

Innovative Superabsorbent Seed Coating

Ivo Krpelan

CEO

PEWAS

Innovative chemistry since 1992



Promoting the Seed Business
in the Americas



Our Mission

PEWAS Mission in Agriculture industry:

- Our R&D company focuses on development of innovative applications of superabsorbing polymers for different industries.
- In agriculture industry, our main focus is on supporting seeds and plants and helping them to withstand drought conditions, minimize crop losses and optimize use of all available water.
- We focus on research & development of globally scalable and affordable applications that help to drive a long-term agricultural sustainability through support of more resilient farming.
- Our mission is to enhance the seed germination and plant emergence for improved climate adaptability by securing a package of available water for each individual seed.**

Our Focus

Main challenges of global agricultural ecosystem:

- Abiotic stress / drought during seed germination
- Root & Shoot development
- Plant uniformity
- Plant resilience
- Lack of available water / soil moisture



Product Concept

Technology & Mode of Action:



- Superabsorbent (SAP) is a set of polymeric chains forming a network with great water absorption and water absorption capacity (WAC).
- Applied on seeds, SAP forms a thin and stable microscopic film layer around each seed.
- When water comes into contact with this layer, SAP immediately absorbs water and turns into hydrogel that serves as a reservoir of water for each individual seed.
- Absorbed water will then be released from this SAP reservoir to the plants during the dry periods in order to support seed germination and plant emergence. It will not harm the seeds during favourable condition with excess of available water.
- Applied chemicals are effectively kept close to the seeds. Chemicals mobility in soil and their soil leaching is reduced, what improves their efficacy and protects ground water.

Our Solution



Innovative Superabsorbent Seed Applied Soil Conditioner:

- Our biobased, biodegradable and microplastic-free superabsorbent polymers (SAP) seed coating technology can hold up available water and soil moisture up to 500x of their weight. Our SAP layer creates a 24/7 water reservoir for each individual seed that is made available during the critical drought periods.

Enhanced Water Retention:

- Our SAP hydrogel creates a protective layer around each seed, ensuring continuous access to water during the seed germination and plant emergence.

Adaptation to Climate Variability:

