Table 1. Larvae per 10 plants

Treatments	Rate lbs/A	Pre-trtmt 10/22	10/26	10/28	11/1	11/16
Untreated	---	4.75	20.25 a	27.75 n.s.	29.25 a	26.0 a
Lannate L	0.45	16.25	6.50 cd	18.00	7.00 b	2.5 cd
Pounce	0.10	10.0	10.25 c	13.25	8.75 b	3.25 c
Ammo	0.04	14.5	10.75 bc	20.25	4.50 bc	3.0 c
Ammo	0.08	21.75	8.25 cd	23.00	7.25 b	1.25 cd
FMC 54800	0.04	10.75	3.25 cd	3.25	0.50 c	0.0 d
FMC 54800	0.08	18.75	2.00 d	6.00	0.00 c	0.0 d
Kryocide	8.0	13.75	18.00 ab	28.80	27.50 a	12.25 b

Application dates: Oct. 25, 29

Means followed by the same letter are not significantly different.

Sugarbeet Variety Test at the Mesa Farm

John Nelson
University of Arizona

Summary

Amstar Spreckels' experimental line H79290 has produced outstanding root yields and sucrose percentages the past three seasons and appears to be superior to several commercial varieties.

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Sugarbeet variety improvement in the United States is a cooperative undertaking of the sugarbeet industry, the U. S. Department of Agriculture and the State Agricultural Experiment Stations. In Arizona, the Agricultural Experiment Station does not conduct breeding work on sugarbeets. However, the University of Arizona has cooperated with Spreckels Sugar Division of Amstar Corporation and other sugar companies since 1968 in testing lines and hybrids that may have potential for central Arizona.

Much progress has been made by breeders in developing varieties that are better adapted to central Arizona conditions. In the late 1960's sugarbeet production in Arizona was seriously hampered by diseases commonly known as virus yellows. Yields were greatly improved by the release of US H9B, a hybrid with moderate virus yellows resistance. Tests at the Mesa Farm showed that this hybrid would outyield varieties without yellows resistance by 2 to 6 tons per acre. More recently, hybrids have been developed that have Erwinia rot resistance and bolting resistance. Bolting resistance is of particular importance to growers in central Arizona, since varieties for use in this production area must have a higher level of bolting resistance than those of most other growing areas because of the winter season. Several hybrids have been developed that have excellent bolting resistance and appear superior to S-445H in yield characteristics. Currently, Amstar Spreckels plant breeder, Dr. Jim Schulke, has developed several experimental lines that appear to be superior in root and sugar yield to varieties now being used commercially.

The entries in this year's test are limited to Amstar Spreckels' lines and hybrids. The test was planted 30 September 1981 and harvested 24 June 1982. The characteristics of each entry are given in Table 1.

Results

Sugar yields, root yields, sucrose percentages and bolting percentages are shown in Table 2. Root yields for all entries were lower than those obtained in past seasons. Petiole samples collected during the winter and spring and analyzed for NO_3-N content indicated that the beets were deficient in nitrogen from mid-March through harvest.

There were no statistically significant differences among entries in root yield. Although the experimental line, H79290, produced high sugar yields and sucrose percentages, they were not significantly higher than those of the three commercial varieties in the test. Only a few bolters were observed in this test.

The experimental line, H79290, has produced excellent root yields the past three seasons (Table 3). In addition, the sucrose concentration in roots of H79290 has been as high or higher than that of SS-E1, S-445H and Sp H9B3 (commercial varieties). This experimental line appears to have adequate bolting resistance for central Arizona conditions.

Table 1. Characteristics of Entries in Variety Test

Entry	Characteristics
SS-E1	Commercial variety, ERR*
S-445H	Commercial variety, VNB, VYR
Sp H9B3	Old commercial variety, VYR, ERS
SS-X912T	Semi-commercial variety, NB, winter growth type
H79290	Experimental, high yield and %S, CTR, VYR
H79251	Experimental, VNB
H79306	Experimental, VNB
H80157	Experimental, NB
H80160	Experimental, CTR
H81178	Experimental, VNB, CTR, high %S
H81184	Experimental, ERR
H81191	Experimental, VNB, CTR

*ERR = Erwinia rot resistant, ERS = Erwinia rot susceptible, NB = non-bolting, VNB = very non-bolting, CTR = curly top resistant, VYR = virus yellows resistant.

Table 2. Sugarbeet Variety Test, 1981-82 - U. of A. Mesa Farm

Variety	Acre Yield		Sucrose	Bolters
	Sugar (Tons)	Roots (Tons)	(%)	(%)
H79290	5.42 a*	29.8 a	18.2 abc	0
SS-E1	5.35 a	30.4 a	17.6 bcd	0
H79306	5.35 a	30.4 a	17.6 bcd	0
H81184	5.26 a	29.4 a	17.9 abcd	0
H79251	5.18 a	28.0 a	18.5 a	0
S-445H	5.10 a	28.8 a	17.7 abcd	0
H81178	5.12 a	27.8 a	18.4 ab	0
H80157	5.04 a	28.5 a	17.7 abcd	0
Sp H9B3	5.01 a	28.3 a	17.7 abcd	0
H81191	4.94 a	28.4 a	17.4 cd	0
SS-X912T	4.89 ab	27.3 a	17.9 abcd	0
H80160	4.19 b	24.2 a	17.3 d	0

*Means followed by the same letter are not significantly different at the 5% level according to Duncan's Multiple Range Test.

CROP HISTORY: Previous Crop: Small grains. Planting Date: September 30, 1981. Row and Plant Spacing: 30-inch, single-row beds, plants thinned to 10 inches apart. Fertilizer: 200 lbs/A of 11-48-0 preplant and 70 lbs/A of N on 12/8/81. Plot Size: Single row plots 20 feet long, replicated 6 times. Harvest Date: June 24, 1982.

Table 3. Average Root Yields, Sugar Yields and Sucrose Percentages of a High Yielding Experimental Line and Several Commercial Hybrids for a Three Year Period, 1980-82.

Variety or line	Sugar yield (T/A)	Root yield (T/A)	Sucrose (%)
H79290	6.43*	37.9	17.1
SS-E1	5.75	35.6	16.3
Sp H9B3	5.42	33.7	16.1
S-445H	5.30	32.2	16.6

*Values are averages of data from two tests in 1979-80 and single tests in 1980-81 and 1981-82.