

Chinese flowering cabbage

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Introduction

Chinese flowering cabbage (*Brassica rapa* L. var. *parachinensis* Bailey) is a native of the Chinese Kwangtung Province and is grown and consumed virtually all year-round throughout south-east Asia. It belongs to the Crucifer family and has other common names, such as tsoi sum and choy sum. Because of its pleasant taste and cooking qualities, it has become a most common leafy vegetable in Hong Kong.

The leaves of Chinese flowering cabbage are large, elliptical and green. The plant has about seven or eight leaves when it flowers, the largest leaves being on the outside. The flowering stems are uniform in diameter and slightly grooved from tip to base. The whole plant can be eaten, including the flowers, which are normally yellow. The height of the plant varies from 20 to 30 cm. The bulk of the root system occurs within a depth and radius of 12 cm from the stem. The average spread of the plant varies between 15 and 45 cm.

Marketing and marketing issues

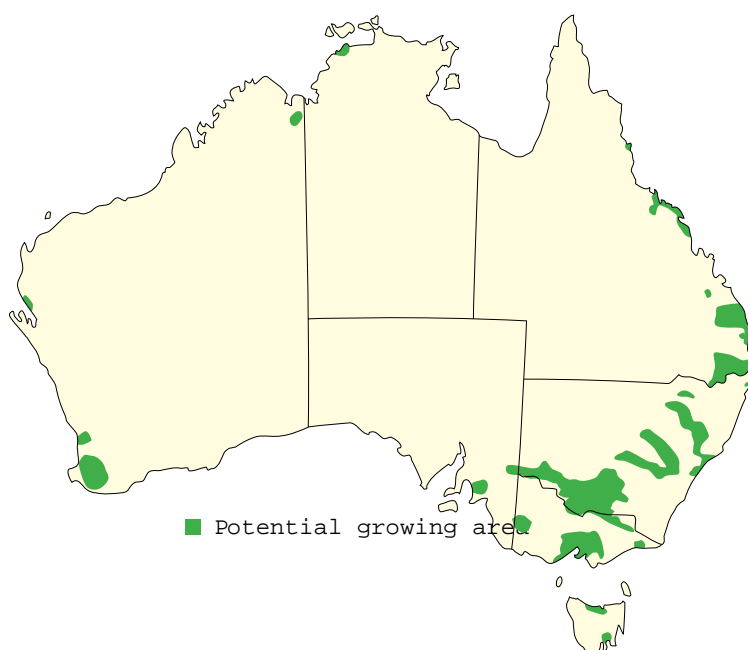
Chinese flowering cabbage is available in Australia at most major wholesale markets and Asian grocery stores throughout the year. The wholesale price range is between \$0.50 and \$1.00/bunch. Similarly, the Melbourne Markets average wholesale price was between \$0.50 to \$1.30/bunch. The average retail price in and around Melbourne was between \$1.00 and \$1.50/bunch.

Chinese flowering cabbage is one of the best selling Asian vegetables in the three main retail outlets: supermarkets, Asian grocery stores and Asian

restaurants. In addition, it was listed as one of the top five Asian vegetables under production in New South Wales and Victoria.

Production requirements

Chinese flowering cabbage is a cool-season crop and prefers uniform conditions that are not too dry, wet or shady. It is of higher quality when grown in cool weather because the shoots are thicker, more tender and sweeter. Chinese flowering cabbage varieties are generally not frost-tolerant. There is a purple flowering variety which can survive temperatures down to about -5°C .



The seasonal changes in temperature will generally determine when a particular crop can be grown and may differ markedly with the variety. It can be grown all year round where seasons are not extreme. Chinese flowering cabbage tends to bolt in summer before the plant reaches sufficient size, resulting in spindly shoots.

Chinese flowering cabbage is shallow-rooted like most other brassicas and requires frequent watering for optimum growth. Watering once or twice a day will produce good quality plants, regardless of the quantity of water applied. However, water should be conserved and applied frequently but lightly. The highest yield achieved was from watering twice a day at a rate that was less than one fifth of that used by many commercial growers in the locality.



