



# Agricultural Seed Treatments

BACKGROUND INFORMATION ON  
BENEFITS, REGULATION, & SAFETY

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# What are seed treatments?

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A mix of multiple products applied to a seed, safeguarding the seeds and seedlings against insects, fungal diseases and soil-borne pathogens

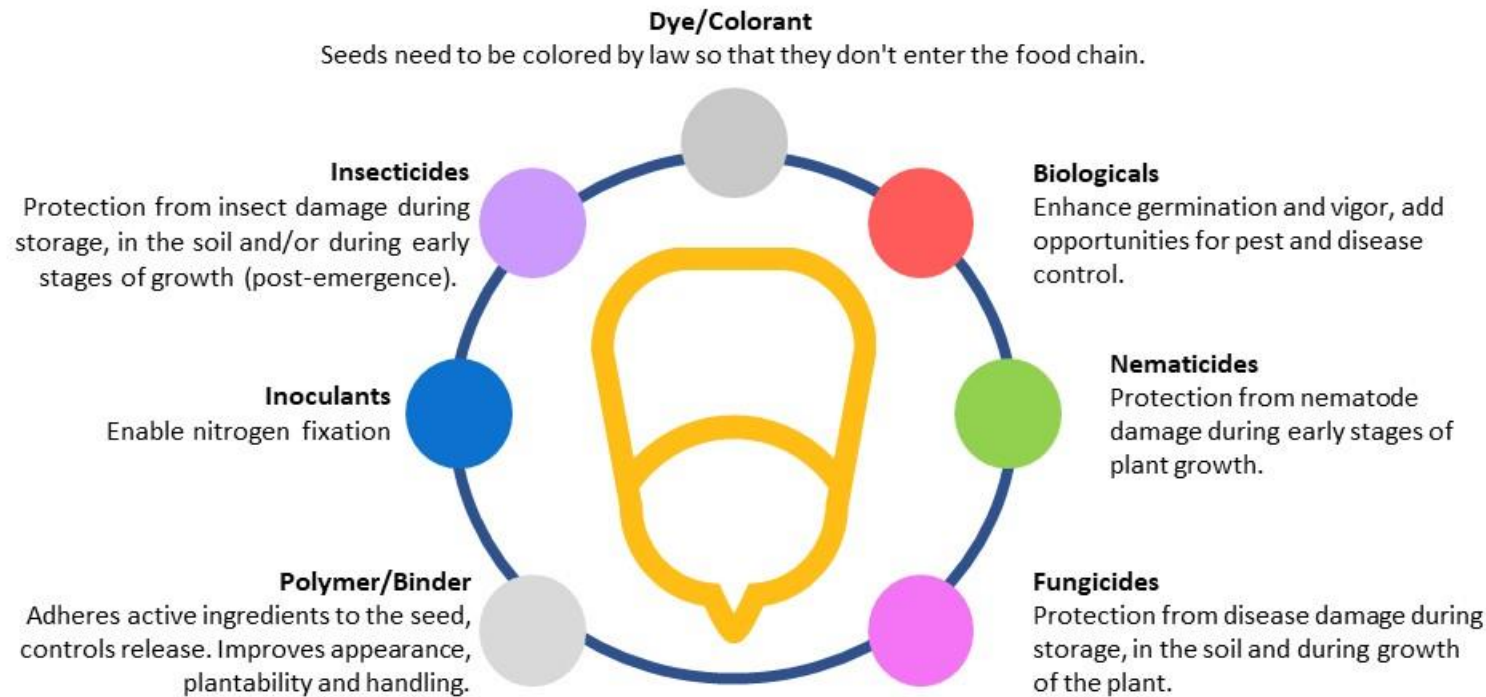
*Right: Corteva seeds are colored to keep the seeds from entering food or feed channels.*





# Seed Applied Technologies – At a glance

*Seed Treatments include multiple components applied to seed which all need to work together.*



# of components on a seed kernel:  
Corn: 12    Soybeans: 10



# Benefits

Why do farmers use treated seeds?

