

## Carambola

### 1. Characteristics and Cultivars

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#### ORIGIN AND DISTRIBUTION

Carambola, also popularly known as starfruit, five-corner, Bilimbing and Yang Tao originates from Malaysia/Indonesia. Carambola is chiefly used as a fresh fruit, and also in salad, punch mix, puree, juice, sorbet, fruit cocktails, jelly, jams, dried preserves as well as an alcoholic carambola wine. It is now widely grown throughout the world 30°N and S of the equator. Although introduced into Australia more than a hundred years ago, it was not until between 1975 and 1985 that an array of the world's best cultivars were imported and this led to the debut of a small scale carambola industry.

Today carambola is grown in northern New South Wales, throughout Queensland up to Cooktown in the York Peninsula and around outlying rural areas of Darwin in the Northern Territory. Carambola is usually planted in mixed orchards. There are no commercial plantings of carambola in the north of Western Australia.

Since 1990, there have been no increase in carambola plantings in northern Australia. In the Northern Territory, the area still remains the same, 20 ha with 5 000-8 000 trees because of the severe ravages from sulphur-crested cockatoos.



#### AGROECOLOGICAL REQUIREMENTS

Carambola will thrive in a wet humid climate or one with a distinct dry season. It grows best on well-drained clay loams with a soil pH 5.5- 6.5, although it can withstand waterlogging, as it is able to recover from continuous or intermittent flooding. Carambola cannot tolerate drought and salinity. The crop is cold hardy, tolerant of temperatures down to 6°C.

## NUTRITIVE PROPERTIES

Carambola is rich in potassium and vitamin A, and also has a fair amount of iron and vitamin C.

## CULTIVARS

The cultivars introduced into Australia can be grouped into long and short styled cultivars. Short styled cultivars are self-incompatible and require pollination from long styled cultivars but long styled cultivars can be self-fertile. Recent studies showed that fruit deformity in carambola is more related to incomplete pollination or incompatibility problems than the lack of calcium, zinc or boron.

Other introduced cultivars include Leng Bak and Jurong from Singapore, Thai Knight (ex Thailand) from Florida; and Kona Beauty, Hart, Kajang and Seremban (both ex Malaysia) from Hawaii. Very little accessions have been obtained from the extensive gene-pool available from Taiwan and Indonesia. Other local selections include Giant Siam, Jungle Gold, BCP-1, Hosie, Chujuba. The best cultivars introduced from Malaysia are:

- (a) B2 (long style), elongated, narrow fruit, ripening yellowish-white. Its flesh is fine textured and sweet with a brix of 8-9%.
- (b) B 17 (short style) or Crystal honey carambola is crispy, juicy, extremely sweet with a brix of 15-18%. The fruit is usually elongated with whitish sugar spots and ripens to a golden yellow colour.
- (c) B 17 has good potential in Asian and Middle East countries because of its sweetness but B 10 is the most widely accepted cultivar world wide. B 10 has broad, large, 12-14 cm, fruit which ripens yellow to yellow orange with smooth fine textured, juicy, sweet (brix 10-12% ) flesh.

Some attributes of a good cultivar are:

- (a) sweet and less tart with brix of >11% and low oxalic acid content,
- (b) good colour yellow to golden yellow,
- (c) Crisp, juicy, fine-textured not fibrous,
- (d) strong, broad ribs to withstand bruising,
- (e) good post harvest shelf life,
- (f) good yielder >40-60 mt/ha/year and
- (g) can withstand cold temperatures.

Yields of 150 kg/tree from 3 year old trees have been reported but average marketable yields of 100-120 kg are more realistic.

## GROWTH HABIT

Depending on where it is grown, carambola flowers and fruits nearly the whole year round. In northern Australian fruit can be harvested 9 months of the year. Although there are 6-8 flower flushes in carambola, basically there are only 2-3 major peaks per year. In Darwin, major flowering occurs in January-February, April to July and September-October, while peak fruit production occurs in April-May, July to early October, and December-January.

**Carambola cultivars introduced into Australia and sources in brackets**

<b>Short style</b>	<b>Long style</b>
B 2 (Malaysia)	B 1 - Yong Toh Yin (Malaysia)
B 4 - Sg. Besi 1 (Malaysia)	B 6 - Sg. Besi 3 (Malaysia)
B 8 - Sg. Besi 5 (Malaysia)	B 11 - Chan Yong 1 (Malaysia)
B 10 (Malaysia)	B 16 - R. Hamilton (Florida ex Malaysia)
B 17 - Crystal Honey (Malaysia)	Real B 2 - Maha 66 (Malaysia)
Fwang Tung (Florida ex Thailand)	Star King (Florida)
Lu Tho (Taiwan)	Maha (Florida ex Malaysia)
Wheeler (Florida)	Arkin (Florida)
Sri Kembangan (Hawaii ex Malaysia)	11-1 Kary (Hawaii, seedling from Sri Kembangan)
Pat Chun (Hawaii)	
9-4 (Hawaii)	
8-1- Kara (Hawaii)	

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