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

Food Plant Solutions Brief Guide to Food Plant Gardens in the Bindoon Chittering 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: 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: Oca

Scientific name: *Oxalis tuberosa*

Cultivation: Plants are grown from tubers or cut pieces of tubers which contain 1-3 eyes. Planting is normally done at the beginning of the rainy season or Spring as soil temperatures increase. Plants are weeded and soil mounded around them. A spacing of 20-40 cm x 20-36 cm is recommended.

Use: The tubers are acid when fresh but are dried slightly then cooked and eaten. The bitter kinds are freeze dried and stored for later use. They can be used in soups and stews. The young leaves and shoots can be eaten. **Caution:** Fresh tubers contain oxalates, which affects calcium absorption.

Nutrients: tuber (cooked): energy

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

Legumes provide protein for growth

Common name: Soybean

Scientific name: *Glycine max*

Cultivation: It is grown from seed direct planted or in a nursery and then plants transplanted to the garden. Plants need to be about 20 cm apart. Plant in garden in spring once all frosts have finished.

Use: The young pods and ripe seeds are eaten. The dried seeds are boiled or baked and used in soups, stews, and casseroles. Toasted seeds are eaten like a snack. The young leaves can be eaten.

Nutrients: energy, vit A, iron

Common name: Common bean

Scientific name: *Phaseolus vulgaris*

Cultivation: Plants are grown from seed, preferably sown in raised beds. Seeds remain viable for 2 years. Germination is normally good if seed has been well stored. Climbing types need stakes. Plants are self-fertilised. Beans can be intercropped with other plants. If grown on their own, bush types can be spaced at 25 cm x 25 cm. They can be sown closer together in rows wider apart to make weeding and harvesting easier. For dried beans, once the pods are mature and turning yellow, the whole plants are pulled, then dried and threshed. Flowering in most French bean varieties is not affected by day length.

Use: The young pods, leaves and mature seeds are edible. Dry seeds are soaked in water and boiled until soft.

Nutrients: protein, vit A

Common name: Yacon

Scientific name: *Smallanthus sonchifolius*

Cultivation: Plants are grown from offsets or slips. Sections about 10-20 cm long are taken from the base of the main stem. These often have roots attached. They are planted throughout the year if there is enough moisture. Earth is mounded up once around the plants.

Use: The roots are sweet and often eaten raw. Before this they are left for several days in the sun to allow the skin to shrivel. They can be sliced and added to salads. The grated pulp can be squeezed through a cloth to make a drink. The juice can be concentrated to blocks of sugar. They can also be cooked. The main stem is also eaten as a vegetable. The leaves are also eaten.

Nutrients: protein

Leafy greens are a source of iron

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

Common name: Garden sorrel, Sheep's sorrel

Scientific name: *Rumex acetosa*

Cultivation: It can be grown from cuttings or division. It is also grown from seeds

Use: The leaves can be eaten raw but are often steamed or lightly boiled then eaten. They are eaten in salads or as a potherb. They are used in soups, omelettes, sauces and chutneys. The flowers are eaten as a vegetable or used as a garnish. The juice of the leaves is used to curdle milk.

Nutrients: energy, protein, vit C, iron

Common name: Warrigal Greens, New Zealand Spinach

Scientific name: *Tetragonia tetragonoides*

Cultivation: It is grown from seeds or cuttings. It is easy to save seed. Seed can be bought in stores. Seeds often grow better if soaked in water overnight. Seedlings are not easy to transplant so it is better to sow direct. Often 3-4 seeds are planted in a mound with the mounds 70 cm apart. Cuttings form roots quickly.

Use: The fleshy leaves and tops are eaten. They can be eaten raw, steamed, boiled, stir-fried, creamed, served with mushrooms, or made into quiche. **Caution:** They can contain oxalates and nitrates which can be poisonous.

Nutrients: vit A, vit C, iron

Fruit are an important source of vitamins and dietary fibre

Common name: Strawberry

Scientific name: *Fragaria x ananassa*

Cultivation: Plants are grown from runners. These runners form roots and then new plants. Plants are spaced about 45 cm apart in rows 75 cm apart.

Use: The ripe fruit are eaten raw. They are also used in desserts, jams, preserves and for flavouring.

Nutrients: vit C

Common name: Passionfruit

Scientific name: *Passiflora edulis*

Cultivation: Plants are grown by seeds or cuttings. Seeds germinate in 15-45 days. Seedlings can be grafted. Plants are put in a hole 30 cm deep and which has had organic matter added. A spacing of 3-4 m apart is suitable. Plants need a trellis to climb over.

Use: The fleshy portion of the fruit is eaten raw. Passionfruit are also used for flavouring in juices, and with other foods. It is used in sherberts, custards, cakes, sauces, pies, fruit soups, candies and ice cream. The seeds are edible. They also yield an edible oil. The tender shoots are boiled and eaten. They are added to meat curry.

Nutrients: vit A, zinc

Common name: Tomatillo

Scientific name: *Physalis ixocarpa*

Cultivation: Plants are grown from seed. Seed germinate in 7-10 days. Plants should be spaced 40 cm apart. Plants are best staked to prevent plants sprawling and fruit rotting. Plants can be grown from cuttings. Flowers are self-fertile.

Use: The fruit are eaten fresh. They can be used for jam, sauces, pickles, or juice. They are used in soups, curries, and in cooked meat dishes. Unripe fruit are often used in a hot chili sauce.

Nutrients: energy, vit A, vit C, iron

Vegetables are an important source of vitamins and dietary fibre

Common name: Okra

Scientific name: *Abelmoschus esculentus*

Cultivation: They are grown from seeds. Seeds are easy to collect. They need high temperatures for germination (over 20°C) and a sunny position. Often seeds are soaked for 24 hours before sowing to give quick germination. Seeds are sown 1.5-2.5 cm deep with 2-3 seeds per hole. Later these are thinned out to one plant. Seeds can be sown in nurseries and plants transplanted. Pinching out the tops of plants when 30 cm high encourages branching. A spacing of about 90 x 45 cm is suitable.

Use: 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. It thickens the soup. They can also be pickled. Young leaves can be eaten cooked. They can be dried and stored. Flowers can also be eaten. Okra can be frozen and canned.

Nutrients: seeds: energy, protein; pods: vit A, vit C; leaf: vit A, vit C

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: Marrow, Zucchini

Scientific name: *Cucurbita pepo*

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.

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 sprouted seeds are used in salads.

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

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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 Bindoon Chittering 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 Bindoon Chittering region. It is not a comprehensive guide of food plants for Bindoon. 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.