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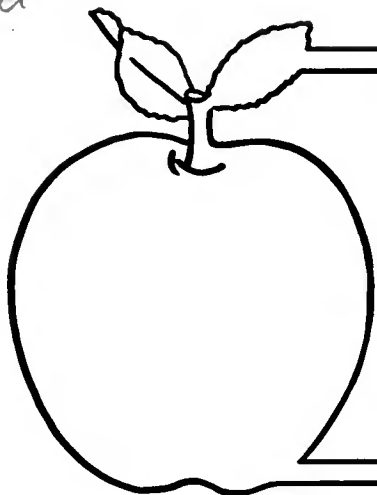
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AGRICULTURE



Co-op 19, 20, 21, and 22 : Four Scab-Resistant Apple Selections Released for Advanced Testing

Bulletin 755
 Agricultural Experiment Station · College of Agriculture
 University of Illinois at Urbana-Champaign in cooperation
 with the Agricultural Experiment Stations of Indiana
 (Purdue University) and New Jersey (Rutgers University)

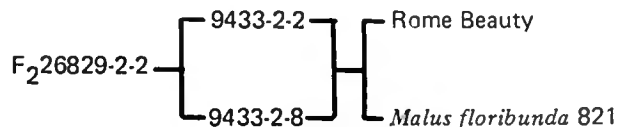
FOUR NEW APPLE SELECTIONS (Co-op 19, 20, 21, and 22) with field immunity to scab caused by *Venturia inaequalis* (Cke.) Wint. are offered for advanced testing. This is the fourth series of releases from a cooperative breeding program at the Agricultural Experiment Stations of Illinois, Indiana, and New Jersey. These selections are identified under the designation "Co-op" to emphasize the cooperation and joint effort of this program.

Co-op 1 through 5 were described in Purdue University Agricultural Experiment Station Research Progress Report 271 (1967), Co-op 6 through 11 in Purdue University Agricultural Experiment Station Research Progress Report 399 (1972), and Co-op 12 through 18 in Purdue University Agricultural Experiment Station Bulletin No. 69 (1975).

Only a very small amount of propagation wood is now available, and distribution must therefore be limited. All distributions will be bound by agreement in which further propagation of the material is prohibited without prior consent of the Experiment Stations involved. It is our intention to patent worthy selections.

PARENTAGE

Co-op 19 through 22 are derived from a scab-resistant selection, F₂26829-2-2, originating from crosses involving a clone (821) of the small-fruited *Malus floribunda* made early in this century by the late Dr. C. S. Crandall of the University of Illinois.



The present program, initiated in 1945 by Dr. J. R. Shay, formerly of Purdue University, and Dr. L. F.

Hough, then of the University of Illinois, utilized this and additional selections derived from *Malus floribunda* 821 along with many other genetic sources of resistance. The fruit of F₂26829-2-2 was the largest and highest in quality of the resistant material then available. Of the 22 Co-op selections released since 1967, 20 descend from this clone, and 2 descend from a "sister" seedling, F₂26830-2.

BREEDING SYSTEM

The "floribunda" resistance to apple scab is conditioned by a single dominant gene, *V_f*. Both F₂26829-2-2 and F₂26830-2 are heterozygous for this gene and, when crossed to susceptible genotypes, produce progeny of which 50 percent of the seedlings are resistant. The susceptible progeny are identified and eliminated in the seedling stage. Seedling trees grown for first-fruited test in the field receive no fungicide protection, thus allowing selection for field resistance to several other diseases. The breeding system from which these selections result involves a modified backcross program with the horticulturally best resistant selections of each generation crossed to high-quality susceptible types. In the illustrated pedigrees, the seed parent is the upper selection in each bracketed cross.

SELECTION DESCRIPTIONS

Co-op 1 through 18

Of the first five Co-op selections released in 1967, three have been named: 'Prima' (Co-op 2) in 1970, 'Priscilla' (Co-op 4) in 1972, and 'Sir Prize' (Co-op 5) in 1975. An additional selection not included in the Co-op series was sent to France and was named 'Priam' in 1974. The prefix *PRI* in each name is an acronym of the three universities involved in this program: Purdue, Rutgers, and Illinois.

