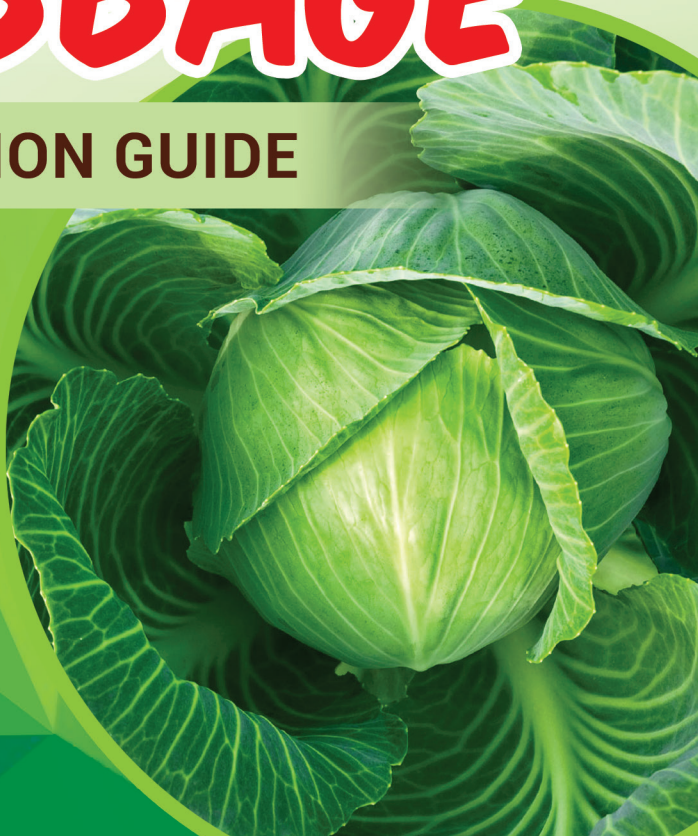
DEPARTMENT OF ARICULTURE
Regional Field Office No. 02
Tuguegarao City, Cagayan

CABBAGE

PRODUCTION GUIDE



Cabbage

Production Guide

This Publication is a project of the **Department of Agriculture, Regional Field Office No. 02, High Value Crops Development Program.** It contains the most recently available and locally adaptable technical information on **Cabbage Production** in Region 02.

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Introduction

Cabbage (*Brassica oleracea var. Capitata Linn.*) is considered an important part of a well-balanced diet. It is usually eaten fresh or combined with other food. It contains protein, carbohydrates, vitamin and different minerals which are essential body requirements. Aside from its high economic returns, cabbage is also considered a nutritious vegetable. It has high vitamin C content and a good source of minerals, especially calcium and phosphorus. Cabbage is often prepared into salads, soups and kraut.

Climatic and Soil Requirements

Cabbage grows best in a cool and moist climate. However, it can grown successfully in the lowlands during the cooler months of the year.

Although cabbage can be planted in different soil types, it grows best in sandy loam soil with a pH range of 6.0-6.8

Its temperature requirements usually range from 15^0c – 20^0c but it may vary according to its variety used.

Varieties

Select varieties adapted to the condition in the locality. The following are recommended for the lowlands of Region 02

Rare ball
Haya
Copenhagen Market
NIZ 9183 F1
Resist Crown
Blue Jays

CULTURAL MANAGEMENT PRACTICES

Land Preparation

Prepare the land thoroughly. Plow and harrow the field 2-3 times at one week interval. For commercial scale production, prepare furrows at a distance 30-50 cm to form ridges. In backyard gardens or in areas where drainage is poor, make raised beds about 100 cm wide.

Seedling Establishment

Grow seedlings in seedbeds or seed boxes, depending on the area to be planted. Prepare seedbed measuring about 1m x 10m in a level area fully exposed to sunlight and accessible to water source. For small scale production, construct seed boxes and fill with a mixture of 2 parts garden soil, 2 parts well-decompose manure, 1 part sand, 1 part compost and 2 parts rice hull ash.

