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## SEED TREATMENTS

### BIOLOGICAL vs. CHEMICAL vs. BIOLOGICAL/CHEMICAL

Kyle W. Rushing<sup>1</sup>

Seed treatment technology has entered into a new era within the past ten years. The traditional chemical compounds are being replaced or enhanced by new classes of chemicals. New concepts in seed treatment have already begun to enter the commercial seed treatment market and can be identified as herbicide safeners, seed coatings, systemic fungicides and insecticides that control foliar pests, and biological agents that become symbiotic with the plant system.

The new systemic products provide disease and insect protection to the seed, seedling, and developing plant system. Examples of the products and systemic activity are:

#### Fungicides:

- |              |   |                                                             |
|--------------|---|-------------------------------------------------------------|
| Vitavax®     | - | <i>Rhizoctonia</i> , Loose Smut, Bunt, Maize Head Smut      |
| PCNB         | - | Bunt, Loose Smut, <i>Rhizoctonia</i>                        |
| TBZ          | - | Dwarf Bunt, <i>Ascochyta</i> sp., <i>Rhizoctonia</i> sp.    |
| Baytain®     | - | Powdery Mildew, Bunts, Smuts, Rusts, <i>Rhizoctonia</i> sp. |
| Topsin®      | - | <i>Fusarium</i> , <i>Rhizoctonia</i>                        |
| Streptomycin | - | Halo Blight                                                 |

#### Insecticides:

- |            |   |                          |
|------------|---|--------------------------|
| Orthene®   | - | Thrips, Aphids, Cutworms |
| Lorsban®   | - | Maggots                  |
| Di-Syston® | - | Thrips, Aphids           |

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<sup>1</sup>Vice President, Research and Development, Gustafson, Inc., Plano, TX.

Many of you involved in seed testing and seed quality investigations have often questioned the reason for using seed treatments and have viewed them to be a detriment to your work. The value added, however, can often mean the difference between a grower's success or failure. The benefits of seed treatments are crop, pest and environmentally dependent. On some crops, seed treatments are required for efficient and stable commercial production of food, fiber and grain crops.

Seed, thus, have become carriers for this new technology and, in combination with genetics and plant genetic engineering, will provide superior disease, insect and nematode control for one-to-two months, or longer, after emergence. The new products will permit pinpoint application, thus reducing the amount of active pesticide utilized in crop production. This will reduce the potential of exposure of production pesticides to the growers and to the environment while permitting maximum yield potentials to be achieved. Due to the narrow spectrum of the newer compounds, many of the traditional products, i.e., Captan, Thiram and Vitavax, will remain as important combination treatments to provide a maximum spectrum of activity for disease and insect control.

The following table identifies major seed treatment compounds that are presently registered for use in the US. They are listed by type of activity. Commercial treatments are normally combinations of one or more of these products.

### Fungicides

#### Protectant

Captan  
Thiram  
Terrazole®  
Maneb  
Botran®  
Nusan®

#### Systemic

Demosan®      Topsin M  
Terraclor®      Baytan  
Epic®      Imazalil  
Vitavax      Apron®  
Benlate®      Streptomycin  
Mertect®(TBZ)

### Insecticides

#### Protectant

Malathion  
Methoxychlor  
Reldan®  
Diazinon

#### Systemic

Orthene  
Di-Syston  
Lorsban



### **Biologicals\***

DePel® Insecticide  
 Quantum™ 4000 - Inoculant  
 Rhizobia - Inoculant  
 Gliocladium - Fungicide  
 Trichoderma - Fungicide

### **Herbicide Safeners**

Concep®  
 Screen®

### **Miscellaneous Products\***

Coatings  
 Dyes  
 Pigments  
 Plant Growth Regulators  
 Trace Elements

\*Products requiring EPA registration are presently under review through the re-registration process.

To facilitate the application of the new, highly systemic, and expensive products, tremendous strides have been made in application technology. Treating equipment is presently available that can accurately apply uniform and designated levels of a.i. product to each individual seed. This is mandatory in permitting the chemical to optimize its potential in pest control during the seed, seedling and plant growth stages.

As we develop the newer products, it has become apparent that our ability to place and adhere them to seed will be dependent on our ability to develop an appropriate coating. The three main benefits expected from coatings are: 1) adherence of products to the seed to eliminate dust off and human exposure; 2) improvement of the performance, planting and handling of the seed and additives; and 3) improvement of the cosmetic appeal of the finished product.

Many products are entering the marketplace, each with their inherent characteristics and costs. Additionally, new equipment innovations are now making the coating process an acceptable practice throughout the seed industry - vegetable, flower and agronomic cropping areas.

As I stated in the beginning, seed technology has entered and is in a new technological era. The future is limited only by our imagination. The time ahead represents some exciting challenges and opportunities for the seed industry.

Vitavax, Tarrazole and Demosan are Reg. TM of Uniroyal Chemical Co., Inc.

Botran is a Reg. TM of Nor-Am Chemical Company

Nusan is a Reg. TM of The Wilbur-Ellis Company

Epic is a Reg. TM MSD Agvet

Benlate is a Reg. TM of E. I. DuPont de Nemours & Co., (Inc.)

Topsin is a Reg. TM of Atochem North America/Agrichemicals Division

Baytan and Di-Syston are Reg. TM of Bayer AG, Germany

Apron and Concep are Reg. TM of CIBA-GEIGY Corporation

Reldan and Lorsban are Reg. TM of DowElanco

Actellic is a Reg. TM of ICI Americas Inc.

Orthene is a Reg. TM of Valent USA corporation

DiPel is a Reg. TM of Abbott Laboratories

Quantum is a TM of Gustafson, Inc.

Screen is a Reg. TM of Monsanto Agricultural Company