Koppert

Cerall

A powerful seed treatment solution against seed-borne diseases in cereals

Partners with Nature

A powerful weapon against fungal diseases

In cereal production, seed-borne fungi such as *Fusarium*, common bunt (*Tilletia caries*), glume blotch (*Septoria nodorum*) and foot rot (*Microdochium nivale*) are serious threats. These diseases can cause plant losses through damping off just after germination and seedling emergence, and affect the crop also in a later stage.

For most of these diseases, seeds are the primary carrier of the infection. Cerall offers a powerful weapon to protect the seeds against these pathogens meanwhile also empowering the plant to speed up seedling emergence, reducing abiotic stresses, and improving overall crop yields. Cerall protects seed used for sowing. It is based on the unique beneficial bacterium, *Pseudomonas chlororaphis* strain MA342.

Biofungicide for seed treatment

Cerall protects wheat, rye and triticale seeds. The product is a seed coating: the seeds are treated prior to sowing. Cerall remains effective on stored seeds for up to one year after application. Cerall is suitable for both conventional and organic agriculture.

Safe to use

Cerall can be safely applied together with a wide range of other seed treatments, but can be adversely affected by some others. Compatibility of Cerall with other seed treatments can be checked in the Koppert Side effects app.

Advantages

- Biological fungicide effective against a wide range of seed-borne diseases
- Combines a direct lethal effect and a long-lasting protection
- Improves plant growth and reduces abiotic stresses, resulting in improved crop yields
- Easy and safe to use
- Can be applied with existing seed-treatment equipment
- Effective in a wide range of conditions, including cold conditions
- Suitable for conventional and organic cultivation
- Leaves no residue and restores soil balance
- No chance on resistance development
- With a narrower range of products, Cerall is the future-proof solution against seed-borne diseases

Improved yields

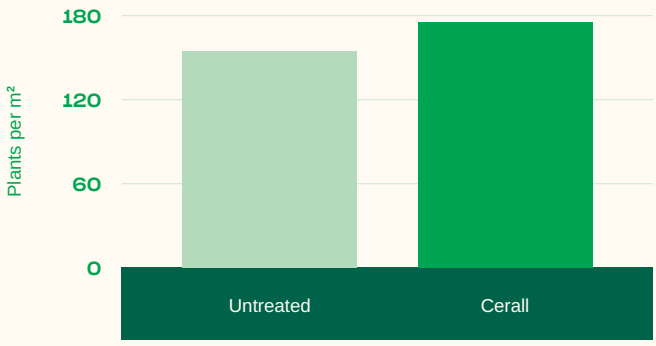
Cerall doesn't only protect your wheat, rye and triticale crops from seed-borne diseases such as common bunt, it also improves overall crop growth:

- Increased seedling emergence
- Better ability to deal with abiotic stress

This results in improved yields and a positive return on investment.

Europe's only microbiology-based biological seed treatment to protect against seed-borne diseases

Fusarium control with Cerall



Average number of winter wheat plants (*Triticum aestivum*) surviving seedling blight (*Fusarium spp.*). Average results from 5 field trials, 1 in Belgium, 2 in Denmark and 2 in Germany. Variation between trials is expressed as standard error: untreated ±53; Cerall ±61 plants per m²

