

## Balsam pear



Balsam pear (*Momordica charantia* L.) is a herbaceous vine. It is a member of the Cucurbitaceae family and is related to squash, melons and cucumbers. It is also known as bitter melon, fu kwa, bitter cucumber, bitter gourd, la kwa or nigari uri. This crop is widely grown in China, India, Japan, Mexico, Thailand, Taiwan, the US and, more rarely, in Australia. The most likely place of origin is China or India.

The vine is fast growing and crushed leaf material and entire fruits have a strong cucumber smell. Fruit are heavily warted and range from short and stubby to long and pointed. They are white or green but mature to orange-red. When mature, the fruit split open revealing bright red flesh and exposing the seeds. It is advisable not to eat the seeds because of their purgative effects.

The fruit are eaten when they are young and immature. Mature fruit have a bitter flavour due to the presence of an alkaloid, morodicine. As the fruit ripen their bitterness increases and they can become toxic to both people and animals. Therefore, fruit are harvested when immature and less bitter. The bitterness can be alleviated by soaking unpeeled fruit in salt water. While the bitterness of the fruit is an added attraction when used in combination with other vegetables, e.g. salads, it may prevent many people from eating balsam pear. Purchasers need to be advised about appropriate uses of this fruit, which include baking, frying or pickling.

The plant has some claimed medicinal uses. In Surinam the fruit is used to control diabetes so it may be possible to derive a type of insulin from the fruit. It is also claimed that the young fruit and shoots are a good source of vitamins A and C and iron.

Like any cucurbit, the crop thrives in areas where squash and melons grow best. Frost will kill the plants and low temperatures will delay plant growth. The crop needs to be supported if the fruit are to be kept off the ground although good results have been obtained by growing plants on a mulched bed.

Export opportunities for New Zealand are limited as the crop is so widely grown in other countries and is inexpensive. It may be more beneficial to target the locally developing Asian market with both fresh and processed forms, but some promotion of the crop's merits is warranted.

Balsam pear has been evaluated by Crop & Food Research and results indicate that the crop grows well in Hawke's Bay, Wairarapa, the Bay of Plenty and around Auckland.

### Growing conditions

Like any other cucurbit, balsam pear is shallow rooted and grows best on light, textured, free-draining soils. Although no specific fertiliser recommendations are available, the application of NPK, 12:10:10, at a rate of 200 kg/ha as a base dressing is a useful guide. However, a soil analysis should be carried out prior to sowing. A side dressing of nitrogen could be applied later depending on soil test results.

### Cultivars

Some cultivars are available from seed sources in New Zealand (e.g. Kings Seeds, Auckland), but it would be advisable to evaluate several cultivars before choosing one for large scale production.

### Seasonal effects

Plants are usually direct seeded as soon as any danger of frosts is past, usually in October. Suggested spacings are 50 cm in-row and 1.5 m between rows, providing 13 300 plants/ha. The plants can also be propagated first and then planted out, but care should be taken not to overly disturb the roots.

### Yields and harvesting

Fruit are harvested when they are about 10-15 cm long. The first harvest may take place about 70-80 days after planting. The first flowers are male and only remain open for about one day. The fruit may take about 10-15 days to mature. Potential yields are about 0.5 kg/plant with a fruit size of about 50-75 g. Yields may be around 5-6 t/ha. Fruit store well at 6-8°C for about two weeks without any visible loss of quality.

### Weed control

There are no registered chemicals for weed control in balsam pear crops, but control may be similar to that

applied in squash crops. Most weeds can still be effectively removed by mechanical or manual means. The stale seed bed technique will assist in removing many weeds just prior to sowing.



### Pests and diseases

No diseases were recorded during trials in Hastings, but aphids caused some damage. Cucurbit fungal diseases, like powdery mildew, will affect balsam pear.

### Irrigation requirements

Regular water applications will ensure even plant growth. Fruit development will also depend on an even water supply so there is a need for a reasonably moist soil at all times. This can be achieved by installing a trickle irrigation system and using the plastic mulch system. The latter will also aid in weed control.

### Potential

Balsam pear may not be a new crop to the growing local Asian population, but it is still a new crop to most other New Zealanders so there is a need to promote this crop. It grows well in moderately warm and relatively frost-free areas in New Zealand. There are no export opportunities for fresh export but process opportunities could be investigated further. Further cultivar evaluation is recommended.

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