

'Ultra Early' Tomatoes

A.A. Boe

Tomatoes are the most used vegetable in the U.S., and are included in virtually every home garden. There is a good reason for this, since tomatoes can be used in a multitude of ways.

Where tomatoes can be successfully grown is dependent primarily on having a long enough frost-free period to mature the fruit. The length of time required by a particular variety is dependent upon its genetic makeup and the maximum and minimum temperatures during the growing season. Areas such as the northern-most states in the U.S. and high elevations may have a long enough frost-free period but may not have high enough temperatures to bring the fruit to maturity. The tomato varieties available early in this century generally required a growing season of considerable length and night temperatures above 55 degrees Fahrenheit in order to successfully set and ripen a crop (Daubeny, 1961).

An early priority of the Horticulture Department at NDSU was to develop tomato varieties that could be grown throughout North Dakota. In 1914, H.O. Werner came to NDSU and initiated a breeding program for tomatoes and other vegetable crops. He moved to Nebraska in 1918 and A.F. Yeager took over the program at NDSU. By 1920 Yeager reported in the Annual Report of the Agriculture Experiment Station that he had observed ripe tomato fruit on some of his selections on August 5 in Bottineau County. This may have been an exceptionally warm year, but it indicates the problem with growing tomatoes in the more northern counties of the state. Yeager continued his breeding program and had released 14 varieties by 1938 when he left the university. One of Yeager's major contributions to tomato breeding was the development of determinate or self pruning tomato varieties. These are smaller, non vining plants which ripen their fruit over a relatively short period of time. This not only saved space in the garden but also made possible more ripe fruit at one time.

Since the time of Yeager, other advances have been made to develop tomato varieties adapted to the cooler parts of the world. Many of the breakthroughs have been made in Canada where earliness and ability to set fruit under cool temperature conditions was imperative.

Harris (1972) introduced the sub-arctic series of tomatoes in the late 1960s and early 1970, which combined both extreme earliness and the ability to set fruit under cool summer conditions. These were very small plants that had sparse

foliage and many small fruit. The varieties extended the range for home garden production of tomatoes almost to the Arctic Circle.

For the past 20 years the author has been attempting to breed new tomato varieties that would be as early as the sub-arctics and have a better vine and larger fruit. The first 14 years of this study were at the University of Idaho at Moscow. During that time nine new varieties were introduced. These new varieties incorporated better vine types with the extreme earliness of the sub-arctics. Boe et al. (1980) suggested that these extremely early varieties be grouped in a new earliness class and be called "ultra early" to differentiate them from "early" tomatoes. "Ultra early" tomatoes begin to ripen after 1,000 to 1,250 heat units (degree days) between 50 F and 90 F. Heat units or degree days is a better measurement of earliness than days since plant growth and development is determined to a large extent by temperature.

Ultra early tomatoes need not be only for very cold regions. They can be used to extend the time when ripe tomatoes are available in warmer areas or be used as the winter crop in warm winter areas. Ultra early processing varieties could be used to extend the processing season and make better use of processing plants. For the market gardener, the early fruit are his money makers. Having ripe tomatoes two or more weeks ahead of the early crop could mean added income.

The need for earlier cultivars is indicated by the fact that all of the nine varieties released earlier are still available through commercial seed channels. Each year many gardeners throughout the cooler areas of the U.S. and Canada use ultra early tomato varieties as a part or all of their tomato crop.

The need to have ultra early tomato varieties that have larger fruit has occupied the efforts in this program for the last 10 or more years. Larger fruit size is associated with later maturity. When crosses are made between large fruited types and the small fruited ultra early types, the F_1 generation is intermediate in both earliness and fruit size. When the progeny from this cross are selected through six generations, the usual results are small fruited ultra early lines and later large fruited trees.

Recently some experimental tomato lines have been found which, when crossed to large fruited varieties, yield F_1 hybrids that are ultra early in yield characteristic but are larger fruited. These tomato lines are being crossed and back crossed in an attempt to get larger fruited ultra early varieties.

