-10 cm long are harvested. This can be repeated every 4-6 weeks.

English: Rosemary
Local:

Scientific name: *Rosmarinus officinalis*
Plant family: LAMIACEAE

Description: A herb with a smell. It is a shrub 1.5-1.8 m high and 1.5 m wide. The stems are densely covered with green needle-like leaves. They are grey-white on the underside. The shrub often sprawls. The bark is dark grey with irregular cracks. The leaves are like needles. The leaf blade is 1-2.5 cm long by 1-2 mm wide. The flower is blue-purple. It is less than 1 cm across. A number of varieties have been selected.

Distribution: It is frost hardy. It grows naturally on rocky hillsides. It does best with well drained light soil. It grows best in the sun. It can grow in areas with low rainfall. In Hobart Botanical gardens. It suits hardiness zones 6-11.

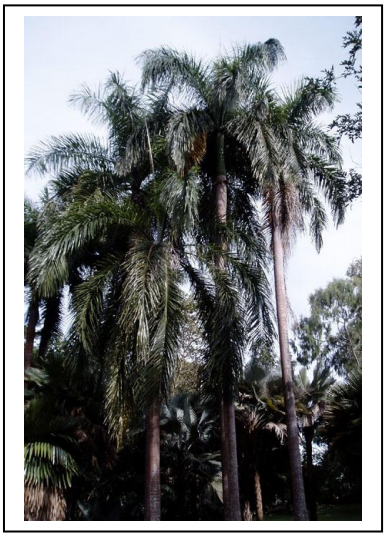
Edible Parts: Leaves, Herb, Spice

Use: The leaves are used fresh and dried. They need to be chopped or crushed to release the flavour. It is used with meat and in soups and stews. They are also used in stuffings, sauces and sausages. Fresh or dried leaves can be used for tea. (They are often combined with tansy.)

Cultivation: Plants can be grown from cuttings. Stem or root cuttings can be used. Ground layering of long stems can be used. The stems are bent over and covered with soil. When roots have formed it can be cut off and a new plant can be established.

Production:

English: Puerto Rican Royal Palm **Scientific name:** *Roystonea borinquena*
Local: **Plant family:** ARECACEAE



Description: A solitary palm. The trunk is stout and tall. It bulges above the middle. It grows 15 m high. The trunk is 45 cm across. The crown-shaft is long. It is 1.6 m tall. The fronds are feathery. The leaflets are glossy green on the upper surface. The leaflets are arranged in many ranks. The fruiting stalk arises below the crown-shaft. The flowers are of one sex but both sexes occur on the one stalk. The flowers are densely crowded. The fruit are pale brown. Each fruit contains one seed.

Distribution: It is a tropical plant. It is cold sensitive. It grows on savannas and cleared areas of limestone hills. It suits hardiness zones 10-11.

Edible Parts: Cabbage, palm heart

Use:

Cultivation: Single palms can produce fertile seed. Fresh seed germinate in 1-4 months.

Production:

English: Sugarcane
Local:

Scientific name: *Saccharum officinarum*
Plant family: POACEAE

Description: A tall thick stemmed clumpy grass. It has many nodes. It grows 1-6 m tall. It spreads 100 cm wide. A large number of different cultivated varieties occur. The leaves are long and narrow. They taper to the tip. They are rigid and droop at the tip. The cane varies in thickness, length of nodes, colour etc. The stalks have distinct nodes and the bottom of the leaf is wrapped in a sheath around the stalk. The flower is brownish. It is surrounded by dense silky white hairs.

Distribution: It is a tropical plant. It needs a temperature over 21°C for sprouting. It is frost sensitive. In Nepal it grows up to about 1400 m altitude. It suits hardiness zones 9-12.

Edible Parts: Sap, Shoots, Flowers

Use: The flowers can be cooked and eaten before the flower opens. The stems are the source of cane sugar. This is used as a sweetener in many foods and drinks.

