

A PROGRESS REPORT ON CHEMICAL WEED CONTROL IN
SUGAR BEETS AT ONTARIO AGRICULTURAL COLLEGE

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This is the 1962 summary of results obtained in a continuing search for herbicides which are effective and safe in sugar beets.

Materials and Methods

Two separate tests were conducted in 1962. In one test all materials were evaluated as pre-emergence application. In a smaller test all materials were worked into the soil before the seeding. Most chemicals were applied in 30 U.S. gallons of water per acre with a compressed air sprayer operating at 40 p.s.i. Some chemicals were applied in the granular form using a "salt shaker". Sugar beets were seeded in 21 inch rows with a plot consisting of 3 rows, 20 ft. long. Monogerm seed was used. The tests were located on a clay loam soil. The weather in May and June was quite dry. Weeds present were mainly lambsquarters and redroot pigweed with some barnyard grass and other scattered annual weeds. Simple randomized block designs were used in both tests.

In the pre-emergence test two replications were seeded and sprayed on May 7 and two more on May 15. The soil surface was cultipacked after seeding and before spraying. The accompanying table indicates the treatments included in this test.

In the pre-plant incorporation test two replications were seeded on each of the following dates: May 7, May 15 and May 22. The chemicals were applied to a dry soil surface and worked into the soil by 2 passes with a double disk. This incorporation was done within 1-5 minutes after the chemical was applied. The plots were harrowed, seeded and cultipacked immediately after the chemical was worked into the soil.

An unsprayed check plot was included in each replication. Notes on stand and vigor of beets and weeds were made one month after the treatments were applied.

Results:

The following table shows the chemicals applied and the average response of beets and weeds. A herbicide rating of 700 or more is considered to indicate satisfactory weed control:

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1962 Summary of Herbicides on Sugar Beets
 Department of Crop Science, Ontario Agricultural College
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<u>Chemical</u>	<u>Rate Active/Acre</u>	<u>Beet Vigor % of check</u>	<u>Beet Count % of check</u>	<u>Weed Count % of check</u>	<u>Weed Vigor % of check</u>	<u>H.R.*</u>
<u>Pre Plant Incorporation - Average of 6 replications</u>						
Eptam	3 lb.	39	63	15	25	969
Tillam Gran.	4 lbs.	80	89	29	38	858
Tillam Liq.	4 lbs.	72	90	17	43	828
Tillam Gran.	6 lbs.	85	93	19	37	895
Tillam Liq.	6 lbs.	75	89	4	32	950
R 1870	4 lbs.	88	87	50	70	577
R 1870	6 lbs.	82	91	64	82	512
R 2007	4 lbs.	72	74	62	57	659
R 2007	6 lbs.	58	79	30	43	859
<u>Pre-emergence - Average of 4 replications</u>						
Endothal	8 lbs.	98	71	62	98	400
T.C.A.	6 lbs.	90	74	66	88	420
Dalapon	4 lbs.	98	75	63	95	448
End. + T.C.A.	4 + 6 lbs.	95	88	58	98	422
End. + Dalap.	4 + 4 lbs.	100	88	100	98	110
Tillam Gran.	4 lbs.	95	93	49	75	578
i Tillam Gran.	6 lbs.	85	86	38	70	715
Beetox	1 imp.gal.	90	65	74	85	460
Beetox	2 imp.gals.	60	72	44	68	650
Niagara 6370	4 lbs.	98	100	70	97	350
O.M.U.	1.5 lbs.	98	65	68	85	458
O.M.U.	2 lbs.	95	82	42	73	667
Alipur	2 lbs.	83	82	36	50	798
Alipur	4 lbs.	58	80	17	38	887
Alipur	8 lbs.	45	59	30	23	865
T.D. 282	2.5 lbs.	95	79	58	93	472
T.D. 282	5 lbs.	98	91	62	88	475
T.D. 282+	2.5 lbs. +					
Asphalt	1 gal.	98	74	52	93	520
T.D. 282+	5 lbs. +					
Asphalt	1 gal.	93	95	60	95	448
R.C. 3056	4 lbs.	95	62	69	85	425
R.C. 3056	6 lbs.	90	71	49	85	508
R.C. 3056	8 lbs.	100	89	63	93	466
Uracil	1 lb.	95	89	53	93	420
Uracil	2 lbs.	90	78	50	88	496
FW 925	2 lbs.	90	70	58	88	468
FW 925	4 lbs.	73	87	33	60	782
Solubar on	20 lbs.					
8" band	(product)	98	87	69	93	409
Solubar	80 lbs.					
(product)		95	91	33	83	725

