Rotary | FOOD PLANT SOLUTIONS ROTARY ACTION GROUP
Solutions to Malnutrition and Food Security

Food Plant Solutions Brief Guide to Food Plant Gardens in the Bundaberg region

Our bodies need nutrients to be healthy and strong - nutritious food provides these:

Starch: Starch provides sustained energy for the body.

Protein: Protein helps the body repair cells and make new ones. Protein is also important for growth and development in children, teens, and pregnant women. Symptoms of protein deficiency include wasting and shrinkage of muscle tissue, and slow growth (in children).

Vitamin A: Vitamin A is very important for eyesight and fighting disease, particularly in infants, young children and pregnant women. People who are short of Vitamin A have trouble seeing at night.

Vitamin C: Vitamin C helps us avoid sickness, heal wounds, prevent infections and absorb iron from food. Severe vitamin C deficiency increases the risk of scurvy with symptoms such as inflammation of the gums, scaly skin, nosebleed and painful joints.

Iron: Iron is important because it helps red blood cells carry oxygen from the lungs to the rest of the body. Low levels of iron cause anaemia, which makes us feel fatigued. Iron is also important to maintain healthy cells, skin, hair and nails. Iron is more available when Vitamin C is also present.

Zinc: Zinc is particularly important for the health of young children and teenagers, and to help recovery from illness. It is needed for the body's immune system to work properly. It plays a role in cell division, cell growth, wound healing, and the breakdown of carbohydrates. Zinc is also needed for the senses of smell and taste. Zinc deficiency is characterized by stunted growth, loss of appetite, and impaired immune function.

Starting a garden

PLAN:
Identify a suitable location for the garden. Factors to consider include:
A site that receives 6-8 hours a day of sunlight and is not shaded by buildings or trees.
Easy access – a garden that is difficult to get to will not be maintained.
Protection from predators like native animals. If this is an issue, consider what can be used as a barrier and install it before planting.
Adequate and easily accessed water, whether it be a garden hose or a watering can.

TOOLS AND EQUIPMENT:
What do you need to turn over the soil, to plant seeds and seedlings (e.g. spade, hand trowel, hoe) and how will soil be moved to cover seeds (e.g. rake). Can you borrow tools to reduce your start-up costs?

SIZE:
Gardens can be all different sizes. Plan the size of your garden – what space is available and how much time do you have? Start small and increase the area as you become more confident. If space is limited, remember plants can be successfully grown in containers or pots.

BUILD:
Clear the area, removing any existing plants and large weeds (turn the soil – dig, lift and turn it over onto itself). Once the soil has been loosened, spread compost and work it into the soil. Avoid stepping on freshly turned soil, as this will compact the soil and undo your hard work. Once the digging is complete, smooth the surface with a rake and water thoroughly. Allow the bed to rest for several days before planting. Use a good quality potting medium if using pots and containers.

PLANT:
Seeds and seedlings can be purchased from nurseries, garden centres and most hardware stores. A packet of seeds will grow a lot of seedlings but take longer to mature than transplanted seedlings. Plant seeds and seedlings in accordance with their specific directions and apply sufficient water to ensure the soil around the seeds and/or seedling roots is moist. Consider how tall and wide each plant will grow when planning the space between plants. Information on seed packets or seedling labels will indicate the appropriate distance between neighbouring plants. Add a thick layer of mulch around seedlings to help keep the soil moist. Make small signs to stick in the ground to show what you have planted.

MAINTAIN:
Plants need regular watering, which ideally should occur in the morning, never in the heat of the day. Weeds will compete with the plants for nutrients and water, so it is important to keep them to a minimum. Hand weeding and adding mulch around seedlings will help keep weeds under control.

Starchy Staples provide energy and dietary fibre

Common name: Sweet potato

Scientific name: *Ipomoea batatas*

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 will not form if the ground is waterlogged when tubers start to develop. Sweet potato are not tolerant to shading.

Use: Tubers are boiled or baked. They can be steamed, fried, mashed, or dried. 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.

Nutrients: energy, vit A

Common name: Potato

Scientific name: *Solanum tuberosum*

Cultivation: Plants are grown from tubers. Large tubers can be cut to include a bud or "eye". A seed piece of 40-50 g is suitable. It is best to inter-crop as this stops bacterial wilt spreading. The plant is surrounded by dirt when 20-25 cm tall. Later the tubers need to be kept covered with dirt.

Use: The tubers are cooked and eaten. They are also fried, canned, and made into starch. The tubers are boiled, baked, roasted, mashed, and used in soups, stews, dumplings, pancakes and potato salads.

Nutrients: energy, iron, zinc

Common name: Sweetcorn

Scientific name: *Zea mays*

Cultivation: It is grown from seeds. It is normal to plant one seed per hole at 1-2 cm depth. A spacing of about 30 cm between plants is suitable.

Use: The cobs are eaten cooked. The dried grains can be crushed and used. The meal can be used for breads, cake, soups, stews etc. Maize is cooked and prepared in many ways such as boiled, roasted, dried and steamed.

Nutrients: energy, protein, vit A, iron

Legumes provide protein for growth

Common name: Pigeon pea

Scientific name: *Cajanus cajan*

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. 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.

Use: Young leaves, shoots and pods are eaten. The pods can be used in curries. The leaves and shoots are used 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.

Nutrients: energy, protein, vit A, iron

Common name: Lablab bean

Scientific name: *Lablab purpureus*

Cultivation: Seeds are sown at 30 x 60 cm spacing near stakes or trees. Fertilising with nitrogen and potash until flowering is recommended. Young pods are ready 4-6 months after planting and seeds 6-8 months. Pods are often harvested over 2 or 3 years.

Use: The cooked young pods, ripe seeds and young leaves are edible. 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.