Cultivation: Plants are mostly grown from tops of canes. They can be grown from sections of the stalk or division of the root stock. It requires a good fertility and good rainfall. Plants can be ratooned or cut back if the soil fertility is high. Tall cultivars need staking.

Production: Plants mostly take 14-18 months until they are ready for harvest.

English: Canadian Elderberry
Local:

Scientific name: *Sambucus nigra* subsp *canadensis*
Plant family: SAMBUCACEAE

Description: An upright shrub. It grows to 4 m tall. It has stout shoots. The leaves are divided along the stalk. The leaves are 30 cm long with 9 or more long leaflets which are light green and have teeth around the edge. The end leaflet is often the largest. The leaflets are 5-15 cm long and have teeth along the edge. The flowers occur in flattened panicles. The flowers are white. The flower heads can be 20 cm across. They occur in broad flat clusters. The fruit are purple-black and 5 mm across. They are edible. There are several named cultivated varieties.

Distribution: It needs damp, rich soil. It grows along roadside ditches and stream banks. They occur in tropical America. In tropical Queensland in Australia they grow between 680-1000 m altitude. It suits hardiness zones 3-10.

Edible Parts: Juice, Fruit, Flowers, Flowers – tea

Use as Food: The flowers can be dipped in batter and fried in oil. The flower buds are pickled and used as capers. The berries can be made into jelly. They are used in pies, jams, preserves, sauces, chutneys, vinegar, pancakes and muffins. The juice can be made into a drink and wine. The dried fruit can be used in deserts. The dried flowers are used for tea. **CAUTION: The unripe fruit can cause vomiting.**

Cultivation: Plants can be grown from seed or cuttings.

Production:

English: Choko, Chayote
Local:

Scientific name: *Sechium edule*
Plant family: CUCURBITACEAE

Description: A herb. It is a pumpkin family plant. It is a vigorously growing climber that can last for several years. The vine can be up to 15 m long. It has strong tendrils which can attach to fences and trees so that the plant can climb well. The choko leaves are about 15-20 cm across and have a rough feel. The fleshy fruits contain only one large seed. The stems have furrows along them. The choko fruit is produced in the angle where the leaf joins the vines. Fruit can be up to 20 cm long and they are rough or irregular shaped on the outside. There are white and green fruited varieties. Some fruit have sharp spikes on the skin. Inside the fruit there is one seed about 4 cm long. The flowers are separate. Male flowers are in clusters and female flowers are on their own. A choko plant produces a large thickened root tuber and the plant can re-grow from this tuber and go on growing year after year. Fruit can be green or white and can have soft spines.

Distribution: A tropical and subtropical plant. Choko requires relative humidity of 80-85%, annual rainfall of at least 1500-2000 mm and average temperatures of 20-25°C with limits of 12-28°C. In equatorial tropical regions chokos will grow from sea level to about 2200 m altitude, but do best between 350 and 1000 m altitude. In Nepal they grow to about 2000 m altitude. In the lowlands it is best in shade. Chokos need a reasonably well drained soil. It can grow in arid places. It suits hardiness zones 9-12.

Edible Parts: Fruit, Leaves, Seeds, Roots, Vegetable,

Use: The fruit are edible cooked. They can be pickled, baked, steamed, or made into fritters and puddings. The young leaf tips are eaten. The seeds can be eaten cooked. They are often deep fried. The fleshy root can be eaten cooked. They can be boiled, baked or fried. Starch can be extracted from it.

Cultivation: The entire fruit is planted as the seed cannot withstand drying out. It is planted flat and thinly covered with soil. Often chokos start to develop shoots and roots while they are still attached to the original plant. These eventually fall off and continue growing if they fall on soft moist dirt. A spacing 2 m apart along a fence is suitable. Trellis support is required. A well drained fertile soil is needed. Cuttings can be used for planting. Plants do not breed true and a large variability of fruit types can occur.

