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Sources, breeding, and performance of resistance to rhizomania
in sugarbeet.

Rhizomania resistance breeding has been in progress at Salinas since 1984. A wide array of germplasm has been screened. Other than the factors from Holly (Rz) and Rizor, high levels of resistance are rare within sugarbeet. In contrast, resistance to rhizomania has been identified from many *Beta maritima* accessions. Eight of these sources of resistance have been enhanced by backcrossing into sugarbeet. Segregation within F₁ and BC populations grown under rhizomania conditions usually suggest single dominant gene action. The allelic relationships of these different sources of resistance are not known. Tests of allelism between Rz and a factor from line PI 206407 (C28) suggested different genes. Field tests also suggested differences in performance. As the severity of disease increased, resistance from PI 206407 gave better protection than Rz. The combined resistance was better than either alone. In greenhouse and field tests, Rz and a factor from WB 42 (C48) reacted differently. In a field test under moderate and severe conditions, Rhizosen (Rz resistance) and Rizor had 30% reduction in yield, whereas a line with *B. maritima* sources of resistance (C50) had 6% additional loss. The effects of differences in gene frequencies and genetic backgrounds may have confounded these results and could not be discounted.