Apple Cultivar Performance in Southwest Iowa[1]

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A study of apple cultivars was initiated at the Bluffs Experimental Fruit Farm near Council Bluffs, Iowa, in the spring of 1947. The primary objective of the study was to find new and better cultivars for the apple growers of the state. Commercial orchards at the time consisted primarily of Jonathan, Delicious and Golden Delicious. Also being grown were many less important cultivars that were planted for hardiness or other reasons after the Armistice Day freeze of 1940. Many of these were of a type or color that have met with consumer resistance during an era of changing consumer habits.

It was hoped that cultivars would be found with medium to large fruits of good color and marketability, suited for storage, and derived from trees that are hardy, strong, disease resistant, and are adapted to the area. These are similar to characteristics described by Lantz.[3]

Summer apples were also included in the test, although the market for summer apples is limited in Iowa, since they are shipped in from states to the south before Iowa-grown summer apples mature. The same is true of early fall apples. However, good fruit color and low transportation costs give fall-maturing cultivars a competitive advantage over shipped-in fruit. Cultivars of this season must be as good or better than Jonathan and Delicious. Although Jonathan is the leading cultivar in the state, it is subject to fireblight infection and storage disorders of the fruit. Delicious has faults in tree structure and precosity of bearing as well as being a poor culinary sort. New cultivars could extend the harvest and storage season and should possess other desirable features not found in Jonathan and Delicious.

One-hundred-sixteen cultivars have been planted since 1947. Included in the test were 24 selections from the breeding program of Iowa State University and 11 selections from the breeding program of the University of Minnesota. After three or more fruiting seasons, most of the selections and many of the cultivars were removed from the test because they did not possess the qualities desired.

Color and growth sports of Delicious and Golden Delicious which have been added to the test in recent years have not yet fruited, and are not discussed here. It is assumed that orchardists planting these cultivars and their sports are aware of the difficulty in selling new or untried cultivars.

Weather during the period of observation was nearly normal for Iowa. Cycles of heat, cold, wetness and drouth occurred. Annual rainfall has ranged from 19.3 to 42.5 inches, with an average of 31.8 inches. Temperatures have ranged from —28° to 106°F. No adverse effects on the trees have been noted except on total growth and on ability to set fruit buds in years of moisture stress.

For purposes of this article, standards of comparison are based upon the performance and qualities of Jona-

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[3]Lantz, H. L. 1953. Report on Promising Cross-Bred Apple Seedlings. Trans. Iowa State Hort. Soc., 88:86-89.

than, Delicious, Winesap and Golden Delicious. McIntosh is not rated as a satisfactory apple in the southern half of Iowa because of poor color and severe dropping.

Table 1 includes notations on yields, fruit color and size, harvest seasons, primary use of fruit, an estimate of the commercial potential, and a rating of fireblight infections in two epiphytotic years. Yields are based on records of young trees and their prolificacy at this stage. The fruit characteristics are averages of their development at this location. Maturity or harvest season indicated is based on days before or after Jonathan, which had an average beginning harvest date of September 19 at the Station. The use and commercial value are based upon fruit characters that would ultimately affect their market ability.

Fireblight was prevalent in epidemic proportions in 1960 and again in 1964. Although infection ratings have been made each year, these two years indicated the amount of infection that might be expected. Ratings given in Table 1 are expressed as the percent of dead leaves and shoots in mid-July for each year. Most of the summer and early fall varieties appear at least moderately susceptible. Cultivars of Delicious, McIntosh, and Winesap families appear the most resistant. There are exceptions, however, since the age of vigor of the

Table 1. Yield, fruit characters, harvest season, use evaluations, and fireblight susceptibility of 70 apple cultivars.

Variety	Yield[1]	Color[2]	Size[3]	Harvest season[4]	Use[5]	Commercial value[6]	% Fireblight 1960	% Fireblight 1964
A 603	M	R	M	2	ES		30	20
Alton	M	PR	S	8	C	3	NR	NR
Ambrosia	M	RS	L	7	C	3	NR	NR
Baxter Winesap	H	DR	ML	−3	ES	2	10	17
Beacon	L	R	M	5	D	2	30	NR
Blaze	M	R	M	4	D	2	30	35
Close	L	PR	M	9	C	3	NR	NR
Compton Sweet	L	Y	M	−2	E	3	30	20
Connell Red	L	R	ML	−1	ES	2	50	50
Crandall	M	R	M	−1	D	1	20	30
Crimson Winesap	M	DR	S	−3	ES	2	0	5
Delawine	L	R	ML	−1	D	3	10	20
Delcon	H	R	M	1	E	2	3	5
Delicious	M	R	L	−1	E	1	0	1
Dunning	M	PR	S	7	C	3	NR	NR
Earliblaze	L	R	M	2	C	3	50	80
Early McIntosh	H	PR	SM	7	C	2	NR	NR
Early Red Bird	M	R	ML	10	C	3	10	15
Fireside	L	PR	L	−1	E	3	40	NR
Franklin	L	PR	M	−1	D	3	10	20
Garrison	M	RS	L	4	C	3	10	15
Golden Delicious	H	Y	ML	−2	D	1	10	15
Grimes Golden	M	Y	M	0	D	2	60	NR
Grove	L	R	M	−3	ES	3	50	80
Haralson	H	R	ML	−1	CS	2	5	5
Hawkeye Greening	H	G	ML	1	C	3	15	NR
Hebard	L	PR	SM	1	C	3	60	50
Idared	H	R	ML	−1	D	2	50	40
Joan	M	R	L	3	C	3	NR	NR
Jonadel	H	R	M	0	D	1	1	10

