Yield–Size Relationship of Strawberry Varieties*

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High yields of large fruit will remain a principle objective of all strawberry breeding programs. Not only does size represent an important factor in harvesting costs, but there is a definite consumer preference for large fruit. While it is obvious that strawberry varieties differ in both yielding ability and fruit size there is no uniform objective method to express these variables. This study was undertaken to determine a satisfactory procedure to evaluate yield-size relationship.

Methods

The present study was conducted with variety trials set at Orleans, Indiana, in 1957. Nine varieties (Armore, Blakemore, Dixieland, Earlidawn, Empire, U.S.D.A. Premier, Pocahontas, Surecrop, and Tennessee Beauty) in eight plant plots spaced two feet by four feet were replicated six times in a randomized block design. The plants were grown in the matted row system. Yield was taken by weight and transformed to quarts on the basis of 24 ounces to one quart. At each picking one quart from each plot was selected at random, and the number of berries per quart was determined along with the quart weight. In this way the average berry weight for each plot at each picking was determined. From these data berry weight can be converted to the number of berries in a standard quart. The relationship between weight and number of berries per quart is nonlinear and can be expressed by the formula Log Y (no. of berries per quart) = $2.737 - .9117$ log X (wt. per berry in grams)*** This relationship is presented in Table 1.

The plots were renovated after the 1958 harvest and similar data were taken in 1959.

Results and Discussion

The fruit size data for each variety at each picking are plotted with Pocahontas in Figure 1. The three peak pickings of each variety are indicated by arrowheads. In this way, the size of each variety at its period of maximum production can be directly com-

Table 1. Predicting number of strawberries per quart from average berry weight.
log Y = 2.737 − .9117 log X

X Average weight per berry	Y No. berries per quart	X Average weight per berry	Y No. berries per quart
grams		grams	
22	33	9.0	74
21	34	8.5	78
20	36	8.0	82
19	37	7.5	87
18	39	7.0	93
17	41	6.5	99
16	44	6.0	107
15	46	5.5	115
14	49	5.0	126
13	53	4.5	139
12	57	4.0	154
11	61	3.5	174
10	67	3.0	200
9.5	70	2.5	237

Table 2. Yield-size relationship of nine strawberry varieties grown at Orleans, Indiana.

Variety	Yield/Acre						Proportion of total crop with 100 or less berries per qt.			Earliness[1] rating		
	Quarts of 100 or less berries			Total quarts								
	1958	1959	Average	1958	1959	Average	1958	1959	Average	1958	1959	Average
	thousands of quarts						percent			percent		
Armore	12.0	12.1	*12.0*	19.3	21.4	*20.4*	62	57	*60*	18	25	*22*
Pocahontas	8.5	10.1	*9.3*	18.8	15.3	*17.1*	45	66	*56*	43	48	*46*
Dixieland	8.1	9.2	*8.6*	17.0	16.7	*16.8*	48	54	*51*	44	45	*44*
Surecrop	6.3	8.8	*7.6*	15.3	15.3	*15.3*	42	57	*50*	41	44	*42*
Empire	6.0	9.1	*7.6*	13.5	12.4	*13.0*	43	73	*58*	35	33	*34*
Earlidawn	7.8	6.6	*7.2*	15.7	9.2	*12.4*	49	72	*60*	63	70	*66*
Tenn. Beauty	3.6	8.0	*5.8*	17.2	18.5	*17.8*	21	43	*32*	25	26	*26*
Premier	3.2	6.1	*4.7*	13.4	13.6	*13.5*	24	45	*34*	45	47	*46*
Blakemore	1.9	4.6	*3.2*	12.0	14.6	*13.2*	16	32	*24*	44	39	*42*
L.S.D. .05		3.1			2.4			13			9	

