Potentially Important Food Plants of Nepal




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

DEPROSC Nepal family is proud to put its few words about the book named "Potentially Important Food Plants of Nepal" based on the database of Food Plant International and published by Food Plant Solution, whose Nepali translation is done by DEPROSC Nepal as ''नेपालको संभाव्य महत्वपूर्ण खाद्य वनस्पति''. For past 25 years, DEPROSC Nepal has been working for prosperous and empowered Nepal through participation of rural people in general and the poorest of the poor, and marginalized groups in particular the development process for the social and economic empowerment. DEPROSC Nepal have reached the most rural district of high mountain region with no road access and continuously worked for poverty reduction, hunger and malnutrition, food security and development.

Nepal is home of numerous natural resources found locally and around the world. However, we are still not aware of locally found bio-diversity. There are lots of work to be done to end hunger and malnutrition in Nepal. In this ground, the information, knowledge and skill in this book can be useful to achieve Government of Nepal aims to fight hunger, malnutrition and ensure food security.

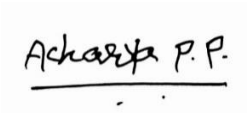
Due to range of geography and favorable climatic condition, Nepal is home to almost 284 flowering plants, 160 animals, 14 cherpeto fauna (National Biodiversity Strategy, 2014) which can be key for reducing malnutrition in Nepal, but very less studies and works have been done in this regard.

Implementation of livelihood enhancement programs while figuring out issues of annual disaster like flood and landslides; other natural disaster like earthquake and climate change; national problems of unemployment and labour migration; and political instability is the major challenge. However, as guided by new constitution of the country, the transfer of total responsibility of local level Food Nutrient Sector (FNS) to local government can make the difference in days to come. In such context, knowledge in this book will be the guidance.

I am ever thankful to Food Plant Solution for providing opportunity to DEPROSC Nepal to collaborate in this important work. I hope for such collaboration for social and environmental welfare in future also.

Lastly, I would like to acknowledge the efforts put by Mr. Ganesh Kumar K.C. (Program Advisor, DEPROSC Nepal and Agriculture Specialist) and Mr. Dhurva Narayan Manandhar (Agriculture Specialist) for this Nepali version. Translating technical books is tiresome work, therefore, their efforts and determination to make this happen is much appreciated. Similarly, I would like to thanks Ms. Geeta Dongol (Senior Program Officer, DEPROSC Nepal) for her support in formatting, typing and improvement of this book.

Thank you.



Pitambar Prasad Acharya
Executive Director
DEPRPOSC Nepal
2074/10/28

Potentially Important Food Plants of Nepal

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 Field Guide – Nepal, Version 4, March, 2018

Preface

This guide is based on information 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.

The selection of plants included in this guide has been developed by Aniela Grun working in a voluntary capacity using the selection criteria developed by Food Plant Solutions. These selection criteria focus on the local plants from each of the main food groups with the highest levels of nutrients important to human nutrition and alleviation of malnutrition. It is intended as a **Draft Guide only** to indicate some important food plants that serve as examples for this purpose. Other important nutritious plants may be equally useful, and it is recommended that the FPI database be used to source information on the full range of plants known to occur in Nepal. This guide has been developed with the best intention to create interest and improve understanding of the important local food plants of Nepal, and on the understanding that it will be further edited and augmented by local specialists with appropriate knowledge and understanding of local food plants.

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

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.

Contents

Introduction

This book is designed as a simple introduction to the more common food plants of Nepal. 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.

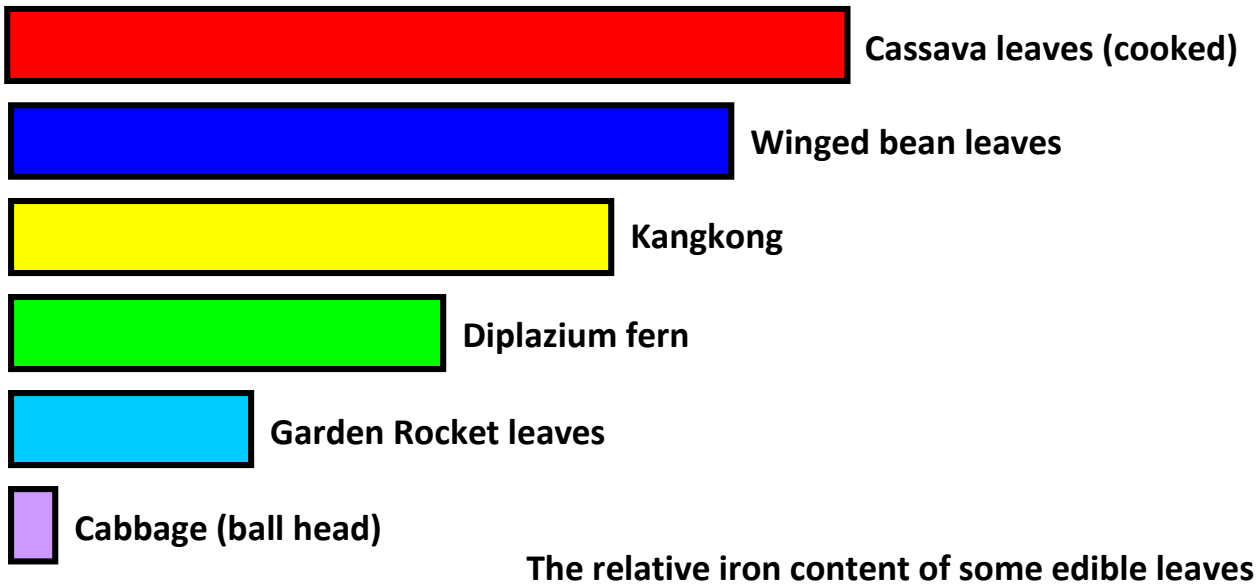
Naming of plants

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.

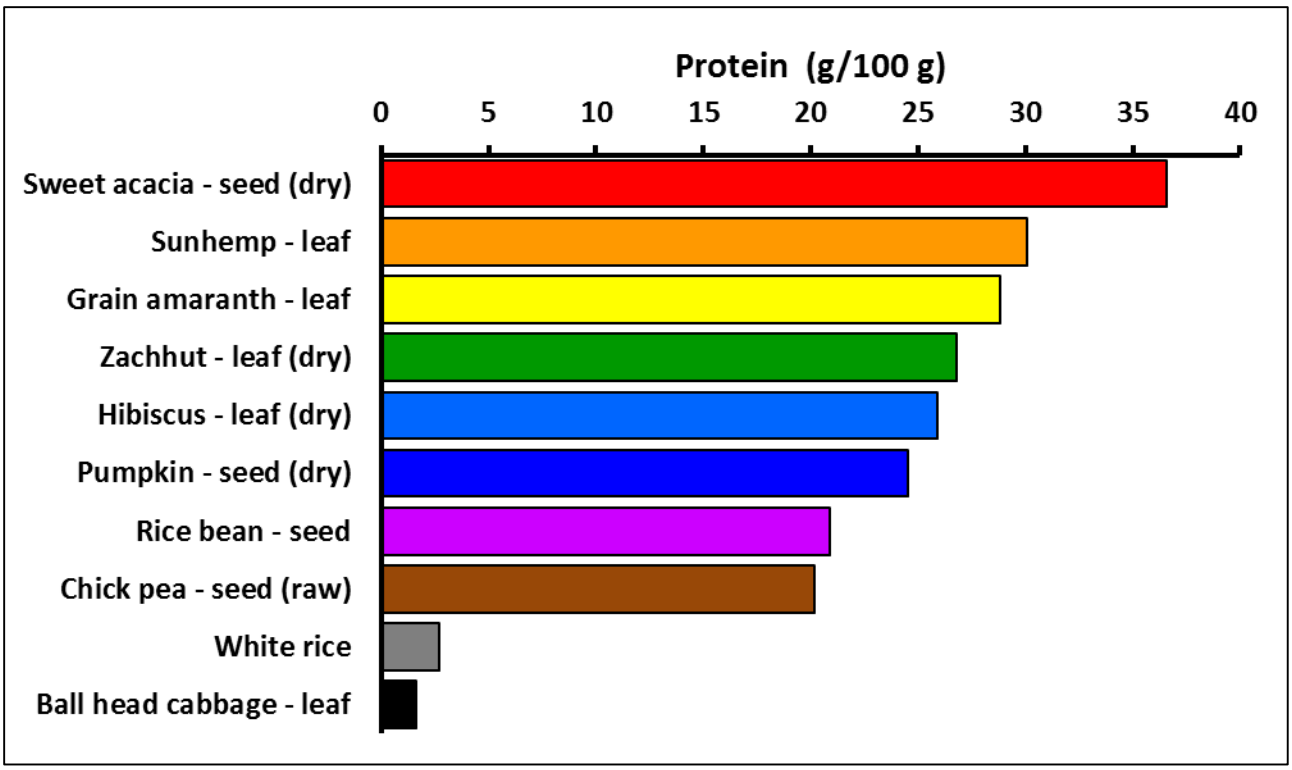
Pests

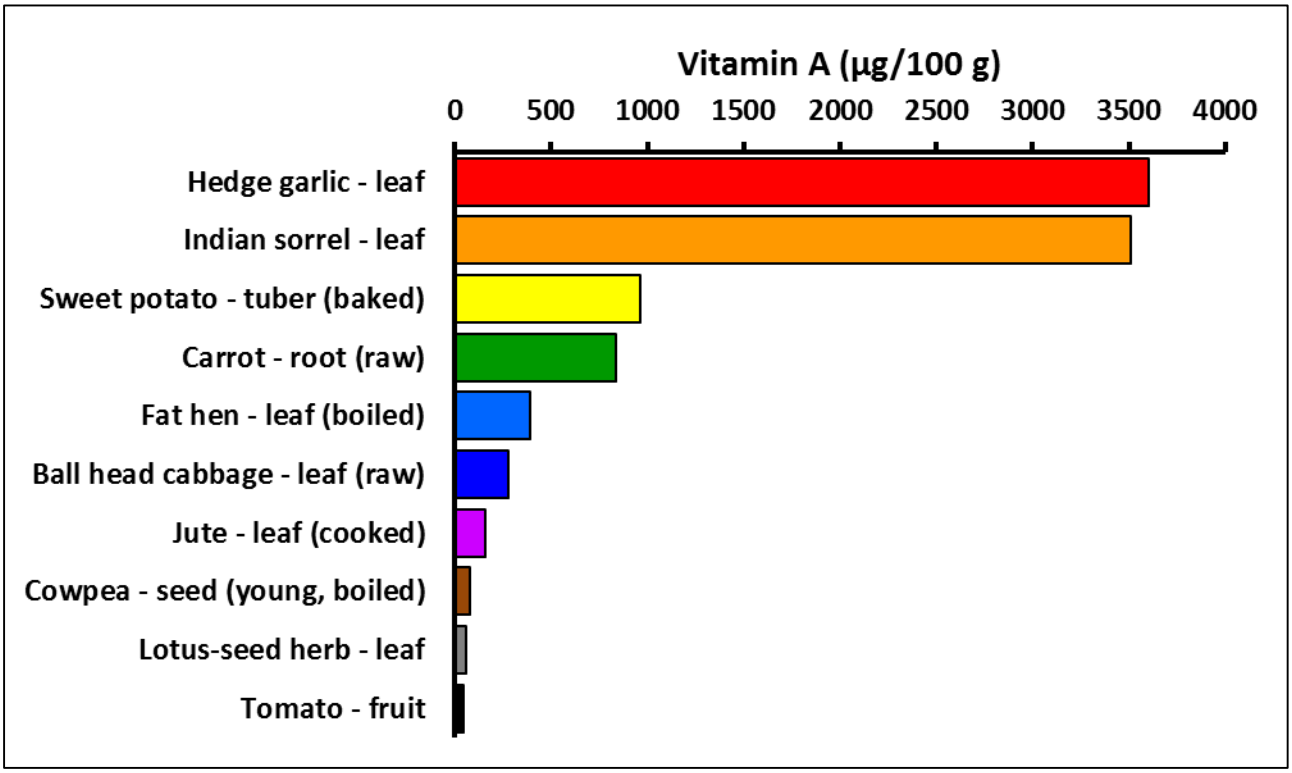
There are a large number of insects that enjoy sharing our food with us! We should not try to kill all these insects as they have an important role to play in keeping everything in nature in balance. What we need to do is to learn to manage these insects so we can all get some food to eat! Some insects 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.

