

Jonathan, Jonnee, Jonadel and Jonalicious Apples: A Quality Comparison¹

R. C. ROM AND G. R. MOTICHEK²

The Jonathan apple is a well-established commercial apple in the Ozark region of Arkansas and Missouri. The Jonadel and Jonalicious cultivars have been found to be equally adapted. All cultivars in this comparison have been under observation and in production in the variety test planting of the Arkansas Agricultural Experiment Station at Fayetteville, AR for ten or more years.

The Jonathan apple originated as a seedling tree discovered on a farm at Kingston, NY in 1826. The Blackjon cultivar, used in this comparison, is a bud mutation of Jonathan. It is identical to Jonathan in every respect except that it is earlier coloring and brighter red. Blackjon was selected by A. T. Grossman of Wenatchee, WA, in 1929 and introduced by the Columbia and Okangan Nursery Co. in 1931. Blackjon is also known as Black Jonathan, Red Jonathan, Double Red Jonathan, or Red Jon (1).

The Jonnee cultivar is a bud mutation of Blackjon. This mutation is said to mature 7-10 days earlier than Blackjon and have a more intense color. Following its discovery in Caldwell, Idaho, by Stanley Robinson and Ivan Wallace in 1964, it was assigned to Hilltop Orchards and Nurseries and introduced commercially in 1967 (1).

The Jonadel cultivar was developed in Ames, IA by H. L. Lantz. It was selected in 1928 from a Jonathan x Delicious cross. In 1958 it was released as a named cultivar by the Iowa Agricultural Experiment Station. The fruit matures with Jonathan and is equal to it in skin color but is larger and somewhat more conic in shape (1).

The Jonalicious cultivar resembles Jonathan in many respects. It originated as a chance seedling discovered in Abilene, TX, in 1933 by Anna Morris Daniels. Stark Bros. Nurseries and Orchards obtained the plant patent and introduced the cultivar in 1960. Jonalicious matures just after Jonathan. It has a yellow ground color and blushes to a bright red when mature (1).

With these four closely related cultivars maturing at approximately the same time and perhaps competing for a similar market, particularly the roadside and pick-your-own trade, it seemed appropriate to conduct a comparison of their fruit quality and consumer preference. A fruit quality acceptance study (2) among six Jonathan cultivars suggested that there was no preference of choice among the six; thus Blackjon was selected as the Jonathan type standard because of its close relationship to Jonnee. Another study (3) involving the raw product analysis of the Jonadel cultivar when compared to Jonathan or Red Delicious showed characteristics similar to both parents. Jonalicious, Blackjon and Jonnee were not included in this comparison.

Fruit sampling from trees carrying a normal crop started on August 24, 1979. This coincided with the commercial harvest of Jonathan for shipping in this area. At each harvest, 20 fruits were collected from four trees of each cultivar. Selection was for those fruit most advanced in maturity based on color. The sampling was repeated on August 31, September 6, and September 13.

¹Published with approval of the Director, Arkansas Agricultural Experiment Station.

²University of Arkansas.

Table 1. Raw product analysis of four related apple cultivars at four harvest dates

	Firmness ¹				% Soluble solids				% Malic acid ²			
	8/24	8/31	9/6	9/13	8/24	8/31	9/6	9/13	8/24	8/30	9/6	9/13
Blackjon	7.6A ⁴	7.1A	7.0A	6.5A	11.3B	12.4B	13.4A	13.6B	.68A	.66A	.66A	.63A
Jonnee	6.8C	6.6B	6.6B	6.1B	11.4B	12.0AB	12.2B	13.2B	.54B	.51C	.44B	.51B
Jonalicious	7.5AB	7.1A	6.9A	6.7A	11.1B	13.0A	13.2AB	14.9A	.51B	.53B	.41B	.41C
Jonadel	7.1BC	6.7B	7.1A	6.6A	12.5A	12.5AB	13.2AB	12.7B	.40C	.38D	.38B	.31D

	Weight grams				Length diameter ratio				% Red color ³			
	8/24	8/31	9/6	9/13	8/24	8/31	9/6	9/13	8/24	8/30	9/6	9/13
Blackjon	159B	178B	172B	174B	.80B	.83B	1.00A	.82B	90	90	93	98
Jonnee	140C	137C	140C	150C	.81B	.81B	.98A	.82B	93	90	93	93
Jonalicious	146C	148C	150C	164C	.81B	.84B	.82B	.84B	73	72	86	96
Jonadel	201A	201A	196A	197A	.88A	.88A	1.00A	.88A	71	60	78	92

¹Magness Taylor determination two shoulder positions/fruit.

²Acidity titrated with .1N NaOH converted to Malic acid.

³Based on visual observation of fruit.

⁴Mean separation in columns by Duncan's multiple range test, 1% level.

Table 2. Panel preference evaluation of four related apple cultivars at four harvest dates.

