The Guide to Seed Treatment Stewardship

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Considerations for Biological Seed Applied Products

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The Seed Treatment Stewardship Guide is intended solely as an educational tool and as general guidance to assist growers in voluntarily developing and implementing stewardship practices related to the use of treated seed. This Guide is intended to serve as a reference document only. Entities may choose to refer to the entire Guide or specific sections of the Guide as appropriate. The guidance is intended to be flexible, and its application will differ according to the products involved and size, nature and complexity of the entity using the guidance. The Guide is representative and not exhaustive.

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Overview

The use of seed treatment products by farmers is an effective tool to ensure that the plant has a greater opportunity to grow a strong root system which is the foundation of a healthy, productive plant. While seed treatments are often thought of as chemical pesticides; i.e., protecting seed from insects, nematodes and diseases that exist in the soil during the critical early developmental stage, they can also be used to improve nutrient availability (e.g., Rhizobium and other inoculants).

Many of these products contain microbes, which are living organisms. Additionally, however, a number of seed-applied products are derived from naturally occurring compounds that do not contain living organisms. These may include plant extracts, fermentation products, proteins, amino acids and other substances.

Biological seed-applied products require management that does not apply to chemical pesticides, particularly considerations of viability, stability and compatibility with other products. Because of these considerations, this reference document specifically addresses biological seed-applied products as a supplement to the **ASTA-CLA Guide to Seed Treatment Application.**

Highlights

- *Consult with manufacturer on any factors that my impact the product's shelf-life and effectiveness before, during and after seed treatment.*
- *Likewise, consult with the product manufacturer for specific recommendations as to the compatibility of the product with conventional chemical seed treatment combinations.*
- *Ensure that the application process itself does not negatively impact microbe survivability.*
- *If using analytical services, make sure the provider has the equipment and experience necessary to conduct assays for biological products, and that they have been validated by the manufacturer.*

Management of Biological Products

I. Product Stability

Because a biological product may contain one or more living organisms, product stability (also referred to as "shelf-life") is generally finite and may be shorter than conventional chemical seed treatments. Proper storage and handling is key, as improper storage or handling (such as high temperature, extreme fluctuations in storage temperature, length of time in storage or other factors) can rapidly decrease the viability of the living organism(s) in the product, which can negatively impact product stability. Upon application to the seed, a product that has lost stability loses its ability to provide the expected beneficial effect. To avoid this, thoroughly read the product label and consult with the manufacturer as to product shelf-life and the factors which may negatively affect the product's stability.

II. On-Seed Stability and Compatibility

Proper application of biological seed-treatment products is key to maximizing plant health and/or pest management benefits. For example, the successful performance of microbial products is influenced by having the appropriate number of colony forming units (CFUs) on the seed surface. Biological products have an inherent level of stability which may be negatively impacted by a number of factors, especially compatibility with accompanying conventional chemical seed treatments (e.g., fungicides, insecticides, and nematicides but also colorants, polymers and other components). Applicators should consult with the product manufacturer for specific recommendations to maximize on-seed stability and verify the compatibility of the product with conventional chemical seed treatment combinations.

Another consideration is application equipment and conditions created during seed treatment. Application equipment types, order of addition (in slurry or applied directly to seed), mix times, and the use of supplemental drying and handling equipment can impact product stability by creating short periods of extreme conditions. Applicators should consult with the product manufacturer for specific recommendations on application methods and when possible conduct a pilot, or small volume, application to ensure successful application conditions and results are obtained.

III. Assuring Proper Loading of Product onto the Seed

Properly mix or shake the product prior to use, then add the product in the prescribed manner according to the label. Avoid letting product settle in the lines after use, and a flush may be recommended prior to starting up a line. Additionally, once a container of biological product has been opened, some products may not be

suitable to use again during a different treating process. Equipment such as pumps and scales should be properly sized to ensure the correct amount of product is delivered during the seed treatment process.

In addition to using proper methods for application to seed, a measurement of on-seed loading (e.g., CFU titer or other methods) may be warranted, and may require specialized microbiological assay techniques and facilities. Before contracting seed treatment analytical services that are often used to verify the application rate of chemical products, consider whether the service provider has the equipment and experience necessary to conduct assays for biological products.

Management of Treated Seed

I. Treated Seed Storage and Use

In general, limiting the exposure of treated seed to temperature and moisture (including humidity) variability and extremes is key to preserving the viability of the microbe. As with formulated product shelf-life and on-seed stability, storage stability of the treated seed can vary widely dependent upon the product. Applicators should consult with the product manufacturer as to the proper conditions for treated seed storage and product expiry.

II. Treated Seed Labeling

Consult the manufacturer and product label for any mandatory treated seed labeling.

III. Disposal

Consult the manufacturer label and state and local authorities as to the proper disposal of seed treatment products and treated seed.

Human & Environmental Safety

Thoroughly read the product label to understand any human and environmental issues and restrictions regarding the application of all products, including seed applied biological products, and the planting of the treated seed.

Definitions and Glossary

Colony Forming Unit (CFU): An estimation of the number of individual viable bacterial cells or fungal cells in a sample product.

Association Resources

Disclaimer: The external links below are intended for use as additional external supplementary resources for the reader. The American Seed Trade Association cannot be held liable for the information found outside the scope of this document.

Biological Products Industry Alliance (BPIA) - http://www.bpia.org/

Biostimulant Coalition - http://www.biostimulantcoalition.org/

CropLife International - https://croplife.org/

Environmental Protection Agency (EPA)/Biopesticides - http://www.epa.gov/pesticides/biopesticides

Disposal Resources

The Pesticide Stewardship Alliance (TPSA) state pesticide disposal resources
https://tpsalliance.org/resources/state-disposal-map/

The Pesticide Environmental Stewardship Website
https://pesticidestewardship.org/disposal/