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THE BREAK O' DAY TOMATO

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ORIGIN AND CHARACTERISTICS

The new early Break o' Day tomato was produced in the Division of Horticultural Crops and Diseases of the Bureau of Plant Industry, United States Department of Agriculture. It originated from a cross between the Marglobe and the Marvana made in the department greenhouses at Washington, in 1923.



FIGURE 1.—Plant of Break o' Day tomato. Notice small leaves, open habit of growth, and heavy set of large fruits

This variety is approximately as early as Earliana, heretofore the variety most commonly used for the production of the earliest crops of tomatoes in the United States, and is much superior to it in size, shape, and other qualities of fruit. The Break o' Day produces small-leaved, open, spreading vines well supported by an extensive root system (fig. 1), and large, smooth, meaty, globular red fruits similar to those of the Marglobe (pl. 1). Not infrequently 60 to 75 per cent of the fruits are of fancy grade.

¹ Died Jan. 13, 1931.

Break o' Day is resistant to *Fusarium* wilt of vines and to nail-head rust of fruits. It is also slightly resistant to several blights, especially *Septoria* leaf spot and early blight. Moreover, it seems to be fully as resistant to blossom-end rot as the Marglobe. In many fields Break o' Day and Marglobe were practically free from blossom-end rot, while other varieties growing beside them were badly affected by it. Break o' Day also possesses some resistance to drought and other adverse weather conditions.

In yield, Break o' Day is superior to Earliana, for it not only produces as much early fruit but also continues to bear through a much longer period. In fact, on the heavier soils and on well-fertilized lands it usually bears until killed by frost. Even in the dry year of 1930, yields at the rate of 15 tons per acre were reported by several growers in the East. Since it produces a heavy early crop and continues to bear a long time, it is doubtful whether many varieties will outyield it. Moreover, the fruits make good size throughout the picking season. This is because it commonly sets neither too many nor too few fruits at any time.

Break o' Day fruits seldom crack badly, and the few cracks that do form are of the circular type, which are shallower than the radial cracks so common in fruits of most other varieties.

The green fruits of Break o' Day are light in color from the time they are formed until they enter the ripening stages. This may occasionally cause premature picking in some trucking regions where tomato fruits are harvested and packed in the mature green stage, as the fruits of most varieties pass from a very green to a light green color as they approach maturity, and this change of color is used as a picking indicator. The mature green stage can readily be determined, however, by cutting a few green fruits transversely with a sharp knife. When the seeds are pushed aside without being cut, the fruits are mature green. The color change in Break o' Day should be checked with this test, which is more reliable than the usual color change for all varieties in general. Fruits lying under heavy foliage are frequently light green while still immature. If tomato fruits are picked before they reach the mature green stage they seldom ripen well.

On the department's test plots where the Break o' Day strains were grown while the variety was being developed, the fruits ripened quite uniformly, even around the stem, and developed a good internal color, especially when ripened on the vine. However, during the intense drought and heat of the year 1930 and the heat of 1931, some Break o' Day fruits failed to ripen well at the stem end and some scalded. This condition, however, was no more serious in Break o' Day than in other early varieties. The fruit really fared better than that of most other varieties. In fact, numerous growers reported that Break o' Day withstood the drought much better than Earliana, John Baer, Clark Early, Bonny Best, and Chalk Jewel. The failure to develop a satisfactory color in the cases cited was due to the extremely high temperatures. The development of the red pigment (lycopin) of the tomato fruit is inhibited at temperatures above 86° F., and much of this time the temperature ranged from 90° to 108°. During such intense heat heavier foliage would doubtless give more protection to the fruits, but it is doubtful whether it would withstand the drought as well, for Break o' Day withstood the drought of 1930 better than



FRUIT OF BREAK O' DAY TOMATO
(Natural size)

most varieties having heavy foliage. Sparse, small-leaved foliage also seems to be associated with early flowering and early setting of fruit. A sure set in the crown cluster is important in an early variety, hence the shortcomings of the sparse foliage are probably outweighed by its advantages. Moreover, it would seem from the resistance of Break o' Day fruits to high temperatures that fruits exposed from the first to the direct rays of the sun withstood more heat than fruits shaded at first by the foliage and later exposed to direct sunlight.

ADAPTATION

After the Break o' Day seedlings had been grown in plant-to-row tests on the department's trial grounds for several generations, preliminary field tests were made on the marl glades of southern Florida during the winter of 1929-30. Owing to very variable conditions resulting from overdrainage, floods, and an accumulation of a high percentage of soluble salts in the soil (0.25 to 1 per cent), the Break o' Day was subjected to unfavorable conditions in these tests. Nevertheless it produced more marketable fruit than the other varieties grown in these tests and demonstrated its possibilities as a shipping tomato for the "green wrap" trade.

