

College of Agriculture & Life Sciences
 Department of Horticultural Science

CABBAGE PRODUCTION

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Cabbage is grown commercially in eastern North Carolina as both a spring and fall crop, and in the mountains as an early summer and fall crop. Cabbage acreage in North Carolina averages 10,000 to 12,000 acres. The biggest problem in growing this crop is insect control.

Soils — Cabbage grows well on a wide variety of soils, but a well-drained sandy loam with high organic matter content is preferred. Avoid soils that dry rapidly.

Plants — It is best to grow your own plants. If plants are purchased, deal with a reputable plant grower and have them **certified** by inspectors from the N.C. Dept. of Agriculture. Using certified plants will reduce the chance of disease and result in more uniform stands. (See Ext. Bulletin AG-337, *Commercial Vegetable Transplants*, for more details on plant production.) Some recommended varieties are described in Table 2: Recommended cabbage varieties and tolerance.

Rotation — Never grow cabbage or related crops on the same soil more than once every 3 years. This is necessary to control various root rots. If club root is a problem, broadcast and disk in 1500 lb of hydrated lime per acre 2 to 3 days prior to transplanting. Do not do this more than once every 3 years.

Spacing — Transplant plants or space seed 9 to 12 inches apart in rows 36 to 44 inches wide for 2- to 3-lb heads. When larger heads are

desired, increase spacing in row. Using double rows per bed will increase yields 30 to 50% or more. To create double rows, place transplanter in tandem or two seeders side by side. If double rows are used, in-row spacing should be 12 to 14 inches. Plants in double rows compete with weeds better and produce a more uniform crop.

Table 1: Planting dates.

Area	Seeding Dates	Transplanting Dates
Eastern (Spring crop)	Sept. 20- Oct. 20	February
Eastern (Fall crop)	Seed directly into field from July 15- Sept. 15	
Western (Early crop)	Feb. and March	March 15- May 10
Western (Fall crop)	May 1- June 15	June 1- June 15

Direct Seeding — Use a precision seeder like an Accord, Gaspardo, Stanhay or Nibex to place a single seed at desired spacing. Place seed 1/2 to 3/4 inch deep in well prepared soil. Plan to irrigate every 3 days until seedlings are established. Precision seeding reduces or eliminates the need for and cost of thinning. Place seed every 6 to 9 inches in the row. If double rows are used, in-row spacing should be 12 to 14 inches.

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Bolting — When cabbage forms a seed stalk (begins flowering) prematurely, it is called “bolting.” This is only a problem in spring crops. Some are more tolerant than others. “Market Prize” is extremely susceptible and is very often a problem variety in spring if plants are grown in eastern N.C. Florida-grown plants of “Market Prize” have not been as susceptible to bolting.

Overwintering — In extreme eastern N.C., along the sounds and in most of the southeastern part of the state, cabbage can overwinter. These plantings should be considered *with caution*, because winter kill and/or bolting can occur in some years causing complete crop loss. “Bravo,” “Green Cup,” “Rio Verde,” and “Conquest” are good varieties to use for overwintering. Plant seed October 15 to 30 or transplant November 20 to 30 for best results.

Fertilization — Apply lime and fertilizer according to a soil test report. The pH should be 6.0 to 6.4. If the soil is not tested, use 800 lb per acre of 10-10-10 containing 10 to 20 lb of borax per ton. **CAUTION:** Green peas or beans should not be planted behind cabbage, because relatively low levels of boron may be toxic to these plants. To avoid root burning, broadcast one half the fertilizer and disk in. The remaining half can be banded. In eastern N.C., when planting cabbage behind potatoes, the base fertilizer application may be reduced. If boron is not added to the fertilizer, spray 10 lb of Solubor or 2 quarts of N-Boron per acre directed to the base of the plant.

Sidedressing — Apply 25 to 30 lb of nitrogen per acre 2 weeks after transplanting or 4 to 5 weeks after direct seeding. Cabbage plants need this as they begin growing. Apply another nitrogen sidedressing 3 weeks later. Cabbage has a high nitrogen requirement early in its growth.

Weed Management* — Cabbage is a shallow-rooted crop. Cultivation should be shallow (2 inches or less) and only as needed to control grass and weeds. Chemicals for weed control are available and generally perform very satisfactorily. Do not depend solely on postemergence materials.

Insect Management* — Several insects, such as cabbage worm, cabbage looper, aphids, flea beetle, diamond back moth, and cabbage maggot (mountain counties only), present problems for the cabbage grower.

Because of the complexity of the problem, it is suggested that growers work closely with their local cooperative extension agent in selection of materials and methods of application.

A control program must be started early. This is especially true for the cabbage looper and other worms. Generally the insect problem is much greater on summer and fall crops, compared to spring crops.

Disease Management* — Disease control begins with seed treatment for black rot control. Plant certification ensures freedom from black rot and keeps this problem in check. If you do have black rot in a field, remove the first infected plants, if practical, and wash equipment before moving to other fields. Also, do not enter field when plants are still wet. All this will help reduce black rot spread.

