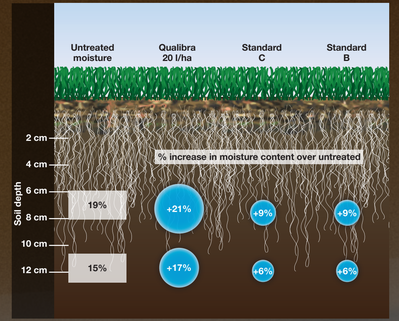
Qualibra holds moisture deeper and more effectively



European Institute of Turfgrass Science (EITS), 2011

Potential for more efficient irrigation

Further trials have shown that Qualibra treated soils retain moisture more effectively in the root zone and can make better use of irrigation resources.

After 10 mm irrigation on a hydrophobic dry soil core of a typical sand used in green construction, soil moisture content was 50% higher with Qualibra, compared to the average with existing wetting agents tested.

Qualibra returned the soil to optimum 15 – 20% moisture content after 19 mm of irrigation – over 25% better performance than other wetting agents. In fact, with some other wetting agents over 50% more irrigation would have been required to get the soil back to the desired moisture content.

Further studies have shown that on non-hydrophobic soils Qualibra facilitates good water movement and poses no risk of excess retention or water logging.

- Improves irrigation efficiency
- Requires less water
- Holds soil water at optimum levels
- Retains root mass and plant health

Application advice

- Commence applications preventatively from March
- Best performance comes from applications at 4 to 6 week intervals

Qualibra® ▶ **20 l/ha**

+

Application volume ▶ **500 – 1000 l/ha**

+

Irrigation after application ▶ **2 – 3 mm**

Qualibra is an exciting new development in wetting agent technology:

- Quick water movement away from the soil surface
- Better moisture retention deep and evenly in the root zone

Qualibra can help turf managers to:

- Maintain plant health and playing surface quality
- Prevent damaging dry patch developing
- Make better use of irrigation resources
- Reduce effects of drought
- Retain healthy root mass

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Deeper thinking

Qualibra® syngenta®

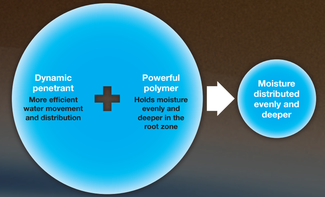
TM

Introduction to Qualibra: Deeper Thinking

Qualibra is an exciting new concept in wetting agent technology. With Qualibra, water quickly moves away from the surface, and then is held more evenly and to greater depth within the root zone for better utilisation by turf plants.

Qualibra helps today's turf managers to:

- Maintain plant health and playing surface quality
- Prevent damaging dry patch developing
- Make better use of irrigation resources
- Retain healthy root mass



Growing pressures – Qualibra helps you deliver superior turf health and quality

Players' demand for consistently better playing surfaces	Scarcity of water resources and demands to reduce golf course water use	Increasing incidence of damaging Dry Patch affecting playing surfaces	Climate change resulting in prolonged hot, dry periods

Qualibra is a further advance in water management technology to help create consistently better quality turf that will enhance the playing experience.

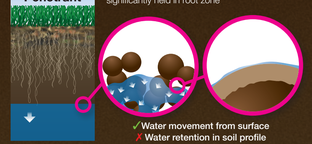
What makes Qualibra more effective?

Qualibra combines a unique and dynamic penetrant to move moisture, with a powerful polymer to hold moisture. Most current wetting agents are either just a penetrant type – with small molecules designed to move water away from the surface quickly, but not hold it – or large molecule block co-polymers, which hold water effectively but are not so effective at moving and distributing it through the root zone.

Qualibra has been designed with the ability to quickly move water away from the surface – to retain firm playing surfaces – then hold moisture deeper and more evenly in the root zone to prevent dry patch forming and invigorate root and plant health.

Current classes of wetting agents

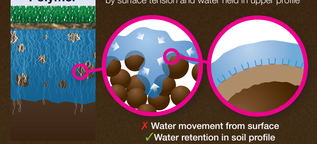
Penetrant



Water moves freely down profile but is not significantly held in root zone

✓Water movement from surface
✗Water retention in soil profile

Polymer

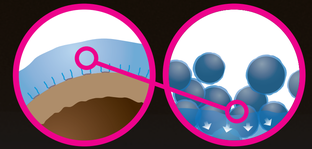


Water movement and flow through profile still restricted by surface tension and water held in upper profile

✗ Water movement from surface
✓Water retention in soil profile

Qualibra

Combining strengths – delivering the best performance of both



High retention, High spreading

Move surface water down:
- ✓Keep the surface firm
- ✓Maintain putting speed
- ✓Achieve a clean cut
- ✓Reduce conditions conducive to disease

Retain soil moisture at depth:
- ✓Increase water availability
- ✓Lower plant stress
- ✓Optimise irrigation
- ✓Increase root mass and depth
- ✓Minimise effects of Dry Patch

Key: Polymer Wetter molecule | Water | Hydrophobic organic coating | Soil particle

Qualibra shows exceptional turf safety. Microscopy studies after application have shown Qualibra has no adverse effect on the leaf wax layer.

Qualibra rooting for quality

Qualibra has been shown to encourage:
- Greater root mass
- Deeper roots
- Better root retention

Healthier root retention helps turf:
- Make better use of water resources – rain and irrigation
- Utilise available nutrients more effectively
- Recover faster from periods of stress
- Stronger plants maintain better playing surface quality throughout the season

Qualibra enhanced root development

Turf plants with stronger rooting systems are best placed to take most advantage of the better retention of soil moisture in the root zone.

The colour of health

The result of the turf safety and enhanced plant health has seen Qualibra treated turf retain green colour for longer under the most testing conditions. STRI visual appraisal of treated turf at The Royal Liverpool Golf Club, Hoylake, showed the colour of unirrigated fairway-type turf retained at 63% in mid-summer assessments, compared to an unacceptable 45% on untreated areas.

The science of wetting agent design and formulation

Now there's a way to effectively move water through the surface layer, whilst retaining crucial soil moisture in the root zone to maintain turf health. Syngenta formulation specialists engineered a new product that combines the best attributes of both penetrants and polymers.

- Actively alleviate hydrophobic issues
- Hold soil moisture deeper and more evenly throughout the root zone
- Retained water holding capacity for up to six weeks
- Achieve continuously high levels of performance between applications

Qualibra® syngenta®