PEWAS

Innovative chemistry since 1992

Innovative seed treatment technology

Drought resilient seeds
Support for higher yield

Healthier plants
Germination support, better start

Environmentally friendly
Environmentally neutral and degradable solution

Industrially applicable
Proven industrial process

Increased productivity
Simple, quick & efficient industrial process

Food security
Applicable at seeds of maize, sunflower, sugar beet, oilseed rape and other

PATENTED TECHNOLOGY

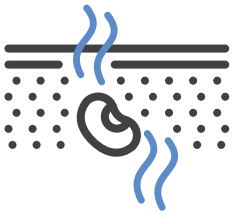
Patent no. EP 4007796 issued by EPO

What is Aquaholder?

Aquaholder is a product designed for hydrostimulation treatment of seeds. The essence of hydrostimulation seed coating consists in applying of a thin layer of Aquaholder product containing a superabsorbent onto the seed. The purpose of this layer is to bind moisture/soil moisture after the sowing into the soil and then form a layer of hydrogel around the seed, from which the seed is able to absorb water.

The hydrogel layer around the seed serves as a reservoir of water that would not otherwise be available for the seed, due to the lower frequency of precipitation, or the drainage of water into the subsoil, which is out of the reach of the seed. Better start, supported by Aquaholder seed treatment, provides conditions for more efficient crop production.

For more information visit **www.aquaholder.com**

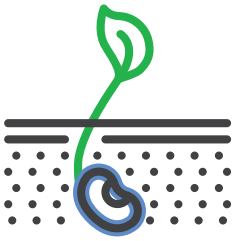


Untreated seeds
Water is lost due to evaporation and drainage

Why to use Aquaholder?

The purpose of Aquaholder seed coating is to support the development of plants in the first, for vegetation critical stages of growth, especially in arid and semi-arid regions and in soils unable to retain moisture. In recent years, the uneven distribution of rainfall has become a major risk for farmers in "favorable" agricultural conditions.

Here, the Aquaholder can serve as an insurance in the event of an unexpected drought in the days following the sowing.



Seeds with Aquaholder applied
Seeds coated with Aquaholder effectively retain the surrounding water and keep the moisture needed for germination and emergence.

What is the active substance of Aquaholder and how does it work?

The active substance of Aquaholder is superabsorbent polymer, called also superabsorbent or absorbent. It is water-absorbing substance which is referred to as hydrogel after the absorption of water. Absorbent is able to absorb 100-500 times water in proportion to its own weight.

After the contact of the absorbent with a water, the water molecules are physically anchored in the 3D structure of the absorbent. Due to diffusion, the water molecules fill the designated areas in the absorbent structure and create a hydrogel, which contains up to 99.9% of water. The water can be subsequently released back from the hydrogel to the environment – root system of young plant.

Aquaholder primary benefits:

- Abiotic stress/drought relief during seed germination and emergence
- Increased plant vigor and biomass

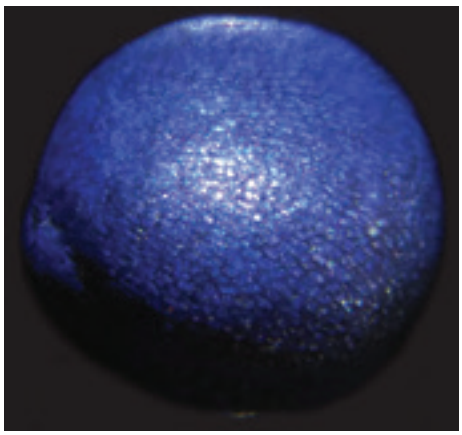
Aquaholder secondary benefits:

- Seed protection against certain pathogens
- Carrier for microbes and nutrients
- Support regrowth of microbes after planting
- Improved uptake low water-soluble actives
- Improved AI uptake
- Reduced leakage of chemical actives to ground water
- Improved plant uniformity

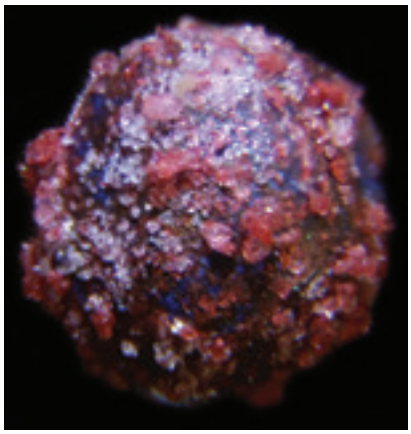
CERTIFIED TECHNOLOGY **Certificate no. 1449 issued by The Central Agricultural Inspection and Testing Institute in Slovakia, E.U.**

Microscopic view of oilseed rape

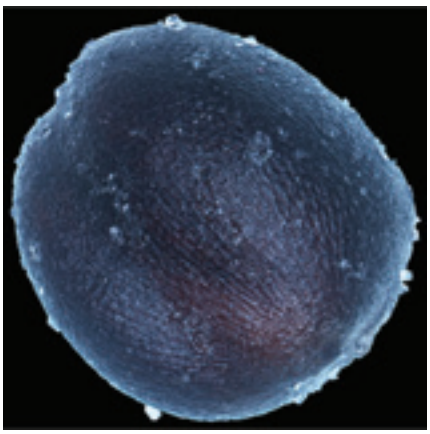
Seed without Aquaholder



Conventional SAP coating method



Seed coated by AQUAHOLDER technology



Activated superabsorbent, creation of hydrogel

Proven in lab and field conditions

PROVEN TECHNOLOGY

by GLP laboratory tests and GEP field trials

Aquaholder seed coating now available

AQUAHOLDER

The Aquaholder project is realized by PEWAS

Pewas is a research organization focused on the research of alternative use of superbasorbent polymers in various industries. Pewas has analytical and production laboratory facilities, a team of laboratory researchers and more than 10 years of research of the effect of superabsorbent polymers and hydrogels on seeds and agricultural substrates.

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