FOOD PLANT SOLUTIONS
ROTARY ACTION GROUP

Food Plant Solutions Brief Guide to Sub-Tropical Food Plant Gardens in Rotary District 3070

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. shovel, 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 size 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 seedlings directly transplanted. 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 either early in the morning, or late in 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	**Scientific Name**	**Cultivation:**	**Use:**	**Nutrients:**
Taro	*Colocasia esculenta*	Taro can be planted from cormels or from the top of the central corm. Taro can be grown under flooded conditions, but root rots develop if the water becomes stagnant. For dryland taro, the soil is prepared by digging the soil and plant 5-7cm deep.	The corms, petioles and leaves are all edible after cooking. The leaves are also dried and stored. The flowers are also cooked as a vegetable.	Root: Energy, Zinc Energy, Protein. Leaves (cooked): Protein, ProvitA, VitC.
Sweet potato	*Ipomoea batatas*	Vine cuttings are used for planting. Cuttings are planted on mounds. It needs a sunny position. Tubers won't form if the ground is waterlogged when tubers start to develop. Sweet potato are not tolerant to shading.	Tubers are boiled or baked. They can be steamed, fried, mashed or dried. The young leaves are edible.	Tuber: Energy, ProvitA. Leaf: Protein, VitC, Iron.
Foxtail millet	*Setaria italica*	Plants are grown by seed, either broadcast or drilled. Pure stands require 8-10 kg/ha of seed. Plants are harvested by cutting off the ears.	It can be cooked and eaten like rice. The seeds can be parched, popped, added to soups and sauces, porridge, cakes, puddings, dumplings and into syrup. The sprouted seeds can be used as a vegetable.	Seed: Energy, Protein, Iron and Zinc.

Legumes provide protein for growth				
Common Name	**Scientific Name**	**Cultivation:**	**Use:**	**Nutrients:**
Pigeon pea	*Cajanus cajan*	They are grown from seeds, direct sown where they are to grow. Seeds normally germinate easily and well. Before sowing soak seeds in cold water for one day. A spacing of 1.5m x 1.5m is suitable. Seeds store well if kept cool and dry. Plants can be cut back and allowed to re-grow.	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.	Seed: Energy, Protein, ProvitA, Iron.
Chickpea	*Cicer arietinum*	Grown from seed and often with other crops but these are planted 3-4 weeks after sowing the chickpea. Seed should be at 2-12cm depth. Seed will germinate at temperatures above 5°C but best above 15°C. Spacing plants 10 cm apart in rows 25-30cm apart. Plants are cut and harvested when leaves turn brown.	Mainly the ripe seeds are eaten. Often they are boiled and mashed. The young leaves, shoots and pods are sometimes eaten. Sprouted seeds are eaten. The seeds can be roasted, boiled, fried and used in soups and stews. When roasted they can be eaten as a snack. It is used to make flour.	Seed: Energy, Protein, Iron.

Lima bean	*Phaseolus lunatus*	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 2-3m tall in the middle. Hills should be about 1m apart. Seeds should be 2-4cm deep.	The leaves, young pods and seeds are all eaten. The seeds are eaten fresh or after drying and are fried in oil. Dried beans are boiled or baked and 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 destroyed by cooking.	Seeds (cooked): Energy, Protein, Iron, Zinc.

Leafy greens are a source of iron				
Common Name	**Scientific Name**	**Cultivation:**	**Use:**	**Nutrients:**
Amaranth Greens	*Amaranthus hybridus*	Plants are grown from seeds.	The leaves and young shoots are cooked and eaten and are also dried. The leaves and stems are chopped and added to pastries, salads or fried with eggs.	Leaf: Protein, VitC, Iron.
Indian Spinach	*Basella alba*	It can be sown from seeds or cuttings. Seeds germinate in a few days. Sticks can provide support or it can grow over fences and stumps. Plants grown from seed are more productive than from cuttings. When cuttings are used, 20-25cm lengths are suitable. Where the plant grows over light soil it can root at the nodes and grow continually. Partial shade, rich fertile soil and adequate moisture favour abundant leaf production. . Light shade gives bigger leaves.	The young shoots and leaves are eaten cooked. In soups and stews the mucilage can be used as thickening. The purple colour of fruit is used to colour vegetables and agar-agar. The leaves can be eaten raw in salads. They are also dried and stored. When fresh they can be stored for 4-5 days. The leaves are used to make tea.	Leaf: Energy, Protein, ProvitA, VitC, Iron.