*A complete list of pests and control materials are published annually in the *1999 North Carolina Commercial Vegetable Recommendations* (AG-586). For more complete information, obtain a copy of *Commercial Cabbage, Broccoli and Greens Production in NC*, AG-487.

Harvesting And Packing — Harvest only those heads that are well-formed and firm. Some varieties mature uniformly while others are variable. For this reason some varieties can be harvested in 1 or 2 cuttings while others will require selective cuttings 3 or more times. Harvesting aids such as conveyors reduce labor cost, improve efficiency, and reduce bruising. Putting a shelter on these aids also allows harvest in inclement weather.

Usually, the market requirement is for those heads that average around 2 to 2 1/2 lb each (20 to 23 heads per crate). Excessively large heads should be packed separately or discarded. Cabbages are also sold in bags or wire bound crates that hold 50 lb.

Never throw cabbage into a wagon or cart. Have someone catch the head and place it in the cart. Better yet, use a conveyor to load bulk boxes or cartons. Conveyors reduce harvest cost and speed harvest. Packing in the field will increase harvesting efficiency.

Once cabbage is cut, move it out of the sun as soon as possible. Cabbage will “sun blister” and lose weight in direct sun. Cool cabbage to 40°F before shipment to

improve shelf life and reduce rot. Cabbage can be stored at 32°F and 98% humidity for up to 5 months.

Yield — A good average yield is 10 to 12 tons per acre (400 to 500 crates). Some growers will produce well over this amount.

Steps to Successful Cabbage Production

1. Select a site with well-drained soil.
2. Test soil for fertilizer, lime and nematodes.
3. Choose a proper variety.

4. Use certified plants or have them certified.
5. Use seed treated for black rot control.
6. Use close spacing and consider double rows per bed.
7. Add boron to the fertilizer.
8. Supply 80 lb of N per acre preplant.
9. Sidedress.
10. Wait for plants to dry before cultivating.
11. Use high pressure sprays for insect control.
12. Pack carefully and avoid bruises.
13. Keep cabbage in shade after harvest.

Table 2 (Part I). Recommended cabbage varieties and tolerance.

Variety	Size	Yellows Resistance	Black Rot Resistance	TipBurn Tolerance	Shape	Color	Days	Hybrid
Applause	L	+	+	0	globe	G	72-78	+
Atlantis	M	+	+	0	globe	G	80	+
Blue Bayou	M	+	+	0	globe	BG	75	+
Blue Dynasty	M	+	+	0	round	BG	75	+
Blue Gem	M	+	0	0		G	78	+
Blue Vantage	M	+	-	+	globe	BG	84	+
Bravo	SM	0	0	0	round	G	78-83	0
Cardinal	L	+	0	0	oval	R	85	+
Conquest	ML	+	-	0	globe	BG	75-80	+
Discovery	S	+	0	0	round	BG	80	+
Gideon	M	+	+	+	round	DG	83	+
Gourmet	SM	+	0	0	round	BG	70	+
Green Cup	M	+	+	-	flat	rd.	G98	+
Head Start	S	0	0	0	globe	G	65	+
Market Prize	M	+	-	0	globe	MG	76	+
Morris	SM	+	-	+	round	G	67	+
Quisto	M	+	++	+	flat rd.	G	88	+
Ramada	M	+	+	+	round	BG	83	+
Red Acre	S	0	0	0	round	R	75-80	-
Red Rookie	M	0	0	0	round	R	78-82	+
Rio Verde	M	0	-	0	round	BG	80-85	+
Ruby Ball	SM	0	0	0	oval	R	90	+
Savoy Ace	ML	+	0	0	flat	rd.	85-90	+
Showboat	ML	+	+	0	globe	G	80-84	-
Solid Blue 760	ML	+	+	0	oval	BBG	76	+
Solid Blue 780	ML	+	+	+	round	BG	78	+
Sombrero	ML	0	0	0	round	RG	70	+

+ = tolerance or resistance or high level. S = small, M = medium, L = large.

0 = no tolerance or unknown. G = green, R = red, BG = blue-green.

- = lack of tolerance. S = spring, F = fall.

Table 2 (Part II). Recommended cabbage varieties and tolerance.

Variety	Spring/Fall	Uniform
Applause	SF	-
Atlantis	SF	+
Blue Bayou	SF	++
Blue Dynasty	SF	++
Blue Gem	SF	0
Blue Vantage	SF	++
Bravo	SF	+
Cardinal	SF	0
Conquest	S	+
Discovery	SF	++
Gideon	SF	+
Gourmet	SF	++
Green Cup	SF	0
Head Start	S	++
Market Prize	S?F	0
Morris	SF	++
Quisto	SF	0
Ramada	SF	+
Red Acre	S	0
Red Rookie	S	0
Rio Verde	SF	0
Ruby Ball	SF	0
Savoy Ace	S	0
Showboat	S	0
Solid Blue 760	SF	0
Solid Blue 780	SF	0
Sombrero	SF	0

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