

## HEALTHY SEED AND SEEDLINGS - PANEL

### Fungicide Dusts Protect Seed

by  
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Fungicide applications in the form of dust treatments on cut potato seed have been in use for over 30 years. Liquid sprays and dips have been tested and tried, but as yet, never found to be practical under commercial use conditions in the Northwest.

Dust formulation volume however, has continued to increase in direct proportion to acres planted. The reasons for this is that dusts can provide an even distribution of the fungicide over the freshly cut seed piece, help dry the cut surface and give visible proof that the seed has been "treated".

To be effective, a fungicide dust must accomplish four things when applied to freshly cut seed.

First, it must protect the seed from infection by disease producing fungal organisms.

Secondly, it must have the capability to wick off moisture from the cut surface rapidly, so the suberization process will take place in a matter of six to eight hours. Longer suberization time than this will allow bacterial infection to develop on the cut surface.

Third, the dust must keep the cut seed from "slicking" together, thereby reducing potential disease infection.

Finally, the formulation must be free flowing through the dispenser and yet not disperse or suspend into the air around the cutting equipment as the latter can be an irritation factor to the workers.

Fortunately, most of the fungicides used in dust formulations have a very low level of toxicity and also a very low level of irritation.

By the very nature of the formulations, the making of such is as much an art as it is a science. No two formulations containing identical active ingredients are exactly alike. The wide choice of diluents, fillers, dedusters and flow conditioners make each brand very distinctive.

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Some may be excessively dusty under high temperature-low humidity conditions or flow poorly under high humidity conditions. Some may dry the cut surfaces well under dry conditions but cause the cut seed to stick together under low temperature and high humidity conditions. Hence, the type of diluents used in the dust formulations can vary the performance of a specific fungicide dust product.

For many years only mineral earths were used such as talcs and suitable clays. However, in recent years blends of these mineral earths and cellulose products such as micro-pulverized tree bark have been added to enhance drying of the fresh cut seed surface and to give a more uniform coverage of fungicide over the seed.

The earlier formulations containing zineb maneb carbamate fungicides provided a limited degree of protection against soil and seed borne fungus diseases. Captan, which had a broader range of disease protection compared to Zineb and Maneb, and Polyram (a complex zinc carbamate compound) both enjoyed widespread use for many years. However, all of these fungicides provided limited disease protection to the seed piece.

Within the past few years new systemic fungicide compounds have been introduced which are much more effective against these disease causing fungi pathogens than those of earlier use. Thiabendazole had been in use of over 20 years in the animal health field prior to its introduction by Chevron Chemical as a potato seed treatment in combination with Captan in 1979 and sold under the brand name of Orthocide Plus.

This formulation was highly effective against fusarium dry rot, the most common cause of seed decay. In 1982 Sim-Chem introduced Sim-Tec 0.50, a .5 percent thiabendazole dust which was effective against fusarium dry rot and found to give suppression of seed borne rhizoctonia stem canker.

In 1983 Gustafson introduced Tops 2.5D, another systemic fungicide known chemically as thiophanate-methyl. This chemical is effective against both dry rots and seed borne rhizoctonia stem canker. Tops 2.5D also contained tree bark as part of the diluent to facilitate drying of the fresh cut surface of the seed.

In 1984 Snake River Chemical introduced a .5 percent thiabendazole bark dust formulation which has become the accepted standard of the industry for consistent high performance on Russet Burbank variety. Hence, we have come a long way in the past 30 years in developing more effective seed treat dust formulations as well as new fungicide chemicals for this use.