Co-op 6 through 18 are currently under test at vari-

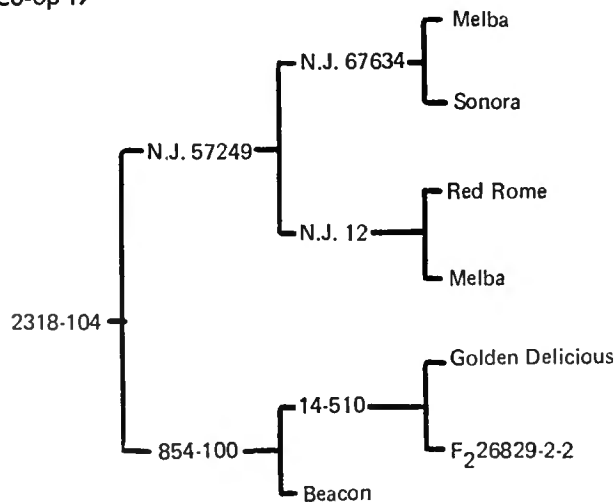
Table 1. Co-op 1 Through 22: Fruit Color and Maturity Season

Code	Progeny no.	Color	Maturity season relative to*	
			Prima (weeks)	Delicious (weeks)
Co-op 1	1235-101	red	-2	-6
2 (Prima)	1225-100	red	0	-4
3	1686-1	red	-1	-5
4 (Priscilla)	1659-1	red	+2	-2
5 (Sir Prize)	673-20	yellow	+4	0
6	1500-100	red	-1½	-5½
7	2023-1	red	-1	-5
8	1326-1	red	+1½	-2½
9	1677-2	red	+3	-1
10	1659-10	yellow	+4	0
11	1947-104	red	+6	+2
12	2175-25	red	-4 to -5	-8 to -9
13	2175-7	red	-3 to -4	-7 to -8
14	1325-101	red	-2 to -3	-6 to -7
15	1569-100	red	+1	-3
16	2174-3	yellow	+4	0
17	1689-110	yellow	+5 to +6	+2 to +3
18	1983-207	red	+5	+1
19	2318-104	red	-4	-8
20	1691-100	red	-2 to -3	-6 to -7
21	2259-100	red	0 to +1	-4 to -5
22	2016-100	red	+2 to +3	-1 to -2

* At Urbana, Illinois, 'Prima' matures September 1-5; 'Delicious' matures September 25-30. Maturity dates for Lafayette, Indiana, are ½ to 1 week earlier.

ous locations. The distinguishing characteristics of all Co-op selections are summarized in Table 1.

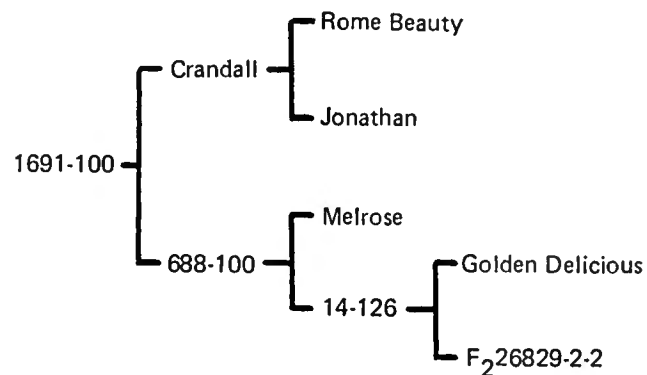
Co-op 19



Matures August 1-5 at Urbana, Illinois (4 to 5 weeks before 'Prima'). Fruit 2¾ to 3 inches roundish oblate. Color 80 to 90 percent washed light red on pale yellow-green background. Skin smooth and glossy. Flesh yellowish, fine grained, crisp, tender when fully

ripe. Flavor mild sub-acid. Dessert quality very good, comparable to cultivars maturing 8 weeks later. Tree field-immune to scab, slightly susceptible to mildew; no fireblight or cedar rust observed on tree.

