

Unstoppable!

Ensured grass establishment



YELLOW JACKET®
WATER MANAGER

Powered by:



 **BARENBRUG**

Great in grass

Be assured of your investment with Yellow Jacket Water Manager

Barenbrug is known for its innovative grass concepts offering different solutions for different situations. Of course we all want a dense, green sward as quickly as possible. But that's not always easy to achieve. For a start, there's a risk of *(a substantial proportion of)* your grass seed not germinating if insufficient water is available. On top of that, abiotic stress may make it impossible for a germinated seedling to establish.

No water, no germination

A plant's germination rate is genetically determined and can't be influenced. What can be influenced is the success of germination, because germination can't take place without water. So the success of germination is largely dependent on the availability of water.

No establishment in the case of abiotic stress

During the establishment period there's a lot of abiotic stress, which has been found to be lethal for many young plants! Abiotic stress is the stress that a plant may suffer as a result of factors such as drought, heat, wind and salt. Moisture and temperature play a crucial part in this context.

Yellow Jacket Water Manager ensures an optimum moisture balance during both the seed's germination and the plant's establishment, even under extreme conditions.

Yellow Jacket Water Manager

Yellow Jacket Water Manager was developed by Aquatrols in cooperation with Barenbrug. It is the first Seed Enhancement Technology worldwide managing the amount of water around the seed and in the soil around the seedling.

Water distributes the Water Manager throughout the soil to create a Plant Survival Zone.



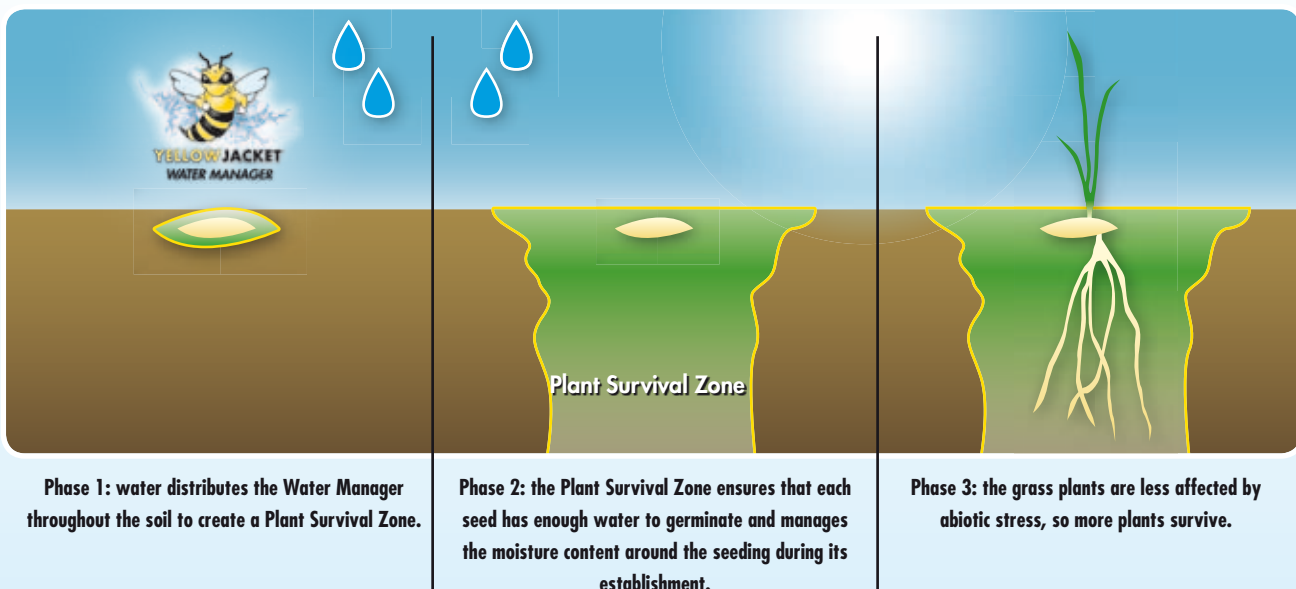
Plant Survival Zone

The Plant Survival Zone ensures that each seed has enough water to germinate and manages the moisture content around the seedling during its establishment. This helps to ensure:

- More successful germination;
- Germination under extreme conditions;
- Guaranteed establishment;
- More survivors.

So the growing conditions are optimised, substantially reducing the amount of stress suffered by the plant. This leads to more vital grass plants and a sward that develops much faster.