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Variety	Yield[1]	Color[2]	Size[3]	Harvest season[4]	Use[5]	Commercial value[6]	% Fireblight[7] 1960	1964
Jonagram		R			C	3	30	50
Jonathan		R			D	1	50	35
Jongrimes		RS			D	2	40	40
Jubilee		PR			D	3	10	20
Kendall		DR			D	2	NR	NR
Killand		RS			C	3	20	40
Lakeland		RS			C	2	40	50
Lodi		Y			C	2	50	75
Mantet		PR			D	1	40	NR
Maud		PR			C	3	40	25
McIntosh		PR			D	3	10	10
Melba		PR			C	3	60	15
Milton		PR			C	3	NR	NR
Minjon		R			D	3	50	60
Minn. 724		RS			D	2	15	25
Monroe		R			D	1	NR	NR
Mutsu		Y			ES	2	NR	90
Newfane		R			E	3	30	25
Nujon		PR			C	3	10	5
Okanoma		PR			E	2	0	1
Oriole		Y			C	2	NR	NR
Orleans		R			E	3	0	15
Patricia		R			E	3	40	30
Peace Garden		RS			C	3	40	95
Prairie Spy		RS			D	3	NR	NR
Redgold		R			E	2	5	10
Red Gravenstein		R			C	2	45	NR
Redwell		RS			C	3	NR	NR
Secor		RS			D	3	60	NR
Sharon		RS			D	2	30	35
Spartan		R			D	1	10	10
Stamared		DR			D	2	10	15
Stark Earliest		RS			D	2	10	10
Summer Delicious		RS			E	3	10	15
Turley		R			DS	1	10	15
Victory		PR			C	3	NR	NR
Waukon		G			C	3	100	NR
Wealthy		PR			D	2	40	50
Webster		R			C	2	NR	NR
Wellington		R			C	1	10	50

[1]Yields: L = light; M = medium; H = heavy.
[2]Color: G = green; Y = yellow; R = red; DR = dark red; PR = pale red; RS = red stripe.
[3]Size: S = small; M = medium; L = large.
[4]Harvest season: Number of weeks before or after (—) Jonathan average of Sept. 19.
[5]Use: C = culinary; E = eating; D = dual; S = storage.
[6]Commercial value: 1 = excellent; 2 = good; 3 = poor.
[7]Expressed as percent of top growth killed; NR = no record.

tree can affect the amount of blight infection. Until a cure is found for this disease, cultivar resistance must be an important factor in selection.

For the commercial grower, cultivars in Table 1 with a commercial value rating of 1 might be suitable for planting. These are A603, Crandall, Jonadel, Mantet, Monroe, Spartan, and Wellington. Each of these has one or more limitations and must be studied for the market area con-

sidered. Brief descriptions of these seven cultivars as grown in Southwest Iowa are as follows:

A603 is a cross between Jonathan and Delicious. It has not been officially introduced. The fruit is medium sized, bright red, firm, crisp and sweet. It is somewhat lobed on the calyx end, similar to Delicious. It will store like Winesap, and has shown no storage disorders. The tree is moderately upright and vigorous. Its resistance to fireblight is similar to that of Golden Delicious.

Crandall has performed very well in this study. The fruit was well colored, firm and attractive. The tree was not as susceptible to fireblight as Jonathan, and might be planted as a supplement to Jonathan.

Jonadel was introduced by Iowa State University in 1958. The variety appears to be specific for certain areas and should be planted on a limited basis. Where adapted, the fruit is well colored, attractive, and fine flavored for eating and cooking. The trees are nicely shaped, easy to prune and resistant to fireblight. Preharvest sprays to prevent fruit drop are required.

Mantet is an early summer cultivar that ripens just ahead of Melba. It has better color than Melba and is more firm and easier to market. The fruits ripen unevenly, and several pickings are required. Trees are upright and vigorous and moderately susceptible to fireblight.

Monroe does not possess an outstanding flavor for a popular dessert apple. It is, however, an attractive, large red apple that is good as a dual purpose sort. The trees have been very productive and produced annual crops here.

Spartan appears the most promising of the cultivars found in this study. Fruits are attractive, red, firm, uniform in shape, fine flavored and store well. They are similar enough to McIntosh to capitalize on the sales appeal of this cultivar. Tree growth is similar to McIntosh. It colors better than McIntosh in this area, and the fruit hangs reasonably well.

Wellington has produced well as a young tree. The fruit ripens in midsummer and should be considered before Mantet for this season. Fruits are large for this season, have fair color, and are excellent for culinary use. They are more firm than many of the cultivars of this season. The tree is somewhat spreading, has heavy wood, and is fairly productive. As with other summer cultivars, its market demand is limited.

Many of the cultivars with a number "2" rating for commercial value could well be used for local retail or commercial markets. Large volume sale of any of these is possible, but production and buyer acceptance of these would be more hazardous than with those rated number "1" or the main commercial cultivars such as Jonathan and Delicious. The most promising of group "2" are Beacon, Haralson, Idared, Lodi, Redgold and Sharon.

For the home gardener desiring high quality cooking and eating apples, the just mentioned cultivars would serve well. In addition, a few other excellent eating apples are Connell Red, Compton Sweet, Patricia, Prairie Spy and Stark Earliest. Delcon appears reliable for high production.

Blueberry Conference in April

On April 6 and 7, 1966, the University of Maine will sponsor a North American Blueberry Workers Conference. Research and Extension workers from the U. S. and Canada will discuss various aspects of the blueberry industry, including varieties, culture, marketing and processing. All interested are welcome.