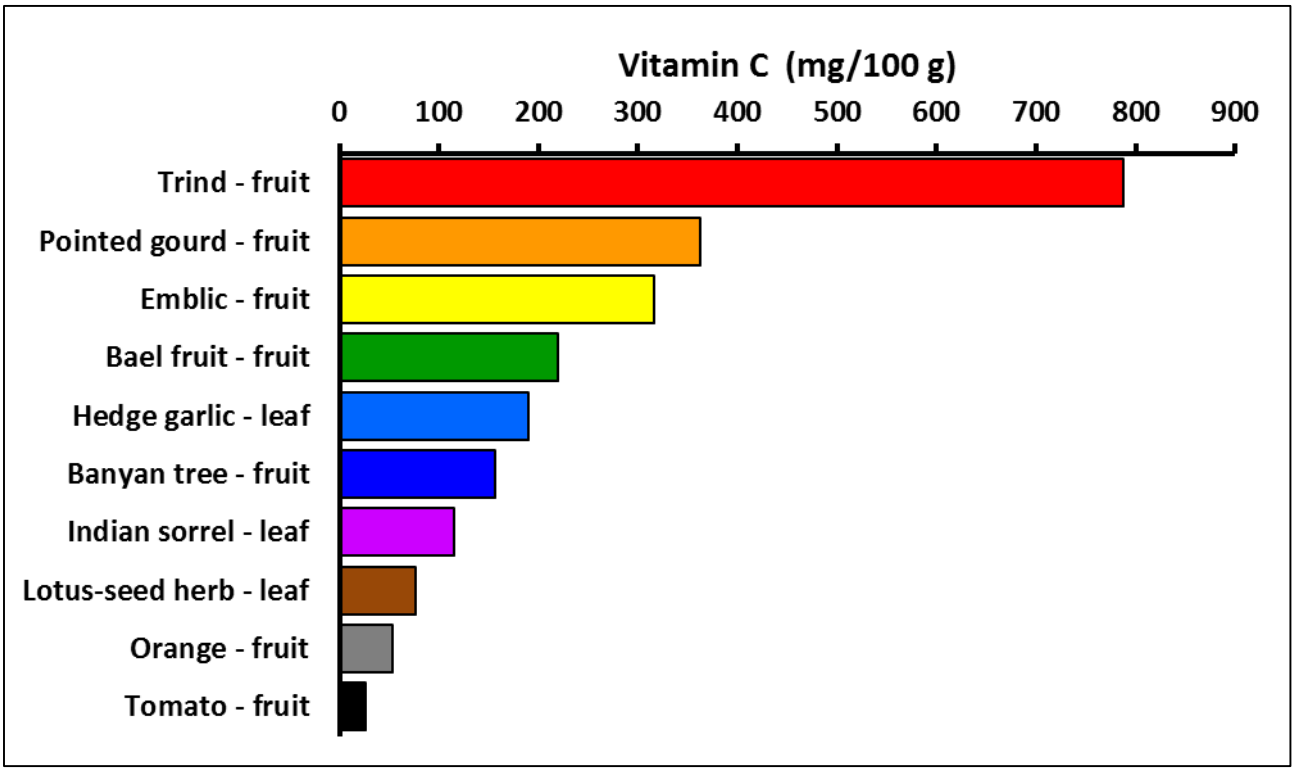
Diseases

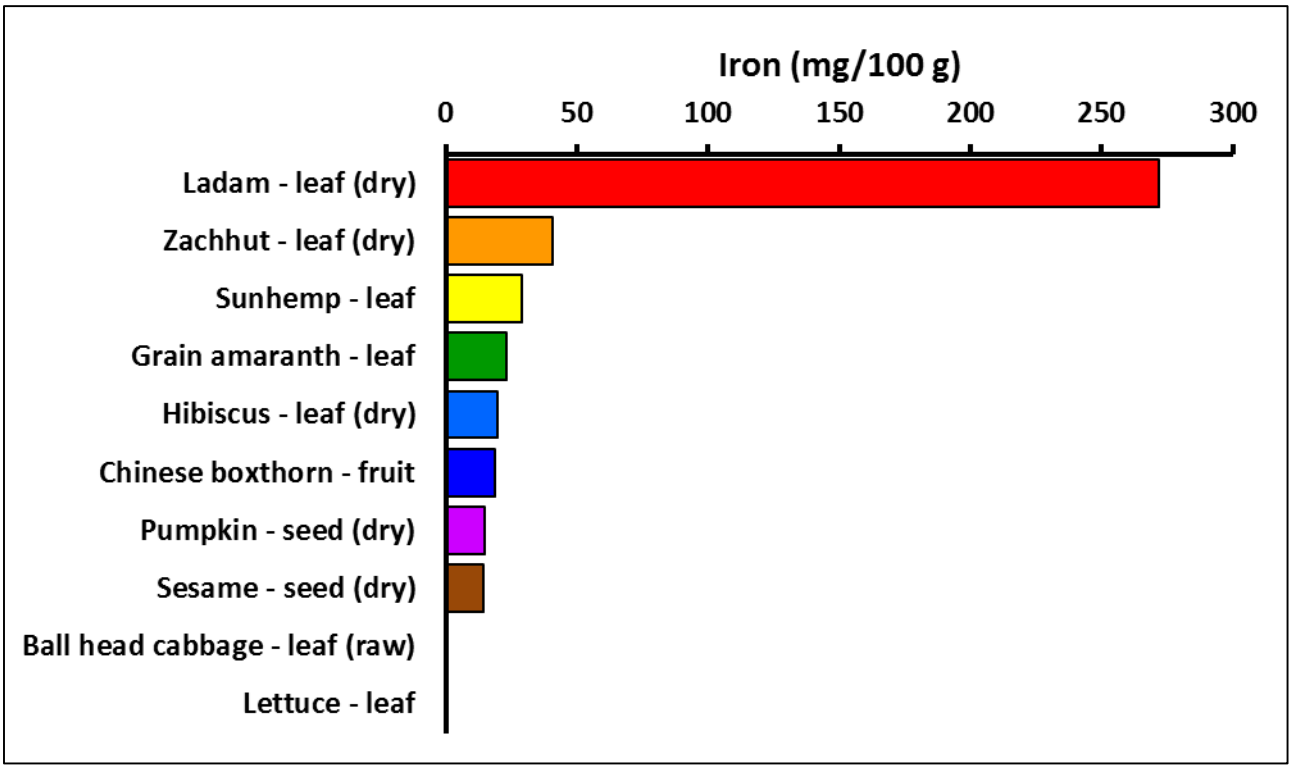
The living organisms that cause disease are much smaller than insects. These disease organisms can often only be seen with a microscope. There are three main kinds of disease organisms - fungi, bacteria and viruses. Fungi are like the mushrooms we eat, only very much smaller. They usually make distinct 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.

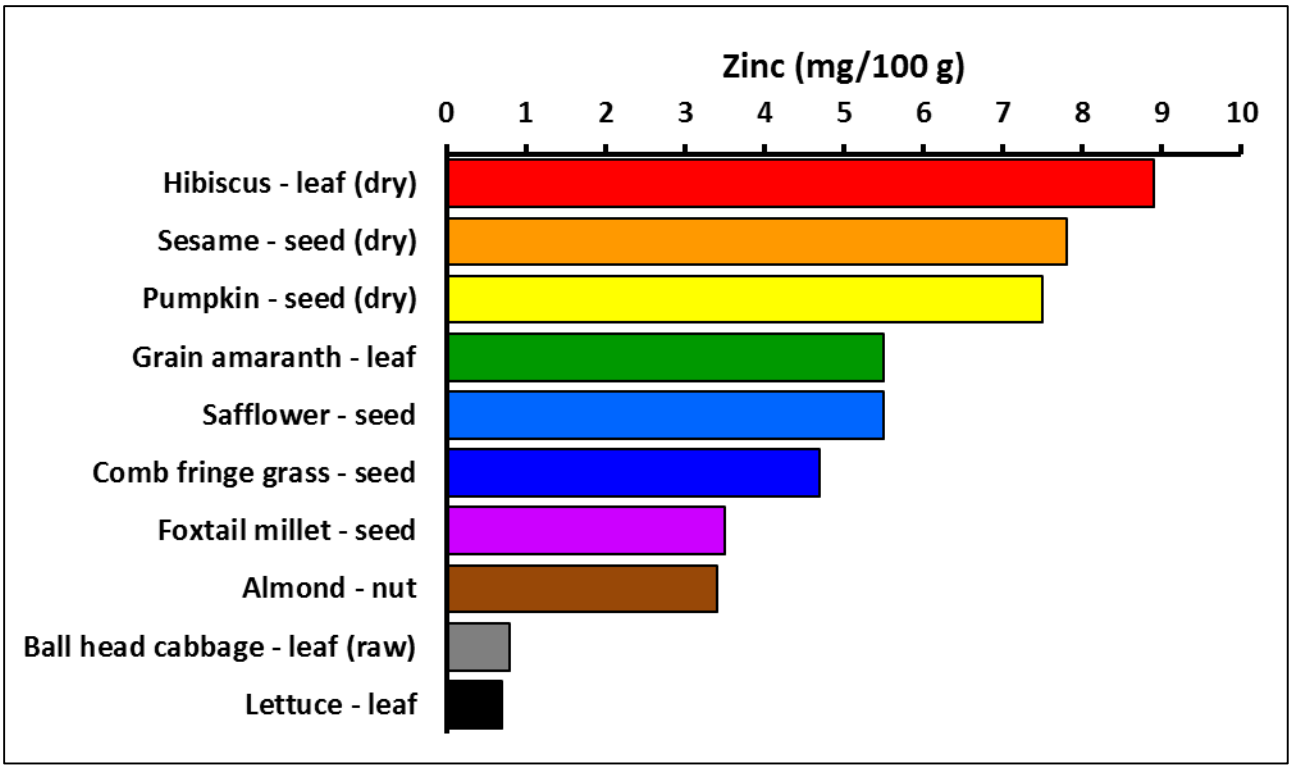
Food value charts for a selection of plants from Nepal






Vitamin C (mg/100 g)
0
100
200
300
400
500
600
700
800
900
Trind - fruit
Pointed gourd - fruit
Emblic - fruit
Bael fruit - fruit
Hedge garlic - leaf
Banyan tree - fruit
Indian sorrel - leaf
Lotus-seed herb - leaf
Orange - fruit
Tomato - fruit


Iron (mg/100 g)
0
50
100
150
200
250
300
Ladam - leaf (dry)
Zachhut - leaf (dry)
Sunhemp - leaf
Grain amaranth - leaf
Hibiscus - leaf (dry)
Chinese boxthorn - fruit
Pumpkin - seed (dry)
Sesame - seed (dry)
Ball head cabbage - leaf (raw)
Lettuce - leaf



Note regarding plant selection: In compiling these field guides, we acknowledge that some staple foods and commercial crops which are grown widely in the target country may be omitted. Such foods are often in the starchy staple category (e.g. rice, corn). This does not mean that they are not useful, but merely reflects a desire for the Food Plant Solutions project to concentrate on plants that are less well known and/or underutilised.

Starchy staples

English: Common millet
Local:

Scientific name: *Panicum miliaceum*
Plant family: POACEAE

Description: An annual grass which grows up to 1 m high. It spreads to 15 cm across. It has a fibrous root system. The stalks are tufted. They are hairy at the base and on the nodes. The leaves are 30 - 50 cm long by 1 - 5 cm wide. They are narrow and flat. The edge is slightly rough with a few long hairs near the base. The seed head is much branched. The flower is yellow. The fruit is a grain. There are several races.

Distribution: It is a temperate plant. It requires a moderately fertile well-drained soil in full sunlight. Once established it can tolerate heat and drought. It suits warm temperate and subtropical climates. Plants are frost sensitive. In Nepal it grows up to 2,200 m altitude. It can grow in arid places. It suits hardiness zones 5 - 9.

Use: The seeds can be cooked and eaten whole or ground into flour. They can be used in bread, pasta or dumplings. They are often browned in a skillet before using in casseroles, stews and for stuffings. They are fermented into *tempeh* or *miso.* The seed can be sprouted and added to soups and salads.

Cultivation: It is grown from seed which takes one week to germinate.

Production: Seeds for harvest can be produced in 10 weeks.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
seed	9.6	1548	11	-	-	-	-

Starchy staples

English: Buckwheat
Local:

Scientific name: *Fagopyrum esculentum*
Plant family: POLYGONACEAE

Description: An upright annual plant up to 1 m high. It spreads to 1 m across. It has angular hollow stems. These are erect and branching. Leaves are heart shaped or triangular and small. It has groups of white or pink flowers. These have a smell. They occur in clusters at the ends of branches. Fruit are small and 3 angled. The plants are not grasses but the seeds are normally grouped with other grain crops.

Distribution: It is a temperate plant. It will grow on poor soils but prefers rich soils and a protected sunny position. It is resistant to frost but damaged by drought. In Nepal it grows between 1,000 - 2,500 m altitude. It can grow up to 4,400 m altitude. In Uttar Pradesh it grows up to 3,000 m altitude.

Use: The seeds are eaten in porridge and biscuits etc. The seeds can be made into flour and eaten in pancakes, noodles and breads or for thickening soups and gravies. Seeds can be soaked overnight then sprouted and eaten. The tender leaves and shoots are cooked and eaten. The young leaves can be stored for 4 - 5 days after harvest. The seeds are used mainly for flour and stock feed. **Caution:** Seeds are bitter. If they are eaten in large amounts they can produce an unpleasant skin disorder.

Cultivation: Plants are grown from seed.

Production: Seeds usually germinate in 5 days. It has a very short growing period from sowing to maturity. It can produce a crop of leaves in 8 weeks and seeds in 12 weeks. Seed ripen irregularly over several weeks making harvesting difficult. Under cool conditions plants flower in 7 - 9 months. Commercial grain yields in Australia have been up to 2.5 tonnes/ha. In India, yields of 600 - 800 kg/ha are achieved.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
seed (dry)	11.3	1404	10.3	-	-	3.0	-

Starchy staples

English: Comb fringe grass
Local:

Scientific name: *Dactyloctenium aegyptium*
Plant family: POACEAE

Description: An annual grass. The stems are slender. They can lie along the ground. These can form roots at the nodes. They can have runners and form mats. It is 15 - 60 cm high. The edges of the leaf sheaths have small hairs. The leaf blades are flat and 5 - 20 cm long by 0.2 - 0.6 cm wide. The surfaces are lumpy/hairy. It tapers to the tip. The flowers spread like fingers on a hand. There are 2 - 9 flower stalks. They are long and narrow. They often spread out horizontally. The spikes are on one side of the stalk. The tip is bare. The seed grains are about 1 mm across.

Distribution: A tropical plant. It grows in disturbed weedy places especially on sandy soils in S China. It grows in tropical to warm temperate regions. It grows on clayey, sandy or black soil along the borders of ponds, swamps and bogs. In West Africa it grows from sea level up to 2,000 m altitude. It grows in alkaline and salty soils. It grows in areas with an annual rainfall between 100 - 1,580 mm. It can grow in arid places.

Use: The seeds are husked then boiled into a porridge. They are also roasted in a hot pot to soften them. It is then pounded into flour and cooked into porridge. The rhizome or runners are eaten raw.

Cultivation: Plants can be grown from seeds.

Production: The seeds are collected during the dry season. The seeds can be stored for several months.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
seed	7.5	1234	9.8	-	-	6.9	4.7

Image sourced from: Giles Tran AFZ @feedipedia.org

Starchy staples

English: Foxtail millet
Local:

Scientific name: *Setaria italica*
Plant family: POACEAE

Description: An annual grass. It grows 1 - 1.5 m tall. It can be tinged with purple colour. The stalks are upright and the section between the nodes is hollow. It develops tillers from the base. It has along leaf sheath. The leaf blade is 30 - 45 cm long by 1.2 - 2.5 cm wide. It has a prominent midrib and tapers towards the tip. The flower is a spike-like branching flower 7.5 - 25 cm long by 1.2 - 5 cm wide. The side branches carry 6 - 12 small spikes each with 1 - 3 bristles. The mature grain is 2 mm long. There are many named cultivated varieties.

Distribution: A warm temperate plant. It suits regions of low rainfall. It is grown from sea level to 2,000 m altitude. It can tolerate a wide range of soil conditions. It cannot tolerate waterlogging or long periods of drought. It can grow in arid places.

Use: It can be cooked and eaten like rice. The seeds can be parched, popped, added to soups and sauces or made into porridge, cakes, puddings, and dumplings. The sprouted seeds can be used as a vegetable. The seeds can be used for making beer. The seeds can also be made into syrup.