The long list of reasons boil down to this: treated seeds help **improve seed and plant health** and **reduce the potential for exposure** to people, beneficial insects and the environment

## *Did You Know?*

*It's estimated that – without the availability of pesticide treated seeds -- for every pound of an insecticide used through seed treatment, up to **five pounds** would be required via traditional application techniques. This translates to a 375% increase in insecticide application rates per acre (AgInfomatics.com).*





# Treated Seed Benefits: Helping Improve Seed and Plant Health



- **Protects against soil borne pests and diseases that can destroy the seed or plant before it emerges from the soil**, which promotes stand establishment (plant growth) and vigor
- Serves as vital component of **Integrated Pest Management (IPM)**
- **Increased and uniform germination**, which results in increased, healthier, and stronger crop stands
- Increases likelihood of **improved yields**

## *Did You Know?*

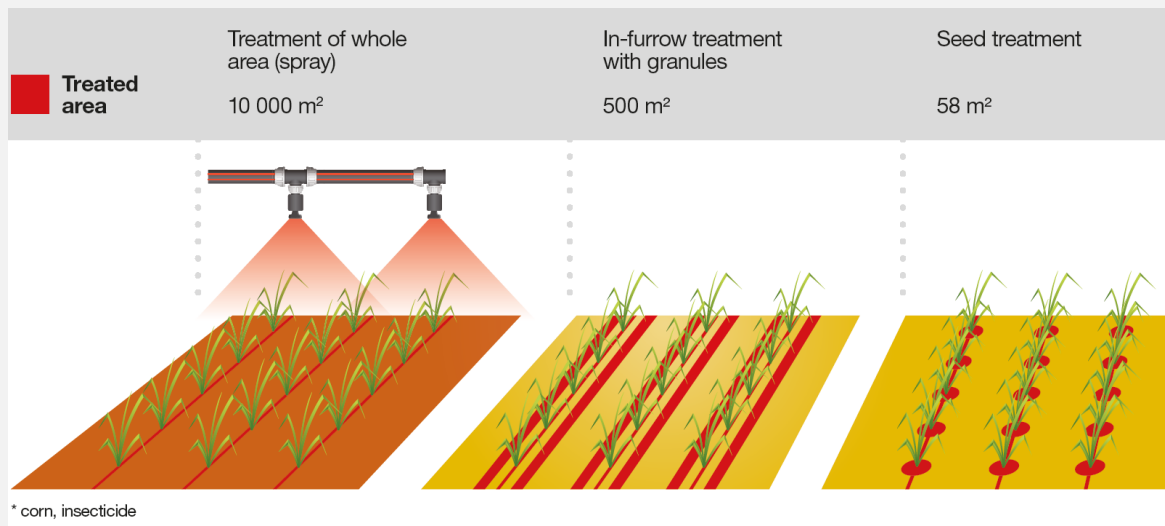
*Seed treatments help protect against pests such as cutworms, wireworms, maggots, thrips, beetles, and fungal plant pathogens like pythium, fusarium, rhizoctonia, and penicillium.*

Source: A. Goggi, Iowa State University.  
2011. Evolution, purpose and  
advantages of seed treatments.  
Seed Congress of Americas

# Treated Seed Benefits

Helping Reduce Potential for Exposure To People, Beneficial Insects and the Environment

Foliar or in-furrow application can use up to **10X higher** amounts of active ingredient than seed treatment.