Production: Fruit can be picked starting 3-5 months after planting and continued for many months. The fruit can be stored for several weeks. Tips can be picked regularly. Annual yields of 75-300 fruit per plant are possible. Fruit can weigh 400 to 500 grams. Tubers of 5 kg weight have been recorded. These are normally produced during the second year of growth and after a time of arrested development such as a dry season.

English: Charlock, Field Mustard
Local:

Scientific name: *Sinapis arvensis*
Plant family: BRASSICACEAE

Description: A cabbage family herb. It is an erect annual plant. The mature plant is 80 cm to 1.4 m high. The leaves are 5-15 cm long and 2-5 cm wide. They are hairy and there are teeth around the edge. There can be lobes near the base. The flowers are yellow and are clustered along the stem. The fruit is like a pod and is about 2 cm long. The valves on the fruit contain 3-5 distinct petals. The pods have more than 10 seeds.

Distribution: It is a temperate plant.

Edible Parts: Leaves, Seed

Use: It can be a source of edible oil. The seeds are eaten or added to barley to increase the flour. The seeds are used as a condiment. The leaves are boiled in milk and eaten. The young finely chopped leaves are used to add flavour to salads, cheeses, omelettes, and sandwiches. The flower buds are prepared and used like broccoli. The sprouted seeds are used in salads and sandwiches.

Cultivation: It can be grown by seeds.

Production:

English: Pea Aubergine
Local:

Scientific name: *Solanum torvum*
Plant family: SOLANACEAE

Description: A shrub 1.5-3 m high. The leaves are oblong and 10-25 cm long. They can be entire or lobed. They often have prickles beneath the midrib. The young stem and underside of leaves are hairy. The flower is white and 2 cm across. The fruit are round berries, yellow when ripe. They are about 1 cm across. They grow in clusters. The seed are roughly circular and 2-3 mm across.

Distribution: A tropical plant. In Papua New Guinea it grows from sea level to 2000 m altitude. In Cambodia it grows between 0 and 1200 m. In Nepal it grows to 1000 m altitude. It grows in open, moist places. In Yunnan in China it grows between 200-1650 m altitude.

CAUTION: This plant has been shown to contain poisonous compounds.

Edible Portions: Leaves, Fruit

Use: The green unripe fruit are added to curries in Malaysia. They are eaten in soup in Cambodia. They are pickled in Nepal. They are used in soup in China. They are also dried and preserved. The young shoots are eaten raw or cooked.

Cultivation: Plants are grown from seed.

Production:

English: Sorghum
Local:

Scientific name: *Sorghum bicolor*
Plant family: POACEAE

Description: A millet grass. A mature sorghum plant resembles maize. Plants vary in height from 45 cm to 4 m. It is an annual grass with erect solid stems. The stems can be 3 cm across at the base. Under the ground there is a widely branching extensive root system. Prop roots occur near the base. There are a range of different types of sorghum. Some have one main stem while others have many tillers. There are more tillers when plants are widely spaced. The nodes on the stem are slightly thickened. The distance between nodes is shortest near the base of the plant. Short eagerly kinds have 7 leaves while tall late varieties may have 24 leaves. The leaf blade can be 30-135 cm long. Leaves are bluish green and waxy. They have a prominent midrib. The large flower panicle can be 20-40 cm long. The flower occurs at the top of the plant. It can stick upright or bend over. The flower can be open or compact. There are several different varieties. Over 1000 cultivated varieties occur in China.

Distribution: A tropical plant. It suits the savannah zones in the tropics. It tolerates heat and drought. It can recover from drought even as a seedling. It can tolerate water-logging. It can be grown on heavy or light soils. Sorghum needs short daylengths to flower. Many kinds are adapted to specific daylength and rainfall patterns. It suits hardiness zones 9-12.