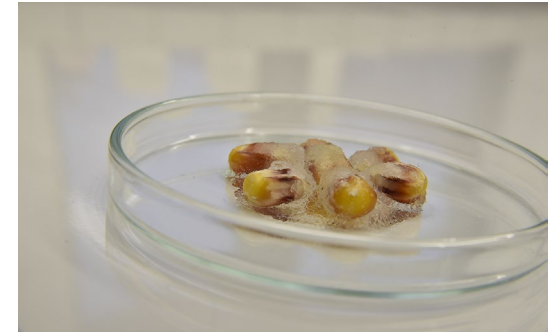
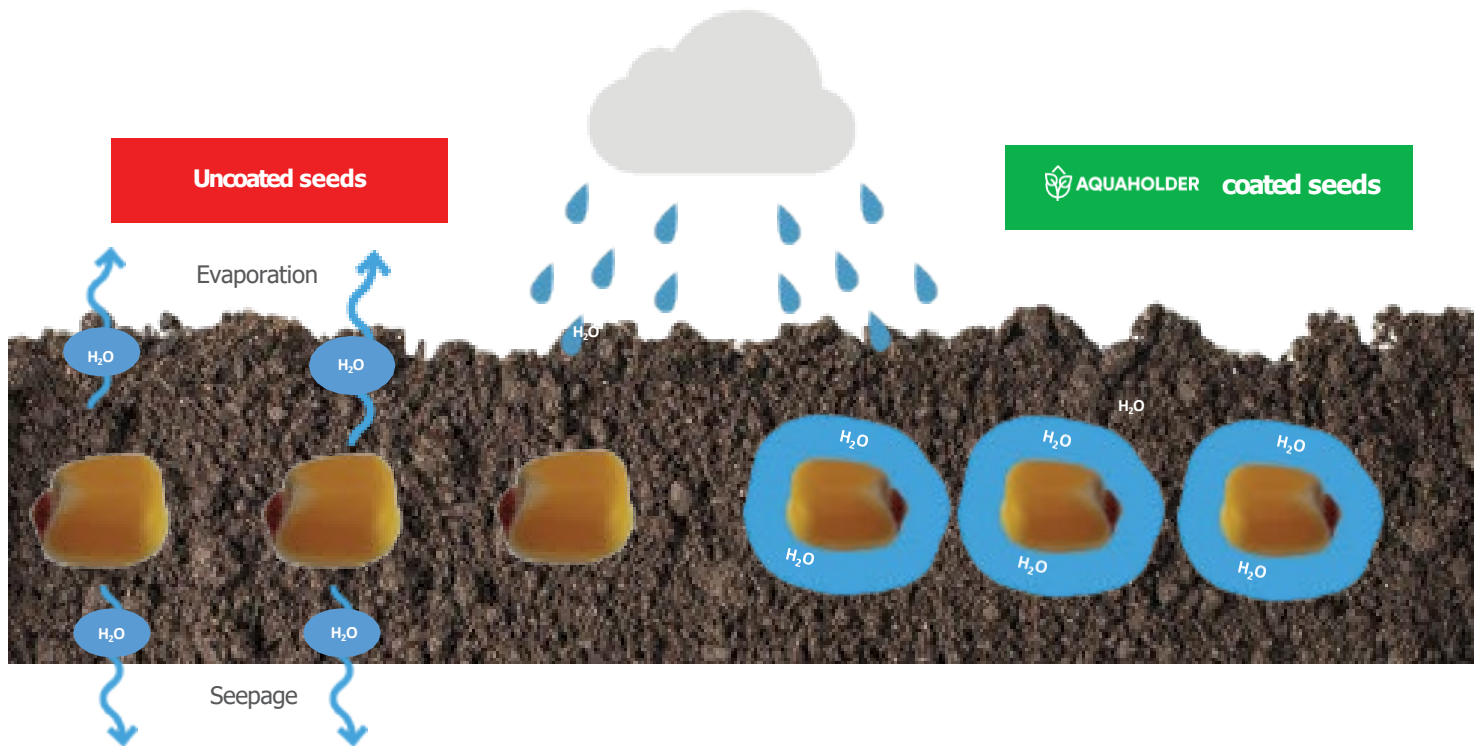
- Aquaholder mitigates the risks associated with climate variability and improves germination rates and plant emergence globally and not only in dry regions.

Economic Benefits:

- Farmers can expect between 5 to 15% increase in crop yields during the dry periods, improved AI uptake and lower environmental impact.

Mode of Action

SAP activation and water absorption:



Product Benefits

Primary benefits:

- Enhanced speed of germination
- Improved plant emergence
- Increased crop uniformity
- Enhanced plant resilience
- Larger and stronger root & shoot biomass

Secondary benefits:

- Carrier for nutrients and microbes
- Improved uptake of low water-soluble actives
- Reduced leaching of actives in soil
- Support re-growth of biologicals

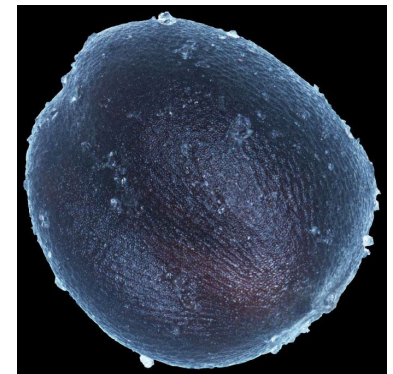
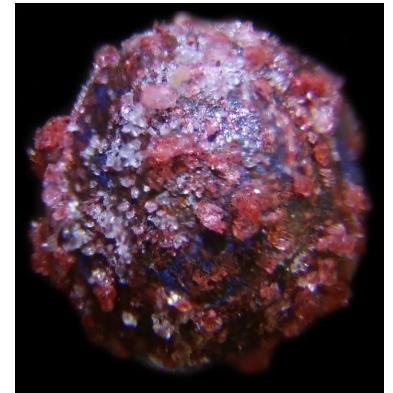
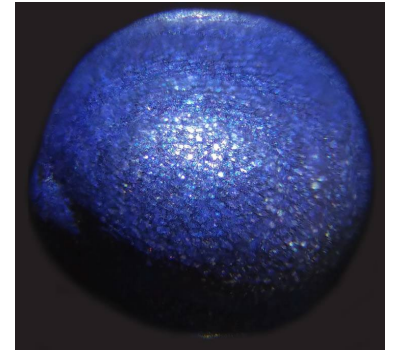
Check our Product Brochure for more details:



