BARLEY YIELD REDUCTIONS ATTRIBUTED TO NET BLOTCH INFECTION

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There are few reports in the literature on the effects of leaf diseases of barley, although it is generally accepted that such diseases reduce yield and quality. A comparison of yields from experimental plots protected by fungicides with those from untreated plots has shown that up to 20% reduction occurred when the plants were infected with one or more leaf diseases (1). In 1963 an epidemic of net blotch, caused by Drechslera teres (Sacc.) Shoem., occurred in Manitoba and provided an opportunity to assess, over a wide area, yield losses attributable to this disease.

Heavy infections of net blotch were observed during a survey in August, 1963, in an area extending from Winnipeg, Manitoba, northwest to Melfort, Saskatchewan. Earlier in the year observations in breeding plots at Winnipeg indicated that the variety Betzes was extremely susceptible to this disease while Herta was relatively resistant. The two varieties could be readily distinguished in experimental plots at Melfort and elsewhere on the basis of their net blotch reaction. In variety trials in Manitoba in 1960, 1961, and 1962, when only trace to moderate infection of net blotch was recorded, Betzes generally outyielded Herta. Data from these trials were compared with that obtained in 1963, an epidemic year, to determine what effect that severe infection of net blotch had on the yields of the two varieties. The data were analyzed by the "t" test for paired comparisons.

Betzes yielded less than Herta at all stations in 1963 whereas it generally yielded more in each of the 3 previous years (Table 1). This is presented as evidence of the destructiveness of a severe epidemic of net blotch. No factors other than the extreme susceptibility to this disease were apparent to account for the reduced yield of Betzes. Only trace to light infections of other diseases were recorded in the area.

Weather conditions were correlated with the prevalence of net blotch in each year. Precipitation is one of the most important factors because periods of high humidity are required for the development of an epidemic. In 1960 adequate moisture early in the season was followed by drought in July and net blotch infections were reported to be moderate. In 1961 dry conditions prevailed throughout the growing season and net blotch infection was trace to light. In 1962 rainfall was above normal but net blotch was only trace to moderate, probably because of the reduction of inoculum the previous two years. In 1963 average moisture and above average temperatures prevailed in the area and net blotch infection was severe throughout the region.

Betzes has been removed from the list of barley varieties recommended for Manitoba because of its extreme susceptibility to net blotch.

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Table 1. A comparison of the yields of the barley varieties Betzes and Herta at 9 locations in Manitoba and Saskatchewan, 1960-1963

Location	Bet.	Her.	Diff.	Bet.	Her.	Diff.	Bet.	Her.	Diff.	Bet.	Her.	Diff.
Winnipeg[1]	80	80	0	56	58	-2	-	-	-	74	85	-11
Hargrave	70	63	7	24	22	2	63	56	7	52	58	- 6
Mountain Road	41	43	-2	30	26	4	56	55	1	37	42	- 5
Dauphin	69	50	19	89	70	19	77	76	1	36	50	-14
Grandview	65	56	9	24	21	3	45	50	-5	36	55	-19
Roblin	48	45	3	17	13	4	58	54	4	43	57	-14
Durban	73	75	-2	30	27	3	95	98	-3	52	63	-11
The Pas	78	66	12	-	-	-	81	68	13	63	75	-12
Melfort, Sask.	55	62	-7	30	26	4	26	26	0	66	76	-10
Mean Difference			4.3			4.6			2.3			-11.3
t		1.59			2.13			1.11			8.04	
t .05		2.31			2.36			2.36			2.31	

[1] Data for Winnipeg and Melfort were obtained from the Report on Cooperative Two-rowed Barley Test compiled by Dr. S.A. Wells, Lethbridge, Alberta; the remainder of the data appeared in the report of the Manitoba Zonation Trials for 1963 compiled by Mr. G.M. Young, University of Manitoba.

Literature Cited

1. BUCHANNON, K.W., and H.A.H. WALLACE. 1962. Note of the effect of leaf diseases on yield, bushel weight and thousand-kernel weight of Parkland barley. Can. J. Plant Sci. 42: 534-536.

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