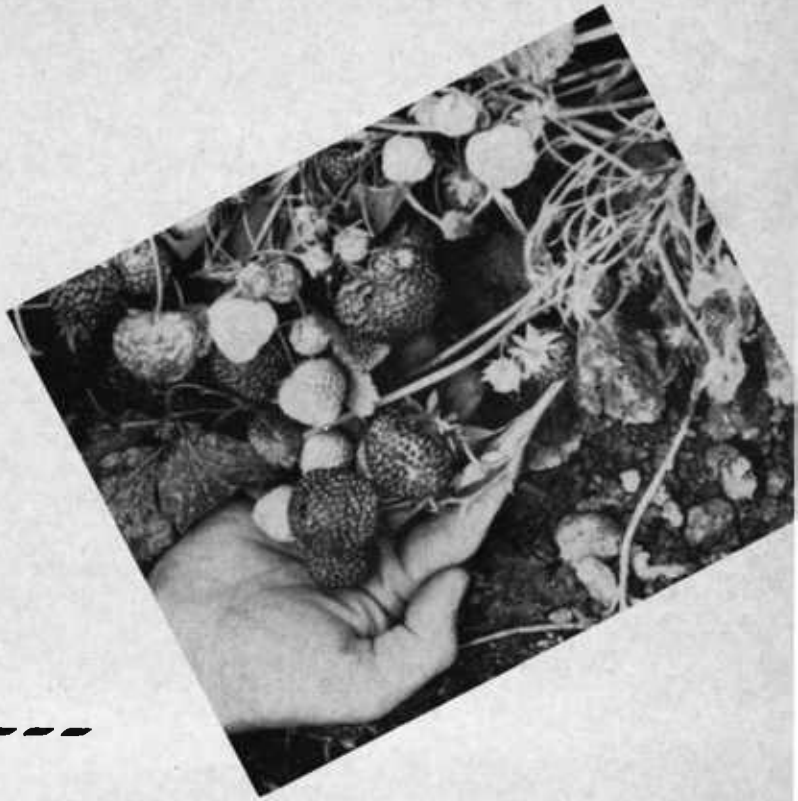

Siletz---

A NEW DISEASE RESISTANT STRAWBERRY

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Siletz---

A NEW DISEASE RESISTANT STRAWBERRY

by George F. Waldo*

OREGON'S two major strawberry varieties—Marshall and Northwest—are susceptible to red-stele or red-core root disease. As a result of breeding work by Oregon Agricultural Experiment Station and the U. S. Department of Agriculture at Corvallis to obtain superior red-stele-resistant varieties, the Siletz is being introduced for trial where the present varieties cannot be grown profitably.

ORIGIN

Siletz was tested as U.S.-Oregon 2172, the result of a cross of U.S.-Oregon 2012 (1491 × 1509) × U.S.-Oregon 1816 (1579 × 319). This was one of several crosses, made in 1947, of the most resistant parents then known. Seedlings of these crosses were grown in soil infested with the red-stele fungus during the fall and winter of 1947-48. Those showing no disease symptoms were planted in the field in the spring of 1948, and selections based on desirable fruit characteristics were made during the 1949 harvest season. Subsequent tests showed that Siletz (U.S.-Oregon 2172) not only has outstanding resistance to red stele, but a high degree of tolerance to other diseases, outstanding vigor and productiveness, and satisfactory processing qualities.

DISEASE RESISTANCE

No strawberry variety now grown in Oregon has shown such high disease resistance as Siletz. Tests for red-stele resistance have been carried on each year since Siletz was selected and at no time has it shown susceptibility. Examination of plants grown in soil infested with red-stele fungus have generally shown no darkening or discoloration of the stele or core of the root, and the occasional discoloration found cannot be attributed to red-stele fungus. Degeneration or stunting of the plants in early spring, characteristic of the red-stele disease, has never been noted.

The foliage of Siletz has a remarkably rich, glossy, dark green color, and it remains green throughout the year. At no time has either mildew or leaf spot appeared serious. Siletz is more resistant to mildew than is Marshall,

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which in turn is more resistant than Northwest.

