DISEASE NOTES –BACTERIAL ROOT ROT

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Hotweather conditions during the middle of August to the middle/end of September in 2012 increased the occurrence of bacterial root rot (BRR) in sugarbeet roots. This form of root rot is caused by soil borne bacteria ubiquitous in Idaho soils and can cause yield losses ranging from 1 to >90%. In addition to losses in the field, roots affected by BRR can also reduce sucrose extraction in surrounding healthy roots in storage. Roots with severe infection do not store well and can potentially hinder factory processing.

In recent surveys, two lactic acid bacterial organisms were identified to be associated with BRR in the Idaho and Oregon growing regions. Leuconostocmesenteroides subsp. dextranicum and Lactobacillus strains are the main causal agents that initiate bacterial root rot associated with wet symptoms. These lactic acid bacteria start the rot/fermentation process, but other bacteria as well as yeast tend to also invade the tissue. The acetic acid bacteria will give the tissue a vinegar-like fermented smell. As rot advances, rotted out cavities and viscous slime will be evident inside the root (Figure 1). External symptoms are mainly restricted to aerial parts including foliar bronzing (Figure 2) and blackening of petioles and the crown (Figure 3). This type of bacterial rot does not have foaming or bacterial ooze on the petioles or in the crown area normally associatedwith rot initiated by Pectobacterium (formerly Erwinia).

The lactic acid bacteria gain access through wounds, which can be caused by a number of biotic and abiotic agents, including Rhizoctonia root rot or rodent damage. Certain cultivars might exhibit a stronger susceptibility to BRR and can be infected directly through growth cracks in the crown area. Infected beets were observed in a wide range of field conditions ranging from moderately dry and sandy soils to fields with heavy soils and excessive soil moisture.

No definite management practices or control measures can be suggested at the moment, since the epidemiology and the infection process of Leuconostocstrains is poorly understood. But it is advised to use best management practices including adequate N fertilization, balanced irrigation, the use of host resistance and fungicides to limit or prevent the problems with Rhizoctonia root rot.

Figure 1:
Advanced infection with lactic acid bacteria caused cavities and viscous slime in a beet root (imagine a vinegar-like fermentation smell)
Photo by Oliver T. Neher

Figure 2:
Foliar bronzing caused by an infection with lactic acid bacteria.
Photo by Oliver T. Neher

Figure 3:
Close-up of a beet crown showing blackened petioles after an infection with lactic acid bacteria.
Photo by Oliver T. Neher