Edible Parts: Stems, Seeds, Cereal

Use: Flour is prepared then used for porridge or other dishes. It is used for dumplings, fried cakes and drinks. It cannot be used for bread as it contains no gluten. The stems of some kinds are sweet and are chewed. It is used for beer, and vinegar. The grains can be popped and eaten. The sprouted seeds are eaten. One of the most important cereals of the semi-arid tropics. It is the most important native African cereal. It is grown on 50 million hectares in Africa.

Cultivation: Sorghum seeds will germinate soon after harvest. The seeds also store well if kept dry and protected from insects.

Production: Grain is ready for harvest 4-8 weeks after flowering.

English: Tamarind
Local:

Scientific name: *Tamarindus indica*
Plant family: FABACEAE

Description: A large spreading tree up to 24 m tall. It has a broad dense evergreen crown. In dry areas the tree can lose its leaves. The trunk can be 1 m across. The bark is rough and grey with a checkered pattern. The leaves are carried one after another along the branch. The whole leaf is 6-12 cm long and it is divided into 10-17 pairs of leaflets. These are oblong and without stalks. The whole leaf has a leaf stalk about 15 cm long. The leaflets are 1-2.5 cm long and 4 9 mm wide. They are a dull dark green and with a rounded tip. The flowers are pale yellow with brown markings. The flowers are about 2.5 cm across and hang on long many flowered stalks. The fruit is an oblong thin skinned fleshy capsule. The brown seeds are inside this long rough surfaced, sausage-like fruit. This pod is 6-8 cm long and about 2 cm wide and contracted between the seeds. The pod cracks when mature. It is a legume. The pulp is date like and reddish brown. The seeds are shiny and hard. The pulp of the pods is edible.

Distribution: A tropical plant. The tree is cultivated in a number of coastal towns in the tropics as a street tree. It is probably best grown below 800 m altitude in the tropics. It is drought resistant. It cannot stand water-logging. It does well on coastal dunes above high water level. It suits semi-arid areas. It must be in frost free locations. In Nepal it grows up to about 1200 m altitude. It suits hardiness zones 11-12.

Edible Parts: Fruit, Seeds, Leaves, Flowers, Spice

Use: The pulp of the fruit is edible. It is also used for drinks. The seeds are also edible, cooked. They can be roasted and ground into flour. The outer skin is removed. The young leaves, flowers and young pods are also edible. They are eaten in curries. They are used to make dishes acid. They are used in sauces and chutneys. The young seedlings are also edible.

Cultivation: It can be grown by seeds or cuttings. It is best to sow seedlings in pots then transplant them but seed can be sown direct. There are about 1400 seeds per kg. Seed should be soaked in hot water or the seed coat nicked before sowing. Seed can be stored for 2 years if kept dry, cool and away from insects. Trees can be topped or cut back and allowed to regrow. Nothing grows under the trees due to the acidity of the leaves. Trees can be grown by air layering or cuttings.

Production: It grows very slowly. Trees are long lived. Fruiting is seasonal. The season tends to be April to June. It is about 8-9 months from flowering to ripe fruit.

English: Guanillo
Local:

Scientific name: *Thrinax radiata*
Plant family: ARECACEAE

Description: A palm. The stems are 1.5-12 m tall. They are 6-13 cm across. The leaf sheath has fine fibres. The leaf stalk is 36-94 cm long. The leaf blade has 51-63 leaflets. The middle ones are 0.7-1.1 m long. They are lighter green underneath. The flowering stalk does not arch over and is not longer than the leaves. There are 13-21 primary branches. The branches are smooth at flowering time. The fruit are round and 7-8 mm across. They are white.

Distribution: A tropical plant. It grows in coastal regions on limestone or sandy soils close to the sea. It is very tolerant to drought.

Edible Parts: Fruit

Use:

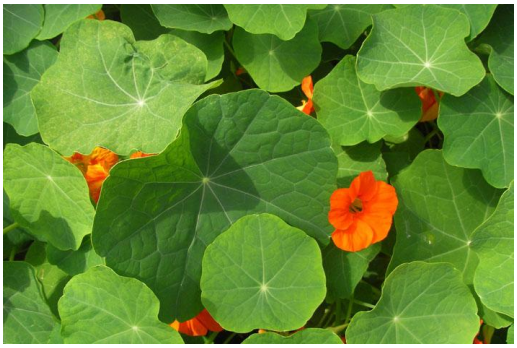
Cultivation:

Production: It is slow growing.