Product Characteristics

Industry required characteristics:

- ✓ Biobased, Biodegradable and Microplastic Free solution
- ✓ Flowability, Plantability
- ✓ Storage, Logistics, Handling
- ✓ Application
- ✓ Seed safety
- ✓ Dust-off / Heubach
- ✓ Efficacy
- ✓ Regulatory



Value Proposition

Farmers

- ❑ Aquaholder **boosts higher productivity in the fields by increasing the yields by 5 - 15%** allowing the farmers to maintain profitability even during climate-induced water shortages. Use of our products contributes to global food security by making **agriculture more resilient to extreme weather conditions.**

Crops

- ❑ Aquaholder can be used on **all major crops globally.** From all **field crops**, such as **corn, soybean, sorghum, canola, wheat and barley**, to **vegetable seeds, grasses and turfs** up to **cover crops and forages**, ensuring wide market applicability and high scalability.

Sustainability

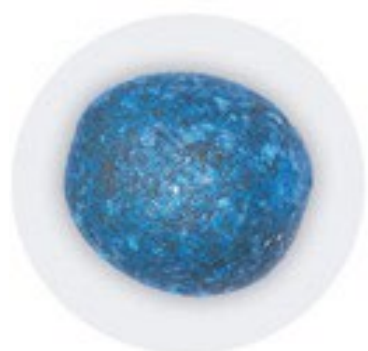
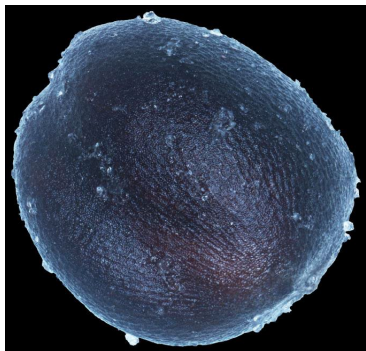
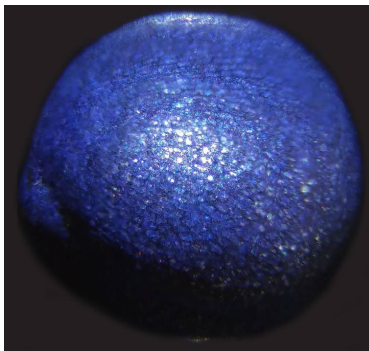
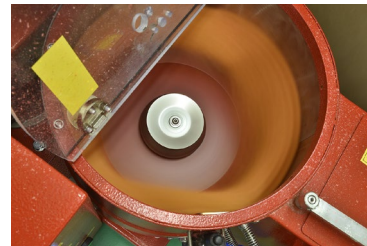
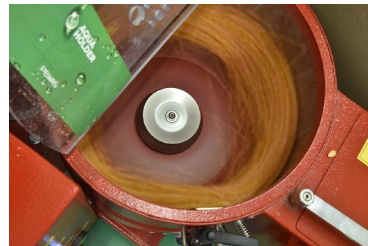
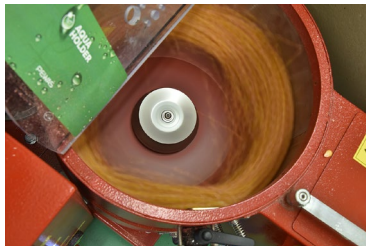
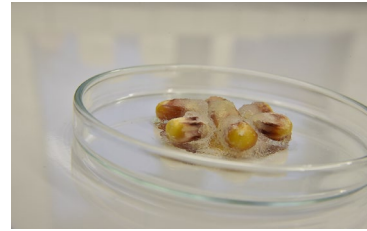
- ❑ Aquaholder's environmentally friendly formulation is **compatible with existing seed coating processes**, promoting sustainable agriculture without the need for disruptive changes to technology.

