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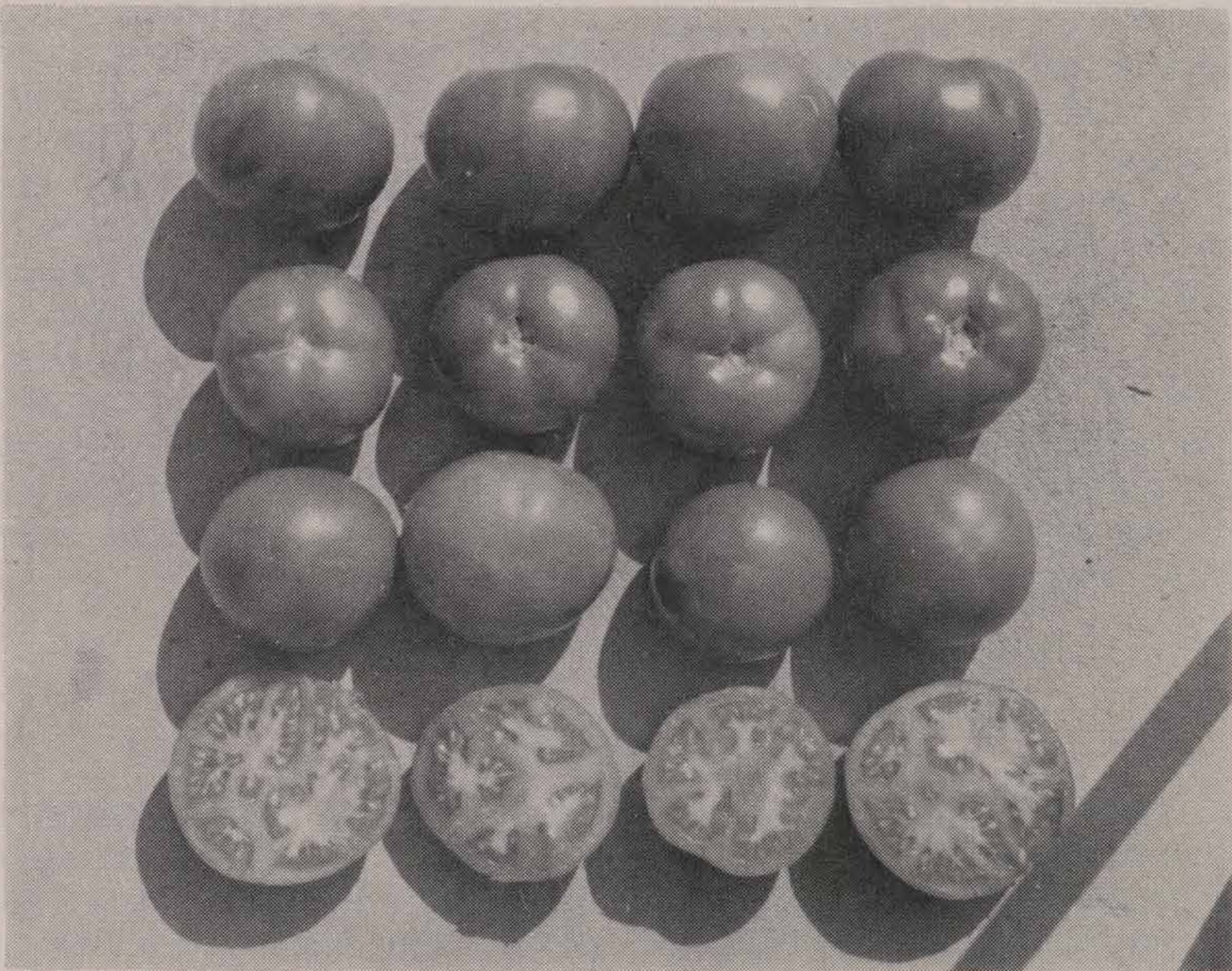
The Owyhee Tomato

Idaho's Curly-Top Resistant Variety

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IDAHO Agricultural
Experiment Station

Bulletin No. 298
March 1959

630.72
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The Owyhee Tomato

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CURLY TOP, sometimes called "yellows," "western yellow blight" or "blight," is the most serious and destructive disease of the tomato in Idaho. It is often responsible for the elimination of entire tomato plantings.

