

# New Sugar Beet Strains from U.S. 22 With Higher Curly-Top Resistance

ALBERT M. MURPHY, F. V. OWEN AND G. K. RYSER<sup>1</sup>

CURLY-TOP-RESISTANT varieties of sugar beets are now grown exclusively in areas of the western United States where the curly-top disease is a factor in sugar beet production. Curly-top-resistant varieties have been in use only 13 years and there has been a rapid succession of varieties. U.S. 1 was the first variety released (1)<sup>2</sup> and was soon replaced by other varieties (2). These varieties were in turn replaced by U.S. 22 and a further selection has resulted in strains with still a higher degree of resistance. The second release of U.S. 22 is designated U.S. 22/2 and now has reached the dominant position for the major part of the curly-top area.

## Source of Material and Method

When the variety U. S. 22/2 was grown under a very drastic curly-top exposure it proved to be an excellent source from which to select individual beets with superior curly-top resistance. The production of such heavy curly-top exposures in the beet breeding field has been discussed elsewhere (3). As a result of selection from U.S. 22/2, strains have been obtained that are considerably higher in curly-top resistance. One of these selections, designated as U.S. 22/3, is now being propagated for commercial use. A selection was made from U. S. 22/3 and designated S.L. 61. Another selection, designated S.L. 62, was obtained in a comparable way from U.S. 22/3. Both selections were made on the basis of disease resistance alone without any sugar determinations.

## Results

In a May 20, 1947, test at Jerome, Idaho, where curly top was so severe that it completely destroyed such varieties as R. & G. Old Type, U.S. 15 and U.S. 33, the following results were obtained:

Variety	Tons per acre	Average C. T. Grade
Original U.S. 22 (SL 922)	6.47	3.05
2nd Rel. U.S. 22/2 (SL 222)	10.78	2.85
3rd Rel. U.S. 22/3 (SL 32)	15.85	2.00
S.L. 61	16.51	1.80
S.L. 62	16.29	1.65

A summary of agronomic evaluation tests of the above varieties shows that there has been a tendency for reduced sucrose percentage in the case of U.S. 22/3 and S.L. 61, but that the reduction was usually less than 0.2

<sup>1</sup>Pathologist, Senior Geneticist, and Collaborator, respectively, Division of Sugar Plant Investigations, Bureau of Plant Industry, Soils, and Agricultural Engineering, Agricultural Research Administration, United States Department of Agriculture.

<sup>2</sup>The numbers in parentheses refer to literature cited.

percent and was too small to measure by statistical methods in well-replicated tests. S.L. 62 showed little superiority over S.L. 61 in curly-top resistance in the May planting but in a still later planting made June 25 where the curly-top exposure was more drastic, S.L. 62 showed greater curly-top resistance than any of the above-mentioned varieties. A few individual beets in S.L. 62 showed remarkable resistance and a further selection of these superior beets was made in 1947. S.L. 62 has not as yet been adequately tested for sugar content.

#### Literature Cited

- (1) CARSNER, EUBANKS, ET. AL.  
1933. Curly-top resistance in sugar beets and tests of the resistant variety U.S. No. 1. U.S.D.A. Tech. Bul. 360, 68 pp.
- (2) OWEN, FORREST V., ET. AL.  
1939. Curly-top-resistant sugar beet varieties in 1938. U.S.D.A. Circ. No. 513, Jan.
- (3) MURPHY, ALBERT M.  
1942. Production of heavy curly-top exposures in sugar beet breeding fields. Proc. Amer. Soc. Sugar Beet Tech. 459-462.