	Taste ¹				Acidity ²				Sweetness ³			
	8/24	8/31	9/6	9/13	8/24	8/31	9/6	9/13	8/24	8/31	9/6	9/13
Blackjon	3.2	3.2A ⁷	2.7	1.9B	1.3B	1.3B	1.4C	2.9AB	2.8	3.5B	3.4A	1.9B
Jonnee	2.3	2.8A	2.7	1.7B	1.8B	2.3B	1.9BC	1.6B	2.2	2.5B	3.1AB	2.4AB
Jonalicious	2.7	1.5B	1.6	3.0A	2.5AB	2.3B	2.6AB	3.4A	2.8	1.3A	2.3B	1.9B
Jonadel	1.8	2.5A	2.7	3.4A	3.8A	3.0A	3.6A	1.7B	1.5	2.7B	2.6B	3.6A

	Texture ⁴				Juiciness ⁵				Oxidation ⁶			
	8/24	8/31	9/6	9/13	8/24	8/31	9/6	9/13	8/24	8/31	9/6	9/13
Blackjon	1.8	2.0	2.0	2.1	2.5	2.2	2.6	2.9	2.2	2.3	2.3B	3.1A
Jonnee	1.7	2.0	1.9	2.0	2.3	2.7	2.4	3.1	2.3	2.2	2.0	2.0B
Jonalicious	2.0	1.8	2.4	2.0	2.3	2.8	2.9	2.6	2.8	2.7	3.1A	2.3AB
Jonadel	2.2	2.0	2.1	2.0	2.5	2.8	2.9	2.6	2.2	2.0	1.7B	1.7B

¹Average score/cultivar ranked on basis: 1 = best taste ranking, 4 = lowest ranking among four cultivars.

²1 = most acid.

³1 = sweetest.

⁴1 = most desirable texture.

⁵1 = most juicy.

⁶1 = no oxidation, 4 = undesirable oxidation.

⁷Mean separation in columns by Duncan's multiple range test, 1% level.

Individual fruits were weighed, measured, rated for overall color and analyzed for firmness (Magness Taylor pressure test at two positions/fruit), soluble solids and titratable acidity. Diced and peeled selections were then presented to a seven-member taste panel who scored the cultivars using a 1-4 ranking for: taste preference, acidity, sweetness, texture, juiciness and oxidation (after 20-minute exposure).

Data were analyzed by an analysis of variance with mean separation by Duncan's multiple range test for each harvest. The coefficients of variability for the objective tests ranged from a high of 11 percent for weight to a low of four percent for diameter. For the subjective evaluations coefficients of variation were as high as 43 percent indicating lack of agreement among panel members.

Raw product quality data (Table 1) showed the Jonadel apple to be consistently and significantly larger and tended to be the most conic in shape. Fruit tended to lose firmness over the harvest span, yet all cultivars retained good firmness during the maturation period sampled. Jonalicious was the firmest and Jonnee was always significantly less firm at each harvest. The percent soluble solids in all fruit increased with time. Jonadel increased the least in soluble solids and, at the final harvest, had the least amount of sugar. Both Blackjon and Jonnee had the highest amounts of malic acid at all harvests; however, Jonnee was significantly less acid than Blackjon. Jonadel had the lowest acidity at each harvest.

Visual estimates of overall red color confirmed the better coloring characteristic of Blackjon and Jonnee. Jona-

del and Jonalicious reached equivalent full color only at the last harvest.

The subjective fruit evaluation produced interesting data. There was no unanimity of taste preference until the last harvest when both Blackjon and Jonnee were rated best. The taste panel was able to rank the cultivars on acidity in a fashion that paralleled the actual acidity present until the final harvest when Jonadel was judged to be significantly more acid than Blackjon and Jonalicious. Panel detection of sweetness also generally agreed with the soluble solids determination, but sweetness was obscured at times by the high acidity in the fruit. All cultivars were judged equal in preference regarding flesh texture and juiciness. Blackjon oxidized more than the other cultivars, but not to a degree considered unacceptable by panel members.

These data suggest for fruit produced by these cultivars in this area that Jonadel reaches a more acceptable maturity ahead of Jonathan types, that Jonnee is not essentially earlier maturing than Blackjon and that Jonalicious maturity coincides with the Jonathan cultivars. All four cultivars produce fruit of excellent dessert quality. Taste preference among them is a matter of individual choice. All are highly acceptable apples when not compared directly with each other.

Literature Cited

1. Brooks, R. M. and H. P. Olmo. 1972. Register of new fruit and nut varieties. 2nd Ed., Univ. Calif. Press.
2. Rom, R. C. and S. A. Brown. 1975. Quality of six Jonathan apple cultivars. *Ark. Farm Res.* 24(1) 13.
3. Rom, R. C. and S. A. Brown. 1976. The Jonadel Apple *Ark. Farm Res.* 25(2):4.