English: Nasturtium, Indian Cress
Local:

Scientific name: *Tropaeolum majus*
Plant family: TROPAEOLACEAE

Description: A creeping climbing annual plant. It grows to 60-300 cm high and can spread to several m wide with long branches. The leaves are small and round. They are light green. Leaves are 2.5-6 cm across. The edges of the leaves are wavy. The veins radiate out from the centre. It has trumpet like flowers. The flowers are orange and yellow and have a pointy piece at the back of the flower. Several ornamental varieties have been bred by hybridization.



Distribution: It is a tropical plant. It prefers a sunny position. It is mainly seen between 600 and 1800 m altitude in Papua New Guinea. It is damaged by frost. It can tolerate drought. They need a temperature above 3°C. It suits hardiness zones 9-11.

Edible Parts: Leaves, Seeds, Herb, Flowers, Spice, Vegetable

Use: The leaves, flower petals and seeds are all edible and have a hot peppery taste. The leaves and flowers are eaten raw. They are used in salads, sandwiches, vegetable dishes and are stuffed like grape leaves. The flowers can be added to vinegars. The flower buds and young fruit are used as a substitute for capers in sauce. The mature seeds can be eaten roasted. They can be used as a pepper substitute.

Cultivation: Plants are grown from seed. Plants reseed easily. Seed should be soaked overnight before sowing. Seed are sown 6-12 mm deep. Plants should be spaced 15-30 cm apart.

Production:

English: Water Celery
Local:

Scientific name: *Vallisneria americana*
Plant family: HYDROCHARITACEAE

Description: A plant that keeps growing from year to year. It is a ribbon like plant which grows in water. It grows 2 m above the water surface and spreads 1 m wide. The stem is slender. The leaves are large and twisted in spirals. They are green and grass-like. They can be 90 cm long by 2 cm wide. The flowers are greenish-white. They are very small and appear in summer. They float on the water. Male and female flowers are separate. After fertilisation fruit develop underwater. The fruit are small, curved seed capsules.

Distribution: It is a temperate to tropical plant. It does best in still water in a protected, sunny position. The water can be 1 m deep. It is sensitive to frost and drought.

Edible Parts: Leaves

Use: The young leaves are cooked and eaten.

Cultivation: Plants can be grown by seed or by division. Seed are only produced if male and female plants both occur. Buds form at the base of the plant in winter and these grow and produce stolon.

Production:

English: Sweet Violet
Local:

Scientific name: *Viola odorata*
Plant family: VIOLACEAE

Desccription: A herb. It keeps growing from year to year. It grows 10-15 cm high and spreads 30-60 cm wide. It has rooted runners. The leaves are heart shaped. They cluster around the base of the plant. The flowers are violet blue. They have a sweet smell. The fruit are round, hairy capsules.

Distribution: It does best in well-composted, moist soils. It needs a protected and partly shaded position. It is resistant to frost but sensitive to drought. It suits hardiness zones 7-10.

Edible Parts: Flowers, Leaves, Herb, Spice

Use: The flowers, roots or leaves can be used to make tea. The leaves can be cooked and eaten. Young leaves should be chosen. They are added to soups. The leaves and flowers can be added to salads. The flowers can be candied or used for garnish or made into syrup, jellies and marmalade. The leaf extract is employed to flavour ice cream, candy and baked goods.

Cultivation: Plants can be grown by seed or by division.

Production:

English: Tannia Spinach
Local:

Scientific name: *Xanthosoma brasiliense*
Plant family: ARACEAE

Description: The tubers are tiny but not acrid.

Distribution: A tropical plant.

