

## ROOT ROT IN SUGAR BEET PILES AT HARVEST

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Sugar beet root rots are not only a concern because of reduced yields, but can also be associated with storage losses. Our primary sugar beet root rot disease problem in the Amalgamated production area is *Rhizoctonia* root rot caused by the fungus *Rhizoctonia solani* AG-2-2 IIIb. However, this fungus frequently only penetrates a short distance past the surface of the root before a bacterial complex stops the fungus and continues the rot process. The bacterium, *Leuconostoc mesenteroides*, initiates this bacterial complex which leads to fermented rotted root tissue that has the potential to consume the whole root. This rot complex leads to direct yield loss at harvest time along with additional costs in factory processing. The dextrans produced by *L. mesenteroides* plug the factory filters and increased impurities, pH adjustments, and enzyme usage all make sucrose extraction more costly and difficult. When rotted roots make it into storage piles, they have been shown to compromise surrounding healthy roots. Healthy roots next to rotted roots have been documented to suffer a 5% reduction in sucrose and 7% reduction in extractable sucrose along with more root discoloration and frozen root area. Thus controlling root rots in the field improves yield, but keeping rotted roots out of storage will increase profits as well.

A recent end-of-harvest storage pile survey of 74 to 76% of the piles at receiving stations in Treasure Valley (Fig. 1) and Magic Valley (Fig. 2) has identified rotted roots entering storage. The full length of the piles was assessed and then the pile was placed into a category (None = no rot; Low = 1 to 9 spots with rot; Intermediate = 10 to 19 spots; and High = 20 or more spots) depending of the incidence of rot observed. Treasure Valley clearly has more root rot than Magic Valley, which made reversing the order of the bars in the figures necessary to see the results. The dramatic trend changes in the figures during 2013 likely does not reflect less rot in the fields, but an effort to keep rotted roots out of the piles. During the 2013 harvest, fieldmen made a concerted effort to keep roots from diseased fields out of long term storage piles. In Treasure Valley, the number of piles in the High category was almost reduced by half, while the number of piles in the Low category was more than doubled (Fig. 1). In Magic Valley, the number of piles in the High category was eliminated and those in the Intermediate category were reduced by 66%. Thus, it appears that the efforts to cleanup piles were successful.

To reduce the amount of *Rhizoctonia* root rot in the field, growers are encouraged to select less rot prone cultivars. However, growers should keep in mind that even

the most tolerant commercial cultivars leave a lot of room for improvement (only 50% effective when compared to breeding lines with a full complement of resistance genes). The tolerance in these cultivars can also be compromised if other disease problems such as curly top and rhizomania are affecting the plant. Crop rotation can be considered, but very few crops (wheat and barley) will likely allow for inoculum reduction. Growing corn, beans, potatoes, and alfalfa in your crop rotation will not eliminate or reduce *R. solani* levels sufficiently. Good weed control in the rotation crops can also help, since many weeds can also harbor *R. solani*. Excessive soil moisture will also increase root rot issues. Fungicide application (ex. Quadris at 0.4 to 0.8 fl oz/1,000 ft row) in-furrow at planting and/or banded at the four- to six-leaf growth stage (or before the soil reaches 62°F at 4 inches regardless of growth stage) could also be considered to facilitate control.

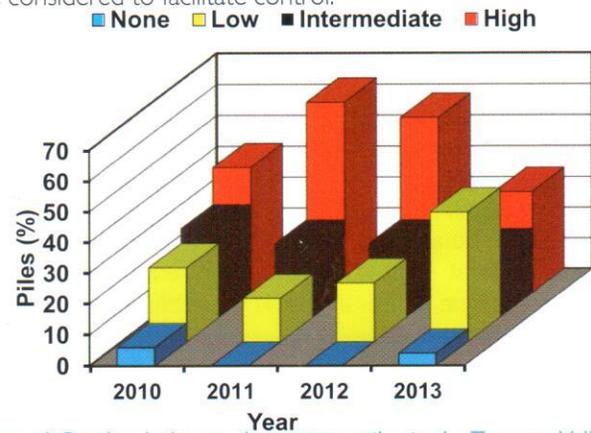


Figure 1. Rot level observed in storage piles in the Treasure Valley at the end of harvest. On average, 74% of the piles in the valley were assessed each year. (None = no rot and High = 20 or more spots in a pile with rot).

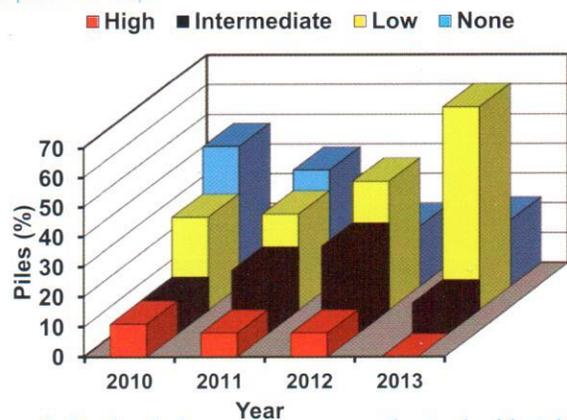


Figure 2. Rot level observed in storage piles in the Magic Valley at the end of harvest. On average, 76% of the piles in the valley were assessed each year. (None = no rot and High = 20 or more spots in a pile with rot).