Rating Systems for Strawberries

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From ancient times fruit varieties have been compared with each other by growers, consumers, and writers. Gradually comparisons became more objective, and descriptive terms such as poor, fair, very good, and excellent, or small, medium, and large, came into use with more or less definite concepts in mind. Nursery catalogues and popular descriptions commonly use such terms. As science developed, still more accurate measures were needed. Relatively accurate measurements often used now are number of fruits per pound or bushel, weight of individual fruits, color names related to wave lengths of light, puncture pressure of epidermis and flesh as a measure of firmness, etc. For physical characters such measurements can often be made, but for some qualitative characters other measures are necessary.

In order to make comparisons as useful and as simple as possible, a numerical rating system has evolved with 1 as poorest and 10 as best (see "A rating system for the evaluation of horticultural material," Morrow, Darrow, and Rigney, Amer. Soc. Hort. Sci. Proc. 53:276. 1949). Where rapidity is necessary, all qualities may be so rated. Where one or more qualities, such as size or weight, are important enough to require a more or less exact figure, actual weights or sizes of samples may be made, and such physical measurements may be integrated into the tables or be translated into the numerical system for use in tables.

For use in small fruit research, in comparing varieties and evaluating selections and seedlings in breeding work, a further concept is the use of a score of 1 to 5 for too low to be commercially acceptable, and 6 to 10 for acceptable. Hence, a score below 6 for any quality would make the variety or seedling unacceptable for commercial usage and those rating 6 or more for all qualities would be acceptable.

If a rating of 6 for any quality can be related to a physical character, the numerical rating can be relatively exact over the years. If, however, a rating of 6 be given the flavor of a strawberry variety, it is based on the scorer's concept of an integration of acid to sugar ratio, tannin content and esters in comparison with other varieties having acceptable flavors. Then, as varieties with higher flavors are introduced an acceptable rating of 6 may shift upward and a variety formerly rating 6 may have a 5 rating. Improvement in flavor of peach varieties in recent years has perhaps been great enough to shift the concept of passable flavor upward for this fruit.

There is little doubt that chemical measurements could be made of the components of flavor to establish relatively fixed standards but at present such are not available, at least for reference in the rapid evaluation of hundreds and thousands of seedlings during a short ripening season.

In the 1947 U. S. Department of Agriculture Yearbook, a brief table was given to illustrate the great differences in qualities of strawberry varieties in one locality, as follows:

*Consultant, U. S. Department of Agriculture.

Variety	*Size*	*Productiveness*	*Firmness*	*Flavor*	*Color*	*Resistance to spot*	*Season**
Blakemore	7		8	7	9	7	2
Suwannee	7		5	10	8	7	3
Midland	10		7	9	7	9	2
Fairpeake	8		8	9	8	7	9
Redstar	8		7	7	8	9	10
Tennessee Shipper	5	8	10	5	7	7	3

*Earliest = 1; Latest = 10.

These ratings were based on judgments of varieties grown in Maryland 15 years ago. Our concept of size has changed and for this character each variety in that table would now be rated at least 1 point lower. For productiveness, too, each might drop 1 point. For firmness, our present judgment is that Blakemore should rate 9, Tennessee Shipper 9, and the others as given. Flavor, color, and spot resistance would not be changed. In season, Midland has proved to be earlier than Blakemore, perhaps enough to change its rating to 1. New standards based on new varieties are now available. Armore, Jerseybelle, and Midway are usually larger, and Armore, Pocahontas, Dixieland, and Earlidawn are more productive than Midland. Dixieland is as firm as Tennessee Shipper; no new varieties superior in flavor to Midland are available; no new variety for Maryland is more resistant to spot than Midland; Earlidawn may be slightly earlier than Midland but the latter still rates 1.

In the same Yearbook article important differences between the same varieties grown in different areas were emphasized. Three varieties were rated for 6 characters in two locations as follows:

Variety	*Location*	*Production*	*Firmness*	*Flavor*	*Color*	*Resistance to*	
						Spot	*Scorch*
Howard 17 (*Premier*)	Md.	9	4	6	7	9	9
Howard 17 (*Premier*)	Mass.	10	6	8	8	9	9
Missionary	Fla.	10	8	6–9	8	7	7
Missionary	No. Car.	8	5	6–9	7	6	6
Marshall	Oreg.	9	6	9	8	7	9
Marshall	Md.	1–3	3	3–5	5	3	7

Differences in climate in these different regions caused important differences in the varieties—Howard 17 *(Premier)* was considerably firmer and higher flavored in Massachusetts as compared with its berries in Maryland, while Marshall showed even greater differences between Oregon and Maryland grown berries. The strawberry in general has better flavor in northern parts of the United States or at higher elevations due to lower night temperatures and more sunshine (longer photoperiods with moderately warm days). However, the strawberry is an extremely heterozygous octoploid, and breeding in many localities has resulted in the selection of varieties with high flavor in many areas—Albritton in North Carolina, Midland from Maryland to Massachusetts, Suwannee from Mississippi

to New York, and Sparkle from New Jersey to Maine. Florida Ninety is large-fruited in Florida but small in Maryland. Weather and climate are important, but breeding for high flavor and other characters in any given section can give varieties with high ratings there.

