CERCOSPORA LEAF SPOT TEST-1968

By: Phil B. Brimhall[1/]

A leaf spot test was conducted on the Heilman farm at Old Fort, Ohio to evaluate the effectiveness of several promising fungicides in comparison to the commercial treatments of copper and maneb-containing compounds.

To insure a good blight epidemic, a fairly susceptible Great Western variety was used in this test. Beets were also planted for the second year in the rotation. With the above practices employed, a very severe epidemic was present in August and September.

Two of the compounds, 1191 and TBZ, were thought to be of a therapeutic nature and have the ability to move in the plant tissue and actually stop the disease after it had started. To evaluate this curative action the first spray was not applied until a moderate infection was present.

During the growing season a considerable number of beets died from crown rot (Rhizoctonia). Counts were made in the fall at harvest time to try to determine if any of the treatments were effective in controlling this disease.

Treatments were replicated four times. Each plot consisted of two, 28-inch rows, 60 feet long.

Spray applications were made with a tractor-mounted high pressure system. Treatments were applied at the rate of 100 gallons per acre with 190 pounds pressure. Each row received spray material from three nozzles adjusted over and to the sides of the row. Spray applications were made on July 30, August 5 and 19.

Leaf spot readings were made on August 13 and September 12. Readings were made on a 0-10 scale, zero equalled healthy, disease-free plants; 10 equalled plants which had been completely defoliated by disease.

Two rows by 18 feet were harvested from each plot for yield and quality information on October 31, 1968.

[1/] Agronomist - Northern Ohio Sugar Company

LEAF SPOT READINGS AND STAND COUNTS

Treatment	Rate Product/Acre	Leaf Spot[a] 8 - 13	Leaf Spot[a,b] 9 - 12	Beets/ 100 Ft.
No Chemical	0	7.0	9.8 a	135
Tribasic copper + oil	6 lbs.+ 4 pts.	5.2	6.8 b	133
Tribasic copper + oil	4 lbs.+ 4 pts.	5.0	7.2 b	133
Manzate-D	3 lbs.	5.2	6.8 b	129
Dithane M-45	3 lbs.	6.0	6.8 b	132
1991 + Surf. F	6 oz.+ 4 oz.	1.6	1.0 f	118
1991 + Surf. F.	12 oz.+ 4 oz.	2.0	1.0 f	133
TBZ + Surf. F	5 oz.+ 4 oz.	4.2	3.6 d	125
TBZ + Surf. F	10 oz.+ 4 oz.	3.8	2.2 e	138
TBZ + Surf. F	20 oz.+ 4 oz.	3.2	1.0 f	128
Duter	8 oz.	5.2	4.6 c	129
Polyram	3 lbs.	5.6	7.2 b	136
Daconil	3 lbs.	5.2	6.6 b	131
Amobam + MN_2SO_4	4.8 pts.+ 31 oz.	4.6	7.0 b	129

(a No disease = 0; completely defoliated = 10

(b Means in the same column which have the same letter are not significantly different at the .05 level.

At the time of the first fungicide application, there were leaf spot symptoms present. The prevalence of disease was "2" on the 0-10 scale. Approximately two weeks later disease symptoms had become worse on all plots other than those treated with 1991. Whether or not 1991 had a curative effect is not known, but at least the disease was stopped and did not get progressively worse. TBZ was the next best compound in leaf spot control, however, its effects were not exhibited as quickly as those of 1991. Duter which has been one of the most promising compounds for use on sugarbeets in past years did not perform as well as 1991 or TBZ. Other compounds used in this test retarded the spread of leaf spot but were not able to control the disease under the severe conditions of this test.

CERCOSPORA CONTROL ON SUGARBEETS

Treatment	Rate Product/Acre	(a Tons/A	(a % Sugar	App. Purity	Recov. (a Sugar/A.
No Chemical	0	20.6 a	14.6 a	93.90	5255 a
Tribasic Cu + oil	6 lbs.+ 4 pts.	25.1 d-f	15.9 b-d	93.18	6865 b-c
Tribasic Cu + oil	4 lbs.+ 4 pts.	23.7 c	15.8 b-d	94.43	6603 b
Manzate-D	3 lbs.	22.2 b	16.4 d-e	94.78	6494 b
Dithane M-45	3 lbs.	24.7 d-e	15.4 b-c	93.13	6528 b
1991 + Surf. F	6 oz.+ 4 oz.	26.9 k	16.5 d-e	93.90	7763 d
1991 + Surf. F	12 oz.+ 4 oz.	26.4 i-k	16.8 e	94.55	7854 d
TBZ + Surf. F	5 oz.+ 4 oz.	26.0 h-j	16.1 c-e	93.68	7301 b-d
TBZ + Surf. F	10 oz.+ 4 oz.	25.1 d-f	16.3 d-e	94.53	7234 b-d
TBZ + Surf. F	20 oz.+ 4 oz.	25.2 d-g	16.1 c-e	93.48	7048 b-d
Duter	8 oz.	25.7 f-h	16.3 d-e	94.95	7507 c-d
Polyram	3 lbs.	25.9 g-i	15.2 a-b	93.58	6835 b-c
Daconil	3 lbs.	24.5 d	15.7 b-d	94.40	6806 b-c
Amobam + Mn_2SO_4	4.8 pts.+31 oz.	24.7 d-e	15.2 a-b	93.18	6444 b

(a Means in the same column which have the same letter are not significantly different at the .05 level.

SUMMARY

The low rate of 1991 appeared to be as effective as the high rate of TBZ. With either of these compounds it appears that time between spray dates could be increased over that of the present commercial compounds. The last spray application was applied on August 19 and the 1991 and TBZ treatments were markedly more residual than other compounds in this test.

It does not appear that any of these compounds had any effect on crown rot control. Possibly an earlier application would have been beneficial.

Yield increases of six tons per acre and a two percent sugar addition were gained by leaf spot control according to the results of this test.

No significant difference in apparent purity was observed due to treatment.

There is a close correlation of both sugar content and yield with leaf spot control; nearly 1600 pounds of recoverable sugar per acre separated the control from the best treatment. The three most promising treatments were 1991, TBZ and Duter. 1991 appears to be the best one of the three in regard to quickness of disease control and sugar per acre.

Under more normal conditions I believe that it would be very difficult to measure a difference between 1991, TBZ and Duter if spraying commenced before symptoms appeared and was continued on a two-to-three week schedule. Any one of the three compounds mentioned above is far superior to any compound which is available for commercial use at the present time.