

# Sugar Beet and Curly Top History in Southern Idaho 1912-1945

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Sugar beets were first grown in the Burley area of southern Idaho in 1912 and in the neighboring Twin Falls area in 1916. Average yields in the first 7 years ranged from 7.21 to 11.33 tons per acre. Curly top probably was not a major factor in those early years and the gradual rise in average yields likely was due mainly to increasing experience in handling the crop. Sugar beet growing in southern Idaho expanded rapidly in 1916, 1917, and 1918 under the stimulus of the sugar shortage resulting from World War I. This expansion was abruptly checked by the first very severe curly top outbreak in southern Idaho which occurred in 1919. Good and bad years followed in about equal numbers until curly top resistant varieties came into general use in 1935.

## Curly Top Control Measures

Curly top control measures available before resistant varieties were developed were of relatively little value. Early planting and good cultural care to get the beets advanced as much as possible before the beet leafhopper invasion occurred was generally recommended. Forecasts by the Bureau of Entomology, U. S. Department of Agriculture. (*I*)<sup>2</sup> of probable leafhopper abundance and the consequent variation in amount of curly top damage encouraged or discouraged the planting of sugar beet acreage to a degree that was generally beneficial.

Control of curly top by the use of resistant varieties began with the release of the variety U. S. 1. This variety suffered damage in years of drastic curly top exposure, but it averaged high enough in resistance so that a great advance was made with it toward satisfactory curly top control. U. S. 1 was soon superseded by the variety U. S. 34 which was in turn replaced by A-600, a variety developed by the Amalgamated Sugar Company, and U. S. 12. Later U. S. 22, a high-yielding variety with very high curly top resistance came into general use. Sufficient seed of U. S. 22 was available to plant the entire sugar beet acreage of southern Idaho in 1942. A yield of 16.84 tons per acre from 21,762 acres, was obtained with U. S. 22 in 1942.

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

Table 1.—Sugar beet yield data for southern Idaho for the period 1912-1945\*

Year	Acres planted	Acres harvested	Acres abandoned	Tons harvested	Harvested acre yield
1912†	3,404	2,936	468	21,171	7.21
1913	5,057	4,380	608	36,889	8.40
1914	4,077	4,700	217	49,654	10.43
1915	8,391	8,119	280	86,464	10.60
1916	14,223	11,081	2,642	120,264	10.30
1917	9,690	8,022	1,658	88,535	10.27
1918	6,885	6,045	840	68,464	11.33
1919	19,182	12,942	6,240	82,214	6.35
1920	16,540	13,332	2,208	120,737	9.81
1921	17,809	15,066	2,733	137,119	9.09
1922	8,891	7,591	1,300	95,998	12.65
1923	15,856	15,601	165	206,478	13.16
1924	22,418	10,076	11,142	60,485	5.51
1925†		11,159		135,702	12.16
1926	7,131	2,119	5,012	12,790	6.04
1927	10,728	9,845	883	147,075	14.94
1928	1,965	1,828	137	20,153	11.02
1929	16,872	13,467	2,405	166,476	12.36
1930	11,862	9,358	2,501	87,764	9.38
1931†		4,291		38,305	8.93
1932	14,536	14,517	19	231,434	16.16
1933†		25,612		278,633	13.78
1934	21,389	2,754	18,635	18,451	4.88
1935	19,552	10,440	112	144,410	13.83
1936	23,060	22,322	1,044	302,403	13.56
1937	21,583	20,765	813	245,993	11.86
1938	28,068	26,841	1,227	432,226	16.10
1939	20,783	26,685	1,348	394,601	15.45
1940	26,531	25,845	1,166	439,803	17.35
1941	22,005	21,418	587	288,126	13.45
1942	22,346	21,762	621	366,554	16.84
1943	12,440	9,047	2,493	176,974	17.69
1944	14,618	12,532	2,266	197,178	15.99
1945	17,228	15,528	1,700	258,841	16.35

\*In 1936 the Twin Falls factory district took in new territory on the north side of the Snake River (Gooding and Lincoln Counties) which are relatively low-yielding areas.

1912 to 1915 for the Burley-Rupert district only.

†Figures for acres planted are lacking.

### Acreage and Yield Records

The historical records summarized in table 1, showing average yields of sugar beets per acre in southern Idaho and the total acreages planted and harvested, reveal some important relationships. The significance of the low average yields per acre in the years of heavy curly top damage becomes greater when the fact is noted that in those same seasons the acreages abandoned between planting time and harvest ran comparatively high. For example, in the good year 1928 only 165 acres or 1 percent of 15,856 acres planted was lost be-

fore harvest, while in the bad year following, 1924, there were lost or abandoned between planting time and harvest, 11,442 acres or 51 percent of the total of 22,418 acres planted. Such figures taken in connection with the average yields per acre, 13.16 tons in 1923 and 5.51 tons in 1924, afford a better appreciation of the enormity of the losses sometimes caused by curly top during the period before resistant varieties were available.