During the summer of 1930 extensive field trials of the Break o' Day tomato were made in the early marketing sections of Maryland, New Jersey, and Ohio, and limited field tests were made in Maine, Connecticut, New Hampshire, New York, Wisconsin, Pennsylvania, Illinois, Virginia, South Carolina, North Carolina, and Georgia. These tests were made on soils ranging from light, sandy loams to heavy clays and under a wide range of moisture and temperature conditions. The results reported from all these States were uniformly satisfactory.

The new variety was regarded with favor on account of several desirable characteristics. Various reports were consistent with reference to earliness. In many instances it was reported to be quite as early as Earliana, and very rarely was it as late as Bonny Best in reaching first harvest. The first few harvests showed a definitely superior yield of early fruit, and good bearing continued longer than in other early varieties. The size of the fruits was considered especially noteworthy for an early variety, as was also the almost globular shape and attractive scarlet color. Its apparent resistance to unfavorable climate and adaptability to a wide range of soil conditions drew favorable comment from many growers.

Years of experience are required to determine definitely the merits and the limitations of a new variety. But the results obtained thus far with Break o' Day indicate that it will occupy a position of considerable importance among early varieties of tomatoes.

TECHNICAL DESCRIPTION

SEASON

Early; typically 60 to 65 days from transplanting medium-sized plants, which have not reached flowering stage at transplanting time, to first commercial harvest, sometimes as early as 55 days; bears until frost.

PLANT

Size medium; at time first fruit ripens, plants typically 40 to 50 cm. (16 to 18 inches) high with maximum spread of 140 to 150 cm. (4½ to 5 feet). Vine growth varies greatly, depending on local conditions. Habit medium decumbent or somewhat sprawling; growth open; fruits usually exposed.

Branches few in number, typically 7 to 9; medium length, 70 to 90 cm. (27 to 33 inches); rather slender, about 0.9 to 1.1 cm. at the base. Main stem medium length and slender, 1.5 to 2.0 cm. (five-eighths to three-fourths inch).

Leaves small; petioles slender, 3 to 4 cm. ($1\frac{1}{4}$ to $1\frac{1}{2}$ inches) long; blades 18 to 22 cm. (7 to $8\frac{1}{2}$ inches) long and about same maximum width. Leaflets deeply cut, upper surface medium green, lower surface distinctly grayish green. Leaves tend to curl markedly, showing light undersurfaces.

Flowers medium in number per cluster, typically five or six, rarely fasciated, style medium short.

FRUIT

Exterior.—Sepals medium in number, typically six, medium long, large. Immature fruits spherical in shape, very pale green in color except dark-green area about stem, which persists until fruit begins to turn color. Mature fruits medium large, typically 185 to 215 gm. ($6\frac{1}{2}$ to $7\frac{1}{2}$ ounces) in weight, apparently spherical in shape, 7.5 to 8.0 cm. (3 to $3\frac{1}{4}$ inches) at greater equatorial diameter and 7.0 to 7.5 at the lesser; depth 6.5 to 7.0 cm. ($2\frac{5}{8}$ to 3 inches); cavity medium shallow, 0.3 to 0.4 cm. (about one-eighth inch) in depth, sides gradually sloping, smooth or with broad, very shallow creases radiating from the stem; generally not susceptible to cracking; basin usually absent; styler end well rounded and smooth; styler scar small, often a mere dot; color, as usually harvested, grenadine or scarlet; when fully ripe, slightly darker than scarlet, tending toward English red; skin yellow.

Interior.—Outer walls thick, typically 0.60 to 0.65 cm., and inner walls very thick, 0.8 to 0.9 cm. Cells visible upon cutting at equator, few, typically six to eight, fairly regular in shape and arranged as segments of a circle. Well-defined, solid, central fleshy mass, large fleshy placentae. Cells small, well filled with pulp; seeds few. Flesh firm, color scarlet red; flavor sweet, mildly subacid.

SEED SOURCES

The success of the first field trials of the Break o' Day in the several States caused an unusual demand for seed. Some growers saved seed from their own test plots and either had it multiplied by seedsmen or grew a seed crop themselves. From these plantings a considerable quantity of seed was produced in 1930, but apparently it was insufficient to meet immediate needs. As this seed came directly or indirectly from experimental test plots and these plots were usually situated in other tomato fields, its purity is questionable. The use of carelessly produced and impure seed of this new variety has given some disappointing results. In fact, in some seed fields grown from Florida seed considerable roguing was necessary to eliminate plants that were foreign to the Break o' Day type. This breaking down of type was not due to any lack of purity of the selected seed stocks of this variety or to any abnormal behavior under different conditions of growth, but was the result of lack of care in handling seed production and of mixing with other varieties. Where the seed plots were isolated and planted with department seed, these undesirable results were avoided.

In order to aid in the production of an adequate supply of good commercial seed for future use, the Department of Agriculture distributed Break o' Day seed to commercial seed growers for the production of a seed crop in 1931. The department also distributed samples to the principal seedsmen for use in their trial grounds; hence all the seedsmen should soon become familiar with this variety, and a plentiful supply of seed should be available for 1932.





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