

CABBAGE

POST-HARVEST
HANDLING
AND STORAGE

**Shika Agblor and Doug Waterer, Department of Plant Sciences,
University of Saskatchewan (June, 2001)**

Maturity

Determining the optimal time to harvest cabbage is often difficult. The decision to harvest may be based on overall appearance such as when the wrapper leaves are spread and the head is exposed and firm to touch. Generally, mature cabbage have good head formation and have good weight in comparison to size. Mature cabbage have a longer post-harvest lifespan and have better use of storage space than immature cabbage because the heads of the mature crop are dense.

Harvesting, Handling & Storage

To maximize storage potential of cabbage, store as cold as possible without freezing. Heads should be trimmed to remove loose wrapper leaves prior to storage. Defective cabbage showing signs of insect damage, freezing damage, sunscald and bruising should be discarded or marketed prior to storage. Harvesting cabbage as soon as mature will prevent cracking of heads.

Cabbage cultivars vary in their ability to store for extended periods of time. Dense-headed cultivars which mature slowly store for longer periods. Cabbage intended for long-term storage (5-6 months) should be stored at 0°C and 98-100% relative humidity.



A number of physiological disorders occur in stored cabbage. Oedema, is characterized by rough, brown dots on the undersurface of leaves caused by erratic watering during the growing season. Black speck and pepper spot occur as numerous dark spots on leaves which develop a few weeks into storage; freezing damage results in water-soaked leaves which usually lead to decay. Vein streaking also occurs during storage of cabbage, and is characterized by brown marks on the midrib of outer leaves. These physiological disorders can cause significant economic losses and the incidence varies with growing conditions and cultivar. Some of these disorders can be prevented by controlled atmosphere (CA) storage.

Storage Diseases

The major post-harvest diseases in cabbage are caused by *Botrytis* and *Sclerotinia*. These rots occur as dark lesions on the outer leaves, and progress inwards until the whole head is infected. Signs of rots are often visible 3-4 months into storage.

Storage diseases can be controlled by (1) preventing wounds, (2) storing at optimum temperature, (3) CA storage, and (4) pre-harvest application of a registered fungicide such as Rovral.

For further information on registered fungicides contact your Rural Service Centre or the Provincial Vegetable Specialist, Saskatchewan Agriculture and Food.

Benefits of CA Storage

Cabbage intended for long-term storage may require CA storage to be competitive in price and quality with imported cabbage. Storing cabbage at 0-1°C, 95-98% relative humidity in a controlled atmosphere with 3-5% oxygen and 5-7% carbon dioxide has been found to improve the quality of stored cabbage.

The benefits of CA storage include:

- (1) Control of fungal diseases
- (2) Control of physiological disorders (vein-streaking, grey speck and pepper spot)
- (3) Retention of bright green colour
- (4) Maintenance of crispness and fresh flavour
- (5) Reduction in weight and trimming losses.

Controlled atmosphere storage is costly to establish and maintain. Growers will need to determine if the benefits of CA (longer storage life and superior quality) are sufficient to cover the added cost of constructing and maintaining a CA storage.

Further Reading

Bérard, L.S., B.Vigier, R. Crête, and M. Chiang. 1985. Cultivar susceptibility and storage control of grey speck disease and vein streaking, two disorders of winter cabbage. *Canadian Journal of Plant Pathology* 7:67-73.

Chipman, E.W. and E.Thorpe. 1979. Effect of maturity and frost on the leaf colour of storage cabbage. *Canadian Journal of Plant Science* 59:429-435.

Sundstrom, F.J. and R.N. Story. 1984. Cultivar and growing season effects on cabbage head development and weight loss during storage. *HortScience* 19:589-590.

Acknowledgement

This fact sheet was generated from the Agri-Food Innovation Fund (AFIF) Post-harvest Specialist Program. The cost of printing was covered by the AFIF Technology Transfer Program.



Canada  Saskatchewan



Shika Agblor and Doug Waterer, Department of Plant Sciences,
University of Saskatchewan (June, 2001)