



TURFTECH
INTERNATIONAL



The Proven Safe & Effective Substrate Wetting Agent

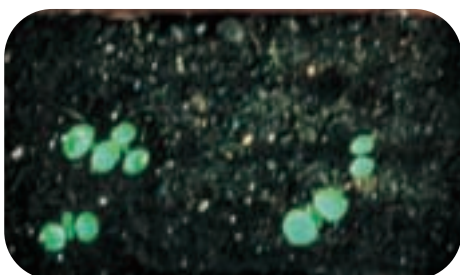
FIBA-ZORB is the leading wetting agent that is used internationally to treat peat, bark and other substrates. FIBA-ZORB has undergone very extensive international research both for bio-assay (phytotoxicity) and efficacy including the certification by RHP in Holland. It is available in Europe directly from the manufacturer, Turftech, via stock held in the UK, Belgium and the Baltic States, and for North America and Canada from approved distributors based in America.

FIBA-ZORB is available in either concentrated LIQUID or GRANULAR form and is applied to the substrate during the production stage.

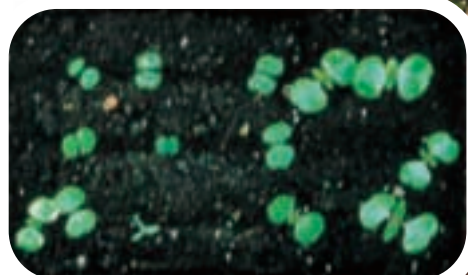
Once the substrate has been treated with FIBA-ZORB it becomes a very manageable growing media with numerous added value benefits for both the professional grower and hobby gardener. These added value benefits far exceed the costs of incorporating FIBA-ZORB into the substrate.

Increased Speed of Germination

Example – White Impatiens



Without FIBA-ZORB



With FIBA-ZORB



FIBA-ZORB[®] Granular

The Superb Substrate Wetting Agent in Granular Form

FIBA-ZORB Granular is the well proven substrate wetting agent in a granular form. This enables growers and producers to incorporate FIBA-ZORB into their substrates without the requirement to use dilution and spraying equipment. It can be added at a suitable stage in the production process when tumbling to ensure even distribution.

The FIBA-ZORB is absorbed onto the very fine vermiculate carrier at a high percentage by weight ratio and as FIBA-ZORB has a greater affinity for moisture, the wetting agent immediately starts to leave the vermiculite carrier when in contact with moist peat fibres, attaching itself to their surface. Only a few days after mixing, the peat substrate displays features of fast initial wetting and the other benefits of the FIBA-ZORB wetting agent.

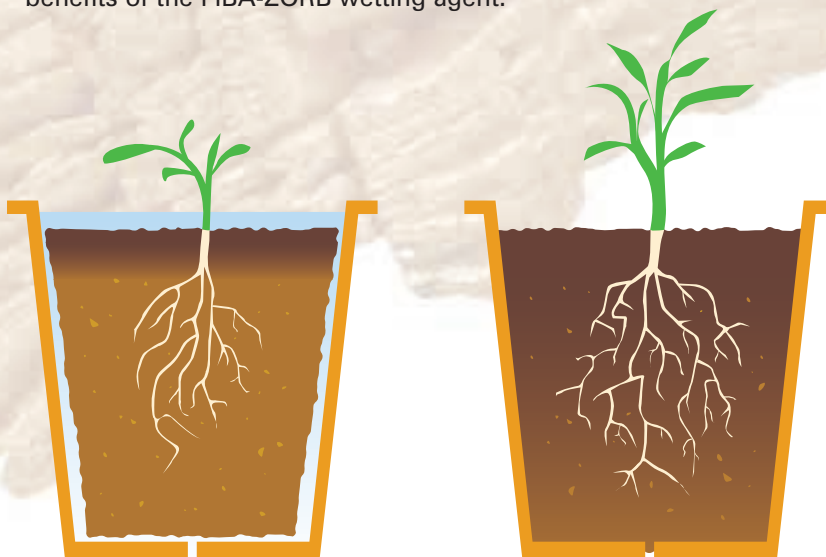


The Vermiculite Carrier

Golden brown in colour, the micro particle size of the vermiculite ensures accurate and even distribution of the wetting agent. There are approximately 1.8 million micro particles in 1 litre of vermiculite.