The tabulated data also indicate for the earlier years the normal tendency of growers to be discouraged and plant less acreage to beets in the season following a bad curly top outbreak and to expand the acreage in seasons following good years. Noteworthy exceptions occurred beginning in 1927. The season of 1926 had a disastrous curly top outbreak, but the acreage planted in the following season, 1927, was increased by 3,587 acres, the increases in the Twin Falls area being slightly more than 100 percent. The explanation is that the Bureau of Entomology leaf hopper forecast was favorable and growers were encouraged therefore to plant beets. An unfavorable forecast was issued in 1928 and even though fine yields had been obtained in 1927, the acreage planted to beets was drastically reduced. In 1928 in the Twin Falls area, 333 acres were planted as compared with 6,940 in the preceding season. Table 1 also reveals that the acreage planted and the average yields tended to become stabilized after resistant varieties came into general use in 1935.

The graph of average beet yields in figure 1 indicates that there were noteworthy drops in yields in 1937 and 1941. The spring leaf-hopper population in the beet fields was very large in 1937 (3). The spring population was not quite so large in 1941 but the invasion was earlier (2). The fact that the average yield was lower in 1937 may have been due in part to the fact that the varieties in use that year were not on the average as highly resistant as those in use in 1941. Curly top damage would probably have been very great in both years if resistant varieties had not been in use. The two best years before resistant varieties became available, 1927 and 1932, did not give average yields as high as the three best years, 1940, 1942, and 1943, after resistant varieties came into use.

### **Improvement and Stabilization**

The stabilization of sugar beet growing in southern Idaho following the introduction and improvement of resistant varieties can be better understood by noting the progress indicated by the comparisons of Old Type, the European variety formerly used widely, and the U. S. curly top resistant varieties which superseded it. The data are shown in table 2. Comparison is also shown in the figure 2.

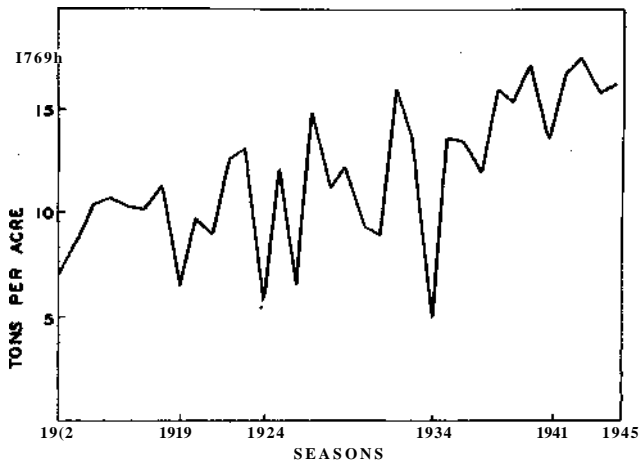


Figure 1.—Average yields of sugar beets per acre in southern Idaho, 1912-1945.

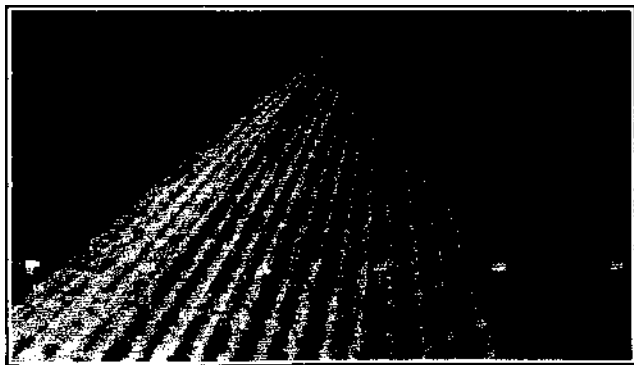


Figure 2.—Sugar beet varieties in breeding field near Buhl, Idaho. Four-row plots, left to right: Old Type, U.S. 1, U.S. 33, U.S. 12, U.S. 22 first release, U.S. 22 second release. Another strip of very badly damaged Old Type in background at left. Planted May 1, 1941. Photographed August 6, 1941.

Table 2.—Yields in tons per acre of a susceptible European variety and resistant U. S. varieties under severe curly top exposure at Buhl, Idaho. Planted May 1, 1941.

Variety	Tons per acre
Old Type	0.00
U. S. 1	6.31
U. S. 33	8.40
U. S. 12	11.25
U. S. 22	14.32
U. S. 22, 2d. release	16.61

### Breeding Better Varieties Continues

Further improvement of sugar beet varieties for southern Idaho and elsewhere has been made. An extremely high degree of curly top resistance has been obtained and by breeding methods is being combined with other improved characteristics. It can be confidently predicted that if other factors are as favorable as the inherent qualities of the beets the trend of average sugar beet yields in southern Idaho will continue upward during the next decade.

### Literature Cited

- (1) Carter, Walter. Ecological Studies of the Beet Leafhopper. U. S. Dept. Agr. Tech. Bul. 206, 1930.
- (2) Douglass, J. R., Hallock, H. C., Fox, D. E., and Hofmaster, R. N. Movements of Spring Generation Beet Leafhoppers into Beet Fields of South-Central Idaho. Proc. Amer. Soc. Sug. Beet Tech. 1946.
- (3) Fox, D. E., Chamberlin, J. C., and Douglass, J. R. Factors Affecting Curly Top Damage in Southern Idaho. U. S. Dept. Agr. Tech. Bul. 897. 1945.