BEET (*Beta vulgaris*)
   Curly top; *Beet severe curly top virus*

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Evaluation of experimental sugar beet hybrids for resistance to curly top in Malheur County, OR, 2005.

Experimental sugar beet hybrids were evaluated for resistance to *Beet severe curly top virus* in a furrow-irrigated sugar beet field near Ontario, OR where curly top had been a problem in previous years. The field trial relied on natural infection and was planted on 6 Apr. Plots were planted to a density of 285,120 seeds/A, and thinned to 40,731 plants/A. Plots were four rows wide (22 in. between rows) and 23 ft long. The experimental design was a randomized complete block with eight replications. The crop was managed according to standard cultural practices. The weather during the growing season was normal except for above average temperatures in Mar and Aug and above average precipitation in Apr and May. Disease pressure was uniform and moderately severe. Disease data were recorded on 16 Sep by three individual raters separately using a disease index of 0 to 9 (0 = no symptoms; 9 = dead plant). The three ratings per plot were averaged prior to analysis. The center two rows were harvested on 10 and 13 Oct using a small plot harvester. Yield data were reduced by 10% to account for tare. Sugar content of the beets was determined by the Amalgamated Sugar Co. laboratory using a polarimeter, and recoverable sugar was estimated based on percent sugar and conductivity. Data were analyzed using the general linear models procedure (Proc GLM-SAS), and Fisher's protected LSD was used for mean comparisons.

Yields were typical for this site and above average for growers. The response of experimental hybrids to *Beet severe curly top virus* ranged from acceptable (slight leaf curl = 2 to most leaves with moderate curling = 4) to moderately severe (severe leaf curling = 5). Analysis of variance indicated there were significant differences among hybrids for disease index, root yield, sugar content, and estimated recoverable sugar. Based on Spearman's coefficient of rank correlation, our disease ratings positively correlated ($r_s = 0.64$, $P = 0.0001$) with those from the 2005 Curly Top Nursery in Kimberly, ID. The relationship ($r_s = 0.33$, $P = 0.3338$) between estimated recoverable sugar and disease index could not be established.

Experimental sugar beet hybrids[z]	Disease index[y]	Root yield (t/A)	Sugar content (%)	Estimated recoverable sugar (lb/A)
Crystal 597 R...	3.54 defghij	51.4 a	16.68 defghi	14,502 a
Beta 5YK0028...	3.06 klm	47.9 abcde	17.02 abcdef	14,000 ab
Beta 3YK0019...	4.12 bc	49.2 abc	16.69 defghi	13,993 ab
HM 2998 RZ	3.71 cdefgh	45.2 cdefghij	17.29 a	13,592 abc
HM 2996 RZ	2.38 p	46.4 bcdef	17.14 abc	13,472 abcd
Beta 5YK0027...	2.96 lmn	45.7 cdefgh	17.16 ab	13,454 abcd
HM 2999 RZ	2.56 nop	47.2 bcde	16.83 bcdefgh	13,408 abcde
Crystal 599 R...	3.81 bcde	46.4 bcdef	17.10 abcd	13,391 abcde
Beta 4YK0025...	3.94 bcd	45.4 cdefghi	17.00 abcdef	13,206 bcdef
Crystal 594 R...	2.90 mno	46.5 bcdef	16.73 cdefghi	13,202 bcdef
Beta 4YK0024...	3.73 bcdefg	44.9 defghijk	17.08 abcde	13,054 bcdefg
Beta 2YK0016...	3.35 fghijkl	48.4 abcd	16.20 kl	13,014 bcdefgh
Crystal 596 R...	3.40 efghijkl	46.6 bcdef	16.56 ghijk	12,997 bcdefgh
05HX555 R	2.42 p	46.5 bcdef	16.66 efghij	12,975 bcdefgh
Crystal 595 R...	3.18 jklm	46.1 cdefg	16.62 fghijk	12,964 bcdefgh
Beta 5YK0029...	3.23 ijklm	46.2 cdefg	16.50 ghijkl	12,867 bcdefgh
HM 2993 RZ	2.48 op	44.1 efghij	16.83 bcdefgh	12,539 cdefghi
04HX438 R	3.48 efghijk	46.2 bcdefg	16.07 lm	12,270 efghijk
SX 1522..	3.94 bcd	42.7 fghijklm	16.84 bcdefgh	12,222 fghijk
05HX520 R	3.06 klm	41.5 ijklmn	17.02 abcdef	12,142 fghijk
SX 1523..	3.17 jklm	44.2 efghijk	16.37 ijkl	12,096 fghijkl
Crystal 598 R...	3.75 bcdefg	41.9 hijklmn	16.90 abcdefg	12,056 fghijkl
04HX434 R	2.94 lmn	41.1 jklmno	17.01 abcdef	11,996 ghijkl
04HX436 R	3.25 hijklm	42.9 fghijk	16.40 hijkl	11,877 hijkl
HM 2997 RZ	4.62 a	38.7 mno	17.12 abcd	11,409 ijklm
05HX522 R	3.58 defghij	41.0 klmno	16.31 ijkl	11,328 jklmn
05HX521 R	2.96 lmn	42.8 fghijkl	15.74 m	11,147 klmn
04HX437 R	3.98 bcd	39.6 lmno	16.42 hijkl	10,978 lmn
05HX523 R	3.25 hijklm	38.2 no	16.21 kl	10,470 mn
Beta 5YK0026...	4.18 ab	37.5 o	16.07 lm	10,236 n
$P > F$[x]	<0.0001	<0.0001	<0.0001	<0.0001
LSD ($P \leq 0.05$)	0.46	4.0	0.43	1,158

[z]Commercial checks included in this study (disease index score; est. recoverable sugar): HH Acclaim R (3.00; 12,419), Beta 4490 R (3.29; 14,534), HM 2980 RZ (3.67; 12,123), and Crystal 217 R (3.80; 11,597).

[y]Disease index scores were analyzed after the mean score for each plot (three ratings per plot) was calculated. The disease index scale ranged from 0 = no symptoms to 9 = dead plant.

[x]$P > F$ was the probability associated with the F value. LSD = Fisher's protected least significant difference value. Means followed by the same letter did not differ significantly based on Fisher's protected least significant difference value with $P \leq 0.05$.