

The benefits of seed treatment

Seed treatment is a safe and targeted plant protection technology that protects crops from harmful pests and diseases, so farmers can deliver a stable supply of high-quality food, feed, fiber, and fuel. Seed treatment allows farmers to protect their crops early in the growing cycle in a targeted and resource-efficient way. This is critical as they face daily pressure from crop pests and diseases that reduce their ability to produce profitable and high-quality crops. To ensure optimal production, various plant protection practices and technologies are available. Seed treatment is often the preferred – in some cases only – option to support successful crop establishment and good harvests.

Protecting crops and respecting biodiversity

Seed treatment is the targeted, one-time application of pesticides to crop seeds, to protect crops from damaging pests and diseases in the early growth process. This targeted approach to insect and disease control protects the seed and seedlings when plants are at their most vulnerable stage of growth.¹ Applying these crop protection products to the seed controls diseases that can stop a crop from establishing and limits damage from below ground pests. Some seed treatments can also stop insects from eating seedlings. Preventing these problems before they start reduces the risk of having to replant a crop. Spraying fungicides or insecticides at these early growth stages is unlikely to be as effective as seed treatments because sprays are less targeted than seed treatments. For these reasons, this practice is one of the most efficient crop protection technologies currently available. Seed treatments are a good fit in Integrated Pest Management (IPM)² because they effectively and efficiently combat the growth of pest and disease populations and thus reduce the need for farmers to resort to additional foliar spray applications.³

BENEFITS OF SEED TREATMENT

For farmers



Seed treatments make possible more sustainable farming practices that produce higher, more stable crop yields.

For consumers



Crop protection provided by seed treatments contributes to food quality and abundance.

For the environment



The targeted approach of seed treatments helps reduce negative impacts on natural resources and non-target organisms.

Why seed treatment matters

Food security and land use

Food is the most fundamental of all human needs, and today producers face a dilemma. The global population's demand for food continues to increase,⁴ while the land available for productive farmland is shrinking.⁵ Crops are continually threatened by pests and diseases that can, without preventative action, significantly reduce crop yield and food quality.⁶ This situation is worsened by changing climate patterns that allow crop-damaging pests and diseases to appear in regions where they were not previously a problem.

Treated seeds offer a highly efficient and sustainable way to boost food security by helping crops thrive and reach their full yield potential. They also protect biodiversity and soil health by significantly reducing reliance on later spray treatments. This also brings farmers savings on labor cost, pesticides, and the fuel needed for spraying.⁷ For families doing their weekly food shopping, the safety and quality of produce are fundamental. Treated seeds help protect the stable supply of the nutritious, high-quality, and affordable food that they expect.



Benefits for food producers

Improved crop health
Seed treatments are a highly effective strategy to protect plant health, protecting crops in a way that is comparable to human childhood vaccination. Treated seeds carry a precise amount of pesticide that protects crops in their infancy from insects and diseases. This is the critical growth period before and during germination; and through a plant's early developmental stages, where crops need to develop into healthy, robust, and high-quality plants. They are also a "curative treatment" that protect plants against seed-borne diseases.

Increased yield protection
Research has shown that seed treatments deliver more robust seedlings to farmers, protecting plant stand (plants per square meter) and yield potential.⁸ This secures farmers' return on investment and the resources needed to cultivate the crop. Conversely, preventing farmers from using treated seeds in high pest pressure areas can lead to yield losses by 50%^{9,10} and more.

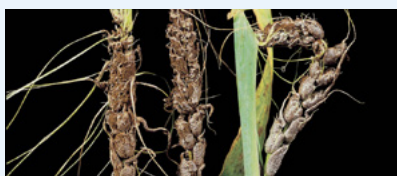
Reduced negative impact of field and weather conditions
Field and weather conditions can prevent farmers from entering the field to apply crop protection products after sowing. Applying treatment directly on the seed before planting protects the seed and young plants regardless of conditions in the field.