Cultivation: Plants are grown by seed. Seed can be broadcast or drilled. Pure stands require 8-10 kg/ha of seed. Plants are harvested by cutting off the ears.

Production: It grows quickly. Plants mature in 80 - 120 days. Flowering occurs over 10 - 15 days. Plants can be self or cross pollinated. Yields of 800 - 900 kg/ha are common and straw yields for livestock feed can be up to 2,500 kg/ha.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
seed	13.5	1425	9.5	-	-	5.5	3.5

Starchy staples

English: Finger millet
Local:

Scientific name: *Eleusine coracana*
Plant family: POACEAE

Description: An annual millet grass. It is robust and forms many tillers or young shoots from the base. It grows 40 - 120 cm tall. The stems are somewhat flattened and the leaves are narrow. The flower heads are made up of 2 - 7 finger like spikes, 1.5 cm across and 10 - 15 cm long. These in turn have about 70 smaller spikes. Each one of these smaller spikes has 4 - 7 seeds. The seeds are roughly rounded and 1 - 2 mm across. There are *coracana* and *africana* subsp.

Distribution: It is a very drought resistant tropical plant. For good yields, it needs good soil drainage and adequate moisture. It cannot stand water-logging. It is an important crop in areas where annual rainfall is 900 - 1,250 mm. It especially suits areas with long hot summers. It needs a minimum temperature above 18°C and does best where temperatures are above 27°C. It grows from sea level to 2,400 m altitude in Africa. It is a short day length plant and does best where day length is 12 hours. It can grow in arid places.

Use: The seed are eaten either roasted or ground into flour. This is used for porridge and flat bread. Alcohol is brewed from the grain. The leaves are also edible.

Cultivation: It is grown from seed. Often plants are grown mixed with sorghum or maize. Good soil preparation is needed to reduce weed competition. Seed can be broadcast or drilled. Young plants need to be weeded and thinned. Seed viability drops to about 50 % after 2 years. Spacings of 5 cm apart in rows 30 - 33 cm apart, or 10 - 12 cm apart in rows 25 cm apart are recommended. About 25 - 35 kg of seed per hectare are needed if seed are broadcast. 5 - 10 kg per hectare are required if seed are drilled. Using fertiliser can dramatically increase yield. 125 kg per hectare of sulphate of ammonia when plants are 15 cm high is used in Uganda.

Production: It is self-pollinating and pollination occurs over 8 - 10 days. Millet seed stores very well and can be stored without damage for 10 years. Often it is stored on the head. Yields of about 450 - 900 kg of dried grain per hectare are usual. This can easily be increased to 1,650 kg per hectare. Crops take 3 - 6 months until harvest.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
seed	11.7	1594	6.2	-	-	5.3	-

Starchy staples

English: Hogweed
Local:

Scientific name: *Boerhavia diffusa*
Plant family: NYCTAGINACEAE

Description: A weedy evergreen vine or shrub which lays over. It grows to 70 cm high. It spreads about 50-200 cm wide. The stem is slender, creeping and twining. It has a large root system. The leaves are dull green and in opposite unequal pairs. They are 1-2.5 cm long by 1-2 cm wide. The lower leaves are broadly oval while the upper leaves are narrower. The edges of the leaves are wavy. The flowers are yellow and white or pink. They occur in groups of 3 at the ends of branches. They are 0.5 cm long. The fruit are about 0.4 cm long. They have glands that make them sticky. In a similar plant, *Boerhavia erecta*, the fruit are smooth and not sticky.

Distribution: It is a warm region or tropical plant. It will grow on most soils. It is drought and frost resistant and very hardy. It does best in an open sunny position. It forms a good ground cover in dry regions. It grows throughout Nepal to about 2,300 m altitude. It grows in areas with an annual rainfall above 300 mm. It can grow in arid places.

Use: The tender leaves are eaten cooked as a vegetable. The harvested leaves can be stored for 6-7 days. The fleshy taproot is baked and eaten. The seeds are added to cereals.
Caution: It may cause diarrhoea if eaten in large amounts.

Cultivation: Plants can be grown from seed or cuttings. Cuttings strike easily.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
fruit (dry)	10.2	1363	8.3	-	-	-	-
root	50.0	678	4.6	-	-	0.3	-
leaf	82.0	-	4.5	-	-	7.8	0.4

Image sourced from: www.biodiversityof india.org

Starchy staples

English: Taro
Local:

Scientific name: *Colocasia esculenta*
Plant family: ARACEAE

Description: This plant has large flat leaves on the end of upright leaf stalks. It grows up to 1 m high. The leaf stalk or petiole joins the leaf towards the centre of the leaf. The leaves are 20 - 50 cm long. Near the ground a thickened rounded corm is produced. Around this plant their is normally a ring of small plants called suckers. Many different varieties occur. If left to maturity, a lily type flower is produced in the centre of the plant. It has a spathe 15 - 30 cm long which is rolled inwards. The flowers are yellow and fused along the stalk. There are many named cultivated varieties. Taro comes in two basic forms. The Dasheen type *Colocasia esculenta* var. *esculenta* and *Colocasia esculenta* var. *antiquorum* or the Eddoe type. The basic difference is the adaptation of the Eddoe type to storage and survival in seasonally dry places, while the dasheen type needs to be maintained in a more or less continuously growing vegetative stage.

Distribution: It is a tropical plant. Taro grows from sea level up to about 2,300 m altitude in the tropics. It grows well in humid places. It can stand damp soil and grow under light shade. It suits hardiness zones 9 - 12.

Use: The corms, petioles and leaves are all edible after cooking. The leaves are also dried and stored. Fresh leaves can be stored for 4 - 5 days. **Caution:** Some varieties burn the throat due to oxalate crystals.

Cultivation: Taro can be planted from cormels or from the top of the central corm. Other sections of the corm could also be used but this is not commonly done. Flowering of taro and seed production can lead to new cultivars. Flowering can be promoted by the use of gibberellic acid. The general growth pattern is for an increase in top growth, in terms of leaf number, leaf area and petiole length, to continue for about 6 months under tropical lowland conditions then for each of these to decrease and tuber storage to continue to increase. Corm weight increases significantly from 5 - 11 months. Starch content also increases with time but protein content declines over the corm development period.

Taro can be grown under flooded conditions but root rots develop if the water becomes stagnant. For flooded cultivation, the land is cleared, ploughed, cultivated and puddled. The aim is to get a field that is flat with embankments allowing the impounding of water. Planting is done into 2 - 5 cm of standing water.

For dryland taro, the soil is prepared by digging, unless a fresh bush fallow is used where the natural friability of the soil allows plants to be put into the undug soil in a small hole that is prepared. Plants are put into a hole 5 - 7 cm deep or deeper. Mulching to conserve moisture and reduce weed growth in beneficial. Setts from corms normally give higher yield than that from cormels. The greater leaf area and root production may be responsible for this. Setts of about 150 g are optimum.

The time of planting is primarily determined by the availability of moisture. Planting is done shortly after the rainfall has become regular, if seasonally distinct wet and dry occur. Higher rainfall, higher

temperatures, and higher hours of sunlight, enhance production and determine seasonality of production.

Evapotranspiration for flooded taro averages about 4 mm per day, ranging from 1.5 - 7.2 mm, with a total of about 1,200 mm for the crop. Intermittent moisture can result in irregular shaped corms. Flooding has been found to be more effective than sprinkler irrigation, or furrow irrigation. Increased suckering, giving greater leaf area, seems to be the reason for this.

Taro is sensitive to weed competition throughout most of its growth, but it is more critical during early growth up to 3 - 4 months. About 7 - 9 weedings are required, to keep the crop clean under tropical lowland conditions, where flooding is not used. Due to the decrease in height and leaf area towards the end of the growth cycle when starch accumulation in the corms is maximum, weed competition and weed control are again significant. Mechanical weeding needs to be shallow to avoid damaging the superficial taro roots. A range of herbicides have been recommended in various situations.

Taro produces the highest dry matter yield under full sunlight, but it can still grow under moderate shade. Under shaded conditions it grows more slowly and develops fewer cormels. They require good moisture conditions and have little tolerance for drought. Taro residue has an allelopathic factor which can reduce the germination and growth of other plants, for example, beans.

Taro tends to demand high fertility, and is responsive to additional NPK fertiliser. Higher doses of K increases starch content and higher doses of N increases protein content. Both N and K applications increase oxalic acid content of the tubers.

Spacing affects total yield, and marketable, harvestable yield, of corms. Close spacing increases the corm yield per area, and the shoot yield per area, but decreases the corm yield per plant, and the contribution of sucker corms, to the yield. Where spacings of 30 cm x 30 cm are used, giving about 110,000 plants per hectare, a very large amount of planting material is required, which reduces the net return per unit of planting material. A spacing of 60 cm x 60 cm in more common. Wider spacings of 90 cm x 90 cm reduces overall yield.

Production: Crops mature in 6 - 18 months. Yields of 5 - 15 tonnes per hectare are probably average.

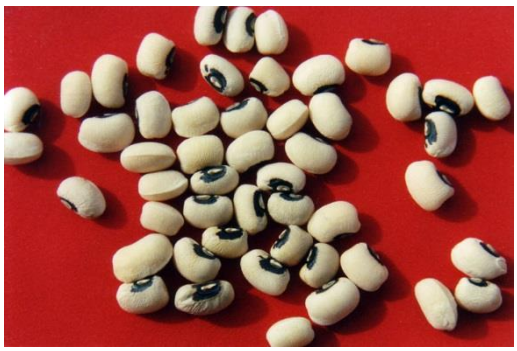
Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
root	66.8	1231	1.96	3	5	0.68	3.2
leaf	85.0	210	5.0	57	90	0.62	0.7
leaf stalk	93.0	101	0.5	180	13	0.9	-
leaf (cooked)	92.2	100	2.7	424	35.5	1.2	0.2

Legumes

English: Cowpea
Local:

Scientific name: *Vigna unguiculata subsp. unguiculata*
Plant family: FABACEAE



Description: A creeping bean type plant with straight firm pods. There is a deep tap root and many branches occur from it in the surface of the soil. The root nodules are large and round. The leaves have 3 leaflets. The end leaflet can be 12 - 16 cm long. The side leaflets are asymmetrical. The stipules at the base of the leaf are large and with spurs at their base. Flowers occur often in pairs on the end of long flowering shoots. Only 2 - 4 flowers in each stalk produce pods. Flowers are white, yellow or blue. They are large and showy. The pods are about 15 cm long. The seeds are white except for a dark scar.

Distribution: It grows in tropical and subtropical climates. It grows from sea level to 1,800 metres altitude in the tropics. Plants can stand high temperatures. Some kinds can tolerate drought. They are sensitive to cold and killed by frost. Plants germinate with a temperature between 11.5 - 15.5°C. The best growth occurs between 20 - 35°C. They can grow on a range of soils providing they are well drained. They are a short day plant. They do well in the semiarid tropics. It will not tolerate acid or alkaline soils. It grows in areas with an annual rainfall between 280 - 410 mm. It can grow in arid places.

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

Cultivation: It is grown from seeds. Seeds remain viable for several years if carefully stored. A seeding rate of about 20 kg per ha is suitable and seed are sometimes broadcast then thinned.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
seed (dry)	11.2	1189	23.5	-	1.5	6.4	-
seed (young, boiled)	75.5	406	3.2	79	2.2	1.1	1.0
leaf	88.4	143	4.2	36	35	4.7	0.3
young pod + seed (boiled)	89.5	142	2.6	45	17.0	0.7	0.2
leaf (boiled)	91.3	92	4.7	29	18	1.1	0.2

Legumes

English: Mung bean
Local:

Scientific name: *Vigna radiata*
Plant family: FABACEAE

Description: An upright hairy bean plant which can grow to 1 m tall. It has many branches. The leaves have 3 leaflets, are dark green and grow on long leaf stalks. There are oval stipules at the base of the leaf. Flowers are pale yellow and small. They occur in bunches of 10 - 20 on the ends of long hairy flower stalks. Pods are black and straight. They do not have a beak. Pods contain 10 - 20 seeds which are usually green or golden yellow. They are smaller than black gram. The beans can be black. They have a flat white hilum. There are 2,000 varieties.

Distribution: A tropical and subtropical plant. The plant will grow from sea level up to about 2000 m in the tropics. It is drought resistant but can't stand water-logging. Plants are damaged by frost. They cannot stand salinity. Rainfall at flowering is detrimental. It requires a deep soil. Both short day and long day varieties occur. It can grow where annual temperatures are from 8 - 28°C. It can tolerate a pH from 4.3 - 8.1. It suits a drier climate and can grow in arid places. It suits hardiness zones 10 - 11.

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

Cultivation: Plants are grown from seed. In some areas these are broadcast while for small plots often 2 - 3 seeds are sown in holes 50 - 60 cm apart. Seeding rates of 6 - 22 kg per ha are used in different locations. It normally requires phosphorus fertiliser for adequate growth. Seeds germinate in 3 - 5 days.

Production: Green pods are ready after about 2 months and ripe pods may take another 1 - 2 months. For ripe beans the whole plant is harvested and dried before threshing. Yields of 450 - 560 kg/ha of seeds are common.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
seed	11.0	1432	22.9	55	4	7.1	-
seed (cooked)	-	439	7.0	2.4	1.0	1.4	-
seed (sprouted)	90.4	126	3.0	2	13.2	0.9	0.4

Legumes

English: Lablab bean
Local:

Scientific name: *Lablab purpureus*
Plant family: FABACEAE

Description: A climbing bean which can have vines 1 - 5 m long. It keeps growing from year to year. The stems can be smooth or hairy. Leaves are made up of 3 almost triangular leaflets. The leaflets are 5 - 15 cm long and 3 - 14 cm wide. The side leaflets are somewhat asymmetrical. Often the plants are flushed purple. The flowering clusters are 5 - 20 cm long. Flowers are often white but can vary from red to blue. The pods are flattened, pointed and up to 12 cm long and 2 cm wide. They can be green, purple or white. Inside there are 3 - 5 white or dark seeds. Seed pods have a wavy margin. The seeds are 0.5 - 1.5 cm long. (This bean is similar to Lima bean but the keel of the flower in not spirally twisted, the pod ends more bluntly with a long thin style at the end and the hilum on the seed is longer.)

Distribution: It is a tropical and subtropical plant. It mostly grows between 750 and 2175 m altitude in the tropics. It is drought resistant and can grow in quite low rainfall areas. Some varieties are short day and some are long day kinds. It suits hardiness zones 9 - 12.