Edible Part: Leaves

Use as Food: The leaves, stems and upper portion of the leaf stalks are used as potherbs.

Cultivation: It is grown as a leaf vegetable.

Production:

English: Corn, Maize
Local:

Scientific name: *Zea mays*
Plant family: POACEAE

Description: A grass. It is an annual plant 2-3 m high. It has a single stem. The stem is solid. It can be 2-3 cm across. Usually there are 14 internodes but this can vary from 8-21. It is a large grass family plant with prop roots near the base. Some forms produce tillers near the base. Seed roots feed the plant initially then casual side roots develop from the lowest node on the plant and continue supplying the plants nutrients. Roots can go sideways for 1 m or downwards for 2-3 m. It is a very variable plant and due to cross pollination variation continues and all forms hybridize. Leaves are produce one after another along opposite sides of the stem and there are between 8 and 21 leaves. The leaf sheath wraps around the stem but opens towards the top of the sheath. The leaf blade is 30-150 cm long and 5-15 cm wide. The leaf blade has a pronounced midrib and is often wavy along the edge. The male flower or tassel is at the top. The female flower is called the ear. It is on a short stalk in the axils of one of the largest leaves about half way down the stem. In the axils of the leaves it produces a large cob wrapped in leaves. The kernels develop in an even number of rows carrying 4-30 grains along the length of the cob. Cobs commonly have 300-1,000 grains. Normally only one or two cobs develop per plant. The seed endosperm is soft in dent types, hard in flint and popcorn types and have more sugar in sweet types.

Distribution: A warm temperate plant. Seeds need a soil temperature more than 10°C to germinate. It grows best at less than 1800 m altitude in the equatorial tropics. It is grown in most areas of Asia. Plants have been grown from sea level to 3,300 m in the Americas. It tends to be in areas too dry for rice but wetter than for millets. Maize must have over 120 days frost free. In Nepal it grows up to 3000 m altitude. It suits hardiness zones 8-10.

Edible Parts: Seeds, Leaves, Cereal, Flowers

Use: The cobs are eaten cooked. The dried grains can be crushed and used. The meal can be sued for breads, cake, soups, stews etc. Pancake like Tortillas from corn have been a staple food in Central America. Maize is cooked and prepared in many different ways. They are boiled, roasted, dried, steamed and other ways. Corn oil is used in salads and cooking. Young tassels are cooked and eaten. The pollen is used in soups. The fresh silks are used in tortillas. The pith of the stem can be chewed or made into syrup. Sprouted seeds are eaten.

Cultivation: It is grown from seeds. It is normal to plant one seed per hole at 1-2 cm depth. A spacing of about 30 cm between plants is suitable. For saving seed, it should be from gardens of over 200 plants and the seed from several cobs mixed to avoid inbreeding depression.

Production: In warm moist soil seeds geminate in 2-3 days after planting. Cobs are harvested when the grains are full and the tassel is just starting to turn brown. This is normally about 50 days after fertilisation. It is sweetest eaten soon after harvesting. Drought and unfavourable weather can result in the silks of the female flowers emerging after the pollen has been shed. This results in poorly pollinated cobs.

English: Ginger
Local:

Scientific name: *Zingiber officinale*
Plant family: ZINGIBERACEAE

Description: A perennial herb with swollen underground stems. It can grow 30-100 cm tall. The underground stem or rhizome branches and is horizontal near the soil surface. It is about 1.5-2.5 cm thick. Inside the rhizome is yellow and it is covered with scales forming a circle around it. The leaves are long (30 cm) and narrow (4 cm). Each leafy shoot usually has 8-12 leaves in two vertical lines on opposite sides of them. The leaf blade narrows evenly to the leaf tip. The flower is a cone 6 cm long on a stalk up to 30 cm long. (Flowers are not produced in all locations.)

