Varietal Responses in Strawberries to Winter Injury

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Strawberry varietal and selection trials are conducted regularly at the Virginia Agricultural Experiment Station to provide information on new varieties, their adaptations, merits and shortcomings. The trials are conducted on the basis of single plots of each variety or selection, consisting of 25 feet of matted row. Eighteen plants of each variety or selection are set at 18 inch spacing in rows 4 feet apart each spring.

The plants are permitted to develop runners and runner plants at will. Only when adjoining rows of plants show indications of growing together are runner plants discouraged through cutting off, pulling up or by cultivating. Each bed is fruited only one season because of the turnover of varieties and selections tested from year to year.

The 1959 fruiting season trials showed unexpected variability in yields of berries, plant vigor, stand of functional plants, survival of plants and general condition of the plots. The observations made, and yield records that were obtained, led to some conclusions that appeared worth reporting.

The plots of strawberries for the 1959 trials were planted May 16, 1958. That date was a month later than the preferred time for setting strawberries at Blacksburg, but wet soil conditions and a delayed spring prevented earlier planting. Dry weather set in shortly thereafter, and the plants made slow growth for some time. Summer showers eventually stimulated growth, and by late summer the planting had made excellent progress. The plot had received 10–10–10 fertilizer at the rate of 1000 pounds per acre several weeks before planting. Plants were given a treatment of starter solution when set, and were side-dressed with ammonium nitrate at a rate of 4 ounces per 25 foot plot, after summer showers had alleviated the early season shortage of moisture.

In spite of a rather dry summer, the plants made vigorous growth and produced many runners except on a few varieties that are shy runner producers. Many of the runners were produced late in the summer however, and it was anticipated that berry yields in 1959 might not measure up to the level indicated by the vigorous appearance of the plots. Runner plants developed late in the season are usually less productive than those developed earlier in the season.

The planting appeared so uniformly satisfactory in vigor and plant stand that the fall notes usually taken on plot conditions were not made. The autumn season was mild and abundantly supplied with moisture. The first killing frost occurred October 7 with a low temperature of 28° F. recorded in a weather box located about 300 yards from the strawberry planting. Growth of strawberry plants continued for sometime after that.

The planting was given a mulch of 4″ to 6″ of wheat straw on November 26, in advance of a predicted cold wave. On November 30, a low temperature of 10° F. was recorded in the weather box. The remainder of

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Table I. **Strawberry Yields and Performance at Blacksburg, Virginia in 1959.**

Variety	Yield in quarts per 25 foot plot	Plant stand in percent	Plant vigor	Root injury rating*
Empire	35.1	110	Good	0–1
Surecrop	29.4	90	Good +	1
Fletcher	28.6	110	Good +	2
Dixieland	27.6	90	Good +	2
Catskill	27.4	100	Good	2
Earlidawn	24.3	80	Good	3
Fairfax	21.6	100	Good	3
Vermilion	20.1	80	Good −	3
Robinson	17.6	100	Good +	0
Redglow	17.2	70	Good	3
Tennessee Beauty	16.9	100	Good −	1
Midland	16.5	80	Good	3
Armore	16.2	60	Medium	2
Frontenac	15.2	70	Medium	2
Sparkle	15.1	90	Medium	3
Stelemaster	15.0	90	Good	3
Tennessee Shipper	14.3	90	Good	3
Redstar	14.2	70	Good +	0
Blakemore	12.1	90	Medium −	3
Pocahontas	10.5	40	Medium −	4
Howard 17	8.8	70	Poor	4

*Root Injury Rating
0 = No apparent injury; 1 = Slight apparent injury; 2 = Light apparent injury; 3 = Medium apparent injury; 4 = Severe apparent injury.

the winter was consistently cool, but no extreme temperatures were recorded. The low for the winter was 0° F. on January 5, but eleven other readings of 10° F. or lower were recorded.

