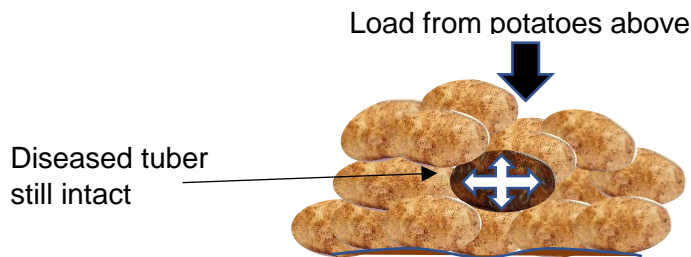


(Jacques Lavoie, P. Ag., Seed Potato Specialist, NBDAAF, Wicklow, email: jacques.lavoie@gnb.ca)

(Janet McLaughlin, Potato Research Technician, NBDAAF, Wicklow, email: janet.mclaughlin@gnb.ca)

Hot spots in potatoes can occur both in box and bulk storages, the consequences however are more severe in bulk storages. The problem starts when tubers begin to rot due to a blight or soft rot infection invading the tuber. (Figure 1)

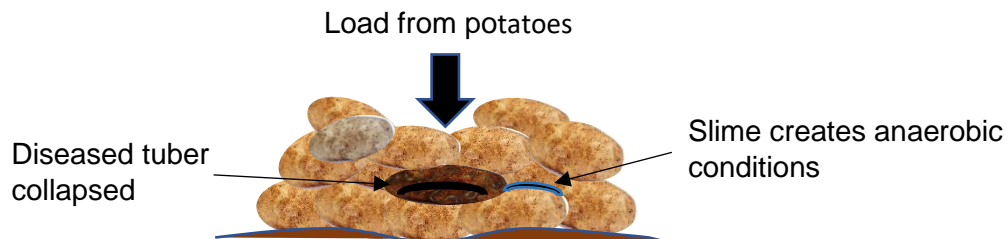
Figure 1



Rotting can occur no matter what storage management procedure is followed. However, this can be exacerbated by tubers remaining warm and wet after harvest!

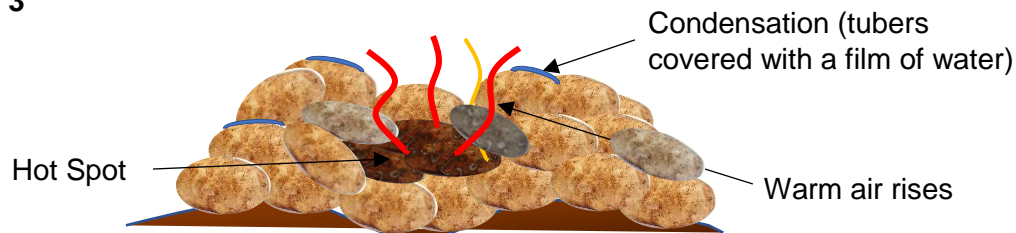
Rotting tubers collapse from the weight of the potatoes above it (Figure 2) resulting in an anaerobic mass of exudates through which ventilating air cannot penetrate.

Figure 2



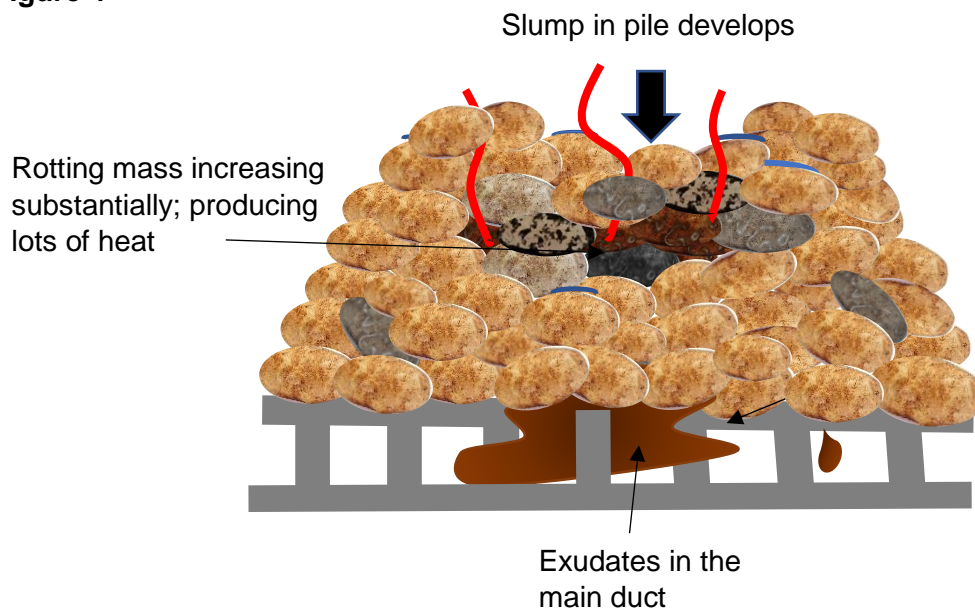
The metabolic heat from rotting exudates results in warm moist air rising from the hot spot and condensing on the cooler sound tubers above (Figure 3).

Figure 3



They then become warm and wet causing further rotting to occur and the hot spot to increase in size with more and more tubers collapsing. The result is the surface of the pile starts to slump (Figure 4).

Figure 4



Other than noticing an unpleasant odor, this slumping, and the exudates flowing into the laterals and main duct, may be the first indication of rotting tubers the storage manager sees.

