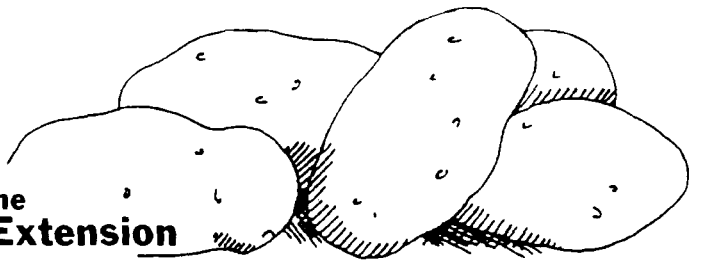

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POTATO FACTS

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Treating Potatoes Before Storage

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Potato tuber losses in storage represent a loss of income to the Maine potato grower each year. Moisture loss, inadequate ventilation and diseases can all contribute to losses in storage.

One of the most destructive diseases of stored potatoes is Fusarium dry rot.

One of the most destructive diseases of stored potatoes is *Fusarium* dry rot. This disease is caused by several species of the fungus *Fusarium*. The most prevalent species in Maine are *Fusarium roseum* var. 'Sambucinum' and *Fusarium solani* var. 'Coeruleum'. Under most conditions, *F.* roseum *'Sambucinum'* is the more aggressive of the two species and will cause rapid decay of tubers.

These pathogens live in the soil and on crop refuse. They are also capable of surviving in soil on equipment, walls, and floors of potato storages. Since these fungi are soil borne, all tubers have the potential to carry one or both of them on their surfaces.

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The pathogens responsible for Fusarium dry rot of potatoes do not directly penetrate the potato. An entry site, such as a wound or a bruise, is necessary for the pathogen to become established. Most tuber rot infections occur through wounds inflicted during harvest or storage. Factors which contribute to increased *Fusarium* tuber rot specifically include wounds, dirty tubers, susceptible varieties, lenticel enlargement, excess air movement and low humidity in storage, and tuber damage from other pathogens, insects or nematodes. Any and all conditions that reduce the rate of suberization and wound periderm formation increase the potential for losses from *Fusarium*.

The initial infection by *Fusarium* is light brown and darkens with age. The fungi are often seen growing through the wound. The rate and type of decay observed depends on the species of *Fusarium* and the storage environment. Usually the decay process progresses slowly towards the center of the tuber. Serious internal decay may occur in the absence of obvious external symptoms. The tuber can become mummified; the shell of a potato may persist with the internal cavity full of fungal growth.

Control of *Fusarium* tuber rot can be aided by harvesting only mature tubers with well-set skins and handling the tubers in such a manner as to minimize bruising. This reduces the entry points for infection. Harvest only when tuber temperatures are above 40 degrees F, as this will reduce bruising. Padding of equipment can reduce injury from bruising and subsequent infection by *Fusarium*. Since the pathogens can survive in soil that adheres to equipment, storage areas and infected tubers, sanitation of equipment and storage areas will reduce potential losses.

Thiabendazole (Mertect 340F), applied properly, can provide excellent control of pathogens causing *Fusarium* tuber rot. To provide maximum control, each tuber must be completely covered with the fungicide. The addition of chlorine to the thiabendazole solution at 500 parts per million (ppm) will aid in control of bacterial soft rot. There are also reports that chlorine aids in the rate of suberization of bruised and wounded tubers. However, treatment should never take the place of careful handling and good crop management practices.

Agclor 310, a chlorine compound, is currently available for postharvest application to potatoes. To achieve a

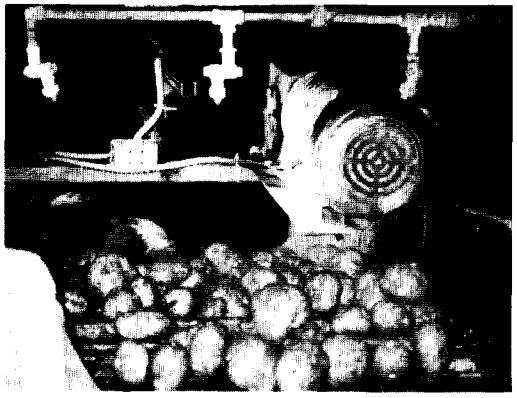
500-ppm solution of chlorine, add 51 ounces of Agclor 310 to 100 gallons. Mertect 340F at the rate of 0.42 ounces per ton of potatoes in the 500 ppm solution of chlorine should be applied to tubers before storage.

Application equipment should provide complete coverage of each tuber with the protectant spray. To insure maximum benefits from the treatment, separate as much soil, diseased tubers and other debris as possible before the treatment is applied and the potatoes loaded into storage. The spray or controlled droplet applicator (CDA) nozzles should be placed on the bin piler where the tubers are tumbling to insure adequate coverage. Application equipment placed over a roller table will provide the best coverage and thereby the best control. Treat potatoes immediately before storage.

Of paramount importance is not to get the tuber too wet. Avoid soaking the potatoes; the idea is to cover them with a penetrating mist. Too much moisture on the potatoes being piled will lead to storage problems. Use between two and four quarts of water/thiabendazole/chlorine mixture per ton of potatoes. If CDA nozzles are used, apply four to eight ounces of mixture per ton of potatoes. The same Mertect 340F rate of 0.42 ounces per ton and chlorine at 500 ppm in solution should be used for CDA nozzles.

Use pressures of at least 80 psi, preferably 100 psi, when treating the potatoes. Higher pressures insure that the protectant sprays will penetrate wounds and prevent the pathogens from infecting tubers. Situating two nozzles across the belt provides good coverage. Place the nozzles far enough away from the potatoes and from each other so that they deliver a good spray pattern. The need for a consistent flow of potatoes during treatment cannot be overstated. Too fast through the application and not all potatoes will be treated with enough material, increasing the potential for Fusarium tuber rot. Too slow through the application and the potatoes can be too wet, increasing the potential for bacterial soft rot.

To calibrate a treatment for potatoes entering a storage, perform the following: Measure the time needed to unload a specific quantity of potatoes. If it takes 40 minutes to unload 320 hundredweight, the unloading rate is 320/40 or eight hundredweight per minute, which is equivalent to 0.4 tons per minute.



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To determine the total nozzle output rate required for application, multiply the desired solution volume by the feeding rate of the potatoes. For example, to apply two quarts (one half gallon) of thiabendazole/water/chlorine mixture per ton at a feeding rate of 0.4 tons per minute requires a total nozzle rate of 0.2 gallons per minute (0.5 gallons x 0.4 tons/minute = 0.2 gallons/minute).

If two nozzles are used, the rate per nozzle is half the total nozzle rate. In this example, one nozzle with a flow rate or capacity of 0.2 gallons per minute at 100 psi or preferably two nozzles with a flow rate of 0.1 gallon per minute at 100 psi would be needed. A minimum of two nozzles is recommended to insure complete coverage.

The results of the treatment will only be as good as the application. The major factors to remember are that complete coverage and penetration of material into wounds are necessary to provide maximum control of storage-related pathogen problems.

Please read labels carefully to insure products are labeled for intended use. Follow all label directions.

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