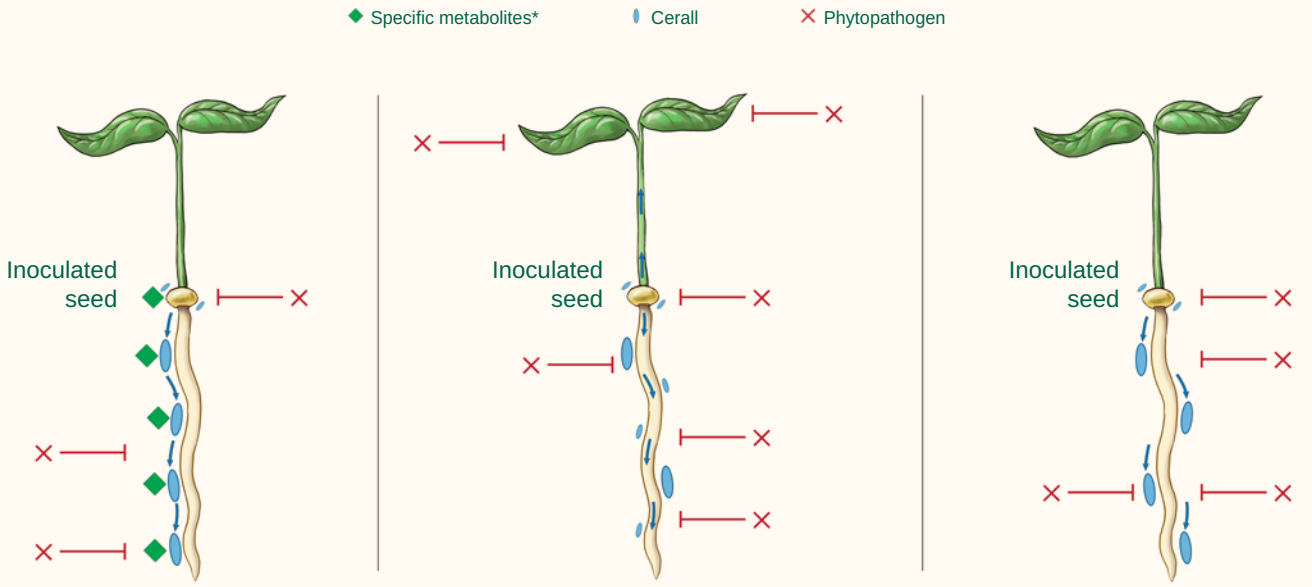
How it works

Cerall offers both an **immediate** and **long-lasting** control on a wide variety of seed-borne diseases.

- Cerall contains a high concentration of the *Pseudomonas chlororaphis* strain MA342 bacteria, which produces metabolites.
- After the application of Cerall, a biofilm is created around the seed.
- The metabolites already present in Cerall have a direct inhibitory effect on various fungal diseases present on the seeds.
- The bacteria present in Cerall will stay inactive when the seeds are stored dry.
- After sowing, when water availability increases, the bacteria will become active and will rapidly start to multiply.

This ensures that the seeds and first developing roots are quickly colonized.

- Subsequently, the bacteria will start to compete with other pathogens for nutrients and space and continue to produce metabolites. This will further inhibit the growth of other pathogens.
- Furthermore, the bacteria will stimulate the plant to start resistance reactions which, in turn, prevents other pathogens from successfully infecting the young plant.
- Cerall not only protects the seeds against seed-borne diseases. It also empowers the plant to speed up seedling emergence and reduces abiotic stresses, which results in improved crop yields.



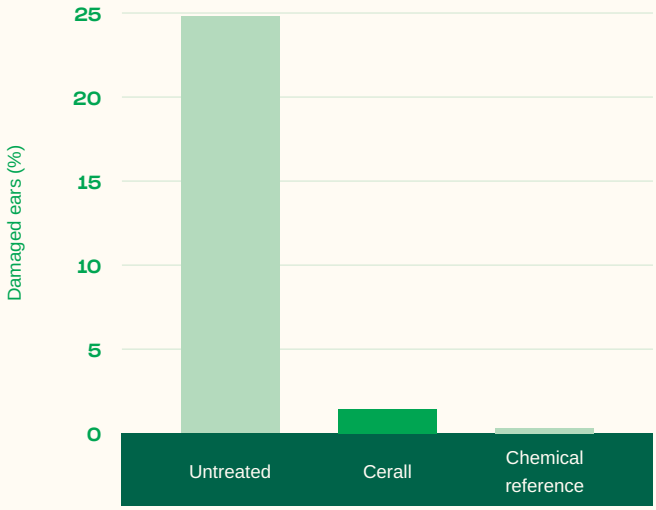
Specific metabolites produced by Cerall protect the plant against phytopathogens

Cerall trigger the plant to activate its defence mechanisms to protect it against phytopathogens

Competition for nutrients between Cerall and phytopathogens, in which Cerall wins and protects the seeds and developing roots