Distribution: It is a tropical plant. It is mainly grown from sea level up to 1900 m altitude in the tropics but will grow at higher places. It needs a loose fertile soil. It does best with plenty of humus. It requires a rainfall of 1500 mm or more per year. It does best where there is a short dry season and a good hot temperature. It cannot stand water-logging. In Nepal it grows to about 2500 m altitude. It suits hardiness zones 9-12.

Edible Parts: Rhizome, Leaves, Herb, Spice

Use: The underground rhizome is eaten raw or in salads. The young shoots are spicy and can be eaten. These young shoots are eaten as a vegetable. They are also pickled. The rhizome can be dried and powdered. These old roots are used as a spice. They are preserved in syrup. Oil of ginger is used as a flavouring. Ginger is used for drinks.

Cultivation: A portion of the rhizome is planted 5-7 cm below the surface of the soil. Sometimes light shade is used but it can be grown without shade.

Production: It takes 12 months to mature. It is harvested several times. The young shoots are cut when about 7.5 cm high.

English: Coolie Plum, Jujube Tree, Indian Jujube **Scientific name:** *Ziziphus mauritiana*
Local: **Plant family:** RHAMNACEAE

Description: A medium sized tree. It is thorny. It loses many of its leaves during the year. It grows up to 10-12 m high. The bark is grey, brown or pale red. Branches and the under surface of the leaves are densely hairy when young. The thorns arise from the base of the leaves. The leaves are alternate and simple. They are finely toothed. They can be oval or round and 8 cm long by 5 cm wide. The flowers are green and have a scent. They occur as 3-5 flowers together. The flowers are 1-2 cm long and on slender branches. The fruit are small, oval and yellow or brown. They are sweet. They are 2-5 cm long and 2.5 cm wide. The fruit are green when young and turn yellow or brown when ripe. The pulp is fleshy, acid and edible. The fruit have one seed imbedded in the flesh in a hard stone. The fruit wrinkle on drying. Many varieties exist.

Distribution: A tropical plant. It grows well on sandy soils. It can survive droughts. It grows rapidly in dry places such as the Sahel. It can tolerate temperatures up to 44°C as well as periodic frosts once the trees are mature. It does best when the mean annual temperature is 22-30°C. It thrives in hot dry climates. It needs adequate water during the fruiting season. It can grow at elevations up to 1,000 m in the tropics but does best below 600 m. It grows in areas with rainfalls of 150-900 mm and is most common where rainfalls are 300-500 mm annually. It does not like excessive humidity for fruiting. It will grow on a range of soils but deep sandy loams with a pH of 7 or slightly higher are best. It can tolerate some salinity and waterlogging.

Edible Parts: Fruit, Leaves

Use: The fruit is eaten fresh, dried, in jelly or candied. They can be used in jellies, preserves, chutney, sauces, and drinks. The unripe fruit are pickled. Young leaves are cooked and eaten. They are also used in soups. Seed kernels are eaten. The roasted seeds are used as a coffee substitute. The fruit are used to make an alcoholic drink. They are high in Vitamin C.

Cultivation: Plants are grown from seed. The hard seed coat makes them difficult to germinate. The shell can be carefully cracked and seed should be sown fresh. They can be soaked for 50 hours or put in concentrated sulphuric acid for 6 monutes to improve germination. Seed can be sown in plastic bags then transplanted after 18-24 weeks. It does not transplant easily so direct planting is best. Grafting and inarching can be used. It is also budded onto the rootstocks of wild species. Light pruning during the dry dormant season to train the tree is recommended. Regular pruning in the hot dry season encourages new growth. A spacing of 6-12 m is recommended. For larger fruit better varieties are grafted into rootstocks of Ziziphus numularia or Ziziphus jujuba.

Production: A budded tree fruits at 4 years and produces for 50 years. Seedling trees take a year longer to fruit. Yields of 80-130 kg of fruit per tree per year occur. Fruit development takes 4-6 months. As fruit does not all ripen at once several harvests are needed. Unripe fruit do not ripen after picking.