Human activities require more and more resources – among them water is certainly the most precious. Modern agriculture consumes almost two thirds of the waters pumped worldwide. For this reason, more and more people are seeking ways to conserve it.

Absorber is a water retainer that, when incorporated into a soil or a substrate, absorbs and retains large quantities of water and nutrients. Unlike most products that become hydrated, Absorber has the property of easily releasing the absorbed water and nutrients, thereby allowing the plant to have water and nutrients available at will as a function of the absorption – release cycles.

Absorber

- ✓ Increases the Water Holding Capacity of soils for several years.
- ✓ Irrigation frequency may be reduced by 50%.
- ✓ Limits losses of water and nutrient due to leaching
- ✓ Reduces evaporation from the soil
- ✓ Improves the physical properties of compact soils through aeration
- ✓ Enhances plant growth. Water and nutrients are continuously available in the root zone for optimal absorption by plants
- ✓ Protects the environment against drought and groundwater pollution

COMPOSITION

Absorber is a range of superabsorbent anionic polyacrylamide polymers. They are crosslinked copolymers of acrylamide and potassium acrylate that are water insoluble.

Absorber products have the property of absorbing up to 500 times their weight in distilled water and they become gels.

HOW IT WORKS

The polymer consists of a set of polymeric chains that are parallel to each other and regularly linked to each other by cross-linking agents, thus forming a network. When water comes into contact with one of these chains, it is drawn into the molecule by osmosis. Water rapidly migrates into the interior of the polymer network where it is stored. As the soil dries out, the polymer releases up to 95% of the absorbed water into the soil.

The quantity of cross-linking agent enables modification of the polymer network:

Absorber + H_2O ⟶ Hydrogel

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- The more the polymer is cross-linked, the tighter the network. Thus absorption capacity decreases but the polymer remains more stable over time.
- Conversely, the less cross-linking there is, the looser the network. Absorption volume increases, but stability is reduced.

PERFORMANCES & ADVANTAGES

Absorber is offered in different particle sizes of which the absorption and release capacities vary depending on the conditions in the soil environment.

An outstanding absorption capacity: In general, the finer the particle size of the polymer, the greater its absorption capacity and speed.

A buffering effect on the availability of fertilizers: Absorber significantly reduces the leaching of fertilizers because they are stored in the network. The fertilizers are available to plants for a longer time due to a delay effect on their release.

The influence of salts: The presence of electrolytes in the aqueous medium significantly diminishes the absorption capacity of Absorber. This explains the fact that the water holding capacity of Absorber in a substrate varies around 100-150 times its weight.

The wilting point is delayed: Absorber makes it possible to increase the Water Holding Capacity of soils and to delay the wilting point. A sandy soil treated with 2 grams of Absorber per kg of soil holds water twice as long as untreated soil.

FORESTRY

Absorber is effective in the planting of trees and bushes. It makes it possible to reduce the mortality rate due to transplanting shock and to enhance root development and therefore bring about rapid growth and production.

- Dig a hole about three times the volume of the root system.
- Mix 1-2kg of Absorber per m^3 into the earth fill.
- The polymer must be evenly mixed into the excavated soil. A small amount of untreated soil must be set aside.
- Place the root ball of the plant at the bottom of the hole and fill in the hole with the treated soil. Make sure that the product is distributed evenly around the

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roots. Then cover the surface with 5cm of untreated soil to prevent degradation of the polymer by ultraviolet rays and stagnation of water on the surface.
- **Be especially careful not to put unmixed dry product at the bottom of the hole.** After hydration, the product would destabilise the plant.

Recommendations: 1-2 kg/m^3 of soil
Absorber KM in coarse soils / Absorber KL in fine soils

LAWNS & SOD

Water retainers are very easily used throughout the growth cycle of lawns and sod. They ensure good germination, faster root development, regular and even growth of lawns. The rooting of sod is also faster. They are widely used in landscaping for golf courses and grass in parks and gardens.

- Work, break up, and level the soil to be planted with grass.
- Spread Absorber on the surface of the soil. The polymer may be broadcast or applied with a fertiliser spreader for a more even distribution.
- Work Absorber into the soil to a maximum depth of 10cm. This can be done by hand with a spade or mechanically with a disk plow or a rototiller.
- Seed the lawn or lay the sod. Roll the soil to compact it.
- Use fertilisers if needed.

Recommendations: Absorber KM - 20 – 50 g/m^2

BARE ROOT DIPPING

Absorber can be used for root dipping in order to prevent the desiccation of the roots of seedlings during transplanting or transport over a long distance.

The dressing is prepared as follows:
- Mix 1 kg of Absorber in 150-200 litres of water. Amounts vary depending on the salinity of the water.
- Slowly pour in the product while stirring the water to obtain a dressing without dumping of particles.
- Let the dressing stand for 15 minutes, the time needed for Absorber to reach its maximum absorption. It is important to obtain a dressing that will adhere completely to the roots. The longer the maturation time, the thicker the dressing will be and the better it will adhere to the roots.

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- A water soluble nematicide and / or fungicide may also be added to the preparation to protect plants against nematode and fungal attacks.

Recommendations: Absorber S - 1 kg in 150-200 litres of water.