No virus symptoms have been visible in Siletz growing under field conditions even though indexing has indicated that viruses were present in some plants. Because of this Siletz can be considered "tolerant" to virus diseases under field conditions. Since virus disease symptoms are not visible in Siletz precautions must be taken to prevent the spread of viruses from it to susceptible varieties like Marshall. The use of "certified" plants is recommended. Virus-free plants of Siletz are available from propagators.

PLANT VIGOR

Siletz plants are vigorous and produce runners freely, especially under irrigation. When runners are removed frequently, large plants with many crowns develop. If no runners are cut off, matted rows may become too thick, and berries too small. Growers need to give special consideration to runner control and plant spacing. A good stand of plants of medium or large size is essential to good berry size and maximum production.

FRUIT PRODUCTION

The great plant vigor of Siletz can be directed into high fruit production. Yields of 5 to 11 tons per acre have been obtained during the test period. At the Oregon Agricultural Experiment Station, Corvallis, yields of Siletz have always exceeded those of Marshall. A comparison of the yielding ability of Siletz and Marshall during three seasons is given in Table 1.

Siletz fruits generally begin to ripen 5 to 7 days later than Marshall. Because Siletz plants bloom later than Marshall, the blossoms have not been damaged as much by frost as have blossoms of other varieties. There is also an indication of some frost hardiness of flowers.

Comparisons of Siletz and Marshall for season of maturity and berry size

Figure 1. Siletz right and Marshall left, growing in Multnomah County. Siletz is growing vigorously showing no virus diseases, while Marshall beside it is severely affected.

TABLE 1. YIELDS OF SILETZ AND MARSHALL STRAWBERRIES, 1952-1955

Season and test number	Siletz	Marshall
1952	*Pounds per acre*	*Pounds per acre*
1	11,200	.....[1]
2	10,120	4,293
3	11,201	.....[1]
4	22,005	9,450
5	12,750	6,900
1953		
6	9,957	4,729
7	12,944	9,957
8	11,440	5,632
9	10,700	8,700
1955		
10	18,669	10,579
11	17,486	.....[2]
12	17,424	.....[2]
13	16,739	.....[2]

[1] No crop, plants destroyed by red stele.
[2] No plots of Marshall for comparison.

are given in Figures 2 and 3. The cumulative yield graph in Figure 2 shows higher production during the early part of the season for Siletz than for Marshall. The size-of-berry curves (Figure 3) illustrate the tendency of Siletz to fall off in size more than Marshall. Most of the Siletz crop, however, had sizes comparable to Marshall so that the yield of large berries was greater than that of Marshall. Under some conditions growers may find it unprofitable to pick the berries produced toward the end of the season.

The blossoms of Siletz are perfect and they usually produce ample pollen. Sterility does not seem to be a problem.