Period of Action

Like the FIBA-ZORB liquid, the granular version will ensure long term benefits to the grower.



Without FIBA-ZORB

With FIBA-ZORB

Benefits observed after only two irrigation cycles:

- Improves drainage
- Alleviates water tension
- No water pooling on top of peat substrate
- Rapid wetting and re-wetting by surface and capillary irrigation
- Uniform water penetration
- Alleviates dry areas in plugs and pot plants
- No water channelling down inside of pots
- Reduces water requirements
- Maximises plant and root growth development
- Slows down drying out process
- Alleviates shrinkage
- Suitable for all growing media
- Better distribution of water soluble chemicals and fertilisers into the root-zone
- Improves AFP in sphagnum peat

PLUS the special benefits of FIBA-ZORB Granular:

- Easy application during the tumbling process of manufacture
- Process does not add further water to already moist peat
- Can be added at any temperature – no viscosity problems
- Safe to handle

Granular

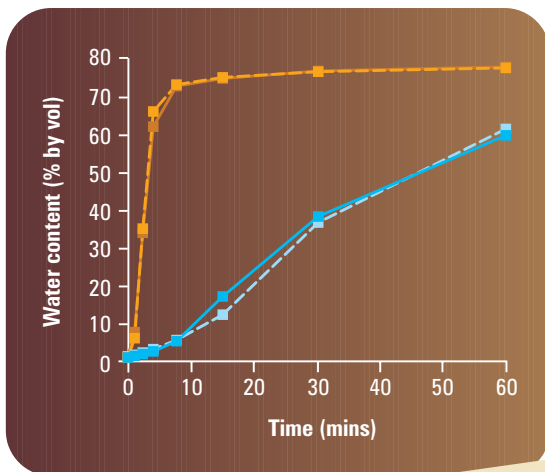
The Key Benefit of FIBA-ZORB

The water retention curves illustrated on the following four graphs show how quickly the water is absorbed by capillary action when substrates have been treated with either Granular or Liquid FIBA-ZORB wetting agent.

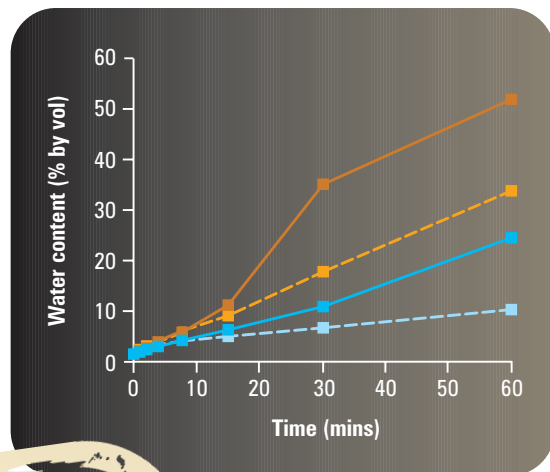
The replicates were also rinsed with 4 times their volume of water and re-tested which proved that the rinsing had no adverse effect on the repeated water uptake tests. The AFP, air filled porosity, for sphagnum peat was also shown to be improved by FIBA-ZORB during the Dutch RHP efficacy test programme.



Water Uptake in Sphagnum Peat



Water Uptake in Black Peat



- FIBA-ZORB Granular
- - FIBA-ZORB Granular rinsed
- Control
- - Control rinsed

Materials and Methods

The water retention curve was determined by the Dutch standard detailed method (Wever and Pon, 1990). In this method cylinders are filled with compaction by free fall and by pressing with 10 kPa. After the drying curve the material was rewetted for 24 hours at a pressure head of -3 cm, to get an idea about the hysteresis.