Sterilize the soil mixture or seedbed by drenching with boiling water or burning rice straw on top of the bed. In case of hot water treatment, cover the seedbed or soil mixture with plastic sheets until the bed cools.

Water the seedbed/seedboxes before sowing the seeds. Prepare furrows across the beds/boxes at 5 cm apart Water the seedbed/ seedboxes before sowing the seeds. Prepare furrows accross the beds/boxes at 5 cm apart. Sow about 10 seeds per cm. About 200 grams seeds is required per hectare.Cover the seeds lightly with soil. To protect the seeds from soil insects, dust the sorrounding of seedbed/seedboxes with Sevin 85S, Furadan 3G or any appropriate insecticide. Saturate the seedbeds/seedboxes with water for the first 3 days. Regulate watering after seed emergence.

Thin sturdy and disease-free seedlings a week after emergence and prick these at 5 x 5 cm apart in beds/boxes intended for this purpose.

Dissolve 3 tbsp of 14-14-14 (complete fertilizer) in one gallon of water and apply to every square meter seedbed/seedboxes one week after pricking. Sprinkle pure water immediately after fertilizer application to avoid burning of leaves.

To produce hard and vigorous seedlings, harden the seedlings by withholding water or watering only the seedbed/seedboxes when the seedlings exhibit temporary wilting. Hardening is done one week before planting.

Transplanting

For upland field, transplant one-month old seedlings on ridges at a distance of 50 cm between rows and 40 cm between hills. In raised beds,use the double row system with a planting distance of 50 cm x 40 cm.

To prevent transplanting shock, transplant late in the afternoon. Cover the seedlings with any covering materials like banana stalk, leaves, etc.

Care of Plants

Water the plants immediately after transplanting. In large-scale production furrow irrigation is advisable. Frequency of irrigation depends on soil condition and occurence of rain. However, minimize watering when the plants start to develop heads to reduce rotting and cracking.

Apply complete fertilizer (14-14-14) at the rate of 3 bags/ hectare 3-5 days after transplanting (DAT). Sidedress 3 bags of urea 30 DAT about 6-8 cm away from the base of the plants.

Pest Management

Pests

1. Diamond Backmoth *(Plutella xylostella L.)*

Nature of damage: The young light green larvae first feed on the leaves as miners, then progressively feed by making small holes.

Control: Spray with insecticides at recommended rates. Another is to use neem leaves to control pests at the rate of 500g neem leaves/liter of water.

2. Common Cutworm *(Spodoptera litura)*

Nature of damage: Feed on young and mature leaves of the host making large holes on leaf blades.

Control: Spray with insecticides

3. Cabbage Moth *(Croccidolomia binotalis)*

Nature of Damage: Larvae feed on the leaves with preference on the growing point or bud and bore into the forming heads.

Control:Use neem leaves extract to control pest.

4. Aphids

Nature of damage: Soft-bodied insects that cluster on young leaves and lower side of old leaves.

Control: Remove the affected plant parts and burn. Spray with insecticides.

Diseases

1. Damping off

Nature of damage: Falling down of seedlings just after germination. The base of the plant stem is drying out.

Control: Avoid too much watering. Spray fungicide.

2. Head Rot

Nature of damage: Caused by fungus present in the soil. Attacks the plants before early head formation and maturity. Infected plants start to decay at the base of non-wrapper leaves which become wilted and pallid. The plant turns brown then black

and decays.

Control: Remove the affected plants/plant parts and bury or burn. Avoid soiling of cabbage leaves during cultivation. Irrigate the field regularly to keep the soil temperature low. Apply fungicide at the base of the plant.

3. Anthracnose of Pepper

Nature of damage: Anthracnose may occur in the field and develop as a post-harvest decay of pepper fruits. Typical symptoms appear on mature fruits such as small water-soaked lesions that expand rapidly. Lesions may be covered with raised, dark, fungal tissues which may appear in concentric rings.