Use: The young pods, ripe seeds and young leaves are edible, cooked. Flowers can be eaten raw, steamed or added to soups and stews. Dried seeds can be cooked as a vegetable. The seeds can also be sprouted then crushed and cooked. The large starchy root is edible. **Caution:** Many types can be poisonous. They should be boiled and the cooking water thrown away.

Cultivation: Seeds are sown at 30 x 60 cm spacing near stakes or trees. About 20 kg of seed per hectare are required. Fertilising with nitrogen and potash until flowering is recommended.

Production: Young pods are ready 4 - 6 months after planting and seeds 6 - 8 months. Pods are often harvested over 2 or 3 years. Pollination and seed setting are reduced in cold weather.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
seed (dry)	10.0	1428	22.8	-	-	9.0	-
seed (young)	86.9	209	3.0	14	5.1	0.8	0.4
pod (fresh)	86.7	203	3.9	-	1.0	2.4	-

Legumes

English: Rice bean
Local:

Scientific name: *Vigna umbellata*
Plant family: FABACEAE

Description: An annual twining, climbing bean plant with a slender hairy vine. It grows from seed each year. It grows to 1.5 - 3 m long. Leaves have 3 leaflets which can vary in shape. They are mostly oval and 3 - 13 cm long by 1.5 - 7 cm wide. They taper towards the tip and are rounded at the base. Usually they are hairy. The leaf stalks are 3 - 16 cm long. Flowers are about 1.5 cm long in dense cone shaped clusters. These flowering stalks can be 3 - 10 cm long. The flowers are yellow. The fruit are straight pods about 10 cm long and 5 mm wide. Seeds are small (5 - 8 mm long) and yellow to brown. The pods split open easily. The seeds can be yellow, green, brown, red, black or mottled.

Distribution: A tropical plant that grows to 1,800 m altitude in the tropics. It suits wet climates. It occasionally becomes self sown in coastal grasslands. It needs a sunny protected position and is drought and frost tender. It can grow in arid places.

Use: The young pods and ripe seeds are eaten cooked. The dried seeds are boiled and served with rice or used in soups and stews. The young leaves can be eaten. The seeds are used in bean sprouts. Seeds should be cooked or crushed if fed to pigs.

Cultivation: It is grown from seeds. Seed collection is easy. Seeds often have a hard skin which must be broken (e.g. by scraping) to help germination.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
seed	13.0	1373	20.9	-	-	10.9	-

Legumes

English: Adzuki bean
Local:

Scientific name: *Vigna angularis*
Plant family: FABACEAE

Description: An erect bushy bean plant that re-grows from seed each year. Plants grow up to 60 cm tall. The flowers occur as clusters of bright yellow flowers. The fruit are pods 6 - 12 cm long and contain up to 12 small oblong seeds. These can vary between red, brown and black. They are 0.5 cm long. There are several named cultivated varieties.

Distribution: A tropical plant. They cannot stand frost but can tolerate some cold. They are short day plants, forming flowers and pods when day lengths or hours of sunlight are getting shorter.

Use: The young pods are eaten cooked. The seeds can be eaten cooked. They are added to soups, stews and salads. They are boiled, mashed and sweetened. The seeds are germinated for sprouts. They can be popped liked corn or used as a coffee substitute.

Cultivation: Seed can be pre-germinated on wet paper to get it growing more quickly. The soil temperature needs to be above 15°C. A spacing of 15 cm is suitable.

Production: For green pods, plants should be picked regularly. For dry beans, plants can be allowed to go to maturity, then pulled up and dried.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
seed (dry)	10.8	1780	19.9	-	-	9.8	-
whole bean (fresh)	69.6	396	6.6	-	-	2.5	1.0

Legumes

English: Chick pea
Local:

Scientific name: *Cicer arietinum*
Plant family: FABACEAE

Description: Chick peas are erect, annual herbs with a strong taproot. Plants grow up to 60 cm high and all parts are hairy. Plants are often bluish green in colour. The leaves are up to 5 cm long and have 9 - 15 pairs of leaflets along a stalk and a single leaflet at the end. The leaflets are 1 - 2 cm long by 0.3 - 1.4 cm wide and are strongly pointed and with a toothed edge. The flowers are carried singly on long stalks in the axils of leaves and are white, pink or purple. The flowers normally never open and are self pollinated. The pods are inflated, 2 - 3 cm long and have 1 or 2 seeds. The seeds are angular and up to 1 cm across. They have a pointed beak. The seed colour can vary from brown, white, red or black. There are many named varieties.

Distribution: Chick pea is a sub-tropical crop. It suits high altitudes in the tropics because it needs cold nights with dew. It is well suited to semi arid regions. It can tolerate salt and drought. It does not do well in warm, humid places. It needs well drained soil and is damaged by frost. For best growth, night temperatures between 18 - 26°C, and day temperatures of 21 - 29°C, are required. The temperature range of 8°C between day and night is required. Annual rainfall of 600 - 750 mm and a relative humidity of 20 - 40% is suitable. The best soil pH is 5.5 - 7.5 but they will grow on alkaline soils.

Use: Mainly the ripe seeds are eaten. They are most commonly boiled and mashed but they can also be roasted or fried or used in stews and soups. The young leaves, shoots and pods are sometimes eaten. Sprouted seeds can be eaten. When roasted they can be eaten as a snack. The seeds can also be used to make flour. Chick peas are used in hummus, coucous, falafel, and to make pita bread. They can be fermented into miso and tempeh and the roasted roots and seeds can be used as a coffee substitute.

Cultivation: Chick peas are grown from seed. Often other crops are grown mixed with Chick peas but these are planted 3 - 4 weeks after sowing the Chick peas. Seed should be planted 2 - 12 cm deep. Seed will germinate at temperatures above 5°C but are best above 15°C. Spacing plants 10 cm apart in rows 25 - 30 cm apart is suitable if plants are put in rows. Plants are cut and harvested when leaves turn brown.

Production: Yields of 400 - 1,600 kg per hectare of seed are average for chick peas. Plants can reach maturity in 4.5 - 5 months, but 7 months or longer are taken for some types.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
seed (raw)	9.9	1362	20.2	190	3	6.4	-

Legumes

English: Lima bean
Local:

Scientific name: *Phaseolus lunatus*
Plant family: FABACEAE

Description: A perennial climbing bean. It is often a tall, vigorously climbing plant which can keep growing for some years. The leaves are slightly rounded at the base and pointed at the tip. The flower is white or yellow. The keel of the flower is twisted which helps tell the difference between this bean and Lablab bean. The pods are long (10 cm), flattened and curved and have 3 - 4 seeds which are highly variable in colour. The seeds are large. The seeds have a short round hilum where the seed is attached to the pod. The seeds also have lines going out from this point across the bean seed.

Distribution: It suits warm and subtropical areas. In the tropics it is common from 500 - 2,100 m altitude but grows to the limit of cultivation (2,700 m). For germination it must have a soil temperature above 15.5°C and cannot withstand frost. In very hot weather seeds often do not set. It does best in a temperature range 14 - 21°C. It is sensitive to a pH less than 6. It can grow in arid places.

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

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

Production: Harvesting can begin after about 100 days. Dried beans can be stored for several months. Yields of 0.12kg of seed per square metre have been obtained. The yield of pods can be 1kg per square metre.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
seed	12.0	1407	19.8	-	-	5.6	-
seed (young, cooked)	67.2	515	6.8	37	10.1	2.5	0.8
seed (young, raw)	70.2	473	6.8	30	23.4	3.1	0.8

Legumes

English: Pigeon pea
Local:

Scientific name: *Cajanus cajan*
Plant family: FABACEAE

Description: An upright perennial shrubby legume that can live for 3 - 4 years. They can grow up to 4 m tall and spread to 1.5 m wide. It has a bushy appearance and a strong deep taproot. The root nodules are round and sometimes lobed. The leaf consists of 3 narrow, green leaflets which are silvery-green underneath. The end leaflet is larger with a longer leaf stalk. The pea shaped flowers are red and yellow and occur on branched flower stalks which stick upwards in the axils of leaves. Pods are long, straight and narrow, often with 4 - 8 seeds. Seeds vary in shape, size and colour. The pods are slightly hairy. Pods are often 4 - 8 cm long and have a beak at the end. Pods are constricted between the seeds. Many varieties of pigeon pea occur. Some are dwarf and day length neutral.

Distribution: A tropical plant that requires a tropical or subtropical climate. Plants grow from sea level up to about 1,800 m in the tropics. They can tolerate drought and are suited to a drier climate. They can grow in places with less than 600 mm rainfall per year. They do less well in the wet tropics. They suffer in waterlogged soils and are damaged by frost. It can also tolerate heat. It will grow on poor soils cannot grow on salty soils. It can grow in arid places and suits hardiness zones 10 - 12.

Use: Young leaves, shoots and pods are eaten. The pods can be used in curries. The leaves and shoots as potherbs. Young seeds are cooked and eaten like peas. Ripe seeds are also cooked and eaten in soups and curries. Bean sprouts can be produced and eaten. Preparation of the seeds for dahl is somewhat complicated.

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

Production: Plants are fast growing. Pods are ready after 5 months. Mature seeds take about 8 months. Plants will often live for 3 - 4 years. Plants are cross pollinated by insects, or self pollinated.

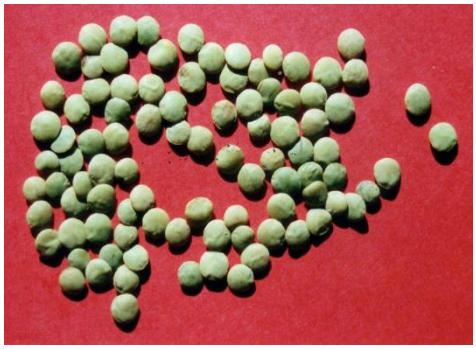
Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
seed	10.0	1449	19.5	55	-	15.0	-
pod (young)	64.4	477	8.7	-	-	2.0	-
seed (young, boiled)	71.8	464	6.0	2	28.1	1.6	0.8

Legumes

English: Lentils
Local:

Scientific name: *Lens culinaris*
Plant family: FABACEAE



Description: A slender, annual plant. They grow to about 25 - 40 cm high. It is erect with many branches. Plants are softly hairy. The leaves are compound with leaflets along the stalk. There is usually a tendril at the end. There are 4 - 7 pairs of leaflets and these do not have a stalk. They are sword shaped and 1.3 cm long. The flowers are in the axils of leaves. There are 1 - 4 flowers in a group. The flower stalk is slender. The flowers are small and up to 8 mm long. The flowers are bluish. The pods are oblong and 1.3 cm long. There are 1 - 2 seeds per pod. The pods are flat and the seeds are about 3 - 6 mm across. There are also large seeded kinds with seeds 6 - 9 mm across. The seeds are lens shaped, round and curved out on both sides. The seeds become reddish brown when ripe. There are several named cultivated varieties.

Distribution: A plant of warm temperate and tropical zones. It prefers a sandy soil in a warm position. It produces most seed when grown on poorer soils. They grow in subtropical, warm temperate and high altitude tropical places. In India they grow from sea level to 3,500 m altitude. In Nepal they grow to about 1,000 m altitude. In Ethiopia it grows between 1,600 - 2,350 m above sea level. They can grow on a range of soils. It suits hardiness zones 7 - 11.

Use: The seeds are cooked, sprouted or eaten raw. Young seedpods can be cooked and eaten. The ground seed can be used with cereals. The seeds are often eaten in soups and stews. They are served as Dahl in India. Lentil flour can be mixed with cereal flour to bake bread. The sprouted seeds are eaten in salads, vegetable dishes and soups.

Cultivation: Seed are sown where they are to grow. Plants are normally self pollinated but cross pollination can occur. In India it is often grown mixed with rice. When grown as a pure stand it can be broadcast or planted in rows.

Production: Yields of 2 ton per hectare are possible. For sprouts, the seeds are soaked for 12 hours in warm water then allowed to sprout for 5 days. Crops mature in about 3.5 months.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
sprouted & cooked	68.7	423	8.8	4	12.6	3.1	3.1
split & boiled	72.1	420	7.6	20	-	2.4	1.0

Leafy greens

English: Hibiscus
Local:

Scientific name: *Hibiscus rosa-sinensis*
Plant family: MALVACEAE

Description: A shrubby, evergreen, woody, shrub used for hedges. It grows 2 - 5 m tall. The bark is grey and flaky and has fine stripes. The leaves are bright green and oval with long tips. The edges are entire on the lower leaves. The upper leaves are coarsely toothed. The flowers occur singly in the axils of leaves. Flowers can be single or double. They are bell shaped and 10 - 15 cm across. There are a range of colours. The fruit are rounded capsules with many seeds inside. The capsules are beaked. Plants usually do not produce fruit in the hot humid tropics.

Distribution: A tropical and subtropical plant, common as an ornamental throughout the tropics. It originally came from China. It thrives on any type of soil. Different types are adapted to sunny or shady places. It grows in open, moist places. It grows where average temperatures are 15 - 30°C. It is very sensitive to frost and can grow from sea level to 1,000 m altitude. It requires a minimum rainfall of 700 mm per year and suits hardiness zones 9 - 11.

Use: The leaves are eaten cooked. In some places they are pounded before cooking. The flowers are eaten raw or pickled. They are also added to drinks. They are used to colour foods including preserved fruit, sliced pineapple, agar-agar jellies, and cooked vegetables. The fresh flower ovary is eaten.

Cultivation: It is mostly grown from cuttings.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
leaf (dry)	6.4	1339	25.9	-	-	19.6	8.9
leaf (fresh)	76.0	321	2.3	-	-	-	-

Leafy greens

English: Grain amaranth
Local:

Scientific name: *Amaranthus caudatus*
Plant family: AMARANTHACEAE

Description: An annual plant which can be 2 m high and 45 cm across. The stems are angular and it can have a single stem or be branched. It is often limp in the upper parts. Plants are hairy at first but become smooth. Often they are tinged purple. Leaves are 2 - 4 cm long by 0.7 - 1.6 cm wide on a leaf stalk 0.5 - 1.5 cm long. Leaves can taper to a tip at the end. They can also thin towards the base. The veins are pale underneath. The flower clusters are in spikes on the side or top branches. The flowers are sometimes branched and can droop over. They can be 45 cm long. The fruit is oval. Seed are 1 - 1.3 mm across.