*Herbicidal Rating =

$$.1000 - \frac{\text{Weed count (\% of check)} \times \text{Weed vigor (\% of check)}}{10}$$

Pre-Plant Incorporation Test

Tillam - Of all the herbicides tested, Tillam at a rate of 4 or 6 lbs. active in the liquid or granular form incorporated into the soil before seeding gave the best results. This agrees with the results which we have obtained during the past three years of testing this material. When using this material in our tests, we have paid extra attention to two details. First, we always apply it to a fairly dry surface and second, we work it into the soil within 1 to 5 minutes of the time of spraying. Usually this incorporation is accomplished with two passes with a double disk. Usually when we have weed control with Tillam we also find the beets slightly stunted when young but this disappears as the season progresses. We think this material is worthy of further trials. If applied as a band treatment a suitable incorporation attachment would have to be a part of the drill. Probably some sort of tractor powered roto-tiller would be required. If applied as an overall spray, a disk or cultivator would have to follow directly behind the sprayer. Seeding could be done immediately or delayed one or two days.

Eptam, R1870, R2007 - We have found no advantage of these materials over Tillam. Eptam at 3 lbs. per acre (active) and R2007 at 6 lbs. gave satisfactory control of weeds but also damaged the beets. This damage was particularly noticeable with Eptam. R1870 did not give sufficient weed control at rates of 4 and 6 lbs.

Pre-emergence Test

Endothal 8 lbs. active per acre, and mixtures of Endothal with T.C.A. and Dalapon at rates of 4 plus 6 and 4 plus 4 lbs. failed to give sufficient weed control. The dry weather and the thick population of lambsquarters and pigweed may have combined to cause a poor response from these chemicals. This type of weed control with these materials has, however, often been recorded at our location.

Tillam granular at a rate of 6 lbs. active per acre gave sufficient weed control without damage to the crop. Four lbs. was not adequate for weed control.

Beetox did not give sufficient weed control this year at rates of 1 or 2 imp. gallons per acre. The 2 gallon rate caused some damage to the crop. In two previous years this material gave excellent weed control at the 1 imp. gallon rate.

O.M.U. and Alipur (a mixture of O.M.U. and BiPC) O.M.U. did not give the required weed control. Alipur at a rate of 2 lbs. per acre gave weed control without damage. The 4 and 8 lb. rates, however, damaged the beets severely. This is the first year we have had Alipur in our tests and it appears to warrant further work.

T.D. 282 at rates of 2.5 and 5.0 lbs. with and without 1 gallon of asphalt emulsion failed to give adequate weed control. The asphalt plugged the sprayer.

R.C. 3056 at rates of 4, 6 and 8 lbs. did not give weed control.

Uracil at rates of 1 and 2 lbs. did not give weed control.

FW 925 gave weed control with some beet damage at the 4 lb. rate; 2 lbs. did not damage the beets or control the weeds sufficiently.

Solubor at a rate of 80 lbs. of product per acre controlled the weeds without damage to the beets.

Discussion

Of all the herbicides tested, Tillam at 4 or 6 lbs. in the liquid or granular form when incorporated into the soil before seeding gave the best results. This agrees with the results which we have obtained during the past 3 years of testing this material. To obtain weed control with this material it seems necessary to apply it to a dry surface and incorporate it into the soil within a few minutes of the time of spraying. Once the material is incorporated into the soil, beets may be seeded immediately or seeding may be delayed two or three days. Other materials in the incorporation test failed to give adequate weed control or gave weed control but damaged the beets excessively.

Most of the pre-emergence treatments failed to control the weeds adequately.