Field trial results

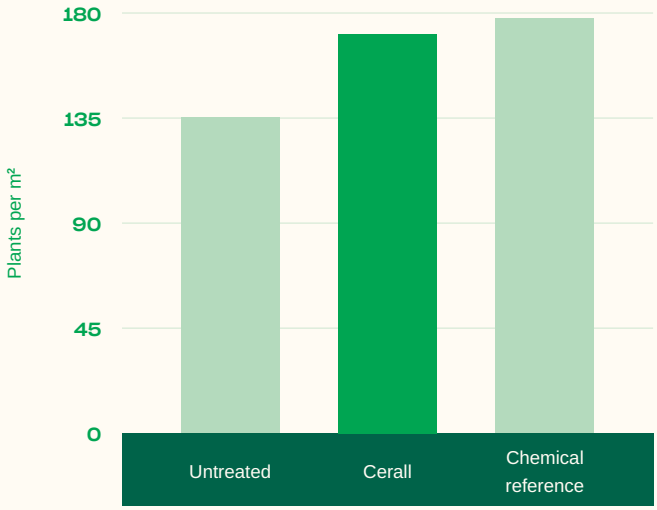
Common bunt control



Percentage of ears damaged by common bunt (*Tilletia caries*) in winter wheat (*Triticum aestivum*).

Average results from 5 field trials, 2 in Denmark, 1 in Spain, 2 in France. Variation between trials is expressed as standard error: untreated ±9%; Cerall ±0.7%; reference ±0.2%.

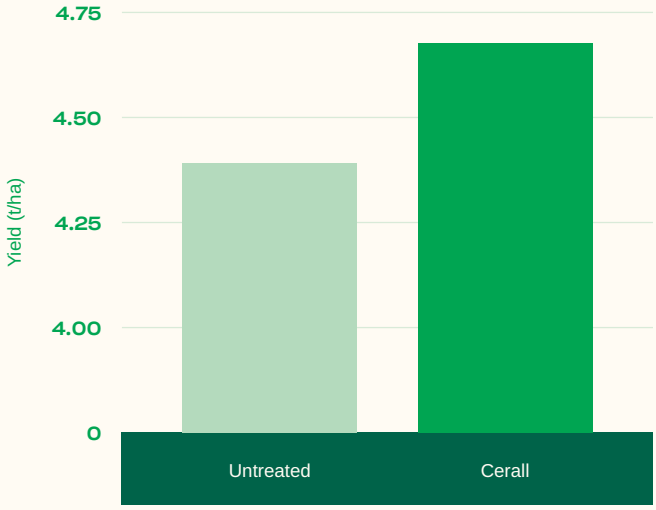
Glume blotch control



Average number of winter wheat plants (*Triticum aestivum*) surviving damping-off by Glume blotch (*Septoria nodorum*). Average from 7 field trials, 1 in Sweden, 6 in Switzerland.

Variation between trials is expressed as standard error: untreated ±30; Cerall ±39; reference ±34 plants per m^2.

Cerall improves yields



Cerall seed treatment improves grain yield on average by 290 kg/ha. Compilation of the results from 11 field trials, 2 in Belgium, 2 in Germany, 2 in Italy, 1 in Spain, 1 in Sweden and 2 in Switzerland.

Variation between trials is expressed as standard error: untreated ±0.6 t/ha; Cerall ±0.6 t/ha.