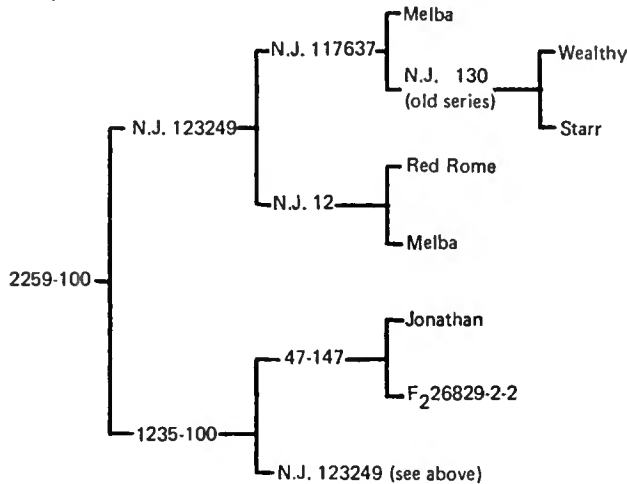
Co-op 20



Matures August 10-15 at Urbana, Illinois (2 to 3 weeks before 'Prima'). Fruit up to 2¾ inches roundish oblate. Color 75 percent medium washed red on banana yellow ground. Skin smooth, glossy, and attractive. Flesh very yellow, very fine grained with very firm texture. Crisp and juicy. Flavor mild sub-acid, with

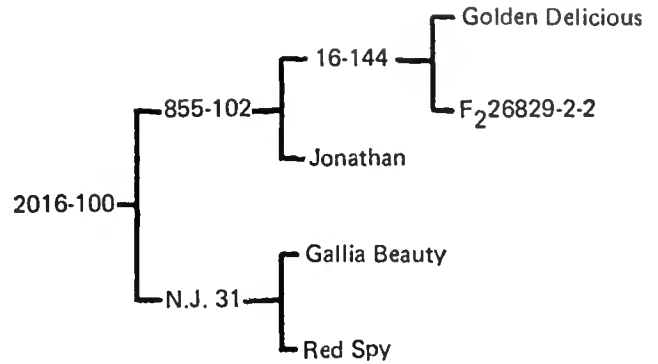
perfume. Dessert quality very good, comparable to cultivars maturing 6 to 8 weeks later. Retains texture and quality 4 weeks in storage. Field-immune to scab, moderately susceptible to mildew; no fireblight or cedar rust observed on tree.

Co-op 21



Matures September 1-5 at Urbana, Illinois (with 'Prima'). Fruit $2\frac{3}{4}$ inches roundish oblate. Color 90 percent washed medium red on yellow ground. Skin smooth, glossy, and attractive. Flesh yellowish, fine grained, crisp to slightly breaking, juicy. Flavor sub-acid to mild. Dessert quality very good. Field-immune to scab, slightly susceptible to mildew; no fireblight or cedar rust observed on tree.

Co-op 22



Matures September 20-25 at Urbana, Illinois (3 to 4 weeks after 'Prima' and with 'Jonathan'). Fruit up to $2\frac{3}{4}$ inches round to slightly subconic. Color 95 percent medium red wash on yellow ground. Skin smooth, no evidence of mildew russet. Flesh pale yellowish, medium-fine texture, firm, crisp, juicy. Sub-acid to mild flavor. Dessert quality very good. Holds texture and flavor well in storage. Tree field-immune to scab, but moderately susceptible to mildew; no fireblight or cedar rust observed on tree.

Resembles 'Jonathan' in shape; color slightly less intense than 'Jonared' but with higher percentage of surface covered with red. Flavor similar to 'Jonathan' but a little less acid. Flesh slightly more yellow than 'Jonathan'. Fruit hang well to tree. Ripe fruit do not develop "Jonathan spot" and have much reduced tendency to internal breakdown when fully ripe.

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