2012 Potato Seed Piece Trial
Joe Nunez

Soft rot in potatoes has been a long-standing issue affecting Kern County growers for quite some time. Results from field trials over the last several years, however, may shed some light on ways to reduce its occurrence.

Caused by the bacterium *Pectobacterium carotovorum* var. *carotovora* or *P. chrysanthemi* (formally known as *Erwinia carotovora subsp. carotovora*), soft rot is a disease promoted by high soil temperatures. Late planted fields which are not harvested until late spring or early summer are most susceptible to infection. Accordingly, a fall potatoes, which are planted in August, are also highly susceptible.

In-season infections are characterized by seed piece decay, followed by stem infection which extends into the lower stem, causing vascular discoloration (in the lower stems). Obvious visual signs of infection include the observance of early senescence (bacterial early dying). Additionally, as decay overcomes the seed piece, bacteria moves from the seed piece to the stolons and through the soil by water to the newly forming tubers. In turn, these “daughter” tubers then develop stem end decay and/or lenticel infections. Post-harvest loss can also occur as a result of the processing practice in which harvested tubers are washed in a “dump tank”. This method forces bacteria-laced water into the lenticels of the potatoes; infection is usually not apparent until several days after packing.

Due to the high temperature ranges prevalent in Kern County during the potato growing season, soft rot will likely never be fully controlled. The impact, however, can be reduced by planting and harvesting early, along with the avoidance of over watering.

One of the more promising field trials resulted in a significant reduction in soft rot and increased marketable yields, accomplished by the use of biological treatments applied as banded applications in the seed furrow at planting. These biologicals were commercial formulations of *Trichoderma* spp., *B. subtilis* and *Streptomyces lycicus* and. Figure 1 illustrates the differences in the tuber marketability of from four trials, conducted over a two year period. The data also suggests that combinations of different types of biological organisms may have additive effect on soft rot control and yield increase.

These treatments, *Trichoderma* spp (Tenet), *Bacillus subtilis* (Serenade Soil) and *Streptomyces lycicus* (Actinovate) were compared to untreated cut seed, whole seed uncut and cut seed treated with Maxim/MZ. All the biologicals tested were applied to cut seed. It has been known that using whole seed will reduce the incidence of bacterial soft of potatoes but is more expensive and whole seed has limited availability. The industry standard, therefore, is to use cut seed treated with a seed treatment such as Maxim/MZ.

More potato seed piece trials will be conducted in 2014 in order to better understand how maximize the potential of these products. In the meantime, growers may want to do their own trials utilizing some of these products, or others like them, as the planting season for the spring potatoes gets underway.
Figure 1. Differences in marketable yield of four trials conducted over two years.

![Figure 1: Marketable Tubers Combined over 2013 & 2012](image)

(P = 0.07, %CV = 13.58, LSD $p=0.10 = 4.468$)

Figure 2. Decay of seed piece and infection of lenticels.
Figure 3. Vascular discoloration caused by *Pectobacterium carotovorum* var. *carotovora* on left verses a healthy plant on right.

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