SUGAR BEET (*Beta vulgaris*)
    Rhizomania; *Beet necrotic yellow vein virus*
    Fungal growth; *Athelia* sp., *Botrytis* sp., *Penicillium* sp.

L. Panella, USDA, Agricultural Research Service, Ft. Collins, CO and C. A. Strausbaugh and I. A. Eujayl, USDA, Agricultural Research Service NWISRL,3793 N. 3600 E., Kimberly, ID 83341

Evaluation of USDA-ARS (Ft. Collins) sugar beet germplasm to rhizomania and storability, Idaho, 2010.

Sugar beet germplasm and commercial check cultivars were evaluated in a sprinkler-irrigated sugar beet field near Kimberly, ID where sugar beet was grown in 2009. The soil type was Portneuf silt loam. The field trial relied on natural inoculum for rhizomania (caused by *Beet necrotic yellow vein virus*) development. The seed was treated with clothianidin (2.1 oz a.i. per 100,000 seed) to limit pests and curly top. The plots were planted on 26 Apr to a density of 142,560 seeds/A, and thinned to 47,520 plants/A on 12 Jun. Plots were single rows (22-in. row spacing) and 10 ft long. The experimental design was a randomized complete block design with eight replications per entry. The crop was managed according to standard cultural practices, except for irrigation. The frequency of irrigation was higher than standard practice during Jun to increase the potential for rhizomania disease development, but the total amount of water applied was normal. The percentage of leaves per plot with foliar symptoms (upright narrow yellow leaves) was evaluated on 29 Jul. Root symptoms were evaluated on 13 Oct. Roots were mechanically topped and lifted, with the first ten roots in each plot being evaluated for rhizomania, using a scale of 0-9 (0 = healthy and 9 = dead). The first eight roots were placed in a mesh onion bag and held on the top of a storage pile in an indoor commercial sugar beet storage facility set at 35°F. On 3 Feb 2011, the roots were evaluated for the percentage of surface area covered by fungal growth after 114 days in storage. Data were analyzed using the general linear models procedure (Proc GLM-SAS), and Fisher's protected least significant difference was used for mean comparisons (SAS).

Rhizomania was uniform throughout the plot area and other disease problems were not evident. There were significant differences among entries with both rhizomania rating techniques used; however, the storage data were not significantly different. The foliar rating for rhizomania ranged from 0 to 100%, and gave better separation of germplasm than the root rating. The commercial checks responded as expected for rhizomania.

Entry[z]	Identification	Description	Rhizomania Foliar	Rhizomania DSI	Storage (%)
55	FC-5	Inc 2005A020 - halfsibs of FC123mm (FC301); monogerm	27 cd	34 a	2
60	FC-10	04-FC1037	16 de	34 a	4
57	FC-7	04-FC1038	31 cd	21 e	4
59	FC-9	09-FC1036	20 cd	24 c-e	7
54	FC-4	FC221	69 b	26 c-e	8
53	FC-3	FC220	57 b	28 bc	9
51	FC-1	FC716	96 a	22 de	10
3	**Angelina**	Rz1+Rz2	0 e	16 f	10
56	FC-6	04-FC1028	23 cd	26 cd	11
58	FC-8	FC221-1 RhzmR, MM, CTR, LSR ({4918, 2915aa} x {FC902, 607, 709-2})-hs	67 b	31 ab	12
2	**Beta G017R**...	Rz2	0 e	15 f	13
52	FC-2	FC220-1 SEL - INC 20051030	34 c	28 bc	14
7	**EL-SP7322-0** .	rzrz,VYS Inc. SP7322-0,4/05	100 a	31 ab	21
5	**Roberta**	rzrz	89 a	34 a	25
1	**Beta 4430R**....	Rz1	0 e	16 f	29
P > F			<0.0001	<0.0001	0.2935
LSD (*P* ≤ 0.05)			18	5	NS

[z] Sugar beet germplasm lines developed at Ft. Collins, CO were evaluated for response to *Beet necrotic yellow vein virus* along with commercial checks (bold). Foliar = percentage of leaves that were yellow, narrow, and upright. Ten roots per plot at harvest time were evaluated using a scale of 0-9 (0 = healthy, 9 = dead) to rate 10 roots in each plot. These data were used to establish a disease severity index (RZ DSI) for each plot using the following formula: [((A)0+(B)1+(C)2+(D)3+(E)4+(F)5+(G)6+(H)7+(I)8+(J)9)/90]100, where A-J are plants in categories 0-9, respectively. Storage = percentage of root area covered by fungal growth (*Athelia* sp., *Botrytis* sp., and *Penicillium* sp.). *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. NS = not significant.

Mention of trade names or commercial products in this publication is solely for the purpose of providing specific information and does not imply recommendation or endorsement by the U.S. Department of Agriculture.

USDA is an equal opportunity provider and employer.