THE EFFECT OF HIGH TEMPERATURE ON POTATO QUALITY

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High temperatures are the order of the day in the Columbia Basin during a large part of the potato harvest season. Temperatures at the soil surface on a 90° F. day have been recorded as high as 140° F. Moisture content in the soil greatly effects the magnitude of this temperature. Dry soil attains a high temperature at a much faster rate than wet soil. Also, a breeze flowing over the soil will keep the soil temperature at a much lower level.

Temperatures of not much over 100° F. cause the development of a disorder called blackheart. This is a physiological disorder and is not caused by fungal or bacterial organisms. It starts as a black shiny streak of tissue in the center of the tuber and usually continues to spread from the center outward to the edges. It finally terminates in a badly rotted tuber.

In addition to blackheart, laboratory investigations have shown that tuber tissue which has been exposed to prolonged periods of high temperature prior to injury will rot rapidly in injured areas. In most instances, no cooling technique can arrest or prevent this rotting from occurring.

High temperature injury is especially difficult to detect at the shipping point, because it is an internal disorder and does not appear at the surface. The tuber becomes progressively more rotted with time after injury. Injury usually becomes evident at the receiving point or later, on the retailer's shelves. Severe cases of this type of rot are very similiar in appearance to soft rot (Leak) and they would be very difficult to tell apart without special pathological techniques.

When air temperatures are exceedingly high, (95° F. or over) special care must be taken to prevent soils from drying out. It has also been observed that truckloads of tubers often set for several hours in the sun while waiting to be unloaded at the shipping shed. If even the top layer of a truck load was to suffer high temperature damage this could result in quite a high percentage of rot in each railroad car at the time the tubers reach the receiving point.

High temperature injury has much the same effect on potatoes as it does on the human body. Food reserves are rapidly depleted, enzyme systems responsible for carrying on life processes are destroyed, and the whole internal physical and chemical structure of cells can be disrupted. The final result is death of the cell.

Biochemical and physiological investigations are now being conducted to

catagorize the exact mechanisms by which high temperature injury occurs. Until more exact methods of control can be determined and incorporated into handling practices it is the responsibility of each grower and shipper to use all of the means at his command to prevent tubers from being exposed to conditions which could result in an increase in pulp temperature.

The following are some of the precautionary measures that both can and should be employed by the potato industry to prevent high temperature injury;

1. Do not let fields completely dry out during the growing season or when attempting to set skins.

2. Do not let half-filled trucks sit in the field for extended periods of time when loading equipment breaks down, unless they are covered with a tarpaulin.

3. Do not let trucks waiting to be unloaded at the shipping shed sit in the sun for extended periods of time. Hold trucks in the shade if at all possible.