Lack of valid alternatives

In some cases, seed treatment is the only reliable method to protect crops, as soil or foliar treatments are less effective¹¹ – for example for cabbage root fly in oilseed rape, or soil- and seed-borne diseases which attack, for example, cereal seed embryos or young plants. Inadequate or delayed pest control interventions can force growers to stop production, or resort to "rescue treatments" like subsequent spraying. Some circumstances may require government intervention, such as the European Union's emergency authorizations of products that are no longer approved for seed treatment.¹²

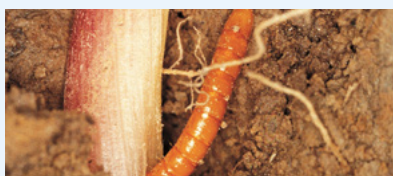
SPECIFIC CASES WHERE SEED TREATMENTS ARE ESSENTIAL

Seed- and soil-borne diseases¹³



Seed- and soil-borne diseases infect many row crops, and their spores can survive in the soil for a long time. Pests and diseases with no practical alternative to seed treatment include virus vectors in cereals and corn, "sudden death" syndrome in soybeans, and seed borne diseases in cereals.¹⁴

Soil-dwelling pests



Managing problems using early diagnosis remains difficult for soil-dwelling pests such as wireworms and insect larvae, as these pests only emerge to feed during a crop's seedling stage. By that time, it can be too late for intervention and the crop can be lost. In some cases, for example the US corn rootworm that feeds on corn roots, even the earliest possible foliar application may prove too late.

Certified seed production



Certified seed production must meet strict regulations aimed at preventing the transmission of economically damaging seed-borne diseases. Here, farmers cannot risk not using preventative treatment on the foundation seed. The presence of disease can lead to the rejection of an entire harvest, causing economic losses and reduced seed availability for the next season's commercial planting.¹⁵

Health and safety

When used according to seed label instructions, treated seeds are safe for people and the environment. Bayer provides training for farmers on the proper use of seed treatments and displays safety advice on every bag of treated seed. Every crop protection product is highly regulated and extensively evaluated by product developers and regulatory authorities before it is approved for use – including the small, targeted amounts applied on seeds.

Ensuring high-quality seed treatment minimizes dust off, reducing environmental exposure, and maintaining the product on the seeds. Over the past 15 years, Bayer has conducted industry leading research to identify polymers, seed coatings, and process changes that dramatically reduce dust, particularly from treated corn seed. Bayer has identified several key ingredients that promote seed treatment adherence and generate low amounts of dust. Bayer reports data on this topic to regulatory agencies and continues to test innovative measures to further reduce dust emissions.¹⁶

References:

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4. Between 70% and 100% increase in global food demand is expected by 2050 (Source: US Department of Agriculture)
5. 11 million acres of farmland have been lost in US only between 2010 and 2020 (Source: US Department of Agriculture)
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11. <https://www.anses.fr/en/Node/149799>
12. <https://www.efsa.europa.eu/en/news/neonicotinoids-efsa-assesses-emergency-uses-sugar-beet-202021>. The full list of EU emergency authorizations can be found at <https://ec.europa.eu/food/plant/pesticides/eu-pesticides-database/ppp/pppeas/screen/home>
13. Seed-borne diseases infect the embryo via the seed surface. Soil-borne diseases live in the soil, where they attack the plant or seed.
14. Dewar A. M., Qi A., 2021. The Virus Yellowings Epidemic in Sugar Beet in the UK in 2022 and the Adverse Effect of the EU Ban on Neonicotinoids on Sugar Beet Production. Available at: <https://uhra.herts.ac.uk/handle/2299/25156?show=full>
15. Dewar, A., 2016. The adverse impact of the neonicotinoid seed treatment ban on crop protection in oilseed rape in the United Kingdom. *Pest Manag Sci* 2017; 73: 1305–1309. Available at: <https://onlinelibrary.wiley.com/doi/epdf/10.1002/ps.4511>
16. <https://www.bayer.com/en/agriculture/bayer-neonicotinoid-report>