Distribution: A tropical plant. It can grow in warm temperate places. It cannot tolerate frost. Plants do best under high light, warm conditions and dry conditions. They need a well-drained soil. Some varieties can tolerate pH up to 8.5 and there is some salt tolerance. It can grow in arid places. In the Andes it grows between 500 - 3,000 m above sea level. It suits hardiness zones 8 - 11.

Use: The leaves and young plant are eaten cooked. They are also used in stir fries and added to soups. The seeds are ground into flour and used to make bread. **Caution:** This plant can accumulate nitrates if grown with high nitrogen inorganic fertilisers and these are poisonous.

Cultivation: Plants can be grown from seed if the soil is warm. Seeds are small and grow easily. Cuttings of growing plants root easily. Amaranths are mostly grown from seeds. The seeds are collected from a mature dry seed head of an old plant. These dry flower stalks are stored and then the flowers rubbed between the hands over the garden site. Collecting the seeds is fairly easy by banging flower heads on a mat or piece of cloth then the rubbish can be blown out of this mixture by dropping it and blowing gently as it falls. The very small seeds of these plants are scattered over the ashes or fine soil in fertile ground. Some types are self-sown.

Amaranthus seeds are very small. A thousand seeds weigh about 0.3 g. It is very difficult to sow such small seeds evenly over the ground. So there are a few different methods you can use to try and get the plants well-spaced. One way is to mix the seeds with some sand and then when you sprinkle this along a row it will only contain a few seeds among the sand. The other way is to throw the seeds over a small plot of ground which will be a nursery. After 2 or 3 weeks the seedlings can be transplanted into the garden bed where they are to grow. If the seeds are just scattered over the garden, the small seedlings can be thinned out and either eaten or transplanted to a different spot. Seedlings are transplanted when about 5 - 7 cm tall. Plants can be harvested when small by thinning out and either transplanted or eaten cooked. Plants can be harvested whole or have top leaves harvested several times. Harvesting begins after 4 - 7 weeks and can continue over 2 months.

A spacing of about 8 cm x 8 cm is used if the plants are to be harvested by pulling up the whole plant. If the harvesting is to be done by picking off the top leaves, a wider spacing is normally used. When the tops are picked out 3 or 4 times over the life of the one plant, a spacing of about 30 cm x 30 cm is used.

As far as producing a large amount of food is concerned, the spacing is not very important. Having between 200 and 1,000 plants per square metre gives about the same total amount of food. The main thing that varies is the size of the leaves. Mostly people like larger leaves so a wider spacing of 8 cm to 10 cm for plants to be pulled out is suitable. For plants to be harvested by picking out the tops, they can be picked down to about 15 cm high. Picking lower makes the plant flower later, but it also recovers more slowly from picking.

Amaranths grow quickly. Seedlings come up above the ground in 3 - 5 days. They are 5 - 7 cm high and big enough for transplanting after about 20 days. The plants can be pulled out and used after 6 weeks. If they are harvested by picking out the tops, this can be started at 5 - 7 weeks and continued 3 - 4 times over the next 2 months.

Amaranths eventually stop producing leaves and grow flowers. Flowering occurs after about 3 months and seed can be recollected about a month later. Amaranths are called day-length neutral plants because they still produce flowers at about the same stage, irrespective of whether there are many or few hours of daylight. Because flowering stops harvesting of leaves, it is a problem, but there does not seem to be any easy way of slowing down flowering. Flowering can be delayed a little by picking out the tops down to a lower level. Also it is made a little later if plants are grown in the shade. But lower picking and growing in the shade mean the plants produce less food, so there is no point. Plants need to be harvested and used when they are ready. If plants are left growing the amount of harvestable leaf gets less and the quality gets poorer.

Nitrogen deficiency shows as the oldest leaves near the bottom of the plant going yellow. This is because the plant needs more nitrogen to grow more new leaves at the top and there is not enough nitrogen in the soil for it to get it from there. So it reuses the nitrogen it used in the oldest leaves. These leaves therefore go yellow. Potassium deficiency shows as the edges of the oldest leaves going yellow. These shortages of nutrients could be corrected by adding some nitrogen or potash fertiliser but it is most likely too late for the current crop.

Production: Plants take 4-6 months from sowing to harvesting the seed, but up to 10 months in some Andean highland regions. Yields from 1-5 tonnes per hectare of seed are common. Yields of up to one kilogram of edible leaves have been harvested by pulling out plants from an area of one square metre. The young leaves or whole plants are eaten cooked. If plants are picked 3 or 4 times over 6-8 weeks then two kilograms of edible leaves can be harvested. From a plant that grows so quickly and is such good quality food this is a very high production.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
leaf	6.0	1034	28.8	33	-	23.3	5.5
seed			13				

Leafy greens

English: Ladam
Local:

Scientific name: *Allium carolinianum*
Plant family: AMARYLLIDACEAE

Description: An onion family plant. A bulb plant. The bulbs are usually in pairs. They are 1.0 - 2.5 cm across. The covering is brown to yellowish brown and leathery. It grows to 40 cm high and 12 cm across. The leaves are broadly linear. They are 5 - 15 mm wide. They are flat and smooth. The scape is 20 - 40 cm long. It is covered with leaf sheaths for half its length. The flower head is round and dense with many flowers.

Distribution: It grows naturally in the Himalayas from Afghanistan to Nepal on stony slopes between 3,000 - 4,500 m. In west China it grows on gravely or stony slopes between 3,000 - 5,000 m altitude.

Use: The bulbs are eaten raw or cooked. The leaves are eaten raw or cooked. The flowers are used raw or to flavour salads. The leaves are crushed and dried cakes made out of this mass then stored for later use.

Cultivation: Plants can be grown from seed or by division of clumps. Bulbs should be planted fairly deeply.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
leaf (dry)	-	-	15.8	-	-	272	-

Image sourced from: www.fotomontaro.com

Leafy greens

English: Zachhut
Local:

Scientific name: *Urtica hyperborea*
Plant family: URTICACEAE

Description: A densely tufted herb. It has stout stems and grows 15 - 35 cm high. It keeps growing from year to year. The leaves are small and crowded and have coarse teeth. The leaves are 3 - 5 cm long and oval or heart shaped. The leaves have stinging hairs. The flowers are green and in dense clusters in the axils of leaves.

Distribution: It grows at higher altitudes. In the Himalayas it grows between 4,100 - 5,100 m altitude.

Use: The young leaves are cooked and eaten. They are cooked, squeezed and fried to use as vegetables.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
leaf (dry)	-	-	26.8	-	-	41	-

Image sourced from: www.alpandino.org

Leafy greens

English: Sunhemp
Local:

Scientific name: *Crotalaria juncea*
Plant family: FABACEAE

Description: An evergreen shrub. It grows to 2.5 m high and spreads to 2 m across. The stem is erect, with silky hairs on the branches. The plant has a strong taproot. The roots have root nodules which have branches and lobes, and are 25 mm across. The leaves are narrow, simple and spirally arranged. The leaves can be 12 cm long and with short leaf stalks. The flowers are bright yellow and pea shaped. They occur in clusters of up to 20 blooms. The fruit is a short, inflated, light yellow pod. It is about 3 cm long and 1 cm wide. It is covered with soft hairs, has a groove on the upper surface and a beak at the end. The mature seeds are loose in the pod. They are dark grey, broad and flattened and hooked.

Distribution: A tropical plant. It prefers light to medium well drained soils. It needs an open sunny position. It is drought resistant but frost tender. In Nepal it grows to about 1,300 m altitude.

Use: The leaves have been recorded as being eaten. The flowers are pickled.

Cultivation: Plants can be grown from seed. Seed need treatment to break the hard seed coat before planting. Plants can also be grown from cuttings.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
leaf	10.2	-	30.1	-	1.39	28.9	-

Image sourced from: www.flickr.com

Leafy greens

English: Jute
Local:

Scientific name: *Corchorus olitorius*
Plant family: MALVACEAE

Description: An annual plant. It is upright, branching, and slightly woody. Plants vary in height, shape, leafiness and hairiness. Plants grown for leaves are usually only 30 cm tall. They also have many branches. Leaves are shiny and have leaf stalks. The leaves have teeth along the edge. The tips of the lowest leaves in each side, have long bristle like structures. Small clusters of yellow flowers grow in the axils of the leaves. The fruit are ridged capsules. They can be 7 cm long. These have partitions across them between the seeds. A ripe capsules contains 180 - 230 seeds. The seeds are dull grey and with four faces and one long point. Each seed has one pale line along it.

Distribution: A tropical plant. It is mostly coastal, below 250 m altitude. Temperatures of 22°-35°C are suitable. It can stand both drought (2 - 3 weeks) and water-logging, except when young. A well-drained soil is best. They require humus-rich soils. A soil pH of 5.5 - 7.0 is best, but they can grow in soils with pH up to 8.5. They also need adequate moisture for good leaf production. A rainfall of 1,000 mm is suitable. A high relative humidity (80 - 90%) is best. It produces seeds when day lengths are short. It grows in most African and Asian countries.

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

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

Production: First leaves can be harvested after 5 - 6 weeks. Tips about 20 - 30 cm long are picked. Production of edible green tips, is not large. 7 - 8 kg of leaf tips can be harvested from 3 - 8 pickings over 3 - 4 months. Seeds can be collected after 13 - 15 weeks. If seeds of a particular variety are desired, it is necessary to grow these plants 16 m away from other plants, to avoid cross pollination. Seeds can be stored for 8 - 12 months in well-sealed jars.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
leaf (raw)	80.4	244	4.5	574	80	7.2	-
leaf (cooked)	87.2	155	3.4	156	33.0	3.1	0.8

Leafy greens

English: Indian sorrel
Local:

Scientific name: *Rumex dentatus*
Plant family: POLYGONACEAE

Description: An erect annual herb. It grows to about 70 cm high. The lower leaves are stalked. They are 3 - 20 cm long by 0.6 - 5 cm wide. They are oblong and rounded or heart shaped at the base. The upper leaves are smaller. The flowers are greenish yellow. They occur in distinct leafy rings in the axils of leaves. The fruit is a nut. It is 3 sided.

Distribution: In Nepal it grows from 1,200 - 1,400 m altitude. It grows in moist, neglected ground.

Use: The tender leaves are cooked as a vegetable.

Cultivation: Plants are grown from seed or thickened roots.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
leaf	89.4	124	3.2	3510	115	3.4	-

Image sourced from: www.thomala.com

Leafy greens

English: Hedge garlic
Local:

Scientific name: *Alliaria petiolata*
Plant family: BRASSICACEAE

Description: A cabbage family herb. It is a biennial plant as it takes 2 years to complete its life cycle. It grows 1 m high and 40 cm across. It gives off a strong smell of garlic. The leaves are bright green and the lower leaves are kidney shaped. The upper leaves are oval. The edges are wavy and can have rounded teeth. They are 5 - 15 cm across. The flowers are small and white. They are 5 - 10 mm across. They are in clusters at the tips of the stems and at the leaf bases. The fruit are slender pods 5 cm long. They are cylinder shaped and upright. There are many very small seeds.

Distribution: It is a temperate and Mediterranean plant. It grows naturally in damp shady places on basic soils in Britain. It is resistant to frost but sensitive to drought. It grows best on alkaline soils but can grow in a range of soils.

Use: The young leaves are eaten raw or cooked. It tastes like mustard seed. It is finely chopped and used in salads. They can be mixed with mint leaves and made into a sauce with lamb dishes. The flowers and young seeds pods are eaten raw as a flavouring.

Cultivation: Plants are grown from seed sown where plants are to grow. They can be grown from cuttings.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
leaf	-	-		3600	190	-	-

Image sourced from: www.nps.gov

Leafy greens

English: Coastal caper
Local:

Scientific name: *Capparis spinosa*
Plant family: CAPPARACEAE

Description: A small dense shrub. It grows 1 - 2 m high. The branches are zigzag and spiny. The thorns are straight. The leaves are rounded and thick. They are dull green and 2 - 4 cm across. They are covered with a white covering. The flowers are in the axils of leaves. The flowers are white. They have 3 petals. They are about 6 cm across. The fruit is a round berry. It is about 3 cm long. It bursts open when ripe.

Distribution: It is a tropical or Mediterranean plant. It grows along streams and in rocky coastal areas. In Nepal it grows up to 2,000 m altitude. It suits hardiness zones 9 - 12.

Use: The unopened flower buds are pickled in vinegar and used as capers. The fruit are edible. The young leaves are extracted in two changes of water then the solid mass is cooked and eaten. Capers are used to garnish pizzas and in sauce. Young sprouts are eaten.

Cultivation: Plants can be grown from seed or cuttings.

Production: The capers need to be harvested in the early morning, before sunrise. They are then allowed to wilt for a day. These are then put in salted wine vinegar to pickle.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
fruit	79.6	379	4.6	-	23	0.9	0.4
leaf (dry)	-	-	17.9	-	-	72	-

Fruit

English: Trind (Himalayan rose)
Local:

Scientific name: *Rosa macrophylla*
Plant family: ROSACEAE

Description: A shrub that grows 2 m high. It has few prickles. The prickles are straight with a broad, expanded base. The leaves have stalks. The leaves are divided into 5 - 9 leaflets with an odd number. These are divided along the stalk without leaflet stalks. They have fine teeth and are hairy underneath. The flowers are large and occur singly. They are pinkish red and at the ends of branches. The fruit are very large. They can be 5 cm long. They are red, bristly and flask shaped. They are edible.

Distribution: In Nepal it grows between 2,100 - 3,800 m altitude. They grow in open, rocky places. It suits hardiness zones 7 - 10.

Use: The ripe fruit are eaten.

Cultivation: Plants can be grown from seed or cuttings.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
fruit	-	-	-	-	787	-	-

Fruit

English: Pointed gourd
Local:

Scientific name: *Trichosanthes dioica*
Plant family: CURCUBITACEAE

Description: A pumpkin family plant. It is a climber. It is a herb. The stems are slender and angled. They have soft hairs. The tendrils are divided 2 - 4 times. The leaves have stalks. The leaves are 5 - 10 cm long. They are oval or heart shaped. There are teeth along the edge. Leaves are rigid and rough on both surfaces. Flowers are of one sex and white. The fruit are oblong or pointed on both sides. They are orange-red when ripe. They are 10 cm long and 5 cm wide. Seeds are slightly compressed.

Distribution: A tropical plant. It grows in tropical India. It suits a warm humid climate. It is common in NE India. In Nepal it grows to 600 m altitude. The soil needs to be well drained.

Use: The young fruit are cooked as a vegetable. They are used in curries. They are also fried, pickled and used in stews. They are also used in confectionary and pickled. The leaves are eaten as a vegetable. They are used in soups and stews.

