

Costs and Returns Analysis Per Hectare

ITEMS	AMOUNT (P)
VARIABLE COSTS	
A. Labor (@P220/MD; P440/MAD)	
Plowing (5 MAD)	2,200.00
Harrowing (3 MAD)	1,320.00
Bedding (5 MAD)	2,200.00
Manure application (10MD)	2,200.00
Seedling production (15MD)	3,300.00
Transplanting (10MD)	2,200.00
Fertilization (3x) (6MD)	1,320.00
Mulching (10MD)	2,200.00
Weeding (20MD)	4,400.00
Irrigation (20MD)	4,400.00
Spraying (10MD)	2,200.00
Harvesting (10MD)	2,200.00
Miscellaneous activities (20MD)	4,400.00
Subtotal	34,540.00
B. Materials	
Seeds (280 g/ha)	2,500.00
Animal manure (10t)	10,000.00
Fertilizer: 14-14-14 (5 bags)	4,750.00
46-0-0 (6 bags)	6,300.00
0-0-60 (3 bags)	2,850.00
Chemical sprays	10,000.00
Fuel and oil	5,000.00
Miscellaneous	10,000.00
Subtotal	51,400.00
Subtotal (A + B)	85,940.00
C. Contingencies (15%)	12,891.00
GRAND TOTAL	98,831.00
Gross Income	450,000.00–600,000.00
Net Income	351,169.00–501,169.00

With marketable yield of 15–20 t/ha at a farmgate price of P30/kg.

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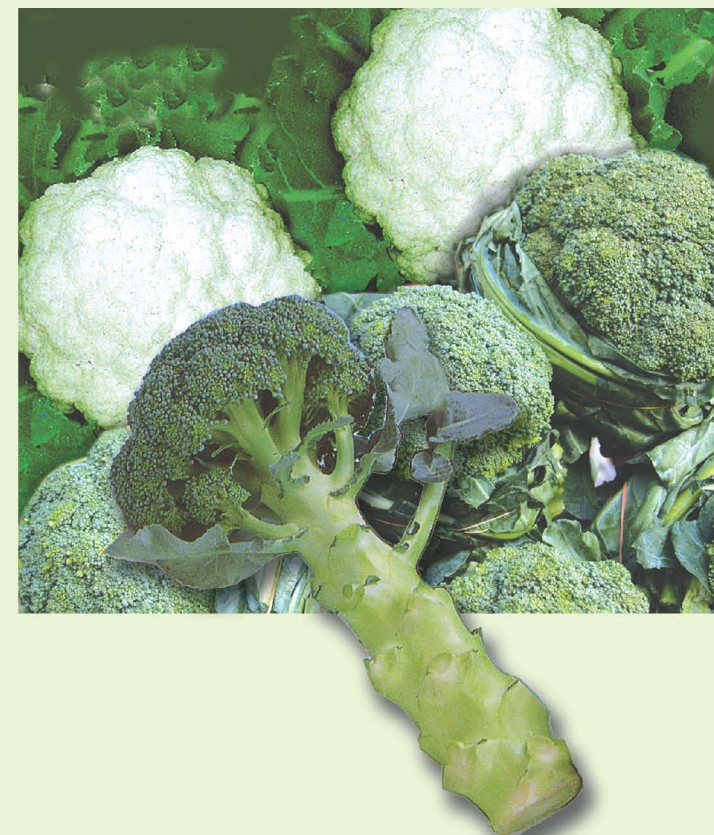
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Broccoli and Cauliflower Production Guide



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Introduction

Broccoli (*Brassica oleracea* L. var. *italica* Plenck) is one of the most expensive vegetables in the Philippines. It can be boiled, steamed, stir fried, or sautéed with other vegetables. It is fairly high in vitamin A, vitamin C, calcium, iron, thiamine, riboflavin, and niacin. Broccoli is being cultivated in about 207 ha, mainly in Benguet (157 ha) and Bukidnon (50 ha) (Bureau of Agricultural Statistics 2005).

Cauliflower (*Brassica oleracea* L. var. *botrytis* L.) is another popular crucifer grown mainly in cooler areas. It is steamed, stir fried, or pickled. Cauliflower is grown in 1,017 ha, mainly in Ilocos Sur (450 ha) and Benguet (340 ha) (Bureau of Agricultural Statistics 2005).