Regulatory

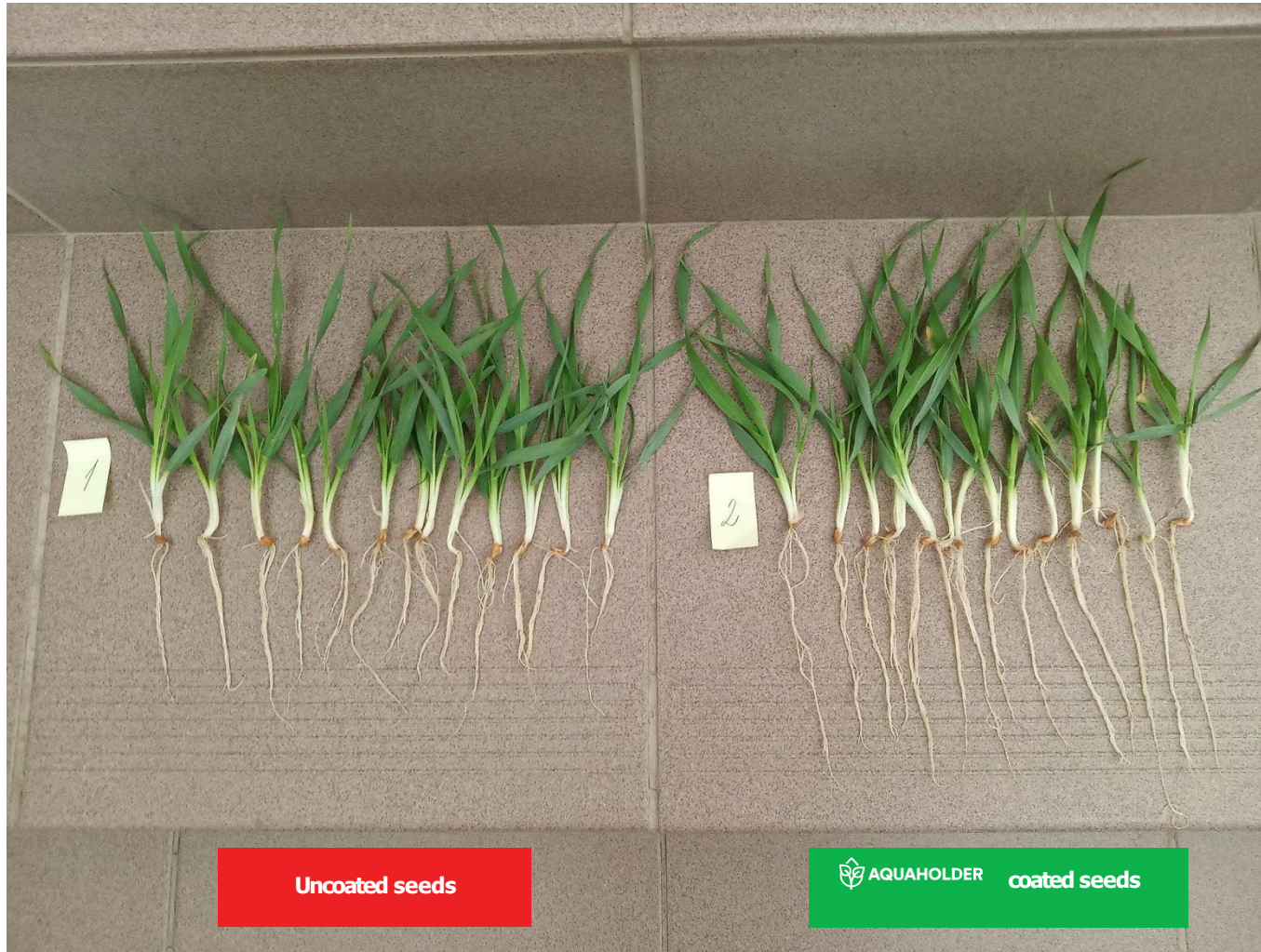
- ❑ Patented **microplastic free** solution, **biodegradable** and **biobased**, **approved** and **certified** for **agriculture** use

SAP, Hydrogel & Seed Application

Aquaholder technology illustration:



Field Trials – sample 1 – Spring Barley



Field Trials – sample 2 - Maize



Field Trials – sample 3 - Sunflower



Globally scalable solution



Product available globally:

- Proven in lab & field
- Patented technology
- Certified product
- Biodegradable & MPF
- Scalable solution

Aquaholder Seed Coating Equipment:





AQUAHOLDER



Ivo Krpelan

CEO and Partner at PEWAS Innovative
Chemistry, YPOer



Product web

www.aquaholder.com



Company web

www.pewas.sk/en