If a small percentage of disease is known to be in the crop, an attempt to cool the pile quickly should be made, 0.6°C (1°F) every 2 to 3 days until a temperature between 8.9°C (48°F) and 10°C (50°F) is reached. The lower temperature will help keep the disease in check while still allowing some curing to take place.

If the scenario is worse, tubers breaking down or diseased (late blight, leak, .), ventilate continuously with cool dry air when available, and try to maintain the temperature between 4.4°C (40°F) and 7.2°C (45°F). Processing storages which are kept warm to maintain low sugar levels are most prone to hot spot development.

It is very important to get as much air circulating through the pile as quickly as possible! To enhance air circulation, supplemental ventilation can be included by setting auxiliary fans either on top of the trouble spot or in the duct below it.

HOT SPOT COOLING FANS

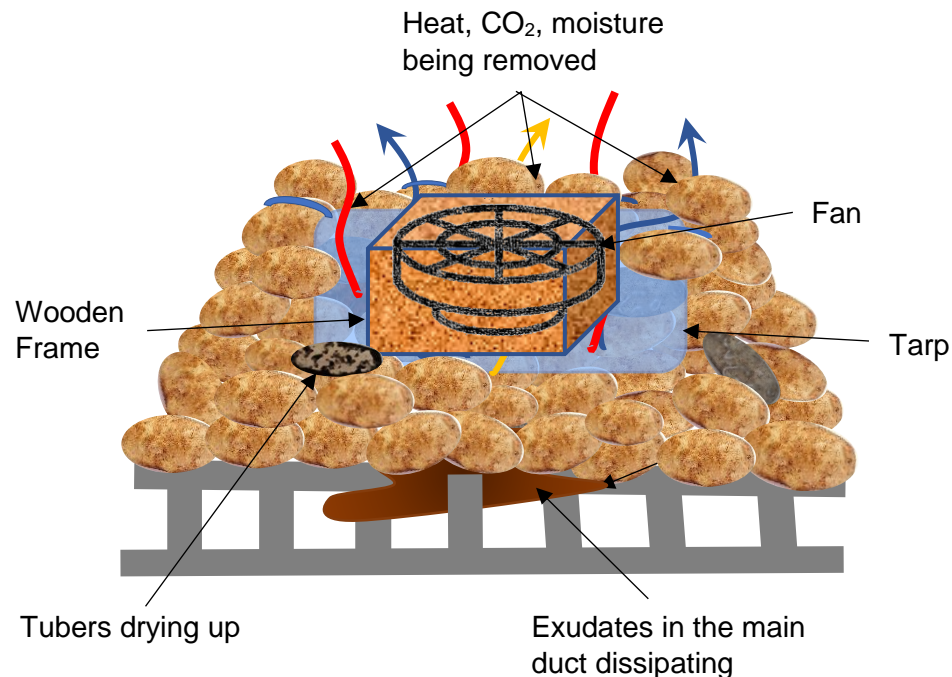
Hot spot cooling fans are a simple, inexpensive, but effective means of helping control localized problems in storages. Increasing air flow is a very efficient means of removing excess heat and moisture from problem areas. This method will not interfere with the normal management of the remaining bins.

To set up the fan: build a plywood or sheet metal frame around the fan with the motor situated inside the framework, dig a hole where the hot spot is located and situate the

framework on top. Note, the framework should be placed with the fan motor facing down, this allows the moisture to be drawn up through and out of the pile.

Another common practice is to include a three to four-foot plastic or canvas skirt around the fan to enhance suction (Figure 5).

Figure 5



One 18 – 24”, 3000-4000 cfm fan will be required for every 2000 barrels (3300cwt) of potatoes. The quantity of potatoes being cooled, and the severity of the breakdown is what needs to be considered when choosing a fan.

Leave the fan on until the moisture formation has disappeared and a check with an infra-red gun shows that the hot spot has cooled.

INFRA-RED GUNS

“Infra-red guns” are a handy management tool to check for hot spots before they have had a chance to multiply.

Within one to two weeks of harvest, diseases that were not visible at the time will have had time to develop. Often, at this point, the breakdown hasn’t reached the point of detection (may smell an odor or notice the pile is slumping); the infra-red gun technology offers a means of detecting potential breakdown before any serious problems arise. Potatoes in storage produce heat through respiration while rotting potatoes release additional heat due to stress and the fungi/bacteria growing on them. This extra heat travels up towards the surface of the pile and can be easily detected by an infra-red gun.



REMEMBER:



“If the crop isn’t managed carefully as it is placed in the storage, a season’s worth of hard work can be lost!”



“WATCH OUT” FOR HIGH PULP TEMPERATURES DURING HARVEST

During harvest activities, the devil is in the details! One detail requiring close attention is the pulp temperature during harvest. Harvesting potatoes above a pulp temperature of 18.3°C (65°F) is a very risky business.

Almost every year growers somewhere pay the price for harvesting when temperatures are too warm! The main problem is disease. Nearly all tuber diseases found in storage are made worse by warm temperatures. Measuring air and pulp temperature throughout harvest and storage is a must to make good decisions!

Many pathogens gain entry in the tuber and initiate their infection cycle during the activities associated with harvest, particularly wounding. Avoid harvesting potatoes when soils are especially wet or when pulp temperatures are high >18.3°C (> 65°F) as leak development under these conditions is very rapid! Regularly checking potato piles for slumping and the duct systems for signs of dripping water from rotting tubers is a must.

REMEMBER:



“At harvest your pocket thermometer is your best friend, if you can’t measure it you can’t manage it!”

