

POST-HARVEST POTATO STORAGE DISEASE CONTROL

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For several years researchers at the University of Idaho's Kimberly Potato Storage Facility have evaluated products for their efficacy in control of storage diseases such as pink rot, late blight, silver scurf and dry rot. Multiple products with various active ingredients have been evaluated including: chlorine dioxide, hydrogen peroxide with peroxyacetic acid, organic acids, buffered water, thiabendazole, mancozeb, azoxystrobin, various bio-control agents, fludioxinil, calcium hypochlorite, salts of phosphorous acid, imazilil and many others.

Primary testing of these products simulates a post-harvest spray as the potatoes are being conveyed into the storage. When testing these products for efficacy, unwashed potatoes are first inoculated with the causal organism of one specific disease, incubate for one hour in a plastic bag (disease favorable environment) and then are treated with the post-harvest product. Before inoculation, tubers to be inoculated with pink rot are additionally tumbled lightly for two minutes to increase their susceptibility to disease and tubers to be inoculated with dry rot are tumbled down a special chain to create a wound for point of entry. Those are two diseases wherein a wound greatly increases disease infection in our studies. Potatoes used for late blight studies, are not wounded since infection occurs very easily through the lenticels and eyes. Silver scurf tubers are not inoculated for our studies. Instead potatoes are grown in a manner to increase silver scurf infection at harvest and therefore show symptoms at the time of treatment. In all of these tests, the application rate was 0.5 gallon of aqueous treatment product to one ton of potatoes. Some say that 0.5 gallon per ton of potatoes is not enough volume for complete coverage of the potatoes. In contrast, others state that this rate puts too much liquid on the potatoes and may increase the risk of disease. For this reason, a demonstration of four different volumes applied to tubers was visually performed at the Storage Workshop, Figure 1.

LATE BLIGHT AND PINK ROT

One group of products that has repeatedly shown efficacy as a post-harvest control for late blight and pink rot is the phosphorous acids. The University of Idaho has tested several different phosphorous acid products as a post-harvest application and they have all shown superior control of late blight and pink rot compared to any other product tested. Our experiments have demonstrated no ill effects when applying phosphorous acids to seed potatoes prior to storage at the labeled rate. Azoxystrobin has also shown good efficacy against late blight but is not currently registered.

SILVER SCURF

The currently registered post-harvest products for control of silver scurf appear to have limited efficacy on controlling the disease in storage. Recent research has shown azoxystrobin sprayed on potatoes prior to storage to be effective in reducing spread of silver scurf in storage. Azoxystrobin is not currently registered but registration is being pursued by Syngenta. A resistance management plan with this product will need to be established since this product is also utilized in the field for management of other diseases.

DRY ROT

The development of thiabendazole (Mertect) resistant Fusarium dry rot has left a void in the post-harvest control of this disease. Unfortunately, our product testing research has not shown a

promising replacement. Research efforts will continue to evaluate potential products for control of this important disease in storage.

RECOMMENDED APPLICATION RATE

Our research-based information recommends 0.5 gallon of aqueous product/ ton of potatoes. That amount converts to less than ½ cup (3.2 ounces) of liquid per hundredweight (cwt) or an increased 4.3 ounces in weight for every hundred cwt of potatoes. To maximize the usefulness of a post-harvest product, careful application of rate and volume is necessary. Applying less than 0.5 gal/ton of potatoes may result in incomplete coverage and applying greater than 0.5 gal/ton of potatoes may add too much free moisture to the surface of the potato. Stewardship of application may take more time and effort, but the consistency of disease control will be greater. Below are pictures depicting the volume of solution applied to potatoes. Note the description and visual representation of the 0.5 gal/ton of potatoes and strive for applying your post-harvest product at that level.



0.25 gallon of product/ ton of potatoes
Product distributed evenly over the top of the russeted skin



0.50 gallon of product/ ton of potatoes
Product penetrating to the bottom of the russeted skin



1.0 gallon of product/ ton of potatoes
Product filling the russeted skin and a shine is seen on the potatoes



2.0 gallons of product/ ton of potatoes
Product dripping from the potatoes

FIGURE 1. Water sprayed on potatoes at four application rates. Our research-based information recommends 0.5 gallon of aqueous product/ ton of potatoes.