Nutritional Value

Per 100 g fresh edible portion, broccoli curd contains:

Properties	Amount
Water (g)	88.0
Protein (g)	4.0
Fat (g)	0.30
Carbohydrates (g)	6.0
Fiber (g)	1.5
Calcium (mg)	150
Potassium (mg)	325
Carotene (mg)	800
Vitamin C (mg)	100
Energy Value (kj)	245
Values are similar for cauliflower except for its lower calcium (25 mg), carotene (200 mg), and vitamin C (40 mg) contents.	

Source: Siemonsma, J.S. and Piluek, K. (Editors). 1994. PROSEA Handbook No. 8. Vegetables. Pudoc, Wageningen. 1993/Prosea, Bogor.

Production Management

Commercial Varieties

Broccoli	
Green King	Shigemori
Green Pia	Sonata
Pinnacle	Tender Green

Cauliflower	
CHL 313	Snow Queen
Montblanc	White Island
Silver Cup 40	White Shot

Soil and Climate Requirements

Broccoli and cauliflower grow well in mid-and high-elevation areas throughout the year. These also grow in low-elevation areas from November to February and thrive best in well drained loamy soil with pH 6.0–6.5.

Land Preparation

Plow and harrow the field twice. For single row planting and raised beds, make furrows 0.5 m apart. For double row planting, 0.75–1.0 m wide, 0.5 m apart. Apply 1 kg fully decomposed chicken manure and 300 g carbonized rice hull/m². Incorporate thoroughly with the soil.

For single row planting, make holes 0.3 m between hills, and for double row planting, 0.3 m between hills and 0.4 m between rows. Wet the holes, apply 10 g 14-14-14 in each hole, then cover lightly with soil.

Seedling Production

About 280 g of seeds per hectare is required. Prepare 1-m wide seedbed at any desired length. Pulverize the soil and incorporate 1 kg fully decomposed chicken manure or compost and 300 g carbonized rice hull/m². Wet the seedbeds and make shallow lines across the beds, 7–10 cm apart. Sow the seeds thinly and cover lightly with soil. Mulch with rice hull, chopped rice straw, or cogon, and water regularly. Provide partial shade during the dry season and rain shelter or clear plastic roofing during the wet season. In case of diamondback moth and cutworm infestation, spray with hot pepper solution (100 g macerated hot pepper/16 L water) plus 1 tbsp soap, or apply pesticides at recommended rates. Harden the seedlings at one week before transplanting by exposing fully to sunlight and watering only when the plants show signs of temporary wilting. Transplant the seedlings at three weeks after emergence.

Transplanting

Water the seedbeds to loosen the soil and carefully uproot the seedlings by using a dibble. Transplant one seedling per hole. Irrigate before and after transplanting. Replant missing hills at once.

Mulching with rice straw, rice hull, or mulching film is recommended to suppress weed growth and conserve soil moisture.

Fertilization

Sidedress with 46-0-0 at a rate of 5–10 g/plant two weeks after transplanting. Repeat sidedressing at 30 and 45 days after transplanting with 10 g/hill of 2:1 mixture of 46-0-0 and 0-0-60. Fertilize after each weeding. Tea manure may be applied weekly as source of micronutrients. To prepare, soak ¾ sack dry cow/horse manure in a plastic drum filled with 189.25 L water for seven days. Fermented plant juice may also be used every two weeks to boost plant vigor. To prepare, mix equal parts of chopped actively growing plant parts and molasses or brown sugar. After one week of fermentation, extract the juice and apply as foliar fertilizer at 1 tbs/3.785 L water.

Irrigation

Irrigate the field weekly by furrow irrigation or two-three times/week by sprinkler irrigation. Mulching helps minimize frequency of irrigation.

Pest and Disease Management

Diseases/Insect Pests	Control
Damping-off	Drench seedbed with fungicide before sowing, sow thinly, regulate watering
Black rot	Crop rotation, thorough land preparation, spray fungicide at the first sign of infection
Soft rot	Uproot and burn infected plants, crop rotation
Diamondback moth	Plant different types of crop, remove and burn debris of previous crop, Bt (<i>Bacillus thuringiensis</i>) spray, pesticide spray
Cabbage looper	Spray with hot pepper solution, Bt spray, pesticide spray
Cabbage webworm	Spray with hot pepper solution, pesticide spray
Aphids	Spray with hot pepper solution + 1 tbsp soap, pesticide spray

Harvesting

Harvest when curds are well formed. Include portion of stems and leaves. If possible, harvest early in the morning and avoid exposure to high temperatures to maintain good curd quality. Use top icing (placing of a 2- to 4-in layer of crushed ice over the top of pallets of precooled produce) to prolong shelf life.