Herbicide Combinations in Sugarbeets-Mesa-1979

C. H. Doty and K. C. Hamilton

Planted: September 6, 1 row of beets on 30 inch beds.
Variety: USH9
Soil: Clay loam.
Treated: Preplanting herbicides were applied September 5. The same day the field was furrowed and beds were shaped. Betanal was applied postemergence on September 26 when weeds were 1 to 4 inches tall and sugarbeets had 2 leaves. On October 3, 1 lb/A of Hoelon was applied in a band over the top of sugarbeets in all plots. Sugarbeets had 4 true leaves. The test was cultivated twice.
Weeds: Watergrass, barley and Southern giant curl mustard were broadcast and disked into the soil preplanting.
Plots: 5 beds - 30 feet long - 4 replications.

Treatments						Weed control Percent estimated					
Preplant		Postemergence				watergrass		barley		mustard	
Herbicide	lb/A	Herbicide	lb/A	Herbicide	lb/A	10/4	11/7	10/4	11/7	10/4	11/7
Nortron	1.0	Hoelon	1.0			64	82	76	71	3	8
Nortron	1.0	Hoelon	1.0	Betanal	1.0	63	76	80	78	100	93
Ro-neet	1.0	Hoelon	1.0			60	90	68	59	0	0
Ro-neet	1.0	Hoelon	1.0	Betanal	1.0	65	90	71	56	100	94
Chem-hoe	3.0	Hoelon	1.0			0	25	93	81	0	0
Chem-hoe	3.0	Hoelon	1.0	Betanal	1.0	0	14	93	78	99	95
Antor	2.0	Hoelon	1.0			98	98	65	56	0	0
Antor	2.0	Hoelon	1.0	Betanal	1.0	97	100	68	55	99	95

In this test:

1. Nortron, Ro-neet and Antor stunted sugarbeets. Antor caused the most stunting.
2. Antor controlled watergrass.
3. Chem-hoe and Nortron gave satisfactory control of barley.
4. Betanal controlled mustard.
5. Hoelon increased control of watergrass following a preplant application of Ro-neet.

Recommendations for the use of herbicides on sugarbeets in Arizona are given in bulletin A-1, Chemical Weed Control for the Irrigated Areas of Arizona, available from your County Extension office.

ECONOMIC INJURY LEVELS OF BEET ARMYWORMS ON FALL PLANTED SUGAR BEETS

Dale Fullerton
University of Arizona

Previous data on economic injury levels were reported in "SugarBeets, a College of Agriculture Report" P-45, January 1979. However, yields had not been obtained at that time and were deemed necessary to determine the validity of economic levels. Since then, yield data has been obtained and conclusions can be ascertained.

In 1978, an experiment was implemented at the Mesa Experimental Farm to test the theory of economic injury levels based on an infested plant method. Planting was completed on Sept. 20, general emergence was apparent on Sept. 24, and the first beet armyworms were detected on Sept. 28, indicating that an early seedling infestation had occurred.

Four treatments consisting of an untreated check and three levels of infested plants were established. The infested plant levels were determined on the basis of 4, 8, and 12 plants in a 20 plant sample. Methomyl at .45 lb. AI/acre was applied to each specific level as needed. The 4 infested plant level was treated 4 times and the 8 level was treated twice. The 12 infested plant level was never reached and was not treated during the duration of the test.

Table 1 shows the mean plant infestation level on any given sampling date. The untreated check did not maintain as high an infestation level as would have been desirable. However, separation of plant infestation levels was apparent during the early stages of plant growth.

Table 1. Mean Number of Infested Plants per 20 Plants

	Treatments			
Sample Date	Untreated Check	4 Inf. Plants per 20 Plants	8 Inf. Plants per 20 Plants	12 Inf. Plants per 20 Plants
10/2	3.8	3.8*	4.6	5.0
10/6	4.8	0.2	7.6*	4.8
10/11	7.8	4.0*	5.0	5.4
10/13	7.0	1.6	3.6	4.8
10/16	7.6	3.8*	7.4*	7.2
10/19	7.4	1.2	2.6	8.0
10/25	3.8	2.2	2.4	4.2
10/27	3.8	3.6*	2.8	5.8
11/1	2.8	1.8	3.2	4.4
11/6	2.0	0.2	1.0	2.0
11/16	0.6	0.2	1.0	0.8
11/20	2.2	0.6	0.8	0.4
Means	4.5	1.9	3.5	4.4

*Date treated with Lannate at .45 lb./acre.

Table 2 shows the root and sugar yields and the percent of sucrose. No significant yield differences occurred between any of the treatments as to root yields or sugar yields when based on the number of tons per acre. The lack of yield variances and the similarity of the sucrose percentage would suggest that plant injury at the levels used in this experiment did not cause economic yield losses.

Table 2. Yield and Percent Sucrose

Treatments	Root Yield T/A	Sugar Yield T/A	Sucrose %
Untreated check	32.3	4.00	12.4
4 infested plants/20	31.3	4.01	12.8
8 infested plants/20	31.6	3.99	12.6
12 infested plants/20	31.3	4.01	12.8

A similar experiment was designed to provide plant protection from beet armyworm feeding through the 2 leaf stage of plant growth, the 4 leaf stage, and the 6-8 leaf stage. A treatment where no protection was provided was used as a comparison to determine the value of each protection interval.

When beet armyworm larvae first appeared on seedlings all three protection intervals were treated with Methomyl and treatment was continued whenever the infested plant count increased throughout the specific plant growth period. The 2 leaf stage treatment was treated twice, the 4 leaf stage three times and the 6-8 leaf stage four times.

Table 3 shows the mean number of infested plants during the protection periods for each of the treatments. No treatments were applied after the plant had reached the end of the 6-8 leaf stage and as a result the mean number of infested plants from seedling infestation to the 6-8 leaf stage shows a staircase effect based on the amount of protection given to each treatment.

Table 3. Mean Number of Plants Infested per 20 Plant Sample

Protection Periods	Treatments: Untreated Check	Plants Protected from Seedling to: 2 Leaf Stage	4 Leaf Stage	6-8 Leaf Stage
2 Leaf stage	3.3	0.9	1.1	0.7
4 Leaf stage	10.8	9.0	4.9	4.7
6-8 Leaf stage	8.3	6.4	4.8	3.1
Means	7.5	5.4	3.6	2.8

Table 4 indicates that protection of the plant at three growth stages did not result in yield differences or variations in the percent of sucrose obtained. Neither was there an apparent difference when compared to an untreated check.

Table 4. Yield and Percent Sucrose

Treatments	Root Yield T/A	Sugar Yield T/A	Sucrose %
Untreated Check	30.2	3.93	13.0
2 Leaf stage	30.2	3.90	12.9
4 Leaf stage	29.4	3.73	12.7
6-8 Leaf stage	30.1	3.85	12.8

Based on these tests and tests conducted in prior years, it is possible that injury to a sustaining sugar beet plant caused by the feeding of beet armyworms, may not be economically decreasing final sugar beet yields. This may be due, in part at least, to the long period of time the plant has to mature after feeding damage has occurred. Even though plants may be stunted or retarded at early growth they may be able to compensate before harvesting occurs.

These experiments did not consider the loss of yields due to plant stand losses. It is possible that losses in yield could occur if beet armyworm populations were large enough to reduce the plant stand.

Experiments for the 1979-80 season are now being conducted to determine if plant stand losses occur and are economically important and if stunted or retarded plants occur after beet armyworm feeding, and if so, the rate of compensation during the period of maturity.