Cultivation: Plants are grown from seed. It is often grown by stem cuttings. Pieces 60 cm long are taken from male and female plants. They are planted out of the nursery after 90 days.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
fruit	92.0	-	2.0	-	362.5	-	-

Image sourced from: www.hygeiajournal.com

Fruit

English: Emblic
Local:

Scientific name: *Phyllanthus emblica*
Plant family: PHYLLANTHACEAE

Description: A small deciduous tree. It grows 2 - 20 m tall. The trunk is bent and has many branches. The branches are spreading. The bark is greyish-brown and peels off in flakes. The leaves are pale green and feathery. New leaves are pinkish. The leaves have short stalks. The leaves are 1 - 1.5 cm long by 0.2 - 0.3 cm wide. The leaves are arranged on slender branches to appear like feathery compound leaves. They are like tamarind leaves. Male and female flowers occur on different trees. The flowers are small and yellow. They are densely clustered on the branches. The fruit are small and yellow to green. They are 2 cm across and edible. They have 6 - 8 faint lines along them. They are fleshy and edible. They are sour. Some improved kinds have fruit 8 - 9 cm across.

Distribution: A tropical plant. It suits the hot humid tropical lowlands. It is native to tropical Asia. It grows in arid bushy savannah. It grows to 1,500 m altitude. It often grows on poor shallow soils. It is light demanding and drought tolerant. It can tolerate forest fires. They are common in tropical deciduous forest in India. It suits the subtropics. It needs warm temperatures at time of flower bud formation. Dry times during fruiting cause fruit to drop. It can tolerate low and high temperatures once established. It can tolerate soils with a pH 6 - 10. Some varieties can tolerate saline soils.

Use: The fruit are cooked and used in preserves. The fruit are acid and can be eaten fresh or used for flavouring. They are also used as a seasoning in cooked food. They are pickled and made into jams, jellies, preserves, tarts and other foods. The dried fruit chips are seasoned with caraway seeds, salt and yoghurt and eaten. Unripe seeds and leaves are edible.

Cultivation: Plants are grown from seed. They are best grown using ring budding or veneer grafting. Trees can be pruned to form 4 - 6 branches from one trunk. They can be grown from cuttings, grafting or by air layering.

Production: Early growth is fast. Some budded trees produce fruit after 3 years. Seedling trees take 7 - 8 years. Best yields are produced after 10 - 12 years and trees can keep bearing for 70 - 75 years. In India fruit are available October to December.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
fruit	78.4	281	0.6	-	316	0.9	0.5

Fruit

English: Bael fruit
Local:

Scientific name: *Aegle marmelos*
Plant family: RUTACEAE

Description: A medium sized tree that grows 3 - 12 m tall and spreads 2 m across. The stem is erect and thorny. The aromatic leaves are green, with 3 leaflets and generally sword shaped. It loses its leaves. The flowers are yellowish-white and have a strong sweet smell. They contain both sexes and occur in clusters. The fruit is large and with a hard shell about 3 mm thick. It is 8 - 10 cm across and is yellow-green when ripe. The edible pulp is reddish or orange. The fruit is made up of small cells (about 15) each with woolly seeds.

Distribution: A tropical plant that prefers rich well drained soils in an open sunny position. It suits tropical or warm places. It appears to do best where there is a distinct dry season. It is drought and frost tender. A hot dry summer is best. It can tolerate some alkalinity and saline soils. It can grow in arid places.

Use: The fruit are eaten raw. They are also used to make drinks. The fruit are often sliced and dried. Marmalade can be made from ripe pulp. They can also be pickled or used in jams and jellies. The young shoots and leaves can be eaten raw in salad. They are also used in chutneys. The flowers are used to make a drink. **Caution:** There are reports that leaves make women sterile or cause abortions.

Cultivation: It is grown from seed. Seed are taken from freshly picked ripe fruit. Seedlings are planted out after one year. It can be grown from root offshoots. They are best grown using patch budding. Trees are spaced 6 - 9 m apart. Trees can be pruned to have 4 - 6 strong branches. Suckers should be removed. It can also be grown from root suckers or air layering.

Production: It is slow growing. Trees produce in 3 - 4 years. Full production is gained after 15 years. Fruit are produced throughout the year. Fruit should be picked and not allowed to drop. There can be 200 - 400 fruit per tree. Fruit ripen in the dry season and can be ripened off the tree. Trees can continue bearing for 50 years. The fruit can be stored for 2 weeks at 30°C and for 4 months at 10°C.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
fruit	58	577	2.3	0.13	219	0.55	-

Fruit

English: Banyan tree
Local:

Scientific name: *Ficus benghalensis*
Plant family: MORACEAE

Description: An evergreen tree. It grows to about 35 m high. It has a spreading canopy. The branches have many aerial roots. They are like thick columns. They grow down from the spreading branches. These support the widely spreading crown. One tree can be 60 m wide. The bark is pale grey. The leaves are alternate and stalked. They are 10 - 20 cm long by 5 - 12.5 cm wide. They are oval and rounded at the base. They are deep green above and paler underneath. They are also hairy underneath. They are thick and leathery. The flowers are very small and inside the fig. The figs grow between the upper part of the leaf stalk and stem. The figs are round and scarlet when ripe.

Distribution: A tropical plant. In Nepal it grows up to 1,400 m altitude. They are common over the plains of India. They grow wild in the sub-Himalayan forests. It is a tropical plant. It can tolerate frost. It can grow in arid places. It suits hardiness zones 11 - 12.

Use: The figs are eaten fresh. They can also be dried. The young shoots are used as a famine food. The young leaves are eaten as a vegetable and are a famine food.

Cultivation: Plants can be grown from seeds or cuttings. Young branches should be used for cuttings. Cuttings root easily. One famous tree in Calcutta covers 1.6 ha.

Production: In India fruit are available June to September.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
fruit	13.0	-	8.1	-	156.6	4.1	-

Fruit

English: Cape gooseberry
Local:

Scientific name: *Physalis peruviana*
Plant family: SOLANACEAE

Description: A perennial herb that grows 45 - 90 cm tall. They are often grown as annuals. It is hairy and slightly branched. The spreading branches are purplish and ribbed. The leaf blade is 6 - 15 cm long by 4 - 10 cm wide. The leaves are heart shaped at the base and taper to the tip. They are slightly wavy and toothed along the edge. The flowers occur singly and hang down in the axils of leaves. The flowers are white with violet anthers and slightly spotted petals. The fruit is a berry 1 - 1.5 cm across. They are orange-yellow or pale brown. This is inside an inflated husk. The seeds are yellow and 2 mm across. There are several named cultivated varieties.

Distribution: A temperate plant that grows in the tropical highlands. It suits warm climates and does best in warm sunny conditions. It needs well drained soil. Plants are not killed by a slight frost but it grows best free from severe frosts and strong winds. In Indonesia plants are found from 700 - 2,300 m altitude, but fruit best above 1,500 m. It can grow in arid places and suits hardiness zones 8 - 10.

Use: The ripe fruit are eaten fresh or cooked. They are used for jam. They can be dried, preserved, stewed, pureed, or used in pies, cakes, jellies and sauces. Roasted seeds are pickled. The leaves have been used instead of hops in beer. The leaves are also used as a potherb.

Cultivation: Plants are grown from seed that is broadcast over the soil. Seeds should be sown 1.5 cm deep in loose soil. Seed germinate irregularly. Plants should be spaced 45 cm apart. In the tropics, plants keep growing from year to year, but in the subtropics they regrow from seed each year. Plants can be grown from softwood cuttings from the upper parts of the shoots. Seedlings can be transplanted.

Production: Plants produce fruit in 1 year.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
fruit (mature)	84.2	201	2.0	36	30	1.5	-

Fruit

English: Chinese boxthorn
Local:

Scientific name: *Lycium chinense*
Plant family: SOLANACEAE

Description: A spiny deciduous shrub. It grows 4.5 m high. The branches are stiff, straight and un-branched. The branches have long thorns. These are where the leaves sprout from the stem. There are only a few leaves. The leaves are oval and vary between 2 - 6 cm long. They are dark green. The flowers are purplish. They are tube shaped and held in clusters of 1 to 4. The fruit are reddish-orange berries. They hang down. The fruit are 25 mm long.

Distribution: A Mediterranean climate plant. It will grow in the highlands in warm tropical countries. It suits hardiness zones 6 - 10.

Use: The berries make a sweet addition to any dish. The ripe fruit are eaten fresh. They taste like liquorice. They can be added to soups or braised dishes. The young soft leaves are eaten in salads. The leaves are cooked with pork or added to soup. Ginger, pepper and a little sugar can help counter the bitter flavour in soups. The roasted seeds are used for coffee. Dried leaves are used for tea.

Cultivation: Plants can be grown from seed or by using cuttings. They often sprout by suckers.

Production: For leaves the tips are cut off creating a hedge. For fruit the branches are left and the fruit picked.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
leaf	89.6	121	4.1	59	-	5.4	-
fruit	19.6	1411	16.3	-	-	18.9	-

Vegetables

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. Purple trumpet shaped flowers grow at the end of the vine. Fattened tubers are produced under the ground. There are a large number of varieties which vary in leaf shape and colour, tuber shape, colour, texture and in several other ways.

Distribution: A tropical and subtropical plant. They grow from sea level up to about 2,700 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. It suits hardiness zones 9 - 12.

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.

Sweet potato are not tolerant to shading. Under shaded conditions, both foliage growth and storage root production are decreased. Some cultivars 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, larger leaves. With increasing shade, fewer 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 - 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.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
tuber (baked)	72.9	431	1.7	961	24.6	0.5	0.3
tuber (raw)	70.0	387	1.2	709	25	0.7	0.4
tuber (boiled)	72.0	363	1.1	787	15	0.6	0.3
leaf	86.3	168	3.9	105	58	2.9	-

Vegetables

English: Marrow
Local:

Scientific name: *Cucurbita pepo*
Plant family: CUCURBITACEAE

Description: A bristly hairy annual vine in the pumpkin family. It has branched tendrils. The stems are angular and prickly. The leaves are roughly triangular. The leaves have 5 lobes which are pointed at the end and are toothed around the edge. Male and female plants are separate on the same plant. Male flowers are carried on long grooved flower stalks. Female flowers are borne on shorter more angular stalks. The fruit stalks have furrows along them but are not fattened near the stalk. The fruit vary in shape, size and colour. Often they are oval and yellow and 20 cm long by 15 cm wide. The seeds are smaller than pumpkin and easy to separate from the tissue. The scar at their tip is rounded or horizontal, not oblique. There are a large number of cultivated varieties.

Distribution: A subtropical plant. They are more suited to drier areas. They are frost sensitive, and grow best with day temperatures between 24 - 29°C and night temperatures of 16 - 24°C. It suits tropical highland regions. It suits hardiness zones 8 - 11.

Use: The young fruit are cooked and eaten. They can be steamed, boiled or fried. They are used in pies, soups, stews and cakes. The young leaves and the ripe seeds can also be eaten cooked. The seeds are dried, salted and toasted and eaten as a snack food. The seeds can also be pressed to produce oil. The sprouted seeds are used in salads. Flowers and flower buds can be eaten boiled. They can be dried for later use.

Cultivation: They are grown from seeds. The seeds germinate after one week. They can be grown from cuttings. They are best planted on mounds. A spacing of 2 - 3 m between plants is needed. Hand pollination assists fruit setting. Plants can also be grown from cuttings as plants root at the nodes.

Production: The first usable immature fruit are ready 7 - 8 weeks after planting.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
seed (dry)	3.7	2266	29.4	-	-	7.3	-
leaf	89.0	113	4.0	180	80	0.8	-
fruit (mature)	92.0	105	1.6	17	16	2.4	-
fruit	91.3	102	1.1	-	12	0.8	0.2
yellow fruit	92.0	97	1.0	180	8	1.4	-
immature fruit (raw)	92.0	92	1.5	-	9	0.4	0.1

Vegetables

English: Bottle gourd
Local:

Scientific name: *Lagenaria siceraria*
Plant family: CUCURBITACEAE

Description: A pumpkin family plant. It is an annual vine with large leaves. It can grow 3 - 9 m long and spread 3 - 6 m wide. The thick stems have furrows along them. It can climb over logs by attaching the tendrils which grow out of the stem near the leaf. The leaves are large and have soft hairs especially underneath. Flowers of both sexes are borne in the same plant. The plant produces male flowers first and these are on long stalks. Next it produces female flowers on short stalks. Flowers are large and white. They can be 10 cm across. They are mainly pollinated by insects. Fruit vary in shape and can be 8 - 90 cm long. They have brown seeds in a whitish green pulp. There are several varieties.

Distribution: A tropical plant that grows from sea level up to 2,700 m altitude in the tropics. It grows best in a warm humid climate. It is sensitive to frost and prefers full sunlight. It grows best with a night temperature of 17 - 23°C and day temperatures of 28 - 36°C.

Use: The young fruit are boiled as a vegetable. The skin and seeds are removed and can also be steamed, fried or pickled. Young tips and leaves are edible. They are often cooked with milk or coconut milk to improve the flavour. They are also mixed with other edible leaves. The seeds are sometimes eaten and provide an edible oil. Old fruit are used as containers, and the seeds are not normally edible.

Cultivation: To achieve fast and uniform emergence, seed should be soaked overnight. Seeds are best sown in raised beds. Seedlings emerge in 5 - 7 days. Seedlings can be transplanted is required. Because plants cross pollinate, plant and fruit types vary. Removing the young fruit to use as a vegetable will prolong the life of the plant. Large fruit can be obtained by removing some of the small fruit. A spacing of 1 - 2 m is suitable. It prefers a trellis to climb. Because it is shallow rooted, weeding needs to be done carefully.

Production: It is fast growing and flowers 2 months after seeding.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
bean (dry)	3.2	2399	28.2	-	-	5.3	-
leaf	83.0	180	4.4	66	-	7.4	-
fruit	93.0	88	0.5	25	10	2.4	-

Vegetables

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 2,600 m altitude. Sometimes on the coast only leaves are produced. Carrots are frost resistant. In Nepal carrots are grown up to 1,700 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 - 7. It suits hardiness zones 3 - 9.

