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BONANZA

A New Hybrid Onion for Long Storage

by
H. A. Jones, D. F. Franklin,
C. E. Peterson

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BONANZA: A New Hybrid Onion For Long Storage

By Henry A. Jones[1], DeLance F. Franklin[2], and Clinton E. Peterson[3]

Characteristics of the F_1 Hybrid

On December 1, 1953, the Idaho Agricultural Experiment Station, the United States Department of Agriculture, and the Iowa Agricultural Experiment Station, cooperating, announced the release of an onion hybrid, Bonanza, pedigree B 2190 x B 2215. Bonanza is an F_1 hybrid of two Brigham Yellow Globe inbreds. It is a long-day storage-type onion, high yielding where it is adapted. As shown in Figure 1, the onion bulbs are high globe

Figure 1.—Bonanza: Pedigree B 2190 x B 2215, a new F_1 hybrid developed for long storage.

in shape and are well-rounded at shoulder and base. They have firm flesh and yellow scales that adhere well throughout a long storage period. Bonanza has been tested rather widely and seems to be adapted to most districts where the variety Brigham Yellow

[1] Head Horticulturist, Horticultural Crops Research Branch, Agricultural Research Service, United States Department of Agriculture.
[2] Superintendent, University of Idaho Branch Agricultural Experiment Station, Parma, Idaho.
[3] Horticulturist, Horticultural Crops Research Branch, Agricultural Research Service, United States Department of Agriculture, Ames, Iowa.

Globe is grown. The yield and storage records for Bonanza for the crops of 1951 and 1953, Greeley, Colorado, and Parma, Idaho, are given in Table 1.

Table 1. Performance of Bonanza in comparison with Brigham Yellow Globe at Parma, Idaho, and Greeley, Colorado, crops 1951 and 1953.

Location	Variety	Yield per acre 50-lb. bags	Weight loss	Storage record			
				Firmness rating[1]	Scales rating[2]	growth rating[3]	Color rating[4]
Parma, Idaho	**1951**						
		No.	**Pct.**				
	Bonanza	692**	7.0	3.8	3.7	3.5	3.0
	Brigham Yellow Globe	528	7.0	3.0	2.7	3.0	2.0
	1953						
	Bonanza	946**	3.1	3.7	3.8	3.3	3.8
	Brigham Yellow Globe	692	1.0	3.0	3.0	3.0	3.0
Greeley, Colorado	**1951**						
	Bonanza	738**	7.2	3.7	4.0	4.0	3.0
	Brigham Yellow Globe	568	8.9	3.0	2.7	3.7	2.0
	1953						
	Bonanza	996**	9.0	4.0	4.0	4.0	3.7
	Brigham Yellow Globe	809	10.0	3.3	3.3	3.7	3.0

[1] Firmness: 1, soft; 5, very firm; 2-4, intermediate.
[2] Scales: 1, very loose; 5, very tight; 2-4, intermediate.
[3] Root growth: 1, pronounced root growth; 5, no root growth; 2-4, intermediate root growth.
[4] Color: 1, light straw; 5, dark yellow or brown; 2-4, intermediate.
**Significantly higher yielding than Brigham Yellow Globe at odds of 99.1.

Storage records for the 1951 crop were taken in 1952, the first week in March at Greeley, and the last week of February at Parma. For the 1953 crop they were taken February 22, 1954, at Greeley, and February 17 to 19, at Parma. At Parma during the storage season of 1953-54, the humidity was higher than normal, whereas at Greeley it was lower. The data show little difference in storage loss between Bonanza and Brigham Yellow Globe stored under similar conditions. At Parma, in February 1954, no rots or sprouts were found in bulbs of Bonanza and only 0.6 percent had sprouts and 0.3 percent had rots in Brigham Yellow Globe by count. At Greeley, Bonanza had 0.7 percent of the bulbs sprouted and 4.7 rotted while Brigham Yellow Globe had no bulbs sprouted and 5.3 percent rotted. At Greeley the storage lots were randomized in three replications in 1951 and 1953. At Parma they were randomized in six replications in 1953. The data show that after storage Bonanza has firmer flesh, tighter scales, less prominent root development, and darker yellow color than Brigham Yellow Globe.

Yield data are available in addition to those given in Table 1. In 1951 at Celeryville, Ohio, Bonanza produced a total yield of

936 50-pound bags per acre and Brigham Yellow Globe produced 680 bags, a highly significant difference. When removed from storage on March 14, 20 percent of the bulbs of both Bonanza and Brigham Yellow Globe had sprouted but they had no rots. At Madison, Wisconsin, Bonanza produced 1,066 50-pound bags per acre. Rochester Bronze produced 990 and Hollandale Yellow Globe 749. There was no significant difference in yield between Bonanza and Rochester Bronze, but the difference in yield between Bonanza and Hollandale Yellow Globe was highly significant. Storage temperatures at Madison were high. They averaged about 60° F. When removed from storage on February 20, 32 percent of the bulbs of Bonanza had sprouts and 4 percent rots; 23 percent of the Rochester Bronze bulbs had sprouts and 9 percent rots; and 24 percent of the Hollandale Yellow Globe bulbs had sprouts and 11 percent rots.