Water transport was studied through capillary rise of water. Cylinder sets were filled, as for the determination of the water retention curve (Wever and Pon, 1990[†]). Directly after filling the double cylinder with field moist material, the bottom cylinder was separated and this cylinder was placed in a water layer of about 2 mm. from this point onwards the wetting procedure starts and after 1, 2, 4, 8, 16, 32, 60, 120, 240, 480, 1440 and 3360 minutes the weight of the cylinder was determined. Afterwards, the cylinder was saturated for 24 hours and a pressure head of -100 cm was maintained for 24 hours. The same wetting procedure was applied by placing the cylinder in a thin layer of water and measuring the weight at different time intervals. Cylinders were dried at 40°C and again the wetting procedure was used. Finally the samples were dried at 105°C.

All analyses were performed in duplicate. As a result the average values are given.

[†] Wever G & Pon C, 1990. Fysische analysemethoden voor potgrond en veen met aanpassingen. PBG, Naaldwijk, Intern rapport nr. 31

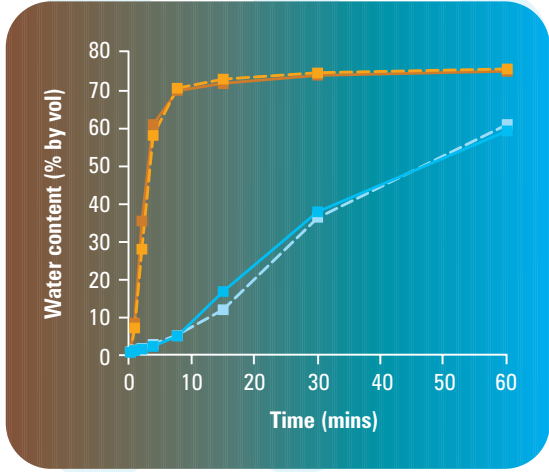
FIBA-ZORB[®] Liquid



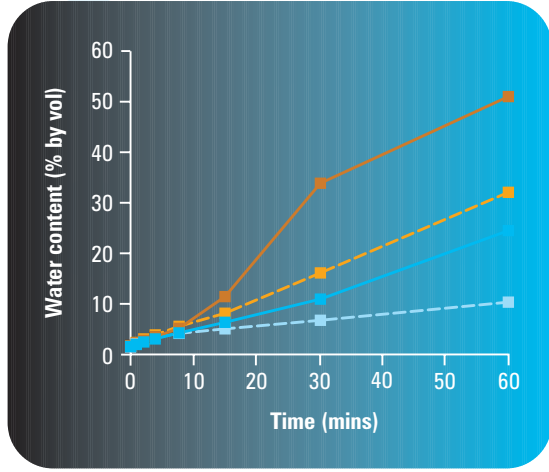
- Total crop safety
- Initial and repeated fast wetting-up of substrates
- Improves drainage – highly suitable for capillary action and flooded benches (ebb and flow)
- Maximises the applied fertilisers and nutrients
- Very leach resistant
- Economic in use

PROVE

Water Uptake in Sphagnum Peat



Water Uptake in Black Peat



— FIBA-ZORB Liquid
- - - FIBA-ZORB Liquid rinsed
— Control
- - - Control rinsed

Rapid Wetting and Re-wetting

After crop safety, the speed of wetting and re-wetting are the most beneficial and important factors for incorporating the FIBA-ZORB wetting agent.

Today, in modern automated production facilities when plugs are watered for the very first time, instant water absorption is absolutely essential, this is a requirement of all professional growers. Furthermore, the world today is a fully integrated trading arena and many European peat substrate manufacturers export their products long distances to the warmer growing regions of Spain,

Portugal, Italy and the Middle East, whilst in North America the principal crop growing regions are in Florida and California with similar long distances from the vast Canadian peat reserves and substrate production factories. For these reasons it is important that FIBA-ZORB treated peat substrates can be packaged and transported long distances and stored for up to a year in some instances and still wet-up evenly and instantly when brought into use for the first time. This advantageous factor means that FIBA-ZORB treated peat substrates have a very long shelf life from a water management viewpoint.