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 the seeds are very small, they are sometimes 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.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
root (raw)	89.9	180	1.0	835	6	0.6	0.4
root (boiled)	91.5	79	0.6	852	4	0.4	0.3
leaf	87.4	-	2.2	65	-	-	-

Vegetables

English: Lotus-seed herb
Local:

Scientific name: *Alternanthera sessilis*
Plant family: AMARANTHACEAE

Description: A low lying and spreading plant which has many branches. It continues to grow from year to year. It has a strong taproot. The stem and branches are up to 60 - 100 cm long and near the ends there are 2 lines of hairs along the stem. The leaves are smooth and attached to the stem without a stalk. They are opposite. The leaves are 1 - 10 cm long and 0.2 - 2 cm wide. The flowers heads are white and 5 - 7 mm long. They grow along the plant and do not have flower stalks. It flowers all year round. The fruit are oval and compressed on the side. The seed is about 1.5 cm across. When plants are growing in water the stems become hollow and the plants float.

Distribution: A tropical plant. It grows in the lowlands and the highlands. It occurs in most tropical places. It is common in waste land at low and medium altitudes in the Philippines. It grows in open moist places from sea level to 2,000 m in Papua New Guinea. In Fiji it grows from sea level to 500 m. In Nepal it grows to 2,400 m altitude. It can grow in arid places. It is best in alkaline soil. It can grow in seasonally water logged soils and near rivers and ditches.

Use: The leaves and tender tips are cooked and eaten. They are used in soups. It is also used to prepare a cool drink. The harvested leaves can only be stored for 2 - 3 days.

Cultivation: It can be grown by dividing the underground stem. It can also be grown from sections which root at then nodes. It can be grown by seed.

Production: The first harvest of leaves can be taken 50 - 60 days after planting.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
leaf	89.3	109	4.5	57	77	-	-
shoot	-	-	5.0	577	-	16.7	-

Image sourced from: commons.wikimedia.org

Vegetables

English: Black fungus
Local:

Scientific name: *Auricularia polytricha*
Plant family: AURICULARIACEAE

Description: A mushroom. This jelly fungus or mushroom grows on logs. The cap is ear-shaped. It is leathery and 8 cm across. The stalk is short. It has frilly, brownish clumps of translucent tissue.

Distribution: A tropical and subtropical plant. In Thailand it grows on logs of Sesbania, Kapok, or mango. In China and the USA it is often near melting snow.

Use: The mushroom is used both fresh and dried. It is used in sour salads and in soups. It can also be fried with chicken. It keeps its crunchy texture if only added to dishes in the last few minutes of cooking.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
mushroom (dry)	14.8	1188	9.3	-	-	5.9	1.3
mushroom (fresh)	87.1	176	1.0	-	-	6.1	-

Image sourced from: www.treknature.com

Vegetables

English: Fat hen
Local:

Scientific name: *Chenopodium album*
Plant family: CHENOPODIACEAE

Description: An annual plant that grows to 1 m tall and spreads to 1 m across. The stem is erect and succulent with no hairs. They often have soft mealy lumps which can be rubbed off. The leaves are simple, with one at each node, and occurring alternately up the stem. The leaves are oval and wedge shaped with saw like edges. They are 5 - 12 cm long by 3 - 10 cm wide. The leaf stalk is usually shorter than the leaf blade. The under surface of the leaf often has a white mealy layer which can be rubbed off. The flowers occur in dense white spikes at the tip and ends of branches. The fruit is a small, roundish, papery pod that opens around the tip. The pod contains large numbers of shiny black seeds that are 1.2 - 1.8 mm across.

Distribution: A temperate plant that also grows in the tropics. It grows best on light to medium well drained soil. It suits an open sunny position but can tolerate shade. It is drought and frost resistant. It commonly occurs as a weed in old fields. In Zimbabwe, it grows from 1,100 - 1,600 m above sea level. It can grow in arid places and can tolerate temperatures of 5 - 30°C.

Use: The seeds can be ground into flour. They contain saponin which should be leached out. They are used for bread, pancakes, muffins and biscuits. The tender leaves are cooked and eaten as a vegetable. They are also used in stews. Young flowers are cooked and eaten. The sprouted seeds are edible.

Cultivation: Plants are grown from seed. Seedlings can be transplanted at a spacing of 30 cm. It does well in soils with lots of nitrogen. It is self-sown and harvested from potato crops in India.

Production: The tops can be eaten before and after flowering. They are harvested after 40 days.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
seed	-	1654	16	-	-	-	-
leaf (boiled)	88.9	134	3.2	391	37.0	0.7	0.3
leaf	87.7	113	5.3	33	108	-	-

Vegetables

English: Elephant foot yam
Local:

Scientific name: *Amorphophallus paeoniifolius*
Plant family: ARACEAE

Description: A taro family plant but with a very divided leaf. It grows to 1 m tall. It is a herbaceous plant with rough and mottled leaf stalks. It has a straight stem and the leaf is divided into leaflets. The leaves can be 1 m wide. The leaves usually come singly from the ground. The flower stalk can be 3 - 20 cm long. The edge is curved back and wavy. The flower is dull purple and up to 30 cm across. The flower gives of a bad smell like rotting meat and this attracts flies. The flower only develops after the leaves have died off. The leaves and corms especially in the wild varieties contain many stinging crystals. It has a large round tuber up to 25 cm across. The large round underground corm produces small corms around the side. These can be 10 cm long.

Distribution: A tropical plant. It occurs mainly in seasonally dry areas and grassland up to 800 m altitude in equatorial zones. It requires an average temperature of 25 - 35°C and rainfall of 1,000 - 1,500 mm during the growing season. Soils need to be well drained as it cannot stand waterlogging.

Use: The corm is cooked and eaten. The leaves are edible. The young petioles or leaf stalks are eaten cooked.

Cultivation: The cormels are planted. Seeds will grow but flowers need hand pollination. Small corms from around the side are the normal part planted. If a very small corm is planted, the plant may need to grow for several seasons to produce a large yield. Setts or small cormels of 200 g are suitable for use planted at 30 cm x 30 cm spacing and produce seed corms of about 500 g. Larger corms take 3 - 4 years to produce. This is achieved by digging up corms and replanting next season. Each crop takes about 8 months to mature. Corms are planted 15 cm deep. Spacing is increased between plants in successive years of growth. After harvest, the corm needs to be kept for a few months before it is ready to produce a new shoot and re-grow.

Production: The stalk dies back when the plant is mature. The corm will keep for several months. An individual corm can finally weigh 8 kg. Eventually the corm under the ground increases in size then the leaf dies back. The corm could be harvested and stored, or eaten at this stage. If it is just left, a very large flower is produced. This type of growth pattern where vegetative growth is followed by a storage organ with dormancy is the type of growth that suits areas with a distinct wet and dry season. It has the advantage that the corm will store well after harvest and can be eaten in the dry season when food is short.

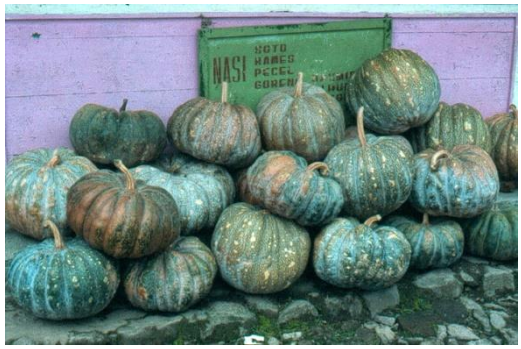
Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
tuber	78.0	340	2.0		6.0	2.4	1.1
corm	76.1	352	1.3		3.5	0.6	0.2

Vegetables

English: Pumpkin
Local:

Scientific name: *Cucurbita maxima*
Plant family: CUCURBITACEAE



Description: A pumpkin family plant. It is a creeping vine with tendrils. It is an annual plant. The stems are soft and round in cross section. The leaves are large and hang loose. They are dark green and kidney shaped. The edges of the leaves are entire. There are large nodes at the base of the leaf. The tendrils are fairly stout and are divided half way along their length into many branches. Male flowers are carried on long upright stalks. The 5 petals are united into a long yellow tube. The female flowers are larger than the male and are fewer in number and carried on shorter stalks. The fruit varies in size, colour and patterns on the skin. They can be round, oval or flattened, with yellow, orange or green skin. The surface can be smooth or rough and warty. The flesh is yellow and edible. The seeds are in the centre. The seeds are white or brown. They are flattened but plump and have a slanting scar at the top. The seeds are edible. (*C. moschata* does not have hairy stems but has fruit with a thickened stalk near where it joins the fruit.) There are a large number of cultivated varieties.

Distribution: A subtropical plant that grows from sea level to 2,400 m altitude. They need a fertile soil. *C. moschata* is better suited to coastal areas. They are frost sensitive but better suited to cooler areas than *C. moschata.* It can grow in arid places. It suits hardiness zones 8 - 11.

Use: The young leaf tips are eaten cooked. They can also be dried and stored. The fruit can be eaten cooked. They are baked, boiled, fried, steamed or mashed. They are used in pies and cakes. The seeds are edible, raw or roasted. They are also ground into a meal. The male flowers are eaten after removing the stamen and calyx.

Cultivation: They are grown from seed. Usually 2 or 3 seeds are planted together in a mound. The distance apart depends on the cultivar. Some kinds are better for leaf tips. It is good to save seed of adapted varieties.

Production: Fruit are ready for harvest after about 3 - 4 months. Seed can be saved from fruit for re-sowing, but as pumpkins cross-pollinate, different types become mixed.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
seed (dry)	6.9	2264	24.5	38	1.9	14.9	7.5
fruit	69.6	439	1.4	-	-	-	-
leaf	88.0	160	4.9	260	28	2.5	0.9
flower	88.7	107	1.4	173	14	0.8	0.1

Nuts, seeds, herbs and other foods

English: Safflower
Local:

Scientific name: *Carthamus tinctorius*
Plant family: ASTERACEAE

Description: An erect, annual herb that grows to 60 - 150 cm tall. It has many branches. It has spines but the numbers vary. The stems are white, stiff and round with fine grooves along their length. The types with more spiny leaves are better for oil production. The leaves are arranged in spirals around the stem. They do not have leaf stalks. The leaves are dark green and glossy. They are 10 - 15 cm long and 2 - 4 cm wide. The flower head is made up of many small flowers that are 13 mm long and like tubes. They are yellow to orange in colour. The fruit is 4 angled and has a hard hull and a single white or grey seed. The seed is oblong.

Distribution: It grows in both tropical and temperate zones. It does better in drier regions. It cannot tolerate waterlogging. It does not suit the low, wet tropics. It needs a good dry season for drying. It is resistant to drought. It can stand some wind and salinity. High temperatures can result in poor seed set. It does best where temperatures are 17 - 20°C on average. At the equator it can grow at 1,600 - 2,000 m altitude but most commonly in other regions it grows below 900 m altitude. A soil pH of 5 - 8 is suitable. It can grow in arid places.

Use: The young shoots and leaves are eaten cooked or raw. They can be seasoned with soy sauce. The seeds are hulled and roasted. They are eaten as snacks. They are also used in chutneys. The seed oil is used in cooking and as a salad oil. This can be done by boiling the seeds and floating off the oil. The dried, edible petals are used to colour foods. They can give red or yellow dyes. The slightly bitter petals can be cooked with rice.

Cultivation: Plants are grown from seed. A fine seed bed is required and seed are broadcast or drilled. It is best sown about 2 - 3 cm deep. Seeds germinate in 4 - 7 days and a soil temperature of 15°C is best. Plants should be topped as soon as the first buds appear to increase the number of flower heads. A spacing of 15 - 30 cm between plants is suitable. Wider spacing gives more heads per plant and closer spacing gives higher yields per area. A seeding rate of 20 - 30 kg per hectare is required. Crops respond to fertiliser if there is sufficient moisture. In very dry weather, harvesting in the more moist morning or evening avoids seed shattering. Plants are uprooted and heaped for a few days before threshing.

Production: Plants take 120 days to maturity. Seeds are ripe about 35 - 40 days after maximum flowering. Plants are harvested when leaves turn brown.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
seed	5.6	2163	16.2	5	0	4.9	5.5

Nuts, seeds, herbs and other foods

English: Purslane
Local:

Scientific name: *Portulaca oleracea*
Plant family: PORTULACACEAE

Description: A spreading branched herb. It lies flat on the ground. It grows each year from seed. The plants spread 10 to 50 cm wide. The stems are purplish. The leaves are fleshy, flat and shaped like a wedge at the base. They are 1.5 - 2.5 cm long and 0.3 - 1 cm wide. The flowers are yellow and occur in a few rounded heads. They are 0.8 - 1.5 cm across. They bloom about the middle of the day. The capsules are 0.5 cm long and oval. The seeds are black and shiny.

Distribution: It grows in tropical and temperate regions. They are common in waste places throughout the Philippines. It is a common self-sown plant in lowland areas and up to 1,700 m altitude. It prefers sandy well drained places. It can grow on salty soils. It can grow in arid places. It suits hardiness zones 7 - 12.

Use: The stems and leaves are cooked and eaten. Usually the skin is scraped off then the plant is boiled and mashed. It thickens stews and other dishes in which it is cooked. It is used as a pot herb. The fleshy stems are pickled. Sprouted seeds are eaten in salads. The seeds are ground for use in cakes and bread. **Caution:** In areas where a lot of nitrogen fertiliser is used plants can cause nitrate poisoning. Plants can also have oxalates.

Cultivation: It roots easily from broken pieces. It can be grown from stem cuttings. It can be grown from seed.

Production: The first harvest of leaves can be a month after planting. In the tropics it can complete its lifecycle in 2 - 4 months. Often it is harvested in the dry season when other vegetables are in short supply.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
seed	9.1	1405	19.5	-	-	-	-
plant	87.0	181	4.0	-	11	2.5	-
root	79	210	3.5	-	-	-	-
leaf	82.2	108	3.1	54	20	0.8	1.5

Nuts, seeds, herbs and other foods

English: Sesame
Local:

Scientific name: *Sesamum indicum*
Plant family: PEDALIACEAE

Description: A small, erect annual plant. It is very branched and grows 1 - 2 m tall. The stem is stout, 4 sided and furrowed along its length. It is densely covered with fine, downy, glandular hairs that vary in shape. The lower leaves have long stalks and are spear shaped, often with lobes or a toothed edge. The leaf stalks are 3 - 11 cm long. The leaf blade is 4 - 20 cm long by 2 - 10 cm wide. Upper leaves are narrow and oblong. They are 0.5 - 2.5 cm wide. The flowers occur in the axils of upper leaves, either on their own, or in groups of 2 or 3. They can be white, pink, purplish and with yellow spots and stripes. The fruit can be smooth or rough and there are 2 chambers in the capsule. The fruit are brown or purple. They are oblong and deeply grooved. The seeds are small and oval. They are 3 mm by 1.5 mm and vary in colour from white, yellow, grey, red, brown or black. The fully ripe pods burst open.