In 1953 Bonanza produced 1,015 bushels per acre in northern Iowa trials compared with 833 for Brigham Yellow Globe — a highly significant difference. At 18 locations in 11 States in 1951 and 1953, Bonanza produced a 28.3 percent average higher yield than the check variety Brigham Yellow Globe.

Parents of Bonanza

The Seed Parent, B 2190, is an inbred from a shipment of Brigham Yellow Globe bulbs obtained in early 1950 from J. H. Snyder, Wolcott, N. Y., through Dr. A. G. Newhall, Cornell University. Both A and B lines of B 2190 have been distributed rather widely through the seed trade, but it is not known to what extent they have been increased or whether they are being used in the production of hybrids other than Bonanza and Fiesta. Additional foundation seed of B 2190 was released to onion-seed growers who requested it in January 1954. The letter "B" preceding 2190 indicates that it is a Beltsville inbred. The letter "A" following B 2190 indicates that it is a male-sterile line. The letter "B" following B 2190 indicates that it is a fertile companion, or maintenance line. Foundation seed has been increased in insect-proof cages at Beltsville, Maryland; Ames, Iowa; and Parma, Idaho. B 2190 is one of the best seed-producing inbreds to be tested by the authors. The ability of an inbred to set a good crop of seed is important when it is used for the production of single-cross hybrids.

The storage performance of A and B lines of B 2190 for the crops of 1951, 1952, and 1953 in storage at Greeley is given in Table 2. The bulbs were grown at Greeley and placed in storage in late September and kept under excellent storage conditions in shallow trays. The data show that under storage conditions at Greeley the A and B lines of B 2190 kept well at least till the first week in March. Little sprouting and rotting occurred; the bulbs remained firm; the scales adhered well, and only negligible root development was evident at the stem plate.

The Pollen Parent. On December 1, 1952, a memorandum was sent to seedsmen announcing the release of B 2215, the pollen parent of Bonanza, by the United States Department of Agriculture and the Idaho and Iowa Agricultural Experiment Stations. Seed was distributed in January 1953 and additional amounts were distributed in January 1954.

B 2215 is from the same lot of bulbs as B 2190. It is a long-day storage-type onion, high globe in shape. It has quite firm flesh and yellow scales that adhere well throughout a long storage period.

After two generations of inbreeding, B 2215 continues to yield well and produce an abundance of pollen and seed. There should be no difficulty in maintaining it. It flowers late but flowering can be hastened by manipulating storage temperatures so that flowering will occur at about the same time as that of the seed parent, B 2190.

Bulbs of B 2190, grown at Clear Lake, Iowa, were stored at Beltsville, Maryland in 1952-53 in a cool room in a headhouse from mid-October to about March 1. The temperature in this room varied from 35° to 40° F. B 2215 from Clear Lake was also stored under the same conditions until about the middle of January when the bulbs were placed in a cool section of the greenhouse where the high temperature was 45° to 50° and the day temperature usually 50° to 55°. Occasionally the temperature was higher during the day. B 2215 was planted on March 11, 1953, and B 2190 was planted on March 23. The first flowers on B 2190 opened on June 4 and on B 2215 on June 8. By treating the bulbs in this manner, the flowering periods of the two lines coincided closely.

Table 2. Performance of A and B lines of B 2190 in storage at Greeley, Colo.

Pedigree	Date removed from storage	Bulbs stored	Bulbs sprouted	Bulbs rotted	Firmness rating[1]	Scales rating[2]	Root growth rating[3]	Color rating[4]
		No.	No.	No.				
B 2190 A	March 1-3, 1952	665	6	21	4	4.0	4.0	4.0
B 2190 B	do	538	4	12	4	4.0	4.0	4.0
B 2190 A	March 1-4, 1953	495	1	2	4	3.0	4.0	3.0
B 2190 B	do	581	0	2	4	4.0	4.0	4.0
B 2190 A	February 24, 1954	323	0	0	4	3.5	3.5	3.0
B 2190 B	do	400	0	0	4	3.5	3.5	3.5

[1], [2], [3], [4] See footnotes Table 1.

During the winter of 1953-54, B2215 was stored at Greeley, at a temperature of about 45° F. throughout most of the storage period. This inbred kept in excellent condition at this high tem-

perature. Of 976 bulbs stored, 0.3 percent had sprouts and 0.4 percent had rots on February 24.

Breeding tests show that B 2215 is homozygous for the male-fertile gene **Ms.** B 2215 has a tendency to double and breeding stock should be rigidly rogued for this defect. It is also rather late maturing; and, in certain locations of northern states, it may not mature well, especially at higher altitudes or during cool summers.