

The Overall Value Of Seed Treatment

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"Everything Seed Treatment"

Seed Treatment Cannot Solve All
Of Agriculture's Pest Problems...

But It Is A Major Tool, And
The Starting Point, In Our
Quest For Increased Crop
Production

Global food supplies are
currently very tight...

**Food production must double by
2050!**

History of Seed Treatments

- Adding materials to seeds to improve crop production began more than 4,000 years ago.
- Most early practices were aimed at reducing smuts, caused by fungi, in wheat.
- Products introduced in the past 40 years, including fungicides, insecticides and nematode control products protect crops from many types of pests.

Why The Rapid Growth In The Use Of Seed Treatments?

- Improvement in seed treatment active ingredients.
- Changes in farming practices resulted in seeds being planted earlier in soils that are often cold and wet to maximize yield potential.
- Higher input costs necessitate maximum crop production; therefore, every seed needs to grow.
- Seed treatments are on the seed, and can protect the seed from planting through early season from attack by many pests.
- No rescue treatment available for below-ground pest control after planting.

Corn

- Corn planted into cold, wet soils can be attacked by Pythium, a soil fungi.
- Several systemic fungicide seed treatment materials can protect corn from Pythium and other diseases.
- Neonicotinoid seed treatment insecticides will protect the corn seed and seedling from numerous soil insect pests and reduce damage caused by early season foliar feeding insects.



Neonicotinoid Insecticides And Improved Plant Health

- Neonicotinoid insecticides provide excellent control of many insect pests, but they also improve plant health.
- According to a report published by a research team from The University of California, Berkeley, these systemic insecticides induce changes in the plant that result in enhanced plant stress tolerance to pathogens, drought and heat.

Soybeans

- Years of testing have demonstrated that soybeans planted near the beginning of the planting season will usually yield more than soybeans planted near the end.
- Early planted soybeans are more likely to be attacked by *Pythium* and other soil fungi.
- Treating soybean seeds with a combination of fungicides will improve plant stand, vigor and yield.

Soybeans

- Soybeans planted early in the season are much more likely to be fed on by over-wintering bean leaf beetles that damage the plant and can spread bean pod mottle virus. BPMV can cause “green stem” problems at harvest along with discolored seed.
- Treating soybean seed with a neonicotinoid insecticide can control over-wintering bean leaf beetle populations.



Oats, Wheat And Barley

- Numerous types of smut infect small grains resulting in loss of yield.
- Stinking smut, or common bunt of wheat, has a “fishy smell” that spreads from infected kernels to healthy kernels. If the smut level is very high, the smell is passed into the flour, making it unusable for baking. Animals will refuse to eat wheat containing common bunt.

Stinking Smut (Common Bunt)



Oats, Wheat, Barley

- A number of systemic seed treatment fungicides are available for smut control in small grains.
- Using seed treatments to control smuts has allowed small grains breeders to concentrate on increasing yield and improving baking quality instead of breeding for smut resistance.

Irish Potato Famine

- Late blight of potato, *Phytophthora infestans*, was the cause of the Irish potato famine. This disease spreads rapidly from plant to plant in the field, but the disease is introduced into a potato growing area by a plant grown from a healthy seed piece that became infected during cutting and handling.
- Certain fungicide seed piece treatments will control the spread of late blight on seed.

Late Blight On Potatoes



Peanuts

- Few, if any, crops are more dependent upon seed treatments for efficient production than peanuts.
- Peanuts are susceptible to many pre-emerge and post emerge diseases that can reduce plant stands by 50%.
- A 12 year study resulted in an average 36% increase in yield when seed treatments were used compared to untreated seed.

Sweet Corn

- Stewart's bacterial wilt is a disease that can devastate some sweet corn hybrids.
- The corn flea beetle over-winters as an adult and can have the bacteria that causes Stewart's wilt in its digestive tract. The beetle transmits this disease to the sweet corn seedling as it feeds.
- Plants grown from neonicotinoid insecticide treated seeds cause the beetle to die, and thus prevent disease infection.

Sweet Corn Plant Infected With Stewart's Bacterial Wilt



Summary

- Seed treatments improve plant stand and yield directly by controlling diseases and insects that attack seeds and seedlings.
- Seed treatments control smuts of small grains increasing yield and grain quality.
- Seed treatment insecticides control insects both above and below ground including those that vector bacterial and viral diseases.
- Seed treatments can induce changes in the plant that improve stress tolerance.
- Seed treatments are the starting point for achieving global food production needs.



CropLife Foundation Report: The Role of Precision Seed Protection in Modern Crop Production