

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

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

Commercial 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 13 and 14 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 commercial hybrids response to *Beet severe curly top virus* ranged from acceptable (slight leaf curl = 2 to most leaves with moderate curling = 4) to severe (most larger leaves becoming prostrate = 6). 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 ($r_s = 0.82$, $P < 0.0001$) with those from the 2005 Curly Top Nursery in Kimberly, ID. There was an inverse relationship ($r_s = -0.63$, $P = 0.0005$) between estimated recoverable sugar and disease index.

Commercial sugar beet hybrids	Disease index*	Root yield (t/A)	Sugar content (%)	Estimated recoverable sugar (lb/A)
HM 2992 RZ	4.14 cd	45.8 ab	16.84 cdef	13,355 a
HM PM90.....	2.58 h	45.6 ab	16.97 bcde	13,326 a
Beta 8600.....	3.33 g	46.1 a	16.84 cdef	13,291 a
SX Cascade	2.46 h	46.0 a	16.80 cdefg	13,275 a
Beta 4490 R.....	3.90 de	43.6 abcd	17.21 ab	12,883 ab
Beta 4199 R.....	3.94 de	43.3 abcde	17.33 a	12,829 ab
Crystal 316 R.....	3.69 ef	44.6 abc	16.75 defgh	12,763 abc
HM PM21	2.40 h	43.1 abcde	17.12 abc	12,738 abc
Beta 4023 R.....	4.08 cd	43.4 abcde	16.73 defgh	12,187 bcd
HM 2991 RZ	4.48 b	39.4 fghi	17.22 ab	11,943 bcde
SX Puma.....	2.60 h	40.9 defgh	16.78 cdefgh	11,822 cdef
Crystal 333 R.....	3.67 ef	43.1 abcde	16.32 ij	11,811 cdef
HH Acclaim R.....	3.40 fg	43.5 abcd	16.24 j	11,802 cdef
HH Meridian R.....	3.94 de	42.3 bcdef	16.32 ij	11,619 def
HM 2984 RZ	2.67 h	41.3 cdefg	16.45 hij	11,593 def
HM Owyhee	2.54 h	40.2 defghi	16.76 defgh	11,458 def
Beta 4773 R.....	4.27 bc	40.8 defghi	16.39 ij	11,434 def
HM 2988 RZ	4.11 cd	37.2 ijk	17.21 ab	11,117 efg
HM 2989 RZ	4.13 cd	37.8 hijk	17.01 abcd	11,108 efg
HM 2980 RZ	4.51 b	38.4 ghij	16.79 cdefg	11,057 efg
HH 142 R	4.05 cd	39.8 efghi	16.33 ij	11,032 efg
SX Raptor RZ.....	4.36 bc	38.3 ghij	16.56 fghij	10,873 fgh
SX Mammoth RZ	4.36 bc	34.5 kl	17.19 ab	10,199 ghi
Crystal 217 R.....	4.27 bc	35.1 jkl	16.64 efghi	9,907 hi
HH Eagle R	5.20 a	34.3 kl	16.51 fghij	9,847 i
HH Phoenix R.....	5.27 a	32.2 l	16.46 ghij	9,232 i
<i>P > F**</i>	<0.0001	<0.0001	<0.0001	<0.0001
LSD (<i>P</i> ≤ 0.05)	0.31	3.5	0.34	985

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

** *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* ≤ 0.05.