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Barley Variety Performance in Michigan—1975-1978

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YIELD TESTS are conducted each year on farms in several Michigan locations. Over the past few years, these tests have been located in Tuscola, Menominee, Delta and Alger counties. Varieties from adjacent states and Canada, as well as our own, are tested. These data, together with information from county demonstration trials, form the basis for varietal recommendations and new variety release program.

Short term averages jump around. Hence our data on new varieties are not as reliable as that on older varieties. The accuracy of important comparisons between older and newer varieties is affected when we use only the last two or three years' data. To get around this difficulty we resorted to regression analysis, wherein we graphed the yield of each variety against the mean yield of all varieties in that test. Surprisingly, one can ignore location and predict varietal yield with a high degree of accuracy based on the test average of all varieties. In many cases the procedure explains over 80% of the variation in yield for a particular variety, at the various locations over a 4-year period.

The main reason this works is that the 25 or 30 varieties in a test cover a wide range of types from those

adapted to the Northern Great Plains and Canada along with our own varieties. As such, these varieties represent the area gene pool; and when we make yearly additions to, or subtractions from, the list of varieties under test, the average reaction to the environment as measured by yield is not greatly changed over a 5- or 6-year period.

Apparently, when the yield of the general gene pool is depressed, the yield of all varieties is depressed. The converse is true where high yield is concerned. As long as the conditions affecting yield are common factors in the Michigan environment, the method is expected to work. Devastating attacks of new or uncommon diseases or insects would certainly throw the predictions off—but this would be true of any system.

Table 1 gives the expected yield of a given variety compared to the average of all test varieties of 40, 50, 60, 70, 80, 90 or 100 bu/acre. One can use this table in the following way. Given an estimate of barley yields for an area, several acceptable varieties could be chosen. Moving on to Table 2, one can then narrow the choice by comparing other agronomic information such as height, maturity, test weight and disease resis-

Table 1—Expected yield of a variety when the average yield of all varieties was 40, 50, 60, . . . , 100 bu/acre.

Variety	Source	No. of tests	Reliability estimate (r^2) (percent)	Average yield at your location						
				40	50	60	70	80	90	100
Beacon	N. Dakota	10	94	37	46	56	65	75	85	94
Bonanza	Canada	9	88	34	45	57	68	80	91	103
Bowers	Michigan	14	96	48	58	67	77	87	96	106
Coho	Michigan	14	89	38	47	56	64	73	82	90
Larker	N. Dakota	14	95	40	50	60	70	79	89	99
Manker	Minnesota	12	92	36	46	57	67	77	88	98
Nordic	N. Dakota	11	84	41	51	61	71	80	90	100

Based on 1975-78 data for Michigan.

Table 2—Characteristics of barley varieties tested at several locations in Michigan, 1975-78.

Variety	Height (inches)	Heading date in June	Lodging (percent)	Test weight (lb/bu)	Disease Resistance		
					Spot blotch	Mildew	Net blotch
Beacon	40	15	30	49.3	MS*	†	MS
Bonanza	41.7	17	28	49.4	MS	S	MS
Bowers	34.1	18	22	49.5	MR	R	MR
Coho	35.9	19	15	54.6	S	S	MR
Larker	37.4	17	30	50.9	S	MS	MS
Manker	36.1	15	13	52.3	MR	S	S
Nordic	38.8	19	30	50.0	MR	†	MR

* R = resistant
 S = susceptible
 M = moderately
 † No data

tance. In another example, if a grower in Delta County raising Manker barley obtained 45-bushel yields, he could readily select several other varieties such as Bowers, Nordic or Larker which would produce higher yields than Manker.

Other considerations such as disease resistance, lodging ratings and test weight should also be considered in selecting varieties.

In making such a decision, small differences in yield of 2 or 3 bu/acre are probably not important, and more weight should be placed on those varieties with large numbers of observations.

Data on test weight, relative maturity, height, lodging and disease resistance have not been examined for regression characteristics, and only means are given in Table 2.