Graphic source:  
<https://register.extension.msstate.edu/sites/register.extension.msstate.edu/files/2018%20MSU%20Seed%20Tech%20Short%20Course%20Proceedings.pdf>

- **Reduces the total amount of pesticide** used throughout the life of a crop<sup>1</sup>
- Reduces need to handle chemistries directly, which **lowers operator exposure** to the measuring or mixing required through traditional pesticide applications
- Seed treatment active ingredients **effective at reduced rates**
- **Potential for less foliar sprays reduces carbon footprint** from fewer tractor passes and additional post emergent pesticide or fertilizer applications
  - More tractor passes may mean increased carbon releases, soil degradation and compaction from the tractor tires, and increased potential of inadvertent offsite movement.
- **Increases adoption of cover crops** since seeds are protected against soil pests that may be enhanced with cover cropping practices
- **Less packaging material use**
- A **precision agricultural tool** that fosters sustainability goals of farmers and the seed industry

<sup>1</sup>Bayer study in 2014: Seed treatment involves exposure of a.i. to 58 m<sup>2</sup> of soil surface compared to 500 m<sup>2</sup> for an in-furrow application and 10,000 m<sup>2</sup> for an over spray



# Regulatory Structure

MULTIPLE LAYERS PROMOTE PRODUCT  
AND PRODUCER SAFETY



# Seed Treatment Regulation

Seed treatment pesticide products are **highly regulated** – just like foliar and soil-applied pesticides – under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA).

All pesticides must go through a **rigorous data review and registration process** via the U.S. EPA, including extensive human health and environmental risk assessments.

*At right: Current treatment requirements call for the use of multiple pumps to apply multiple coverings such as fungicides, insecticides, biologicals and polymers.*





# Seed Treatments in Agriculture

**Registrations are required for seed treatment products.**



**All seed sold for farm use is regulated at the federal level by the Federal Seed Act and at the state level for:**

- Seed purity %
- Germination %
- # of noxious weed seed/pound
- Chemical seed treatment (if present)
- Kind and varietal identification
- Name & address of the interstate shipper
- State-specific regulations



**All seed treatment pesticide products are regulated and registered by U.S. EPA and state pesticide agencies under the same process as foliar & soil-applied products.**

Registrations are required for:

1. Individual active ingredients
2. Formulated (finished) treatment products
3. Each individual and specific use, including crop, pests controlled and use rate defined by label – label approved by U.S. EPA. Approved label includes directions for use, safety requirements and any precautions.



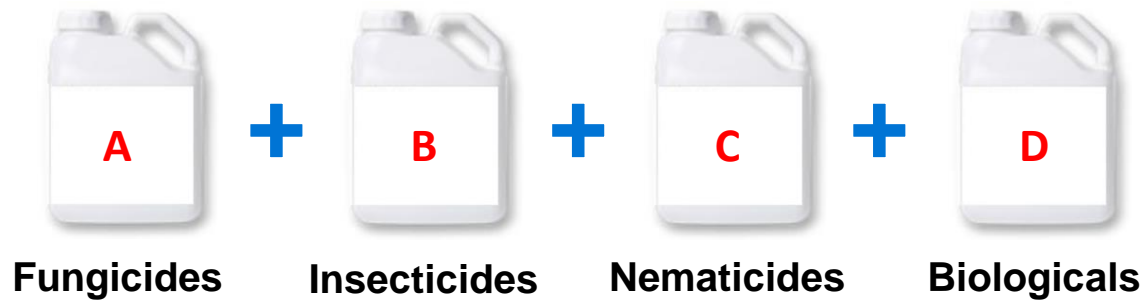
**Seed coated with registered pesticide products is labeled with directions for use and other information required by the registered seed treatment product.**

In registering the seed treatment product, U.S. EPA conducts risk assessments for all proposed uses, and requires the treated seed bag/tag to include all appropriate directions for each use and any precautions.

# Seed Applied Technologies

## What goes into seed treatments

### Seed Treatment Recipe\*



(components governed under TSCA)

### Regulatory Summary

- All crop protection products that claim pesticidal activity/pest control require regulatory approval at the federal level by U.S. EPA under FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) as well as at the state level.
- Biologicals claiming pesticide control require approval at the federal and state levels.
- Biostimulants/inoculants/bio-fertilizers do not usually have federal oversight – but **do** require state approval.

