



Seed Treatment for Crop Protection

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More than ever, farmers must have access to the instruments that will enable them to increase food production while preserving the environment in light of the expanding global population. One of these tools is seed treatment. The significance of seed treatment and its numerous benefits cannot be overstated, as they provide farmers with more chances to lower the risk of crop failure. Commercial seed treatments are being used by an increasing number of farmers around the world. Some people prefer pre-treated seeds because they can be utilised right away without the need to apply the treatment themselves.



What is Seed Treatment?

The process of applying a fungicide, insecticide, or a combination of the two to seeds in order to rid them of storage insects, pathogenic organisms, and soil-borne pathogens is known as seed treatment. It also describes exposing seeds to solar energy, submerging them in conditioned water, etc.

Integrated Pest Management and Seed Treatment

Integrated Pest Management (IPM) is "the careful consideration of all available pest control techniques and subsequent integration of appropriate measures that discourage pest population development and keep pesticides and other interventions to levels that are economically justified while reducing or minimising risks to human health and the environment." IPM emphasises good crop growth with the least amount of interruption to agro-ecosystems and fosters natural pest control methods."

Seed treatments can be utilised as a major instrument in a successful Integrated Pest Management Program for sustainable agriculture since they target pests and diseases with fewer active ingredients per acre and are not released into the environment. In many cases, growers would have tremendous trouble managing some seed-borne and early season seedling pests and illnesses without the use of seed treatment, and would have to resort to more expensive and less environmentally friendly techniques.

Role of Seed Treatment

Crop diseases and pests can have catastrophic effects on agriculture. If not adequately handled, horticulture yield could suffer. Breeding is a great method for giving plants tolerance to pests and illnesses. Crop protection solutions are frequently required and employed for good crop management because breeding alone cannot handle all agronomic difficulties. In addition to being given to the seed as a seed treatment, these crop protection

agents can also be applied during the crop's growth. In the history of humanity, seed treatments have played and continue to play a crucial role in preventing famine and starvation by enhancing the development of nutritious crops.

How to Apply Seed Treatments

The phrase "seed treatment" refers to both goods and operations. The various procedures include basic dressing, coating, and pelleting. Delivering the substance to the seed at the right dose and as consistently as possible from seed to seed forms the cornerstone of successful application procedures in all circumstances.



Different Seed Treatments

- 1) Seed disinfection: This process involves getting rid of fungus spores that have colonised the seed coat or more deeply rooted tissues. The fungicidal treatment must actually reach the seed in order to destroy the existing fungus for effective control.
- 2) Seed disinfestation: Seed disinfestation is the process of removing organisms from surfaces that have contaminated seeds but not infected them. Chemical dust, slurry, dip, soak, and fungicide applications have been found to be effective.
- 3) Seed Protection: The goal of seed protection is to shield immature seedlings from soil-dwelling organisms that could otherwise cause the seed to rot before germination.

Conditions that must be met while treating seeds

- 1) Damaged Seeds: Fungi have an excellent opportunity to enter damaged seeds and either kill it or awaken the seedling that will grow from it if there is a break in the seed coat. When seeds are combined and threshed, or when they are dropped from extreme heights, they might sustain mechanical damage. Weather conditions or poor storage practises may also harm them.
- 2) Diseased seed: Seed can get contaminated during processing if it is treated on contaminated equipment or if it is stored in contaminated containers or warehouses. This can happen even at the time of harvest.
- 1) 3. Unfavorable soil circumstances: Sometimes seeds are sown in unfavourable soil circumstances, such as cold, moist, or severely dry soils. Some fungal spores may be able to grow and flourish in such unfavourable soil conditions, which would then give them the ability to attack and harm the seeds.
- 3) Disease-free seed: Seeds are usually contaminated with disease organisms that might have mild to severe economic repercussions. Seed treatment offers strong protection against soil-borne pathogens and illnesses, enabling weak seeds to germinate and produce seedlings.

Equipments used for Seed Treatment

1. Slurry Treaters
2. Direct Treaters
3. Home-made drum mixer
4. Shovel

Seed treatment precautions

The majority of products used to treat seeds are toxic to humans, but they can also injure seeds. To ensure that treated seed is never utilised as food for people or animals, extreme caution is necessary. This likelihood should be reduced by explicitly labelling treated seed as harmful if consumed. If care is made to only treat the quantity for which sales are guaranteed, the temptation to use unsold treated seed for human or animal feed can be avoided.

Applying too much or too little material can be just as harmful as not treating the seed at all, thus care must be given to treat the seed at the proper dose rate. When treated with some of the concentrated liquid treatments, seed with a very high moisture content is particularly vulnerable to harm. If bacterial cultures are also to be used to treat the seeds, they should be applied in the following order:

- Chemical processes
- Treatments with fungicides and insecticides
- Unique therapies

Chemical treatments to improve germination and vigour potential

Soaking / treating the seeds with nutrients, vitamins and micronutrients etc.,

Examples

Paddy: Seeds can be soaked in 1% KCL solution for 12 hours to improve the germination and vigour potential.

Sorghum: Seeds could be soaked in NaCl₂ (1%) or KH₂PO₄ (1%) for 12 hours for improving the germination and vigour potential.

The Benefits of Seed Treatment

There are numerous advantages to seed treatment that make it popular among farmers.

Among these benefits are the following:

- Seed treatment safeguards seeds against insects and diseases.
- One of the most significant benefits of seed treatment is the additional protection it provides to the seeds.
- Seed treatment keeps soil insects at bay.
- Seed treatment benefits not only the seeds but also the soil.
- Germination is improved by seed treatment.
- A multitude of factors influence seed germination, but seed care can boost germination prospects.
- Because seed treatment is delivered uniformly to all seeds, it can also promote uniform crop germination.

Conclusion

Seed treatment is the process of applying a fungicide, insecticide, or combination of the two to seeds in order to rid them of storage insects, pathogenic organisms, and soil-borne pathogens. Commercial seed treatments are being used by an increasing number of farmers around the world. Some people prefer pre-treated seeds because they can be utilised right away without the need to apply the treatment themselves. Fungi have an excellent opportunity to enter damaged seeds and kill or awaken the seedling if there is a break in the seed coat. Seeds can get contaminated during processing if it is treated on contaminated equipment or stored in contaminated containers or warehouses.

Seed treatment offers strong protection against soil-borne pathogens and illnesses, enabling weak seeds to germinate and produce seedlings. Too much or too little seed treatment can be harmful, so care must be given to treat seed at the proper dose rate. If care is made to only treat the quantity for which sales are guaranteed, the temptation to use unsold treated seed for human or animal feed can be avoided. There are numerous advantages to seed treatment that make it popular among farmers.