Chinese flowering cabbage

The amount of water needed is influenced by soil type, with sandy soils draining very quickly and requiring more frequent watering than other soils. The ideal soil type for vegetable production is fertile and has good drainage along with a high organic matter content. The soil pH should be between 6.0–7.0 and should not fall below 5.0.

Varieties

Chinese flowering cabbage varieties are classified by the number of days from sowing to harvest and their susceptibility to bolting prematurely. For example, 40 days (sze sap yat), 50 days (ng sap yat), 60 days (luk sap yat) and 80 days (bat sap yat). In addition, the flowering stem colour that ranges from white to light green will help determine the variety.

Agronomy

The rates of fertiliser required for optimum crop development can differ markedly between soil types. Soil testing is the best way to determine the elements needed for crop development. Two suggested mixes of fertilisers for Western Australian soils, are as follows:

1. Sandy Soils. Base dressing of poultry manure (50 m³/ha), superphosphate (1.25 t/ha) and trace elements. Two side dressings of Agran 34-0 and muriate of potash (each at 150 kg/ha) should be applied about one and three weeks after emergence.
2. Medium and Heavy Soils (Poor fertiliser history). Base dressing of superphosphate (2tonne/ha), muriate of potash (600 kg/ha) and trace elements. Two side dressings of Agran 34-0 (300 kg/ha) should be applied about one and three weeks after emergence.

Nitrogen fertiliser can improve Chinese flowering cabbage yields. Field trials have shown that the marketable fresh weight yield (46.1 tonne/ha) of Chinese flowering cabbage was the highest at a spacing of 10 × 10 cm with 200 kg/ha of nitrogen. The yield is over double that of the average yields in Malaysia which are between 11 and 20 t/ha. At other spacings (i.e. 20 × 30 cm, 30 × 30 cm and 40 × 30 cm) the maximum yields were reached at about 100 kg/ha of nitrogen.

Chinese flowering cabbage can be difficult to grow unless the correct variety is matched with the climatic conditions. Germinating seeds at high

temperatures may help to prevent premature bolting. Seed can take 3 to 9 days to emerge from a sowing depth of 0.6 cm during autumn and 3 to 7 days in summer. The size of the seed is also very important. The larger seeds give more vigorous seedling growth and the plants came to maturity earlier than those from the smaller-size groups. The recommendation was then to discard any seed under 0.118 mm in diameter.

Key statistics

Statistics are not available on Australian/principal State production, imports, exports for Chinese flowering cabbage mainly because of commercial sensitivities.

Chinese flowering cabbage can be sown directly or transplanted in rows about 30 cm apart and spaced/thinned to about 10–20 cm. Spacings between plants are generally 8–20 cm, allowing wider spacings for larger varieties. In commercial greenhouses, plants are direct sown in rows 18 cm apart and the

seeds spaced at 2.5–5 cm. The seedlings are thinned close together so that they do not grow large and tough-stemmed. The highest yields were obtained at close spacings of 10 × 10 cm.

Pest and disease control

See Chinese chard.

Harvest, handling and postharvest treatments

Chinese flowering cabbage can be harvested from direct seeding in the field when fast-growing in as little as 30 days. The time of harvest of most Asian vegetables is critical for high quality produce. Harvesting in the cool of the morning is preferred because it reduces moisture stress, especially during summer. Once picked, many Asian vegetables are tied and bunched as whole plants into groups or bunches. The size of the bunches depends largely on the market requirements and the type of vegetable. Asian vegetables should be fresh and free from any defects, foreign matter and chemical residue.

Many vegetables should be rapidly cooled as soon as possible to storage temperature (0–2°C) without freezing. In general, a high relative humidity (90–100%) is important to prevent wilting especially during the pre-cooling phase. It is critically important that leafy Asian vegetables should be stored under these conditions throughout postharvest (even during transport) for a high quality product, otherwise it will quickly dry out, wilt and become unsaleable.

Chinese flowering cabbage is harvested as the first flower buds begin to open. The whole plant is cut at the base, bunched into bunches of ten to twelve and tied. The main stem should be long (10–15 cm) and thick in diameter (1.5–2.5 cm) at the base. Side shoots will develop after cutting the main stem and they can also be harvested. Chinese flowering cabbage should be presented free of roots and with or without flowers.

Economics of production, Key contacts and Key references

See Chinese chard.