Distribution: A tropical plant that suits the hot, dry, semi-arid tropics and sub-tropics. It can tolerate short periods of drought once established. It needs a temperature of 20 - 24°C in early growth, then 27°C for ripening. It grows from sea level to about 1,200 m in areas with an annual rainfall of 400 - 1,000 mm. Soils need to be well drained. It is very intolerant of water-logging. It cannot stand high humidity and needs frost free conditions. It needs a dry period for seed drying. It does not like acid soils. It grows in open sunny places. It can grow in arid places.

Use: The seeds are eaten. They are used in soups or fried or boiled. They are used in tahini and hummus. Seeds are eaten in the form of sweetmeats. Roasted seeds are used in pickles. They are also put on bread. Oil from the seeds is used in cooking and on salads. The refuse from the seed after the oil has been extracted is boiled in water and made into soup.

Cultivation: Plants are grown from seed. Seed will not germinate below 21°C. Seeds are broadcast on well prepared land and then harrowed in using a light harrow, or sown 2 - 15 cm apart in rows 20 - 45 cm apart. Plants can be thinned or weeded during early growth to produce a better crop. Seeding rates of 9 - 11 kg/ha are used. Some varieties shatter easily.

Production: Yields of 340 - 500 kg/ha are average. Plants reach maturity in 80 - 180 days. Crops are harvested as the leaves begin to drop. Plants are cut and stooked or dried in racks. The hull is removed by soaking in water overnight, then partly dried and rubbed against a rough surface.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
seed (dry)	4.7	2397	17.7	1	-	14.6	7.8
leaf (raw)	85.5	188	3.4	-	-	-	-
oil	-	3683	0.2	-	-	-	-

Nuts, seeds, herbs and other foods

English: Almond
Local:

Scientific name: *Prunus dulcis*
Plant family: ROSACEAE

Description: A deciduous tree. It grows 7.5 - 12 m high. It can spread 7.5 - 9 m wide. It grows straight then spreads later. The bark is dark grey and cracks. The bark has yellow rings of pores around the trunk. The leaves are alternate and long pointed. They are 12 cm long by 4 cm wide. They hang down. The leaves have fine soft teeth around the edge. The leaves are folded along the midrib. It loses its leaves during the year. The flowers appear before the leaves. The flowers occur either singly or in pairs. They are pink and 5 cm across. The fruit are green and contain edible nuts. The fruit are 6 cm long. The flesh is dry and leathery. There is one stone and the white seed inside is edible.

Distribution: It is native to North Africa, Central and South-West Asia. They are frost hardy and suit a Mediterranean climate. They need a warm summer to fully ripen. It suits hardiness zones 7 - 10.

Use: The oil from the kernel can be bitter and contains HCN which needs to be removed by heating. The oil is used as food flavouring. The kernels of sweet kinds are eaten. They can be eaten fresh or dried, crushed, flaked, ground and used as ingredients. The nuts can be blended with water to form almond milk, made into almond butter or pressed for their edible oil. The oil is used in salads.

Cultivation: Almond trees cannot pollinate themselves. For good fruit set pollinating cultivars are planted along with others.

Production: Trees can bear for 50 years. A tree can produce 10 - 15 kg per year.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
56	5.3	2418	21.3	1	-	4.3	3.4

Nuts, seeds, herbs and other foods

English: Walnut
Local:

Scientific name: *Juglans regia*
Plant family: JUGLANDACEAE

Description: A large, deciduous tree that grows up to 30 m tall. The straight trunk can be 120 cm across. The leaf stalks are 5 - 7 cm long. Leaves are often 30 cm long and with 5 - 9 leaflets. Leaflets can be 6 - 15 cm long by 3 - 6 cm wide. They are smooth except for a tuft of hair in the axils of the veins. Male and female flowers are separate but on the same tree. Flowers are small and greenish. Male flowers are compact in hanging spikes. Female flowers are on short stalks. The fruit has a green leathery husk. Nuts are hard shelled and about 4 cm across. The surface is figured. The kernels are edible.

Distribution: It is native to China and S.E. Europe. Trees can stand hard frosts when no flowers are on the tree. It is a cold temperate plant. It does best with a temperature of 29 - 32°C near harvest time. It does not bear in the highlands of India, but does produce in Garhwal Himalayas. In China they are common in the northern regions, between 23 - 42°N. They grow on mountain slopes between 500 - 1,800 m altitude. It suits hardiness zones 4 - 10.

Use: The kernels of the nuts are eaten raw or cooked. They are used in cakes, ice cream sauces, soups etc. The young green fruit can be pickled in vinegar and eaten. They can also be made into jams and preserves. Oil is extracted from the fruit. The remainder can be used in bread. The trees yield a sweet sap made into syrup or sugar.

Cultivation: Trees can be grown from seeds but quality is often variable. It is best to used grafted trees. Trees can be pruned, which should be done during the summer as calluses form more easily preventing bleeding. Seedling plants are spaced 10 m apart and budded plants are spaced 8 m apart. They easily become boron deficient.

Production: Seedling trees can produce nuts in 8 - 12 years. Grafted trees can produce in 4 years. Trees can live for 150 years. A good tree produces about 150 kg of nuts per year but 40 - 50 kg is more common. Nuts are harvested when the hulls start to turn yellow and crack. Nuts can also be collected from the ground.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
nut	4.4	2903	14.4	4	3	2.5	2.7

Nuts, seeds, herbs and other foods

English: Sweet acacia
Local:

Scientific name: *Acacia farnesiana*
Plant family: FABACEAE

Description: An evergreen shrub. It grows 5 - 7 m tall and 3 m across. The stem is slender and erect. The crown is open. It is a spreading, densely branched shrub. The bark is smooth and brown. The leaves are branched and green. There are 4 - 6 pairs of larger leaves and 10 - 20 pairs of small leaflets. They have tiny leaflets and thorns up to 2 cm long, occur in pairs. The leaf stalk has a gland at or above the middle. The flowers are large orange balls. They are strongly perfumed. (The oil is used as a perfume in France.) The pods are long and dark brown to black. They are 5 - 8 cm long by 0.5 - 1 cm wide. They are inflated and sausage like. Often they are curved. They are marked with narrow lines. The pods have hard grey seeds imbedded in a pithy substance. The pods do not split open at maturity. The seeds are chestnut brown and 7 - 8 mm long by 5.5 mm wide.

Distribution: It is a tropical plant. This tree occurs naturally in Australia, Asia and Africa. It will grow on most soils. It is drought and frost resistant. It most commonly grows naturally on clay soils. In Papua New Guinea the plants are coastal below 60 m altitude. It grows in areas with an annual rainfall between 400 - 4,000 mm. It can grow in acid or alkaline soils. It can grow in arid places. It suits hardiness zones 11 - 12.

Use: The pods have been recorded as eaten after cooking. The gum is eaten. The ground up seeds are eaten. The germinated seeds are claimed to be eaten. The gum is used to prepare sweets. The young leaves are used in India as a substitute for tamarind in chutneys.

Cultivation: It is grown from seed.

Production: It is fast growing. Flowering can occur almost continuously if watering is regular. In northern Australia, flowering is normally May to July, with pods available from September to November.

Food Value: Per 100 g edible portion

Edible part	Moisture %	Energy kJ	Protein g	proVit A µg	proVit C mg	Iron mg	Zinc mg
seed (dry)	8.1	1522	36.6	-	-	6.0	0.6

Nutritional values of food plants by plant Family

Plant Family	Scientific name	Common name - English	Common Name - Nepalese	Edible part	Moisture %	Energy kJ	Protein g	Vit A µg	Vit C mg	Iron mg	Zinc mg	Page
AMARANTHACEAE	*Amaranthus caudatus*	Grain amaranth	Lateae	leaf	6.0	1034	28.8	33	-	23.3	5.5	28
AMARANTHACEAE	*Alternanthera sessilis*	Lotus-seed herb		leaf	89.3	109	4.5	57	77	-	-	49
AMARYLLIDACEAE	*Allium carolinianum*	Ladam		leaf (dry)	-	-	15.8	-	-	272	-	30
APIACEAE	*Daucus carota* subsp. *sativus*	Carrot	Gajar	root (raw)	89.9	180	1.0	835	6	0.6	0.4	48
ARACEAE	*Amorphophallus paeoniifolius*	Elephant foot yam		tuber	84.5		0.9			1.4	0.2	52
ARACEAE	*Colocasia esculenta*	Taro	Pindalo	root	66.8	1231	1.96	3	5	0.68	3.2	16
ASTERACEAE	*Carthamus tinctorius*	Safflower	Jhuse Til	seed	5.6	2163	16.2	5	0	4.9	5.5	54
AURICULARIACEAE	*Auricularia polytricha*	Black fungus		mushroom (dry)	14.8	1188	9.3	-	-	5.9	1.3	50
BRASSICACEAE	*Alliaria petiolata*	Hedge garlic		leaf	-	-		3600	190	-	-	35
CAPPARACEAE	*Capparis spinosa*	Coastal caper		fruit	79.6	379	4.6	-	23	0.9	0.4	36
CHENOPODIACEAE	*Chenopodium album*	Fat hen	Bathuwa	leaf (boiled)	88.9	134	3.2	391	37.0	0.7	0.3	51
CONVOLVULACEAE	*Ipomoea batatas*	Sweet potato	Sakharkhanda	tuber (baked)	72.9	431	1.7	961	24.6	0.5	0.3	44
CUCURBITACEAE	*Lagenaria siceraria*	Bottle gourd	Lauka	fruit	93.0	88	0.5	25	10	2.4	-	47
CUCURBITACEAE	*Cucurbita pepo*	Marrow	Pharsi	fruit	91.3	102	1.1	-	12	0.8	0.2	46
CUCURBITACEAE	*Cucurbita maxima*	Pumpkin	Pharsi	seed (dry)	6.9	2264	24.5	38	1.9	14.9	7.5	53
CURCUBITACEAE	*Trichosanthes dioica*	Pointed gourd	Parwal, Padwal	fruit	92.0		2.0	-	362.5	-	-	38
FABACEAE	*Vigna unguiculata subsp. unguiculata*	Cowpea	Bodi	seed (young, boiled)	75.5	406	3.2	79	2.2	1.1	1.0	18
FABACEAE	*Vigna radiata*	Mung bean	Mugi	seed (sprouted)	90.4	126	3.0	2	13.2	0.9	0.4	19
FABACEAE	*Lablab purpureus*	Lablab bean	Heunde cemi	seed (young)	86.9	209	3.0	14	5.1	0.8	0.4	20
FABACEAE	*Vigna umbellate*	Rice bean	Masyang	seed	13.0	1373	20.9	-	-	10.9	-	21
FABACEAE	*Vigna angularis*	Adzuki bean	Rato masyang	seed (dry)	10	1780	19.9	-	-	9.8	-	22
FABACEAE	*Cicer arietinum*	Chick pea	Chana	seed (raw)	9.9	1362	20.2	3	3	6.4	-	23
FABACEAE	*Phaseolus lunatus*	Lima bean	Heunde cemi	seed (young, cooked)	67.2	515	6.8	37	10.1	2.5	0.8	24
FABACEAE	*Cajanus cajan*	Pigeon pea	Rahar	seed (young, boiled)	71.8	464	6.0	2	28.1	1.6	0.8	25
FABACEAE	*Lens culinaris*	Lentils	Massor	split & boiled	72.1	420	7.6	20	-	2.4	1.0	26
FABACEAE	*Crotalaria juncea*	Sunhemp	Jute, sanpat	leaf	10.2	-	30.1	-	1.39	28.9	-	32
FABACEAE	*Acacia farnesiana*	Sweet acacia		seed (dry)	8.1	1522	36.6	-	-	6.0	0.6	59
JUGLANDACEAE	*Juglans regia*	Walnut	Ookhar	nut	4.4	2903	14.4	4	3	2.5	2.7	58
MALVACEAE	*Hibiscus rosa-sinensis*	Hibiscus	Ghanit phool japa kusum	leaf (dry)	6.4	1339	25.9	-	-	19.6	8.9	27
MALVACEAE	*Corchorus olitorius*	Jute		leaf (cooked)	87.2	155	3.4	156	33.0	3.1	0.8	33
MORACEAE	*Ficus benghalensis*	Banyan tree		fruit	13.0	-	8.1	-	156.6	4.1	-	41
NYCTAGINACEAE	*Boerhavia diffusa*	Hogweed		root	50.0	678	4.6	-	-	0.3	-	15
PEDALIACEAE	*Sesamum indicum*	Sesame		seed (dry)	4.7	2397	17.7	1	-	14.6	7.8	56
PHYLLANTHACEAE	*Phyllanthus emblica*	Emblic		fruit	78.4	281	0.6	-	316	0.9	0.5	39
POACEAE	*Panicum miliaceum*	Common millet		seed	9.6	1548	11	-	-	-	-	10

POACEAE	*Dactyloctenium aegyptium*	Comb fringe grass		seed	7.5	1234	9.8	-	-	6.9	4.7	12
POACEAE	*Setaria italica*	Foxtail millet		seed	13.5	1425	9.5	-	-	5.5	3.5	13
POACEAE	*Eleusine coracana*	Finger millet		seed	11.7	1594	6.2	-	-	5.3	-	14
POLYGONACEAE	*Fagopyrum esculentum*	Buckwheat		seed (dry)	11.3	1404	10.3	-	-	3.0	-	11
POLYGONACEAE	*Rumex dentatus*	Indian sorrel		leaf	89.4	124	3.2	3510	115	3.4	-	34
PORTULACACEAE	*Portulaca oleracea*	Purslane		plant	87.0	181	4.0	-	11	2.5	-	55
ROSACEAE	*Rosa macrophylla*	Trind		fruit	-	-	-	-	787	-	-	37
ROSACEAE	*Prunus dulcis*	Almond		nut	5.3	2418	21.3	1	-	4.3	3.4	57
RUTACEAE	*Aegle marmelos*	Bael fruit		fruit	58	577	2.3	0.13	219	0.55	-	40
SOLANACEAE	*Physalis peruviana*	Cape gooseberry		fruit (mature)	84.2	201	2.0	36	30	1.5	-	42
SOLANACEAE	*Lycium chinense*	Chinese boxthorn		fruit	19.6	1411	16.3	-	-	18.9	-	43
URTICACEAE	*Urtica hyperborea*	Zachhut		leaf (dry)	-	-	26.8	-	-	41	-	31

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