4. Cercospora Leaf Spot

Nature of damage: Early symptoms appear as small, circular, water-soaked spots on leaves which later enlarge up to 1 cm or more in diameter. Typical lesions are brown and circular with small to large light gray centers and dark brown margins. Several spots may coalesce causing the entire leaf to turn yellow and drop without yellowing.

The occurence of insect pests and diseases reduce the yield and eventually the quality of produce. To prevent the attack of pests, employ the following measures:

- Removal/cracking of insect pests egg masses.
- Crop rotation
- Intercropping non-host plants
- Early planting
- Proper fertilizer application
- Roughing of diseased plants
- Field sanitation
- Use of pesticide (as last resource)

Weeding

Control weed growth as early as possible through cultivation and handweeding.

To control weed growth and conserve soil moisture, mulching with rice straw may be applied immediately after transplanting. Plastic mulch may also be used. Place this just before transplanting.

Harvesting

Cabbage heads are ready for harvesting 55-60 days after transplanting. That is when the heads become firm and compact. Include several wrapper leave for protection. Discard and bury rottingheads or heap in compost pits. Treat the base of the marketable heads with lime or alum solution to prevent rotting.

The heads will split when over mature; rapid growth due to excess moisture and fertility will also cause splitting.

Health Benefits of Cabbage:

1. Cabbage contain phytonutrients, works to protect the body from free radicals that can damage the cell membranes. Phytonutrients also signal our genes to increase its production of enzymes involved in detoxification. Cabbage may lower the incidence of cancer, especially in the lung, stomach and colon prostrate.
2. Cabbage is a muscle builder, blood cleanser and eye strengthener.
3. The juice of fresh raw cabbage has been proven to heal stomach ulcer.
4. Cabbage is rich in iron and sulfur.
5. Juice of fresh cabbge is effective in treating fungus infection (due to sulfur content).
6. Cabbage can lower serum cholesterol. (15 MD)
   Cabbage contain Sulforaphane, a substance that can increase the production of antioxidant and detoxification enzymes.

Sulforaphane works by stimulating the production of glutathion, the body's most important internally produced antioxidant.

For optimum quality of produce, harvest when the heads are firm and compact. This appears about 50-55 DAT. In harvesting, cut the head with 2-3 non-wrapper leaves to serve as protection during transport. Wrap the produce with old newspaper before packing. Pack properly in net sack, plastric crates or wooden containers.

COST AND RETURN ANALYSIS PER HECTARE

ITEMS	AMOUNT
A. LABOR (250/MD; 500 MAD)	
Plowing (6 MAD)	P3,000
Harrowing (6 MAD)	3,000
Bedding (5 MD)	1,250
Manure application (10 MD)	2,500
Seedling production (10 MD)	2,500
Mulching w/ rice straw (20 MD)	5,000
Transplanting (15 MD)	3,750
Replanting (2 MD)	500
Fertilization (2 MD)	500
Sidedress (10 MD)	2,250
Irrigation (10 MD)	2,500
Spraying (10 MD)	2,500
Weeding (10 MD)	2,500
Harvesting (15 MD)	3,750
Washing/sorting/packing (20 MD)	5,000
Sub-Total	P40,750

B. MATERIALS	
Seed (200 grams/ha)	3,600
Fertilizer:	
Organic fertilizer (20 bags)	5,000
14-14-14 (3 bags)	3,000
46-0-0 (3 bags)	2,940
0-0-60 (3 bags)	6,000
Chemical sprays (Insecticide/Fungicide)	5,000
Fuel & oil	5,000
Miscellaneous	3,000
Sub-Total	**P33,540**
Grand Total	**P34,290**

Gross Income
Regular Season – (P10/kg w/ 25t/ha yield)=P250,000
Offseason –(P20/kg w/ 15t/ha yield) =P300,000

Net Income
Regular Season – P250,000 - P74,290 = P175,710
Offseason - P300,000 – P74,290 = P225,710

References:
1. *Cultural Directions fir Philippine Agricultural Crops, 1986*
2. *Agriculture Magazine, November, 2010*

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