The culture of ultra early tomatoes is not different from that of other varieties, but there are a few factors that could help the grower be more successful. A first step in successful tomato production is to start with good plants and to keep them in good growing vigor. If you buy plants from a greenhouse or garden store, select young plants. They should be short, have a thick stem and have dark green foliage. Under no circumstance should they be in flower. The first truss of flowers will produce the earliest fruit; if they are already flowering before transplanting, this early fruit will probably be lost. Also, old plants are stunted and their establishment after transplanting will take longer than if young vigorous plants are used.

If you grow your own plants, do not start them too early. A good rule of thumb for sowing date is to count back from the transplanting date five or six weeks. If you usually can safely transplant into your garden at the end of May, the tomato seed should be sown about April 20. An easy way to produce a few plants for the home garden is to sow the seed directly into peat pots or Jiffy 7s. Good sterile potting soil should be used in the peat pots. Tomato seeds require a higher temperature to germinate, so place them where the temperature will be above 70 F. Once the seedlings have emerged, thin them to one per pot and place them in the brightest light you have. If the days are warm, set them outside in a protected spot. For larger quantities of plants, a greenhouse or cold frame is essential.

For best results, tomatoes should not be grown in the same spot year after year. Rotate them around your garden plot. This will cut down on disease problems. If disease is a problem, it might be necessary to move the tomato growing area out of the garden for a couple of years. Removing and destroying old plants at the end of the growing season will also help.

Over fertilization is one of the biggest detriments to the production of early tomatoes. Only enough fertilizer should be added to keep the plants growing with good vigor and allow them to set a good crop of fruit. Add a small amount of fertilizer at planting time. If after three or four weeks the plants aren't growing vigorously, additional fertilizer can be added as a side dressing.

Early and ultra early tomato varieties should never be pruned. Pruning has the same effect as overfertilizing and tends to keep the plant vegetative. If having the fruit on the ground is a problem, use a straw or plastic mulch. If a slug infestation exists, use slug bait and harvest the tomatoes as soon as they are ripe.

Many varieties of tomatoes are available and the gardener should select those that will fit his particular needs. If having a constant supply of fruit for use in salads is desired, fruit size

may not be important. However, if you want to can a large supply, large fruited varieties are easier. Small fruited varieties can be used for making salsa and sauces. Paste tomatoes are high in solids and are easier to cook down for tomato paste and catsup.

The following is a partial list of varieties that have been successfully grown at the NDSU campus.

	Height (in)	Spread (in)	Fruit Size (in) (oz)		pH	Soluble Solids (%)
"Ultra Early"						
Small Wonder	12	30	1-1½	1.1	4.4	6.0
Northern Delight	12	30	1½-2	1.5	4.3	5.8
NoDak Early	12	24	2-3	2.8	4.3	5.8
Mountain One	12	30	1½	1.3	4.4	6.4
Bonner	12	30	1½	1.2	4.3	6.4
Gem State	12	24	1	1.2	4.3	5.6
Ida Gold	14	30	1½	1.3	4.5	6.8
Latah	12	24	1½	1.2	4.5	6.8
Pixie Hyb.	16	20	1½-2	2.1	4.3	4.6
Early						
Quick Pick	30	48	2½-3	4.6	4.4	6.5
Wayahead	18	42	2½-3	4.5	4.5	6.0
Lark	12	36	2-3	3.4	4.4	5.9
Scotia	24	36	2½-3	3.4	4.2	6.0
Benewah	16	30	2-3	3	4.4	6.0
Nova (Paste)	20	36	1½-2	1.7	4.3	6.0
Main Crop						
Early Girl	30	60	2½-3	4.0	4.3	6.6
Sheyenne	20	30	3-4	5.6	4.2	6.0
Floramerica	30	40	3½-4	5.6	4.3	5.3
Dakota Gold	24	30	3-4	4.6	4.2	6.0

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