Flower-of-an-hour	*Hibiscus trionum*	Plants can be grown from seed or cuttings.	The shoots and leaves are cooked and eaten. The pods are used in soups and stews, or sun-dried and powdered and used later in food. The seeds are eaten raw and have a sesame flavour. The flowers are used as a herbal tea.	Leaf: ProvitA, VitC, Iron, Zinc.

Fruit are an important source of vitamins and dietary fibre				
Common Name	**Scientific Name**	**Cultivation:**	**Use:**	**Nutrients:**
Pineapple	*Ananas comosus*	The suckers, slips and top of the fruit can be used for planting. 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. Therefore use suckers that grow from the stem near the ground, for earliest yield. Other suckers or the top of the fruit can be used. They can grow well under shade.	The fruit is eaten fresh or used for juice. It can also be sliced and cooked or used in ice cream, jams and juices. The young heart leaves can be eaten, 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. The rind of the fruit is used for drinks.	Fruit: Energy, ProvitA, VitC.
Banana	*Musa x paradisiaca*	They are planted from sword suckers. Spacing depends on variety. A spacing of 1000-3000 plants per hectare is used depending on variety. Suckers are usually put 30cm deep.	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.	Fruit: Energy, ProvitA.

Chinese Date	*Ziziphus jujuba*	Plants can be grown from seed but these do not breed true. Grafting, budding or cuttings can be used. Root suckers can be used. Although cross pollination is not required for fruit production it is needed for producing viable seed. A spacing of 3-4m is suitable.	The fruit are eaten fresh, dried or preserved in sugar. They can be stewed, baked, pickled, or used in puddings, cakes, breads, jellies, soups and sweetmeats. The ripe fruit are powdered and cooked with millet or rice. The kernels are edible.	Fruit: Energy, Protein, ProVitA, VitC, Iron, Zinc.

Vegetables are an important source of vitamins and dietary fibre				
Common Name	**Scientific Name**	**Cultivation:**	**Use:**	**Nutrients:**
Okra, Lady's fingers	*Abelmoschus esculentus*	They are grown from seeds, which are easy to collect. They need high temperatures for germination (over 20°C) and a sunny position. Often seeds are soaked for 24 hours before sowing to give quick germination. Seeds are sown 1.5-2.5cm deep with 2-3 seeds per hole. Later these are thinned out to one plant. A spacing of about 90 x 45cm is suitable. Seeds can be sown in nurseries and plants transplanted. Pinching out the tops of plants when 30cm high encourages branching.	Pods are eaten cooked. They are slimy, but less so if fried. They are also less sticky if a little lemon is added. Dried powdered seeds can be used in soups to thicken. They can also be pickled. Young leaves can be eaten cooked. They can be dried and stored. Flowers can also be eaten.	Pods: Energy, Protein, ProvitA, VitC, Iron. Leaf: ProvitA, VitC.

Beetroot	*Beta vulgaris*	Plants are grown from seed, normally in the final site because transplanting is difficult. When the small clump of seeds or seed ball are planted more than one seedling will result.	The red tubers are eaten after cooking. They can be pickled, fermented, boiled, or sliced and served with vinegar. The root is dried and powdered and the flour mixed with barley or wheat. The leaves are edible, cooked in soups and stews.	Root: Energy. Leaf (raw): ProvitA, VitC, Iron.
Choko, Chayote	*Sechium edule*	The entire fruit is planted as the seed cannot withstand drying out. It is planted flat and thinly covered with soil. Often they 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 2m apart along a fence is suitable. Trellis support is required. A well-drained fertile soil is needed. Cuttings can be used for planting. Plants do not breed true and a large variability of fruit types can occur.	The fruit are edible cooked, they can be pickled, baked, steamed, or made into fritters and puddings. The young leaf tips are eaten. The seeds can be eaten cooked, often deep fried. The fleshy root can be eaten cooked. They can be boiled, baked or fried. Starch can be extracted from it.	Leaf: Protein, ProvitA, VitC, Iron. Root: Energy, Protein, Iron.

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 "Sub-tropical India for Rotary District 3070" is a limited selection of food plants, which is 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 Sub-tropical India for Rotary District 3070. It is not a comprehensive guide of food plants for Sub-tropical India for Rotary District 3070. 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 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 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.

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