The Siletz berries are borne on medium-to-long clusters with an average

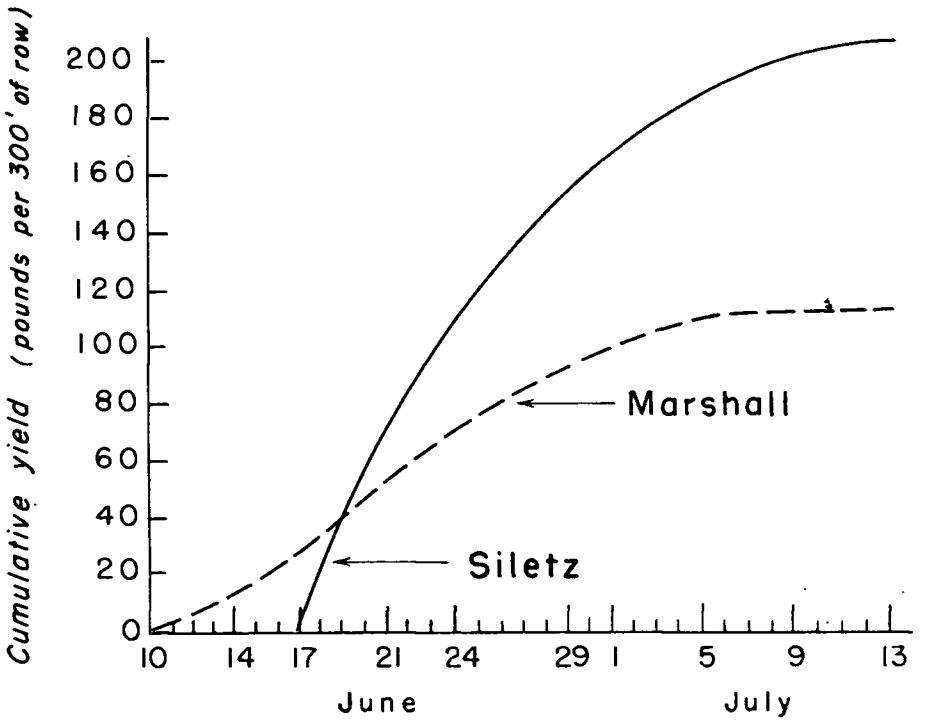

Figure 2. Siletz yields more than Marshall during the early part of the season.

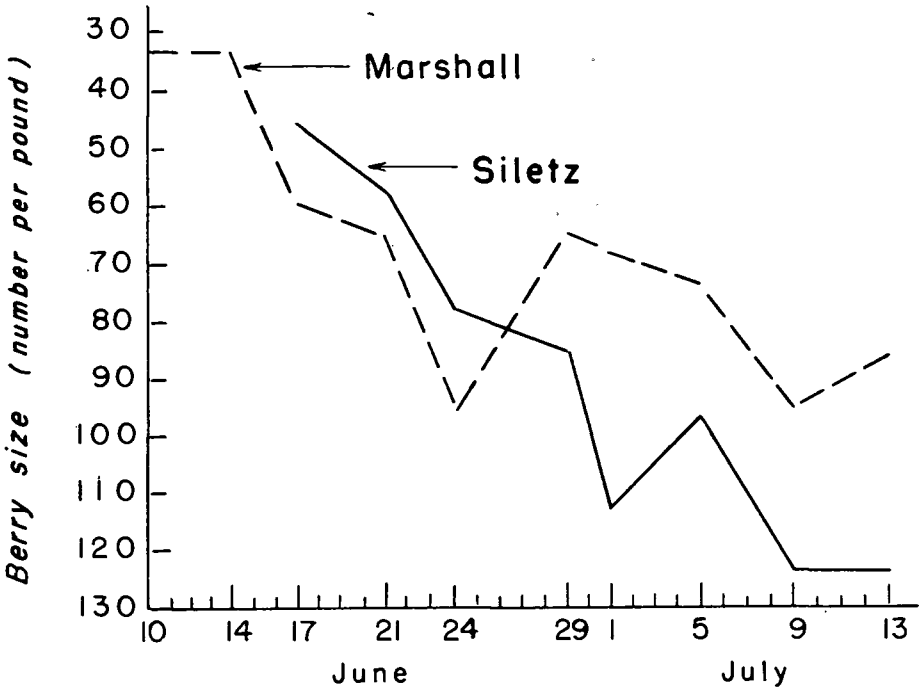

Figure 3. Siletz berries fall off in size toward the end of the season.

of 5 to 7 berries per cluster. They are round-conic and moderately easy to pick without stems. They are bright medium red, firmer, and better liked for local market than Marshall. They keep the bright red color longer than Marshall berries do. Cores pull out sometimes when the berries are picked without the hull or stem. Thus, there is exposed a fairly large cavity which may allow fruit rots to start or may become a recess for foreign matter.

PROCESSING QUALITY

Frozen packs are the main outlet for most strawberries grown in Oregon. Since a large quantity are sliced and frozen with sugar commercially, the Oregon State College Food Technology Department prepared the berries in that way for testing selections obtained in the strawberry breeding project. The berries were rated for the qualities listed in Table 2.

Marshall was more affected by unfavorable weather conditions and disease than Siletz. These effects were reflected in the lower percentage of usable berries after washing and sorting.

The Food Technology Department made a limited number of jam tests and concluded that Siletz is satisfactory for this purpose but not equal to Marshall. Although the fresh, whole berries appear lighter colored than Marshall, the jam appears slightly darker because Siletz has more color in the flesh. The canning quality of Siletz is superior to that of Marshall because of its firmer flesh, solid red color, and greater acidity. Siletz flavor

Figure 4. Siletz makes a thickly matted row.

cannot be considered equal to Marshall when the latter is grown under normal weather conditions. Siletz flavor has been satisfactory in all tests, and equal to or superior to that of Marshall where both varieties are exposed to disease and unfavorable weather.