Nutrients: energy, protein, vit A, iron

Common name: Mung bean

Scientific name: *Vigna radiata*

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. It normally requires phosphorus fertiliser for adequate growth. Seeds germinate in 3-5 days.

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

Nutrients: energy, protein, vit A, iron

Leafy greens are a source of iron

Common name: Amaranth

Scientific name: *Amaranthus hypochondriacus*

Cultivation: Plants can be grown from seed if the soil is warm. Seeds are small and grow easily. Seeds germinate 3-4 days after sowing. Cuttings of growing plants root easily.

Use: The seeds are eaten cooked. They are made into tortillas and chapaties. The leaves are eaten cooked. The seeds can be sprouted and eaten.

Nutrients: leaves: iron; seeds: energy, protein

Common name: Silver beet

Scientific name: *Beta vulgaris subsp. cicla*

Cultivation: A spacing of 30cm between plants is suitable. Seed are sown 2.5 cm deep.

Use: The leaves and stalks are cooked and eaten. They can be eaten raw in salads. The leaf stalks can be cut from the leaf and cooked separately as an asparagus substitute.

Nutrients: vit A, vit C, iron, zinc

Common name: Indian spinach

Scientific name: *Basella alba*

Cultivation: It can be sown from seeds or cuttings. A spacing of 1 m is suitable. Plants grown from seed are more productive than from cuttings. When cuttings are used, 20-25 cm long cuttings are suitable. Partial shade, rich fertile soil, and adequate moisture favour abundant leaf production. It is responsive to nitrogen fertiliser. Light shade gives bigger leaves.It requires a trellis to climb over. Frequently picking off the bud encourages branching.

Use: The leaves can be eaten raw in salads or cooked like a vegetable. They are also dried and stored. When fresh they can be stored for 4-5 days. The young shoots and leaves are eaten cooked. They are somewhat slimy. In soups and stews the mucilage can be used as thickening. The purple colour of fruit is harmless and is used to colour vegetables and agar-agar. Some lemon juice added to the dye enhances the colour.

Nutrients: energy, protein, vit A, vit C, iron, zinc

Fruit are an important source of vitamins and dietary fibre

Common name: Pineapple

Scientific name: *Ananas comosus*

Cultivation: The suckers and slips can be used for planting as well as the top of the fruit. The time to maturity is the fastest for the suckers near the bottom of the plant and slowest when the top of the fruit is planted.

Use: The fruit is eaten fresh or used for juice. The young heart leaves can be eaten. They are cooked in curry dishes. Unripe fruit are also cooked and eaten. The flower spikes are peeled and sliced and steamed as a vegetable or added to stews.

Nutrients: vit A, vit C

Common name: Pawpaw

Scientific name: *Carica papaya*

Cultivation: Pawpaw seeds grow easily, and plants grow quickly. Fresh seeds can be used, or if dry seeds are used, they should be soaked before planting. Seeds should be planted when temperatures are 24-30°C. Seedlings can be transplanted when they are about 20 cm high. Plants should be about 3 m apart

Use: Fruit can be eaten ripe and raw. Green fruit can be cooked as a vegetable. The young leaves can be eaten cooked but are bitter. The flowers and the middle of the stem can be eaten.

Nutrients: vit A, zinc

Common name: Banana

Scientific name: *Musa x paradisiaca*

Cultivation: They are planted from sword suckers. Suckers are usually put 30 cm deep.

Use: Fruit are eaten raw or cooked depending on variety. Male buds and flowers are eaten on some varieties. They are cooked as a vegetable. The central pith of the false stem and the underground rhizome are also sometimes eaten.

Nutrients: energy, vit A, vit C

Vegetables are an important source of vitamins and dietary fibre

Common name: Pumpkin

Scientific name: *Cucurbita maxima*

Cultivation: They are grown from seed. Usually 2 or 3 seeds are planted together in a mound.

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. 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.

Nutrients: seeds: energy, protein, iron, zinc; leaves: vit A, vit C; fruit: energy

Common name: Carrot

Scientific name: *Daucus carota subsp. sativus*

Cultivation: They are grown from direct sown seed. The seed are small, mix 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.

Use: The roots and leaves are edible. The young leaves are used in soups. The roots can be eaten raw or cooked, 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.

Nutrients: vit A, vit C, iron, zinc

Common name: Choko

Scientific name: *Sechium edule*

Cultivation: The entire fruit is planted as the seed cannot withstand drying out. It is planted flat and thinly covered with soil. Often chokos start to develop shoots and roots while they are still attached to the original plant. These eventually fall off and continue growing if they fall on soft moist dirt. A spacing 2 m apart along a fence is suitable. Trellis support is required. A well-drained fertile soil is needed.

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

Nutrients: energy, protein, vit A. vit C

Acknowledgements:

This guide is based on information from the Food Plants International (FPI) database, "Edible Plants of the World", developed by Tasmanian agricultural scientist Bruce French AO.

"Food Plant Solutions Brief Guide to Food Plant Gardens in the Bundaberg region" is a limited selection of food plants intended as a **Draft Guide only** to identify some local food plants that have high levels of nutrients that are important to human nutrition. This guide has been developed with the best intention to create interest and improve understanding of the important local food plants in the Bundaberg region. It is not a comprehensive guide of food plants for Bundaberg. Other important nutritious plants may be equally useful. Please contact Food Plant Solutions if you would like further information about these, or more detailed information about the ones selected.

Food Plant Solutions Rotary Action Group 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, which are well adapted to the prevailing conditions in which they are to be grown, and how this resource may be used to address hunger, malnutrition and food security. For more information, visit the website www.foodplantsolutions.org or email info@foodplantsolutions.org

Disclaimer: This 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:

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Always be sure you have the correct plant, and undertake proper preparation methods.