Water Mobility

Following the treatment of the peat with FIBA-ZORB solution the peat substrate will absorb the applied irrigation water uniformly whether it is in seedling plugs or larger growing pots. This even absorption of applied water ensures that the root structure will receive the correct volume of water and therefore benefit from all the applied nutrients in the peat substrate.



Finally, plants can suffer from a fungal attack caused by water stress and conversely root-rot can be a problem in poorly drained substrates. Both of these symptoms are alleviated when FIBA-ZORB is incorporated into the peat substrates.

Slows Down the Drying-out Process

An outstanding feature of FIBA-ZORB is its ability to slowdown the drying-out process of the peat substrates. The maximum volume of water absorbed ensures that the drying out process is extended in comparison to untreated substrates and therefore the intervals between watering can be extended significantly. This feature is very beneficial to pot plant producers as it ensures good shelf life when grown plants are sent to the retail market.



Bark Mixes

Extensive trials have been carried out using FIBA-ZORB to treat bark substrates and all of these trials concluded that FIBA-ZORB is an excellent wetting agent for bark mixes. Most importantly the research demonstrated that a plants ability to extract manganese from the substrates was in no way diminished by the presence of FIBA-ZORB.



iquid

Method of Application of FIBA-ZORB Liquid

The best method to incorporate liquid FIBA-ZORB into the substrate is first to dilute the concentrated FIBA-ZORB with water (see table below) and agitate to make an aqueous FIBA-ZORB solution. This solution is then sprayed on to the peat near the start of the conveyor system through fine nozzles.

The volume sprayed must be calculated to correspond to the correct rate for the particular substrate. Adjustable self-priming pumps, in-line water powered dilutors and agricultural spray systems can all be modified to achieve accurate automatic spraying systems.

Physical Features

FIBA-ZORB is classified as a non-hazardous surfactant and is safe for the user, although it is not classified as an irritant care should be taken when handling the bulk containers.

FIBA-ZORB has a very low freezing point but the best mixing results are obtained above 5 degrees Celsius. FIBA-ZORB is non-caustic and a low-foaming product that will not cause damage to steel spray equipment. FIBA-ZORB is manufactured to a strict quality control procedure in accordance with ISO9000.

FIBA-ZORB[®] Granular

Packaging

FIBA-ZORB Granular is supplied in 15 kg cartons. These are packed 36 boxes per pallet (4 layers of 9 boxes), total weight 540kg.

Recommendations for Use

Peat Substrate Use	Volume of substrate	Weight of FIBA-ZORB Granular
Multi-purpose Use, Seedlings and Bedding Plants	1 cubic metre	250 grams
Grow Bags, Hanging Baskets, Pots and Tubs	1 cubic metre	350 grams

FIBA-ZORB[®] Liquid

Packaging

FIBA-ZORB Liquid is available in 200L polypropylene drums, 4 drums per pallet, 800 litres per pallet.

Recommendations for Use

Peat substrate use	Total volume of substrate	Volume of FIBA-ZORB	Volume of pure WATER	Total volume of aqueous FIBA-ZORB solution per cubic metre of substrate
Multi-purpose use, Seedlings and Bedding Plants	1 cubic metre	100 mls.	1000 mls. (1 litre)	1100 mls. (1.1 litre)
Grow Bags, Hanging Baskets, Pots and Tubs	1 cubic metre	150–175 mls.	1500–1750 mls.	1650–1925 mls.

These rates may be varied slightly depending on the moisture content and the natural water repellent properties of the peat and tests should be carried out to ascertain the best and most economical rate of FIBA-ZORB to be incorporated into the peat substrate.



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