Because Siletz is darker than Marshall when made into jam or frozen, some processors have not accepted Siletz. Other processors are favorably impressed with Siletz and accept the variety for the frozen pack. Of particular interest to processors is the fact that the core of the fruit pulls out at harvest giving rise to difficulties in washing and offering an added opportunity for the development of molds.

TABLE 2. EVALUATION OF PROCESSING QUALITIES OF SILETZ AND MARSHALL STRAWBERRIES

Season and variety	Berries usable after sorting and washing[1]	Size of berries		Agricultural Marketing Service grade	Color	Appearance and flavor
		Large[2]	Small[3]			
	Per cent	*Per cent*	*Per cent*			
1953						
Siletz	91	61.6	38.4	A	Slightly dark	Very good
Marshall	75	41.6	58.4	A	Good	Very good
1954						
Siletz	94	47.0	53.0	A	Slightly dark	Very good
Marshall	62	42.0	58.0	A	Good	Satisfactory
1955						
Siletz	93	45.0	55.0	A	Slightly dark	Very good
Marshall	76	41.0	59.0	A	Good	Very good

[1] By weight. [2] Held on 33/32 inch screen. [3] Held on 20/32 inch screen.

particularly if the berries get dirty or processing is delayed.

Where red-stele or virus diseases interfere with profitable production of Marshall or Northwest, Siletz is a good replacement; but growers should determine prior to planting whether processors will accept Siletz.

ADAPTATION

About 15 test plantings of Siletz have been made in the Willamette Valley. Many of these tests have been on soil infested with the red-stele fungus but otherwise fertile and well supplied with moisture. Under these conditions, growth of Siletz has been superior to that of Marshall or Northwest. Adequate tests have not been made on poorer soils or where soil moisture is lacking.

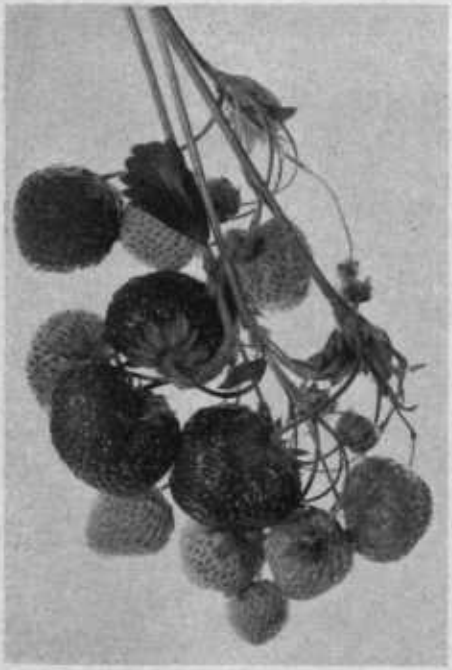

Figure 5. Typical fruit clusters of the Siletz.

Since the outstanding characteristics of Siletz are red-stele resistance and virus disease tolerance, Siletz is recommended for trial where these diseases make other varieties unprofitable to grow. Red-stele fungus is present in many heavy soils where it readily spreads. Wherever red-stele disease is a threat, therefore—especially on the heavier soils—Siletz may be a useful substitute for Marshall or Northwest. Since Siletz is tolerant to virus diseases, it may also be useful in areas where these diseases are so difficult to control that other varieties might be severely enough affected to become unprofitable.

Siletz berries, however, do not appear to have distinct advantages over those of Marshall and Northwest where these can be well grown and especially where diseases are not limiting factors. Growers who are having disease problems and are contemplating changing from their present varieties to Siletz should evaluate possible market outlets. They should contact processors and make arrangements for disposal of the crop before making extensive plantings. Careful evaluation of the characteristics of Siletz should also be made.

NAMING

The name Siletz is given because the appearance of the plant is suggestive of the native beach strawberry of the Oregon Coast, *Fragaria chiloensis.* This wild strawberry, as well as the western native meadow strawberry, *F. ovalis,* and cultivated varieties, has entered into the parentage of Siletz and may in part account for its vigor and disease resistance. Siletz is the Indian name of an Oregon Coast river.