The winter mulch was removed from the planting on April 1, and while the foliage appeared to have been frozen somewhat more than usual, the planting appeared to be in good shape. As the season developed, however, some plots showed definite signs of injury, poor growth and lack of vigor. Most plots bloomed heavily and set an ample crop of berries. May and June were deficient in rainfall and as the berries ripened some plots showed real distress. Inspection of the plants revealed some leaf spot, slight leaf scorch, varying amounts of spittle bug injury, and light infestation of mites, but nothing of sufficient severity to be of much consequence.

Ten representative plants were then dug from each plot and inspected for root condition. The roots showed great variation in root condition. Plants of some varieties had few if any live roots with only the crown and primary root alive. Others showed slight to moderate root damage. The damage was characterized by typical "black root" condition. The degree of blackening of the roots varied from none or very slight on three varieties to very severe on two varieties. Slight blackening of the roots appeared to have little influence on vigor of plants and their yielding ability. Severe to medium blackening was accompanied by death of secondary and feeder roots. In some severely affected plants it appeared that the only root tissues alive during the berry ripening season were those in the crowns and primary roots. Growth of foliage and berries made by such plants appears to have been based essentially on the food reserves stored in the crowns and primary roots. No evidence of infec-

tion by a pathological organism was detected.

All plots were scored for apparent root damage and also for condition of the above ground portions of the plant. The scoring and data on yields and plant stand are presented in Table I. In general the scoring for condition of the roots agreed closely with the scoring given for condition of the above ground portions of the plant. In most cases the condition of the roots agreed closely with the yields of berries obtained; but several noteworthy exceptions should be pointed out. Dixieland and Earlidawn showed considerable root injury but were among the better yielding varieties included in the test. Redstar and Robinson showed no root injury and had vigorous top growth but had below average yields of berries. Redstar is below average in runner production at Blacksburg, and many of its blossoms do not set berries at Blacksburg, which may explain its mediocre performance in the test.

It appears that root condition was an important factor associated with strawberry yields in the 1959 trials at Blacksburg. The root damage probably resulted from the sudden drop in temperature to 10° F. on November 30, 1958 after a rather moderate fall season with conditions favorable for late fall growth of the berry plants. It appears possible that varieties such as Pocohontas, Blakemore and Howard 17 may be slower in acquiring dormancy in the fall season than other varieties such as Empire, Surecrop, Fletcher and Catskill.

Trumpeter, a New Strawberry

A new June-bearing strawberry variety named Trumpeter has been introduced by the University of Minnesota. This very promising variety is the product of a cross of Burgundy (female parent) and a selection resulting from the inbreeding of Premier. The plants are tall, hardy, very vigorous, resistant to roots rots and foliage diseases. Yields have been satisfactory, according to A. Wilcox, of the University of Minnesota. It appears to do well on many kinds of soil.

The fruit is large, conical, with attractive red skin and flesh, which is firm and of good flavor. It matures late, and stores well. In tests for freezing quality, Trumpeter has rated very high when the cut berries were packed in sugar. The frozen slices retained their shape, color and flavor very well.

Trumpeter appears to be a general-purpose strawberry well worth trying in the northern states.

Moongold and Sungold Apricots

Two hardy apricot varieties, Moongold and Sungold, have been introduced by the University of Minnesota. They are crosses of the variety Superb and Manchu, a seedling selection of a Manchurian species collected by N. E. Hanson. They are adapted to northern regions of high rainfall. Moongold and Sungold are both very hardy, vigorous, productive, resistant to diseases. Both are self-unfruitful and should be planted together or with other apricot varieties. The fruit of both varieties are medium-sized, freestone, have very good quality for eating fresh, for jam and preserves, and are suitable for canning. They ripen in late July or early August, and hang on the tree well until fully ripe. The fruit of Moonglow are earlier than Sungold, have a more sprightly flavor, thicker and tougher skin, and are oblate in shape in contrast to the longer fruit of Sungold.