The principal varieties of strawberries may be rated for areas to which each is adapted for 8 commercially important characteristics as follows:

Variety	*1960 % of Com. acreage*	*Size*	*Productivity*	*Firmness*	*Flavor*	*Color*	*Res. to spot*	*Res. to vertic.*	*Season**
Blakemore	18	6	8	8	7	9	8	8	2
Northwest	17	8	9	8	7	8	7	6	5
Robinson	9	8	9	5–6	6	8	5	9	7
Lassen	7	8	10	5–6	6	9		7	6
Headliner	6	–	8	–	–	–	–	8	–
Tenn. Beauty	6	7	8	7	7	8	7	8	6
Catskill	5	8	9	6	7	7+	8	10	5
Sparkle	4	7	9	6	9	9+	7	5	6
Howard 17 (*Premier*)	4	6+	9	5–6	6	6+	9	9	2
Shasta	4	9	7	7	7	9	6	6	6
Marshall	4	8	6	5	9	7	4	4	4
Jerseybelle	2	9	7	6	6	10	6	3	10
Pocahontas	2	8+	9	7	8	9	6	4	3
Albritton	1	8	8	8	9	9	9	6	6
Armore	1	9	9–10	6	8+	7	6	4	6–7
Dixieland	1	8+	8	10	6	9	7	1	2
Dunlap	1	6	8	6	8	7	6	–	3
Fla. Ninety	1	9	9	7	7	8	9	–	–
Klonmore	1	6	7	8	7	8	10	–	–
Siletz	1	6	9	8	7	8	10	8 or less	8
Earlidawn	0	7–8	9–10	7	8	8	8	1	1
Midland	0	7	8	7	9	7	8+	3	1
Fairfax	0	7	7	7	10	7	9	6	4
Klondike	0	6	6	7	7	6	7	?	3
Missionary	0	6	6	6	7	7	7	4	2
Senga Sengana (N. Y.)	0	8	8	6	7–8	9		–	6

*1 = earliest; 10 = latest.

This table gives individual values for each character. An overall score is often desired and is sometimes useful. It involves rating for other characters or adjusting the values for the more important qualities. Earliness or lateness may sometimes have twice the importance of some other qualities. Size or flavor may be of unusual importance. Thus, for Glenn Dale, Md., the relative values for several qualities may be scored as shown in table on next page.

The score indicates that NJ–157 may be of value if leaf spot can be controlled; if not, NJ–157 has no value at Glenn Dale. Its estimated productiveness, its size, and its lateness indicate that extra care and expense to control leaf spot may be warranted. Earlidawn may be the most profitable variety, especially on good soil where a good stand of plants can be obtained. Midland may be the third most profitable, although its higher flavor may not return a higher price to compensate for lower yield. Ratings such as the above for a few qualities that are often important may have value in showing potential values. However, the annual cycle of weather, soil fertility, insect and disease, weed or labor fac-

Variety	*Size (1–20)*	*Productiveness (1–20)*	*Firmness (1–10)*	*Flavor (1–10)*	*Color (1–10)*	*Resistance to spot (1–10)*	*Season**	*Total score*
Earlidawn	15	19	7	8	8	8	20	85
Midland	15	16	7	9+	7	8+	19	81
Dixieland	15	17	10	7	9	7	16	81
Pocahontas	16	18	7	8	9	6	12	76
Armore	19	19	6	9	7	6	14	79
NJ-157	19	17	7	6	8	4	20	81

*20 = Earliest; 10 = Mid; 20 = Latest.

tors may have sufficient impact on many genetic qualities to change the values by limiting plant stands, vigor, flower bud formation, fruit set and fruit development. For full evaluation of varieties, it would be necessary to interrelate number and time of runner production, leaf growth, and flower-bud formation and development; response to temperature, soil moisture, and to soil fertility; resistance to verticillium, mildew, leaf scorch, many kinds of nematodes, root fungi, fruit rots, bud and root weevils, spittle-bug and to other insects; as well as response to competition from various weeds and to cultural operations. For areas other than Glenn Dale, Md., other qualities will be rated as most important, and the qualities in Maryland may be given different values.

Very Early California Peach Varieties Decreasing

Don Bones, of the California Fresh Fruit Advisory Board reports that considerable replanting and top-working of the very early peach varieties to later varieties is now taking place in California. The varieties being discarded are those being harvested between April 28 to May 1. He attributes this trend to the high prices these varieties have to get in order to take care of the high cost of production resulting from low average production—6 to 7 tons per acre, and the high cost of packaging.

Galbraith Baldwin Susceptible to Cracking

Severe, triangular cracks, as much as ¼" deep, in the fruits of Galbraith Baldwin, have been observed in Massachusetts and New Hampshire by different growers. They are reporting 50 to 100% of their crops of this variety cracked, according to W. J. Lord of University of Massachusetts. The standard Baldwin and other varieties in these orchards do not show the injury. The cause is unknown.

A Peach Tree Trouble

A trouble in young peach trees has been observed in New Jersey by E. Christ, involving a swelling and mechanical weakness at the bud union. The most seriously affected trees have been seen in a block of Rio-Oso-Gems. Afflicted trees of Sunhigh, White Hale, and Sunhigh have shown the weakness at the bud union, as well as a pithiness of the wood not evident in Rio-Oso-Gem. It has been suggested that the difficulty may be due to either an incompatability or a virus.