

BEET (*Beta vulgaris*)
 WILD BEET (*Beta vulgaris* spp. *maritima*)
Cercospora Leaf Spot; *Cercospora beticola*

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Beta PIs from the USDA-ARS NPGS evaluated for resistance to *Cercospora beticola*, 2001.

Thirty Plant Introductions (PIs) from the USDA-ARS National Plant Germplasm System (NPGS) (garden beet, sugar beet, leaf beet, fodder beet, and wild beet) were evaluated in an artificially produced epiphytotic (J. Am. Soc. Sugar Beet Technol. 16:384-389) at the Crops Research Lab-Fort Collins Research Farm (CRL-FCRF), Ft. Collins, CO. Randomized complete-block designs, with two replications were used to evaluate germplasm. Internal controls included a highly susceptible synthetic check, SP3510690, and a resistant hybrid check, (FC504 X FC502/2) X SP6322-0. Two-row plots 4 m long, with 56 cm between rows and 20 to 25 cm within-row spacing, were planted on 1 May. The nursery was inoculated twice, on 5 and 16 Jul. Visual evaluations on the plot with a disease index (DI) on a scale from 0 (no disease) to 10 (plant dead) at the CRL-FCRF were made on 3, 10, 17 and 24 Sep, with the peak of the epidemic occurring between the last two dates. The field was sprayed three times with Betamix Progress (6, 14, and 27 Jun) and twice with Upbeet (6 and 14 Jun) and Stinger (14 and 27 Jun) to control weeds. The field was thinned by hand and irrigated as necessary.

The high temperatures in the summer of 2001, combined with low moisture, contributed to a moderate leaf spot epidemic. The *Cercospora* epidemic did not become severe enough to rate until the beginning of September. Disease severity peaked by mid-September, after which regrowth started to outpace new disease development, so that disease ratings remained constant or decreased by the final rating. Thus, only the first three ratings are shown. At our third evaluation (17 Sep), means of the resistant and susceptible internal control were 4.97 and 6.42 (scale of 0-10), respectively, across the nursery. In 2000 (14 Sep), these means were 2.4 and 3.8, respectively. Means of contributor lines ranged from 2.0 to 8.0. An analysis of variance (PROC ANOVA - SAS) on the disease indices (visual evaluation scores) determined that there were significant differences among entries ($P = 0.05$) on all three dates of evaluation. A number of accessions were not significantly different from the resistant control, and on the 17 Sep rating date, five accessions had significantly lower ratings than the resistant control. These data, and more information on the accessions evaluated, are available through the USDA -ARS GRIN database at <http://www.ars-grin.gov/npgs>.

Entry	Donor's ID	subsp.	Identification Origin	Disease Index ¹		
				3 Sep	10 Sep	17 Sep
PI 540645	WB 897	<i>maritima</i>	France.....	3.0	4.0	4.0
Ames 3096	IDBBNR 4828	<i>vulgaris</i>		3.0	4.0	5.0
Ames 19160	Adanskaja Zeltaja	<i>vulgaris</i>	Russian Federation.....	4.0	5.0	5.5
PI 540584	WB 838	<i>maritima</i>	France.....	3.0	3.8	3.8
PI 540617	WB 871	<i>maritima</i>	France.....	2.0	3.0	3.3
PI 540629	WB 883	<i>maritima</i>	United Kingdom	2.5	3.5	4.3
PI 540642	WB 896	<i>maritima</i>	France.....	3.3	4.0	5.0
PI 540647	WB 901	<i>maritima</i>	France.....	2.3	3.0	3.0
PI 540649	WB 903	<i>maritima</i>	France.....	3.0	2.5	2.0
PI 540651	WB 905	<i>maritima</i>	France.....	2.5	3.0	3.8
PI 540653	WB 907	<i>maritima</i>	France.....	3.0	4.0	4.5
PI 540654	WB 908	<i>maritima</i>	France.....	3.8	5.8	6.0
PI 540656	WB 910	<i>maritima</i>	France.....	2.5	3.5	5.0
PI 540657	WB 911	<i>maritima</i>	France.....	2.5	2.5	3.5
Ames 8280	IDBBNR 9497	<i>vulgaris</i>	United Kingdom	3.8	6.5	6.3
Ames 19022	IDBBNR 9554	<i>vulgaris</i>	Kazakhstan	4.0	5.5	7.0
Ames 19158	Kyzyl-ca	<i>vulgaris</i>	Russian Federation.....	3.8	5.5	6.0
Ames 19161	Alasehirskaia	<i>vulgaris</i>	Russian Federation.....	4.0	5.5	6.0
Ames 19162	Abhazskaja Zelena	<i>vulgaris</i>	Russian Federation.....	5.0	6.5	8.0
PI 518424	IDBBNR 5918	<i>maritima</i>	United Kingdom	3.0	4.5	5.5
PI 540585	WB 839	<i>maritima</i>	France.....	2.0	2.5	4.0
PI 540613	WB 867	<i>maritima</i>	France.....	3.0	4.0	5.0
PI 540616	WB 870	<i>maritima</i>	France.....	2.5	3.0	4.0
PI 540518	WB 872	<i>maritima</i>	France.....	2.3	2.5	2.3
PI 540619	WB 873	<i>maritima</i>	France.....	2.5	2.5	3.0
PI 540625	WB 879	<i>maritima</i>	France.....	2.8	3.0	3.8
PI 540630	WB 884	<i>maritima</i>	United Kingdom	2.5	3.0	4.5
PI 540631	WB 885	<i>maritima</i>	United Kingdom	3.5	4.0	4.3
PI 540638	WB 892	<i>maritima</i>	France.....	2.5	3.5	4.5
PI 540643	WB 897	<i>maritima</i>	France.....	3.0	3.3	4.8
Leaf Spot Synthetic Susceptible Check² (931002)				4.0	5.0	6.0
Leaf Spot Resistant Check³ (821051H2)				2.5	3.0	4.5
				LSD_{0.05}	0.89⁴	1.11
Trial Mean				3.0	3.9	4.6

¹Disease Index is based on a scale of 0 (=healthy) to 10 (=dead).

²The Leafspot Susceptible Check is SP351069-0.

³The Leafspot Resistant Check is ((FC504CMS x FC502/2) x SP6322-0).

⁴Mean separation according to Fischer's protected LSD ($P = 0.05$)