

Useful products from plants

Food

About 7 000 plant species have been used as food for humans and our domestic animals. Many of these are wild plants, which provide important alternative sources of food for poor people or when crops fail. Leaves, roots, stems, seeds, fruits and flowers can all provide sources of nutrients. Foods obtained from plants include berries, nuts, tubers, grains, herbs and edible oils.

Wild relatives of domestic crops provide an extended gene pool which can be used in breeding programmes to develop new crop varieties that are resistant to new diseases, can adapt to climate change or be grown in new areas.

Fuel

Plants are important sources of renewable biofuels (for example, bioethanol and biodiesel) that can be used for cooking, boiling water, transport, heating homes and workplaces.

Wood used as fuel supplies over half the energy used in developing countries. However, much of this is gathered from the wild in an unsustainable fashion, which is putting some shrub and tree species at risk of extinction.



Figure 1 Biodiesel can be made from sunflower and other plant oils by reacting them with an alcohol.

Fibres

Plants use elongated woody cells in stems, leaves, bark and seeds for support and transport. These form fibres which can be used to make ropes, textiles and paper:

- fibre cells in the leaves of sisal (*Agave sisalana*) are used to make string and rope;
- cotton (*Gossypium* species) made from hairs that grow on the surface of the seeds is the most important textile;
- a wide variety of fibre sources, but mainly wood pulp, are used to make paper.

Medicines

In developed countries, about 25% of all prescriptions contain materials isolated from plants. Others, like aspirin, are synthesised copies of naturally occurring chemicals or modified from the original plant product.

Only about a fifth of the known plant species have been investigated for their medicinal potential.



Figure 2 Aloe vera leaves are widely used to heal burn, wounds and other skin ailments.

Recently, the Madagascan rose periwinkle (*Catharanthus roseus*) has been used as the source of two drugs to treat cancer and alkaloids used to treat childhood leukaemia and Hodgkin's disease.

Many medicinal plants are taken from the wild and are at risk of extinction.

Dyes

A wide range of colours can be obtained from renewable plant sources, including red from madder (*Rubia tinctoria*), yellow from dyers' chamomile (*Anthemis tinctoria*) and blue from indigo (*Indigofera tinctoria*). Many synthetic dyes are based on petroleum compounds – a finite source.

Perfumes

Plants have been used as a source of essential oils and aroma compounds throughout history; they provide the largest source of fragrant compounds used in perfume manufacture. Many of these compounds can also be used as insect repellents, antiseptics or disinfectants.

Gums and resins

Gums form when the cellulose in plant cell walls breaks down. Originally used as adhesives, today they have many other uses. For example, gum Arabic harvested from *Acacia* trees is used as an adhesive on postage stamps, and to thicken medicines and inks.

Certain plants secrete resins from specialised cells. Aromatic and flammable, they have long been used in medicines, embalming, incense and torches.



Figure 3 Pine resins are used to waterproof timber ships and are refined to produce turpentine.

Building materials

Resins are also used in paints. There are many other building materials obtained from plants, such as timbers, insulation, pitches for waterproofing, pipes and thatching materials. Rattans (climbing palms) are used for all kinds of purposes, from building shelters to making cane furniture, baskets, mats and fish traps.

Compost

All plants and animals decay when they die, recycling nutrients. Rotted plant materials can be used to form compost which can be used as a soil conditioner and to return nutrients to the soil after cropping.

Pesticides

Extracts from plants or their derivatives can be used successfully to control a wide range of pests, including insects, weeds, fungi and rodents.