



## Food: Just Grow It!



# MUSTARD CABBAGE

### Types & Climatic Requirements

Many types of leafy cabbages are used for vegetables, particularly in the Orient. These vegetables belong to several different species and there are many varieties of each, so the classification is confusing to most people. Green mustard cabbage (kai choy) and white mustard cabbage (pak choy) are two types commonly grown in Hawaii. Kai choy, *Brassica juncea*, includes the types called kai choy in Hawaii, the mustard greens grown in the southeastern United States, and the rai and sarson grown for oil seed in India and Pakistan. It is also called brown mustard and Indian mustard. The species is variable, with either smooth or hairy, entire or divided leaves, and narrow or wide petioles. It can be distinguished from pak choy by its somewhat lighter green leaves and shorter green petioles. Pak choy, *Brassica campestris* (Chinensis group) or *B. chinensis*, includes types called white cabbage, spoon cabbage, choy sam (Singapore), pechay (Philippines), and taisai and Shirona (Japan), as well as others. Pak choy has darker green leaves than kai choy, and white petioles rather than green. Some varieties of both vegetables are grown for their flowers and flowering stems rather than for the leaves. Both kai choy and pak choy grow well under high temperatures, although they will form larger plants and are slower to bolt (flower) when temperatures are cooler.

The type of kai choy preferred in Hawaii has wide petioles and forms a slight head with the innermost leaves. Of the two strains grown in Hawaii, the UH strain has a greater tendency to form a head and is somewhat darker green than the Waianae strain. Varieties obtained from Taiwan, Japan, or the mainland U.S. have either not grown as well or have not produced the right type of plant for the Hawaii

market. The type of pak choy preferred has dark green leaves and somewhat wide, white petioles which are upright and long. Seeds imported from Japan are usually used by local growers.

### Soil Management & Fertilization

Mustard cabbages do well on fertile, well drained soils with a good moisture holding capacity. If drainage is poor, seeds should be planted on raised beds: The pH should be between 5.5 and 7.0; and the soil should be free of nematodes. If nematodes are present, add 10 pounds of well-rotted chicken manure and 10 pounds of compost per 100 sq. ft. of soil before planting. Add lime if the soil is very acidic. Apply a complete fertilizer such as 8-8-8 at 3 to 4 lbs. per 100 sq. ft. Apply the fertilizer in two applications, half at planting time and the other half at thinning, about 3 to 4 weeks after planting. Place fertilizer in a band about 3 to 4 inches away from the base of the plants. Over-fertilization will result in plants that are too succulent and that may develop tipburn under warm conditions.

### Planting

Plant seeds directly in the field in rows spaced about 12 to 15 inches apart. At 3 to 4 weeks of age, before the plants start to become crowded, thin to about 10 to 12 inches in the rows for kai choy and 8 to 10 inches for pak choy. If thinning is delayed too long, the plants will become spindly and leggy, and may bolt before forming a useful plant.

### Irrigation & Cultivation

An abundant and continuous soil moisture supply is essential for the best quality. Insufficient moisture may

result in tipburn and slow growth with a loss of tenderness of the leaves. The best time to irrigate is during the morning hours to allow the leaves to dry before night, to prevent white rust infection.

## Insect & Disease Control

The most common insect pests of mustard cabbages are cutworms, aphids, thrips, red spider mites, cabbage webworms, and loopers. Caterpillars may be controlled with *Bacillus thuringiensis* insecticides. Other pests may be controlled with Neem or insecticidal soap sprays. Sprays containing rotenone and pyrethrin may be used up to 1 day before harvest. Mites can be controlled by spraying sulphur, which can be continued right up to harvest if necessary. Do not mix sulphur with other emulsifiable (liquid) insecticides or spreader stickers or wetting agents, especially in the warm and humid lowlands, as it may cause foliage injury.

The most common diseases of mustard cabbages are damping off, mosaic, white rust, and soft rot. Damping off and soft rot can only be controlled by planting in soil free of the causal organisms. Mosaic is best controlled by controlling the aphids which transmit the disease and removing any infected plants so they do not spread the disease. White rust can be controlled to some extent by reducing overhead watering to prevent the spread of fungal spores and pruning off infected leaves.

## Harvesting

Both kal choy and pak choy can be harvested for food before they are mature, and can be thinned by this method. For maximum yield, harvest at the mature stage, which is 45 to 50 days after planting. Cut off the whole plant at ground level and remove any damaged outer leaves. Harvest before the flower stalk begins to appear, except for the flowering types.

## Seed Availability

For the purposes of the Food: Just Grow It! Project, seeds of mustard cabbage are available from the project directors at the University of Hawaii.

**Information from:** University of Hawaii, College of Tropical Agriculture and Human Resources Home and Garden Vegetable Series No. 10.

<b>Nutrition Facts</b>	
Serving Size 1/2 cup (64g)	
Servings Per Container	
Amount Per Serving	
<b>Calories</b> 15	Calories from Fat 0
% Daily Value*	
<b>Total Fat</b> 0g	<b>0%</b>
Saturated Fat 0g	<b>0%</b>
<b>Cholesterol</b> 0mg	<b>0%</b>
<b>Sodium</b> 460mg	<b>19%</b>
<b>Total Carbohydrate</b> 3g	<b>1%</b>
Dietary Fiber 2g	<b>8%</b>
Sugars --g	
<b>Protein</b> 1g	
Vitamin A 10%	• Vitamin C 0%
Calcium 4%	• Iron 2%
*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:	
	Calories: 2,000 2,500
Total Fat	Less than 65g 80g
Saturated Fat	Less than 20g 25g
Cholesterol	Less than 300mg 300mg
Sodium	Less than 2,400mg 2,400mg
Total Carbohydrate	300g 375g
Dietary Fiber	25g 30g
Calories per gram:	
Fat 9 • Carbohydrate 4 • Protein 4	