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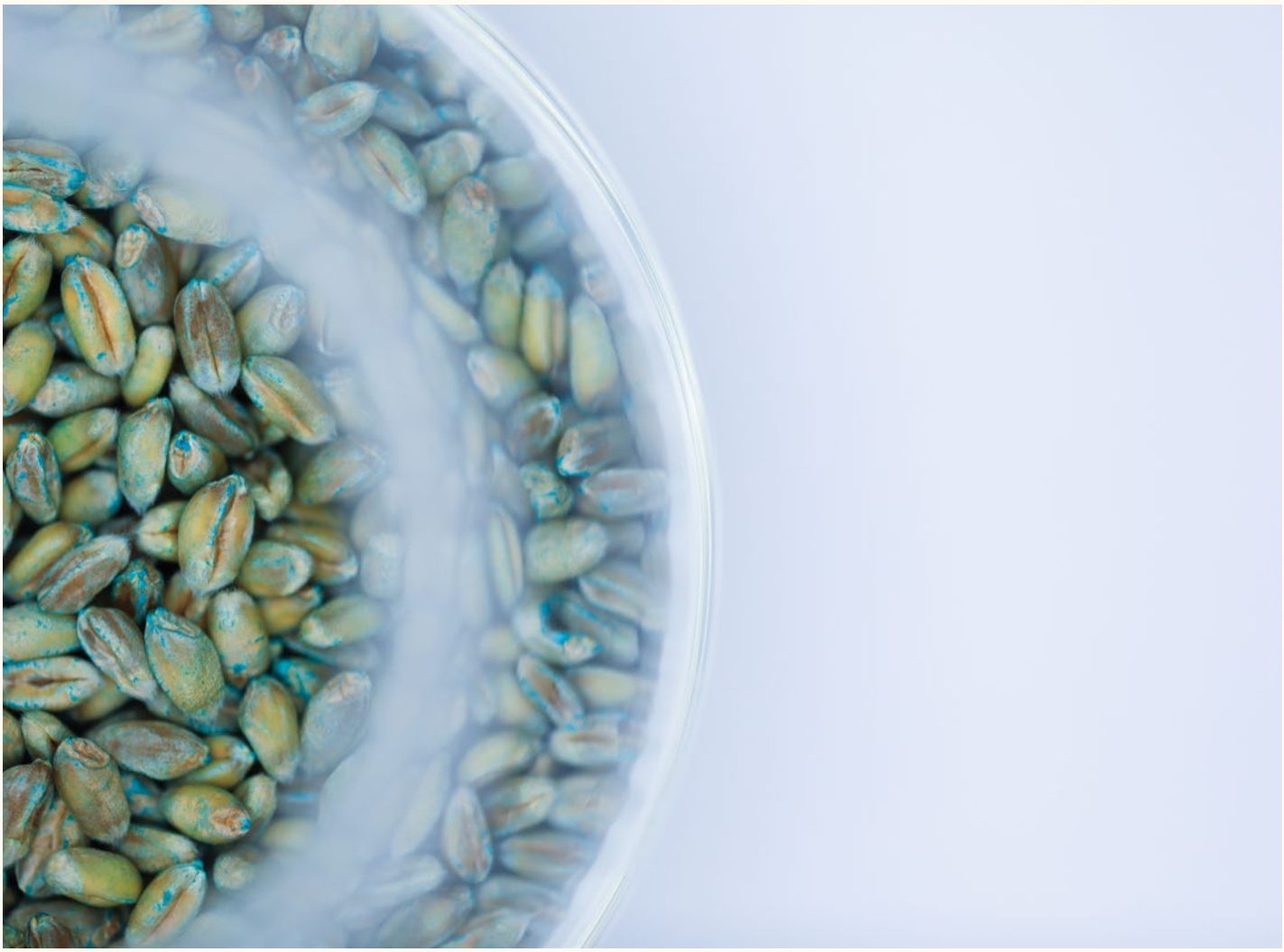
Application Cerall

Cerall can be applied in various crops against different seed-borne pathogens.
In below table you will find the full overview.

Product	Crops*	Targets*
Cerall	Wheat	Seed-borne diseases; Fusarium (*Fusarium spp.*), common bunt (*Tilletia caries*), glume blotch (*Septoria nodorum*) and foot rot (*Microdochium nivale*)
	Spelt	Seed-borne diseases; Fusarium (*Fusarium spp.*) and foot rot (*Microdochium nivale*)
	Rye	Seed-borne diseases; Fusarium (*Fusarium spp.*), glume blotch (*Septoria nodorum*) and foot rot (*Microdochium nivale*)
	Triticale	Seed-borne diseases; Fusarium (*Fusarium spp.*) and foot rot (*Microdochium nivale*)

* Not in all countries where the products are registered are all crop-target combinations on the label.



Application

Cerall is a ready-to-use formulation and must be distributed as evenly as possible over the seeds. This should be done with certified seed treatment equipment, which is suitable for liquid preparations. Before using Cerall, the seed treatment equipment must always be thoroughly cleaned with hot water, or a suitable detergent. If necessary, clean and wash jets. Residues should be removed from containers, pipes, etc.

To avoid frost damage, the mixing bowls and other accessories should be emptied after use. In continuously operating seed treatment equipment, the exact setting of the sprayer must be carried out, to ensure a precise application, to avoid underdosing, for example.

Storage / Shelf life

At 4-8°C: up to 3 months
At 20°C: a maximum of 1 week
On seed: until 1 year after seed treatment

Koppert B.V. is not liable for any loss of quality if the product is stored for longer than recommended and/or under incorrect conditions.

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Only use products that are permitted in your country/state and crop.
Check local registration requirements.

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