FIGURE 1: THE EFFECT OF YELLOW JACKET WATER MANAGER AND THE PLANT SURVIVAL ZONE.



More successful germination

A plant's germination rate is genetically determined and can't be influenced. What can be influenced is the success of germination. The first essential for the growth of grass seed is water. Germination can't take place without water. Yellow Jacket Water Manager provides the key to germination by creating optimum moisture conditions!

Trials carried out by renowned research institutes have shown that Yellow Jacket Water Manager leads to significant differences in the success of germination in both seeding and overseeding (see figure 2).

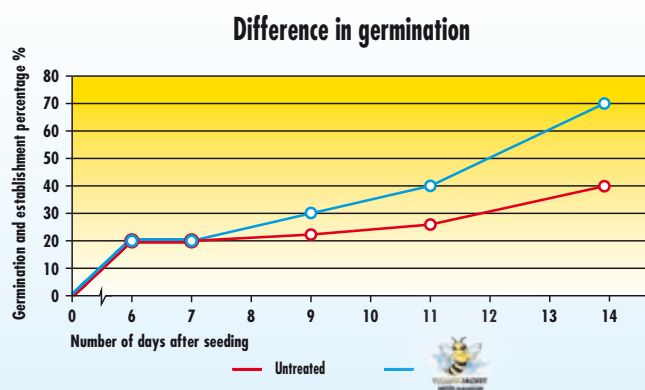


Figure 2: Difference in germination 7 days after seeding and a significant difference 14 days after seeding

Source: STRI, Bingley UK

Worldwide research - Yellow Jacket Water Manager

- Aquatrols HQ Paulsboro, NY (USA)
- New Mexico State University, Las Cruces NM (USA)
- Penn State University (USA)
- Universities of Florida & Texas (USA)
- STRI, Bingley (UK)
- Landlab - Vicenza (IT)
- Trails on golf courses (NL)
- Barenbrug Holland - coating plant Nijmegen & Research Wolfheze (NL)

Extreme conditions

Yellow Jacket Water Manager offers extra possibilities under extreme conditions. It makes it possible to get water to the seeds via the Plant Survival Zone, and to create conditions in which the grass plants can establish free of stress. This way it restores the entire moisture balance.

Damage

A damaged sward is often overseeded in the hope of restoring it. In many cases the damage is caused by extreme conditions in the preceding period. Good examples are the dry patches caused by drought stress and damage resulting from saline or wet conditions.

Damage caused by drought

Dry patches often occur on sandy soils. Usually there's no sense in seeding or overseeding bare patches caused by drought (see figure 3). The soil is water-repellent, so there's no water – the key to germination – for the grass seeds. And when water is applied it won't reach the seeds because it will flow away from the dry patch instead of infiltrating it due to hydrophobic circumstances. Yellow Jacket Water Manager will ensure infiltration, and hence the availability of water (see figure 4).

Wet conditions

Sometimes the top layer of soil retains too much moisture, suffocating the grass seed. In soil with a too high moisture content Yellow Jacket Water Manager distributes the excess water away.

So whether your soil contains too much or too little moisture, the Plant Survival Zone created by Yellow Jacket Water Manager will protect the seed and make sure that it can germinate and establish!



No germination under water-repellent conditions!



Yellow Jacket Water Manager is the key to germination!

Guaranteed establishment

Water is also of great importance for fast and successful establishment. It plays an essential role in:

- The first step of photosynthesis;
- The take-up of nutrients;
- The transport of nutrients and building blocks through the plant;
- Cooling the plant.

However, too much or too little water or a too high temperature will cause a lot of abiotic stress during establishment. This stress reduces a young plant's resistance and often even killing it (see figure 5).

Yellow Jacket Water Manager optimises a seedling's growing conditions by creating a Plant Survival Zone that will ensure stress-free, and hence guaranteed establishment.

Abiotic stress causes losses during establishment

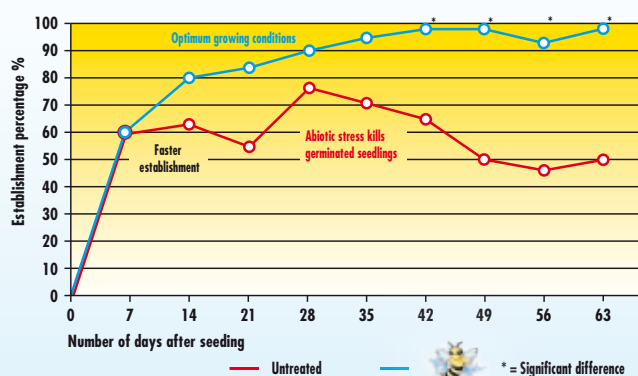


Figure 5: Some of the seedlings that germinate from untreated seed are killed by abiotic stress!
(Source: De Pan - Aquatrols/Barenbrug)

More survivors

Yellow Jacket Water Manager substantially reduces the amount of stress suffered by plants, making the plants more vital and allowing a sward to develop much faster.

