

# Strawberry Variety Testing in New Jersey\*

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Strawberry variety testing as it has evolved at the New Jersey Agricultural Experiment Station has become more than the testing of horticultural characters. It became clear about ten years ago that plantings in the state were suffering from viruses and that the growers were powerless to do anything about the situation. The introduction of the Jerseybelle variety in 1954 provided a stimulant to the industry, but soon reports of erratic yields from this variety caused great concern.

The strawberry breeding program was expanded in 1955 and 1956, and the first seedlings, about 20,000 from this expanded program, were fruited in 1957. Early in 1957 the two groups interested in strawberry research agreed that the "cultural" group should undertake the annual replicated testing of strawberries. It was the desire of the "cultural" group to have a continuing test of strawberry varieties to measure the effect of variations in seasons. The seedling selections were included because the breeders felt they were worthy of such critical trial. It was agreed that the testing program should also provide the seedling selections with as much protection as possible from viruses and all other harmful diseases and insects. The entire program was considered as advanced testing.

At this same time the State Depart-

ment of Agriculture in New Jersey‡ was asked to provide new strawberry plant certification regulations to provide a source of high-quality planting stock. These new certification regulations were clearly the means by which promising seedling selections could be protected; and thus there developed an intimate cooperation between the State Department of Agriculture, the New Jersey Agricultural Experiment Station, and a third group, the New Jersey Small Fruits Council, a non-profit organization of growers which took on the job of helping to finance the program.

In 1957, the first seedling selections were accepted for advanced testing, and to date 32 have been entered in the advanced testing program. The first step was to give the seedlings the protection of screenhouses and fumigated soils, the same physical facilities that are used to produce foundation stock for the certification program. The plants were indexed and no virus detected. Indexing of planting stock for the screenhouses has been an annual job.

The next step was to propagate plants of these promising seedling selections in the field under certification conditions, that is, isolation; soil fumigation; insect, disease, and weed control; and inspection as required by certification regulations. Thus, with the naming of a new variety, it would

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**TABLE 1. Rate of Yield of Strawberries in Annual Variety Trial.**

Variety	Yield (quarts per acre <sup>o</sup> )			
	1959†	1960	1961	1962
Jerseybelle	5,130	9,710	14,338	11,605
Sparkle	9,137	9,445	11,217	6,497
Midland	6,668	8,683	11,557	6,962
Catskill	9,771	11,268	12,759	7,743
Pocahontas	7,893	11,577	12,981	7,841
Surecrop	7,837	9,662	11,971	8,089
Earlidawn	4,963	10,756		9,502
Dixieland		10,698	13,549	7,998
Redglow	6,555	8,226	10,612	
Redstar	5,895			
Empire	3,060	8,715		
Albritton		8,491		
Redcrop		6,487		
Vesper (NJ 157)	13,314	14,163	16,735	13,461
NJ 257	5,313	9,249		
NJ 357			12,978	11,663
NJ 457		9,710	14,370	9,521
NJ 557		12,738	14,838	10,382
NJ 857				12,904
Modified Tukey				
D Test				
.05		2,535	3,065	1,085
.01		2,921	3,590	1,244

<sup>o</sup>50-foot single row plots. Weights converted to quarts per acre by using a 23-ounce quart. Plots replicated six times.

†These data not subjected to statistical analysis because three replications suffered some fire damage.

**TABLE 2. Average Weight of Berries at First Picking.**

Variety	Average weight (grams <sup>o</sup> ) of 25 berries			
	1959†	1960	1961	1962
Jerseybelle	405	540	672	538
Sparkle	183	331	396	338
Midland	252	380	376	333
Catskill	271	420	317	346
Pocahontas	199	276	304	285
Surecrop	204	348	359	346
Earlidawn	175	267		182
Dixieland		280	329	295
Redglow	167	257	277	
Redstar	267			
Empire	177	368		
Albritton		383		
Redcrop		311		
Vesper (NJ 157)	454	675	713	565
NJ 257	313	423		
NJ 357			543	465
NJ 457		541	412	433
NJ 557		443	449	456
NJ 857				435
Modified Tukey				
D Test				
.05		97	79	N.S.
.01		112	92	N.S.

<sup>o</sup>50-foot single row plots replicated six times.

†These data not subjected to statistical analysis because three replications suffered some fire damage.

be eligible for certification. Plants produced under this program were then used for replicated variety trials, on farm tests, and tests with cooperating Experiment Stations.

Part of the results of the replicated tests since the establishment of the program can be found in Tables 1 and 2. The replicated tests include the more important varieties in New Jersey as well as new varieties from other states, along with the seedling selections for advanced testing. Jerseybelle plants fruited in 1959 contained virus when planted. Those fruited in 1960 were virus-free when planted, but were exposed to other plants not virus-free, whereas in 1961 all plants used in the test were virus-free. The 1962 fruiting season reflects the results of a severe drought prior to harvest, and high temperatures during the harvest season. These high temperatures caused a large variation in fruit size within a variety, as indicated by the statistical examination of Table 2. This came about due to premature ripening of fruit even though the plants were irrigated.

As the data have accumulated, and been made available to the breeding group, they have proven valuable not only in the breeding but in the cultural research program as well. Several cultural problems have been detected in the annual strawberry variety trials, and the value of the trials increases as we accumulate the effect of seasons upon the performance of strawberry varieties. The data reported here came from the large annual tests, but other smaller replicated tests are carried out where plant supplies are limited. The variety trials are used to test plant supplies from our certification program.

Vesper (NJ 157) is the first-named variety to result from this program. The announcement of this new variety

is reported elsewhere in this issue of *Fruit Varieties and Horticultural Digest*. Other selections have been dropped from advanced testing for various reasons. In addition to not having the desired horticultural characters, one selection was dropped because it was too sensitive to two spotted mites. Another selection was found to pose propagation problems, and the cultural research group has been working on this problem for several years.

The final step in the program is to provide as many plants as possible to fruit growers for the planting season after naming. By working with commercial nurseries in advance of the time a selection is named, it has been possible to provide between four and five million plants of Vesper to fruit growers this planting season.

The program in New Jersey breaks with tradition by going beyond the testing of horticultural characters, and endeavors to provide an integrated program of plant protection and testing that will help its expanding industry. Its success is the result of the cooperation of horticulturists, plant pathologists, and entomologists of the Experiment Station and State Department of Agriculture, as well as the support and stimulation of the growers through their Small Fruits Council. Within the Department of Horticulture, this program has provided the means of critically testing worthy seedling selections and annually establishes reference points in screening seedlings. It also provides an early opportunity to detect certain cultural problems that may exist with new varieties and our own seedling selections. In this manner, the industry profits from good supplies of healthy planting stocks of adapted varieties.