



BULB ONION PRODUCTION IN EASTERN NORTH CAROLINA

Douglas C. Sanders, Extension Horticultural Specialist

The onion is a cool-season crop that will withstand moderate freezes. It may be grown either by seeding directly in the field, or by setting transplants. North Carolina growers have an excellent market opportunity in June and July when very few onions are available. Yield will range from 400 to 800 (50-lb) sacks per acre depending on the year and cultural practices. A premium is paid for large onions during our harvest season.

Soils – Any fertile, well-drained, loamy soil, fairly high in organic matter, with a pH of 6.0 to 6.5, is suitable for onion production.

How to Plant – Onions may be planted in one of the following ways:

1. Planting the seed directly in the field and thinning to the proper stand. Seed should be sown in late fall or early spring (Sept. 10 to Oct. 15 or Jan. 15 to Feb. 25) about $\frac{1}{2}$ to $\frac{3}{4}$ inch deep with about 8 to 12 seeds per ft of row. This will require 2 to 4 lb of seed per acre if 2 seed lines per bed are used. This system will result in a good yield of medium sized onions. If larger bulbs are desired, space seed 4 inches apart and use $\frac{1}{2}$ lb of seed per acre. Onions grown from sets do not make the best bulbs, are rather costly, and are not recommended for commercial plantings in this area. Precision seeding assists in producing large bulbs which bring the best price.

Place seed 3 to 4 inches in the row. If a Stan Hay planter is used, plan to have seed coated. If a vacuum planter is used do not coat seed. Plant seed $\frac{1}{2}$ to $\frac{3}{4}$ inch deep. If plants become too large (greater than the diameter of a pencil) during late November and December, then undercut 2 inches below the surface to keep onions from getting too large and being more subject to bolting.

2. Transplants can be set from late December through February. Plants should be about 6 inches high and about half the thickness of a lead pencil at the time of transplanting. Set plants at a uniform depth, with the bottom of the plant about 1 to 1.5 inches below the surface of the soil. Set 2 to 4 plants per ft of row for large bulbs and 4 to 6 per ft for medium bulbs. When setting plants it is best to use a “wheel-marker” so that the labor will set the plants at a uniform spacing.

Plant Growing – Most often, plants are purchased from certified plant growers in more southern states. Growers may raise their own plants by seeding in protected beds in early fall. These seeds are drilled about $\frac{1}{2}$ inch deep and in rows about 4 inches apart at the rate of 8 to 10 seeds per inch. About one lb of seed is required to produce plants to set one acre. One acre of plant bed space will produce sufficient plants to set about 10 acres in the field. Seeds should be planted

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should be planted October 1 to 15. Beds should be protected when temperatures reach 20°F or below.

Varieties – Because onions are a cool season crop, those planted too early in the fall may bolt (go to seed). This results in small bulbs with large necks which are hard to cure and are generally not usable. Onions planted at the time suggested above should not bolt unless extreme weather conditions exist.

Onion varieties are classified into groups according to when they bulb. Regardless of when they are planted, varieties won't form bulbs until the days are long enough for them to do so. Varieties that bulb in a 10- to 12-hour day (short day) are desired in eastern North Carolina for May to June harvest. It is also desirable to have an onion that has a small neck when mature. Juno has high cold tolerance but is more pungent than Grano types. Some new varieties, classed as intermediate or long day types (14 to 16 hours), have potential for harvest in June and July. Recently, long day- and intermediate day-type onion varieties have been developed that are well-adapted to N. C. conditions. They all have been very resistant to bolting and have produced good yields of large bulbs when overwintered. Some of the varieties overwinter very well. See Table 1 to choose your varieties.

Fertilizer – Apply 400 to 500 lb of 10-10-20 fertilizer per acre, under the seed line 7 to 10 days before planting. Sidedress with 30 to 40 lb of nitrogen when plants are about one-third grown or when growth begins in the spring. Make additional applications every 3 to 4 weeks later. If heavy rains leach out the nitrogen, apply another

sidedressing when plants are about half grown. Heavy nitrogen application later in the season may result in necks that are too large.

Spacing – Row spacing will depend on cultivation equipment available. Seed should be spaced 2 to 4 inches in the row depending on desired size for market. Plant 2 to 4 rows (10 to 12 inches apart) on beds 36 to 60 inches apart. Transplants should be spaced 3 to 4 inches apart in the row. Planting on shaped beds will insure better drainage and make possible the operation of pulling the soil away from the bulbs at time of maturity to hasten drying and facilitate digging.

Weed Control – Growth and yields are considerably reduced by weeds and grasses. Several herbicides are available for onions (consult the current *N.C. Agricultural Chemicals Manual*). Shallow cultivation is necessary to break crusts.

Disease Control – Downy mildew, powdery mildew, and tip burn are common onion diseases in North Carolina. Consult the current *N.C. Agricultural Chemicals Manual* for proper control procedures.

Insect Control – Thrips, onion maggots and wireworms are common onion insects. Consult your county extension agent or the current *N.C. Agricultural Chemicals Manual* for control procedures.

Irrigation – Properly timed irrigation of 1 to 1.5 inches per week will assure larger bulbs and better yields. Irrigating a few days before harvest will make digging

Table 1. Recommended Varieties for Eastern North Carolina.

Short Day*	Intermediate Day	Long Day
Early Grano F	Juno F,S,TS	Golden Cascade S
Texas Grano F	MidStar F,S,TS	Sweet Sandwich S,TS
Texas Grano 502 F	Primovera, F,S,TS	Avalanche S,TS
Granex 33 F,TS		Magnum S
Texas Grano 1015y		Yula S
Tough Ball F		Durango TS
Hi Ball F		

F = Fall planting held over winter, all varieties may bolt.
 S = Spring planting
 TS = Transplant in Spring

easier. Avoid excess irrigation or waiting too late since such irrigations can cause cracking.

Harvesting – About a month before harvest, it is best to start working the soil away from the bulbs. This process should involve 2 or 3 cultivations so that about 7 to 10 days before harvest time, the bulb is about one-third above ground which hastens bulb and neck drying. Harvest when 75% or more of the tops fall over. To hasten drying out, some growers use a sub-surface knife (such as a peanut plow) to cut the roots a few inches below the bulb. The bulbs are then allowed to dry for a day in a row. They are then dug by machine or pulled. Tops should be removed by cutting 1 to 1.5 inches above the top of the bulb (hand sheep shears work well for this) or machines will remove tops in the digging operation. Bulbs should not be exposed to direct sunlight since they sunburn easily. The tops are cut 1 to 1.5 inches from the bulb, the roots trimmed off, the bulbs placed (not thrown) in field crates and transported out of the field within 1 to 2 hours.

Curing – Curing is very important. If necks are not thoroughly dry, neck-rot results. Tobacco barns or peanut wagons or similar structures in which artificial heat (90 to 100 °F) is applied to hasten the curing process may be utilized for short-term storage.

Preparing for Market – Onions are graded according to size and quality. A high quality pack is obtained by eliminating immature, decayed, sunburned, and mechanically injured bulbs, double bulbs, and bulbs that have started a second growth.

Buyers usually specify minimum size of the onions they will buy. This minimum size is usually 2 inches in diameter although some will buy onions 1.5 inches in diameter. Usually onions 3 to 3.5 inches bring a premium price. Onions are usually sold in 50-lb mesh bags, although fiberboard boxes provide better protection and are becoming more popular.