Less stress thanks to water management

The optimum moisture conditions created by the Plant Survival Zone make water available to the plants while simultaneously ensuring a more constant temperature in the soil around the plants. Water absorbs and releases heat at a slower rate than soil. A more constant temperature also means less abiotic stress, and less stress means better photosynthesis, and hence faster establishment. The ultimate outcome is successful establishment of your grass.

So water is essential for a plant's growth. Neither too much nor too little: Yellow Jacket Water Manager ensures precisely the right amount!

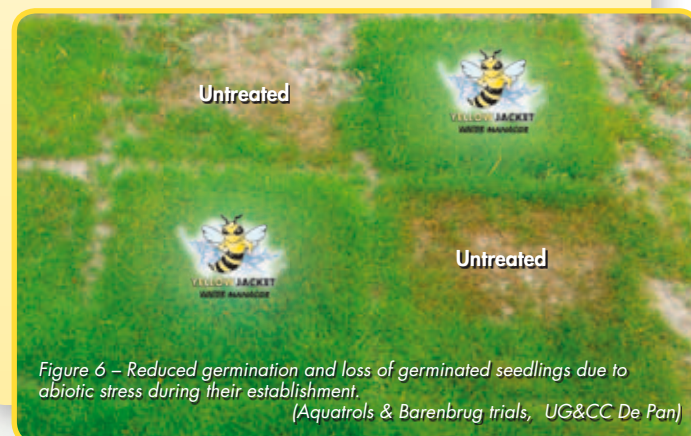


Figure 6 – Reduced germination and loss of germinated seedlings due to abiotic stress during their establishment.
(Aquatrols & Barenbrug trials, UG&CC De Pan)



Figure 7: 9 days after seeding - Sallandsche Golfclub De Hoek

Bar Fescue

A must for sustainable greens!

- ☒ Green
- ☒ Fairway
- ☒ Tee
- ☐ Rough

UNSTOPPABLE!

Ensured grass establishment.

- Tolerates close mowing.
- Dense sward.
- High wear tolerance in summer.
- High disease resistance.
- Lower fertiliser requirement.
- Excellent drought tolerance.
- Lower irrigation requirement.

Composition

Chewings fescue	60 %
Slender creeping red fescue	40 %

Specifications

- Establishment rate: fast • Fertiliser requirement: low
- Growth rate: normal • Sowing rate: 30 - 40 g/m²
- Mowing height: from 4 mm • Package: 15 kg

BARENBRUG
Bar Fescue



NEW

Fescue Overseeding

Sustainable seeding & overseeding concept for tees and fairways!

- ☐ Green
- ☒ Fairway
- ☒ Tee
- ☒ Rough

UNSTOPPABLE!

Ensured grass establishment.

- Strong mixture for tees and fairways.
- Dense, fine sward.
- Lower irrigation requirement.
- Lower fertiliser requirement.
- Less mowing.

Composition

Strong creeping red fescue	40 %
Chewings fescue	40 %
Slender creeping red fescue	20 %

Specifications

- Establishment rate: fast • Fertiliser requirement: low
- Growth rate: normal • Sowing rate: 30 - 40 g/m²
- Mowing height: from 7 mm • Package: 15 kg

BARENBRUG
Fescue Overseeding



Powered by:
Aquatrols®

Powered by Aquatrols

Aquatrols is a global leader in the development of technology that optimises the balance between soil, water and plants. Barenbrug is a global market leader in innovation in the development of new grass concepts. This cooperation has made it possible for the best grass seeds to germinate without problems and grow into vital, strong grass plants.



YELLOW JACKET® WATER MANAGER

Powered by:
 **Aquatrols®**

UNSTOPPABLE! *Ensured grass establishment.*

Some of the advantages of
Yellow Jacket Water Manager:

- More successful germination;
- Germination under extreme conditions;
- Guaranteed establishment;
- More survivors.



For experiences or any questions about Yellow Jacket Water Manager:

 **@BarenbrugGroup**

 **BARENBRUG**
Great in grass