SOIL MIXES

Mixed into a substrate, Absorber provides a reduction in water stress. It ensures that cutting and transplants take root better and that seedlings grow faster. Irrigation frequencies are spread out. It is an ideal solution in substrates for containers, hanging plants and houseplants.

Watering frequencies are commonly reduced by 30% to 50%, which likewise reduces labour costs, and the amount of water used.

- Evenly mix Absorber into the substrate. The amount must be adapted to each type of substrate based on water requirements and characteristics of the plants and cultivation and weather conditions. As a general rule, the more permeable the substrate, the greater the need for Absorber
- In permeable substrates made of bark, wood fiber or coconut-residue, the recommended amount is 2-3 kg/m^3
- In less permeable substrates, such as peat or composts, the recommended amount ranges from 1 to 2 kg/m^3

Recommendations: Absorber KM - 1-3 kg/m^3

MIXING WITH FERTILIZERS

To reduce leaching of nutrients in the soil, Absorber may be mixed dry into fertilizer preparations. The behaviour of plants fertilised with this mixture makes it possible to maintain or even increase yield while at the same time protecting the environment from leaching. Manufacturers' test results also show better root development of the plants.

Savings on the order of 15% to 30% are observed in the amount of fertilisers.

The polymer is added dry when the fertilisers are manufactured.
Recommendations: Absorber KM - 1%-5% by weight

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FLORAL DECORATION

Absorber is commonly used for colouring the water in glass containers. Absorber in granules is allowed to expand in coloured solutions. The hydrogel is placed in glass containers in which cut flowers may be placed.

Recommendations: Absorber KL or K4 - 1 kg in 150 litres of water

TRANSPORTING CUT FLOWERS

Absorber In the form of hydrogel may be placed in sealed plastic pouches. Once frozen, the pouches are often used in the transport of heat-sensitive plant products such as cut flowers. The hydrogel has excellent resistance to heat shock and does not leak after thawing.

Recommendations: Absorber KM or KL

AGRICULTURE

Absorber has also shown its effectiveness in large-scale farming, especially at the time of germination and development of the root network due to good aeration of the soil. The storage of rainwater or irrigation water by Absorber delays the wilting point and thus makes it possible for certain plants to begin to be well established while waiting for the water regime to become adequate. Absorber ensures a good population and an even growth of plants even in very permeable soils.

For example, in the farming of rain-fed sugar cane, significant increases in yield of approximately 25% are observed.

- When planting a field, put Absorber in the furrows where the cane shoots are placed.
- Absorber may be applied at the same time as a fertiliser.
- Cover the shoots with soil by earthing up.

Recommendations: 10-15 kg / ha
Absorber KM in coarse soils / Absorber KL in fine soils

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INFORMATION ON PRODUCT USE

Application of the dry or hydrated product:

- After hydration of the dry product, it becomes a transparent gel that is greatly expanded.
- When the product is mixed dry into a substrate, it is recommended that an empty space of a minimum of 15% be left in containers. During hydration, the substrate could overflow its container.
- Dry products must not be placed under plugs. The plant could be destabilised after Absorber hydration.
- It is preferable to mix the dry product in an irrigated soil or substrate.
- On the other hand, hydrating the product in a non-irrigated soil is recommended so that it becomes active immediately.

Choice of particle size:

This is an important factor to consider based on the soil type.

- In general, the finer the particle size of the polymer, the greater its capacity and speed of absorption and vice-versa.
- When applying Absorber to very porous soils (e.g. sand, compost) use a small particle size for more rapid absorption.
- In heavy soils (for example, clay), granules are preferable. They improve the porosity of the soil due to their great expansion capacity.
- In the preparation of dressings, use a very fine product to achieve adequate protection of the root hairs.

Very fine products:

- Because of their volatility, wearing a dust mask is recommended.
- If the product is hydrated before use, slowly pour the product into the water. Stirring lightly will prevent the fine particles from clumping.

Additional information:

- The higher the water temperature, the faster the absorption of water by Absorber™.
- All the products in the Absorber line have a high absorption capacity. If the product is spilled, be sure not to rinse it with water. The ground would become extremely slippery. Shovel or vacuum it up.
- To clean equipment, blow off the powder traces with compresses air.
- Avoid contact with eyes and skin (use of gloves and goggles is recommended).

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ENVIRONMENT

Environmental Consequences:

- Biodegradation
  The polymer is sensitive to the action of ultraviolet rays that, by breaking bonds, degrade the polymer into oligomers (molecules of much smaller size). It thus becomes much more sensitive to the aerobic and anaerobic processes of microbiological degradation.

  Absorber therefore degrades naturally in soils (up to 10% - 15% per year) in CO_2, H_2O and nitrogen compounds.

- Bioaccumulation
  The polymer is much too voluminous to be absorbed into the tissues and cells of plants. Its potential to bioaccumulate is therefore nil.

  The period of effectiveness of Absorber in the field ranges from one to five years depending on particle size and agro-climatic conditions.

Toxicity:

- Absorber products demonstrate no systemic toxicity (oral LD50/rats > 5000 mg/kg).
- Consult the safety data sheet for additional information.

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