- The Toxic Substances Control Act (TSCA) of 1976 provides EPA with authority to require reporting, record-keeping and testing requirements, and restrictions relating to chemical substances and/or mixtures.
- Certain substances are generally excluded from TSCA, including, among others, food, drugs, cosmetics and pesticides.

<https://www.epa.gov/laws-regulations/summary-toxic-substances-control-act>

# Summary: Seed Treatment and Federal Treated Seed Regulations

## Highly regulated, like all pesticides

Seed treatment pesticide products are highly regulated, just as foliar and soil-applied pesticides, under FIFRA. All pesticides must go through a rigorous data review and registration process via the U.S. Environmental Protection Agency (EPA), including extensive human health and environmental risk assessments.

## Extensive risk assessments

US EPA undertakes an extensive risk assessment of all seed treatment pesticide products, including an evaluation of applying the product and planting the seed (i.e., environmental fate, ecotoxicology, and operator exposures) and the consumption of the harvested commodity by the consumer. The associated science-based evaluation also considers the application rates, analysis of the quantity “planted per day,” and typical seeding/planting rates per acre, among other factors.

Just like traditionally applied pesticides, the pesticide used as a seed coating must be evaluated according to application rates and delivery system.

## Periodic Review

All pesticides are subject to periodic review to ensure that, as the science advances and/or policies and pesticide use practices change over time, all registered products continue to meet the statutory standard of “no unreasonable adverse effects” on humans or the environment.

## Strict labeling requirements

The Federal Seed Act (FSA) regulates the sale and movement of seed in the U.S; seed companies must abide by those regulations. Within the FSA, there are requirements about the labeling of treated seed. The US-EPA-approved labels for commercial seed treatment products also include language that must be placed on the seed tags accompanying treated seed regarding permitted and prohibited practices. Tags on a seed package must include identification of what the seed has been treated with; hazard related warnings; and other applicable labeling requirements.

Any worker safety requirements are ~~must be~~ printed on the seed tag so workers can read them when planting. Anyone who treats, handles, transports, plants, recycles, re-uses, or disposes of treated seeds must manage them properly and in accordance with label instructions.

## Stewardship

Industry-wide collaboration between seed companies, seed treatment providers and universities provides farmers and seed companies with Best Management Practices for the proper use and disposal of treated seed

## Treated Article Exemption

Seeds treated with pesticides are considered “treated articles” if and only if the article (i.e., the seed) is treated with a pesticide registered for this use (meaning EPA has already assessed whether use as a seed treatment, meets FIFRA’s registration standard); the seed treatment is intended to protect the seed itself.

**Without a ‘Treated Article Exemption,’ EPA would be required to duplicate the effort and resources it used in registering the seed treatment to also register the treated seed itself as a pesticide product. Given EPA’s comprehensive assessment of the seed treatment product, the duplicative review would have no additional benefit to health, safety, or the environment.**



# What is the industry doing to make seed treatments safer for pollinators and other wildlife?

Seed treatments, such as those with neonicotinoid pesticides, undergo rigorous testing and review by the EPA prior to being permitted to be used commercially.

In addition, industry is constantly evolving to improve seed treatment processes such as:

- Using closed application systems and continuously improving mixing and drying processes to create a better and precise application of active ingredients to the seed.
- Enhancing seed coating polymers to keep active ingredients on the seed and reduce dust-off.
- Creating new flow agents for use with planting equipment to help further minimize the amount of dust-off during planting.
- Implementing an ISO planting equipment standard to better control dust emissions.



[https://seed-treatment-guide.com/wp-content/uploads/2021/04/Pollinator\\_FAQ\\_Updated.pdf](https://seed-treatment-guide.com/wp-content/uploads/2021/04/Pollinator_FAQ_Updated.pdf)



# Questions?

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