[1]Earliness is calculated as percent of total crop picked by an early picking. This was 4th (June 5) of 10 pickings (May 28–June 19) in 1958 and 5th (May 30) of 11 pickings (May 21–June 15) in 1959.
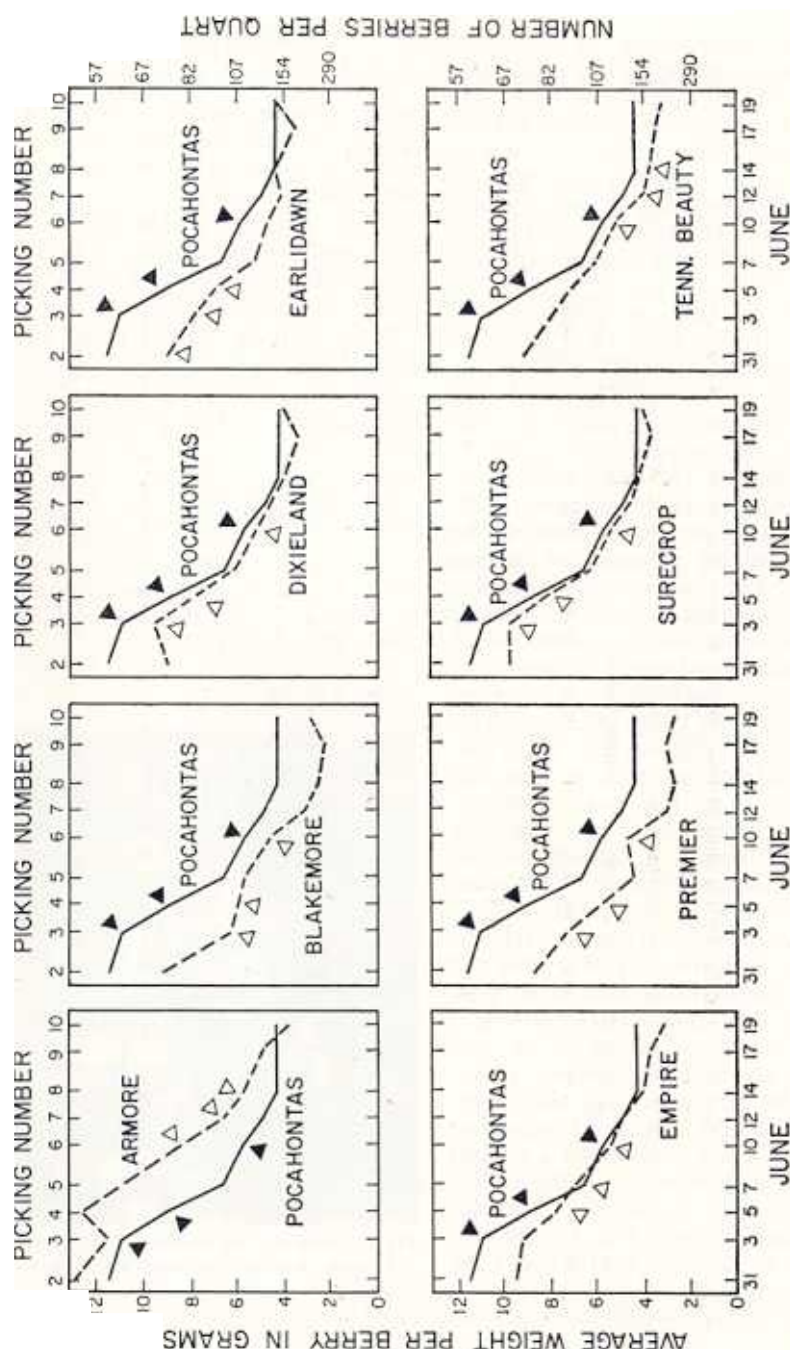
30

Fig. 1. Relationship between berry size and picking date for nine strawberry varieties. The arrowheads refer to the three peak pickings for each variety.

31

pared. A comparison of the performance of each variety indicates that the relative decrease in berry size from picking to picking is similar for all varieties. The major size differences between varieties depends on the relative berry size at each picking date and in which part of the size curve the peak pickings are concentrated.

In order to evaluate both size and yield directly the total yield was subdivided into yield of fruit of 100 or less berries per quart. The yield data for the 1958 and 1959 season are presented in this manner in Table 2. Comparing the two-year average of total yield with yield of fruit of 100 or less berries per quart changes the relative ranking position of certain varieties. For example, Tennessee Beauty, which ranked second in total yield, drops to seventh place when this yield is based on fruit size.

The horticultural value of a variety is not necessarily based on its capacity to produce the largest fruit at a particular picking, or even on the size of the fruit at the peak pickings. Rather it is which variety will give the highest yields of large fruit. Describing yield in terms of a particular size appears to be the most satisfactory index for evaluating varietal performance. The use of 100 berries per quart as the dividing line is an arbitrary one. A standard division would have to be agreed upon as an prerequisite to uniform testing procedures. The mechanics for size determination would consist of sampling varieties at each picking on a weight basis and then converting the resulting weight value to number of berries per standard quart. The number of berries to be sampled would also have to be determined.

Pacific Gold Apple

The Pacific Gold apple originated as a chance seedling near Myrtle Point, in southwest Oregon. I introduced it either in the winter of 1947–48 or 1948–49.

The tree is moderate in size, with well-spaced, strong, wide-angled limbs. It bears young, and yields heavy crops annually.

The fruit of Pacific Gold is very large, with crisp, tender flesh, quite sweet, and of fine dessert quality. It's just grand for salads or frying (doesn't melt into a sauce), and is fine for baking and pies. Its season is late Fall or early Winter. With C. A. storage, Pacific Gold should keep until Spring.

Although no trees are as yet available, I can supply some scionwood or buds.—*J. E. Miller, 5595 Sierra Park, Paradise, Cal.*

Fig. 1. Clusters of Pacific Gold apples in Oregon, where this new variety was originated.