Curly top is a virus disease, transmitted by the beet leafhopper, *Circulifer tenellus* Baker. The leafhopper overwinters wherever suitable hosts occur; that is, on wild vegetation in the desert and foothills, and on ditch bank weeds. Leafhoppers which hatch in the spring on wild vegetation migrate to cultivated areas. This migration reaches a peak after winter soil moisture is exhausted and plants of the winter host area start to dry.

Control of this disease by the use of insecticides, sanitation, or modified cultural practices is not satisfactory, therefore, the use of genetically resistant material of-

fers the only feasible solution to the problem.

In 1939, an accession of *Lycopersicon peruvianum* Dun, (wild tomato) obtained from the Gray Herbarium, was demonstrated to be resistant to curly top. A cross was made between this accession and a commercial tomato, and early generation material was planted in Idaho in the early 1940's. Selections were made from this material and a breeding program was established in an attempt to transmit the resistance from these lines into an acceptable commercial variety. The Owyhee was derived from this breeding program. Through several years of testing, the Owyhee has exhibited good field resistance to the curly-top disease. In test plots where present commercial varieties were completely eliminated, most of the plants of the Owyhee remained healthy and produced good yields.

Description

Vine type—The vine type of Owyhee is indeterminate and bears a close resemblance to that of Sioux. The plant growth is sufficiently compact to supply ample shade to minimize sunburn, and yet open enough to favor good

fruit-set and even ripening. The untrained plant has a space requirement of 10-16 square feet per plant. The leaflets are medium in size and dark green in color.

Fruit—The fruit of Owyhee is sub-oblate in shape, smooth, uniform, and equal in size to Sioux (4.2 ounce average for the season).

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COVER PHOTO — Owyhee fruit are medium to large, moderately flattened, with smooth shoulders. Numerous small locules contribute to "meatiness."



The plant being held by the author exhibits the yield potential of the Owyhee. Note the large number of fruit produced on one vine.

Tomatoes are attractive in the pink stage and ripen uniformly. The fruit is moderately "meaty" with thick outer and interocular walls and five or more locules. The seed cavities are small and the fruit remains firm during the ripening period. The stem connection is small, slightly recessed, with smooth shoulders moderately free of radial or concentric cracks and catfacing. The flesh is red in

color with little core or fiber (usually well colored) at the stem connection.

Maturity — Owyhee has the early-setting habit which is an important characteristic for tomato production in southern Idaho. Maturity is classified as midseason-early or about five days later than Sioux, the commercial variety commonly grown in the area.

Pedigree

The Owyhee tomato is not immune to curly top, but it has exhibited good field resistance to the disease in southern Idaho. The genetic history of Owyhee is as follows:

Bounty X *Lycopersicon peruvianum* X *Bison*, selfed, X *Sioux*, selfed, selected, X *Sioux*, selfed, selected, X *Sioux*, selfed, selected, X *Sioux*, selfed, selected three generations.

Performance

The curly-top resistance of Owyhee is demonstrated by the data presented in Table 1. These data indicate that although curly top was severe enough to eliminate the commercial varieties under experimental test, a high per-

centage of the Owyhee plants remained healthy. In a commercial field in 1958, the Owyhee survived without curly-top damage while 30 to 35 percent of the plants of the commercial varieties tested were eliminated by the disease.

Table 1.—Percentage of tomato plants surviving the curly-top disease in experimental and commercial tests for a 3-year period.

Variety	Replicated test plot			Commercial tomato field		
	1956	1957	1958	1956	1957	1958
Owyhee	87	83	86	95	97	100
Sioux	0	0	0	60	74	65
Stokesdale	2	4	1	63	72	70

Performance trials were conducted in 1958 in an area where exposure to curly top was extremely light in order that the yield potential of the Owyhee could be compared with other commercial varieties. Plants used in these trials were started in the greenhouse and transplanted to the field on May 24. This is approximately one month later than is recommended for commercial operations. The first fruits were

harvested on July 20. The fourth and final picking was made on September 16. An additional picking would have yielded a profitable return. The growing season was, therefore, somewhat shorter than would normally be expected under commercial operations. In spite of this shortened season, the yield potential of this variety indicates that profitable production can be expected.

Table 2.—Tomato yield trials in replicated test plots in an area with light curly-top exposure.

Variety	Yield in tons per acre				Total
	Pickings				
	1	2	3	4	
Owyhee	1.20	4.94	10.18	8.89	25.21
Sioux	1.59	11.88	12.25	7.59	33.31
Stockdale	.78	7.40	8.31	9.46	25.95