WATER AND THE FUTURE OF FOOD

The water crisis in food production and the implications for UK food manufacturers

Introduction

Food production and manufacturing businesses face a significant balancing act.

On one hand they are being pressured more and more to feed a growing global population but, on the other, they are being criticised for not reducing their impact on the planet fast enough.

The core challenge is that we need to produce 56% more food globally by 2050 if we are to stand any chance of feeding the growing population.

However, this huge increase also has to be delivered while food manufacturers and their supply chains make significant cuts to their impact on the environment.

Much has been said about carbon footprints and the race to net zero but, a growing crisis is starting to garner more headlines and that is around the water being consumed by food production.

This not only relates to the colossal amounts of water being consumed by food producers in water-stressed regions of the world, but also to the milder parts of the world which are battling unpredictable weather driven by climate change, population density increase and other challenges like water pollution from run-off and leaching in the food production process.

Water is a critical resource in the production and growing of food ingredients used by UK food manufacturers.

The increasing pressure on global water supplies, driven by climate change, population growth, and agricultural demands, presents significant challenges for the future.

The competing needs of preserving water supplies versus feeding a hungry population is set to become a fierce battleground in the years ahead and it is critical food producers work to seek out new solutions to overcome this crisis.

This report examines the extent of water usage in food production, the associated challenges, and the implications for the UK food manufacturing industry. It also provides strategic recommendations to help businesses adapt and mitigate future risks.

About the author

Peter Blezard is an award-winning, international biological technology entrepreneur.

He is the founder of Engage Crop Solutions and is working with a number of major businesses around the world to help tackle the challenges around water use in food production.

Throughout his career he has grown and developed a number of global businesses that have pioneered a range of cutting-edge technologies to enhance crop yields and food quality, while also tackling some of the biggest challenges facing food production.

He floated his previous agriculture business on the stock market and has recently secured a six-figure funding package for his current business, Engage Crop Solutions.

Engage Crop Solutions provides a range of innovative crop input technologies and the flagship product, Aqualatus, is working to solve the global water crisis by cutting agricultural water use by half while still improving plant health and crop yields.

> **Currently, consumption is only predicted to get higher, with global agricultural water use expected to rise to 89% by 2050.**

Water use in food production

Water is used extensively in both the growing of food ingredients and the manufacturing processes. The growing global water crisis is well documented and food production's role in the consumption of our dwindling resources is fast becoming the topic of hot debate, not just in arid countries but across the world.

In the UK, around 90% of our water consumption is linked to food production. This equates to 2,700 litres of water a day to produce the food and drink consumed by each person.

The scale of the global water crisis is daunting. Spain declared a drought emergency as early as February this year and some Middle East countries predict they will run out of fresh water completely within a few years if solutions aren't found quickly.

Globally, agriculture accounts for 70% of all global water usage. In the Middle East, the figure is far higher, with agriculture accounting for up to 92% of all freshwater usage in some regions. Currently, consumption is only predicted to get higher, with global agricultural water use expected to be 89% by 2050.

Back home, the UK Government estimates that an extra four billion litres of water will be needed per day in our country by 2050. These increased water demands are compounded by the fact that water companies predict they will be able extract one billion litres a day less due to decreased rainfall in the same time period.

> **2,700 litres of water a day is needed to produce the food and drink consumed by each person in the UK**

When you consider that the UK is perceived globally as a country where it always rains, it helps to demonstrate just how great a crisis we are facing with water around the world.

In many countries, water has already been dubbed the new "blue gold" and the production of certain foods requires particularly high water inputs.

The term "water footprint" has been coined to measure how much water is needed throughout the entire production cycle of a given product.

Key examples of this water footprint include:

- Grain and cereals: On average, 1kg of wheat requires around 1,500 litres of water, while 1kg of rice can demand 3,500 litres.
- Meat production: Producing 1kg of beef can use up to 15,000 litres of water due to the water-intensive nature of growing animal feed and maintaining livestock.
- Fruits and vegetables: Water requirements vary, but common crops such as tomatoes (214 litres per kg) and apples (822 litres per kg) also make significant demands on water supplies.
- Dairy: Producing 1 litre of milk can use 1,000 litres of water due to the resources required for feed crops.

This heavy reliance on water in producing crops makes the food sector one of the largest consumers of this finite resource, presenting growing risks as the global supply of freshwater faces increasing constraints.

Challenges for future water use

Several key factors are exacerbating the challenges of water use in food production:

Competing water needs

The growing population will also fuel urbanisation and industrial growth and this will intensify competition for water resources between sectors, including agriculture, energy, and public supply.

This competition is now resulting in less water being available for food production, leading to price increases for essential ingredients and forcing food production companies to find new ways to operate.

Increasing prices and investment in systems could ultimately impact the bottom line as margins tighten and profitability falls.

Population growth

The global population is rapidly growing. We will exceed a population of eight billion people on earth this year. By 2050, there will be 9.7 billion people and over 10 billion by 2060.

This exponential rise in the population is putting massive pressure on growers and food manufacturers to produce more. This will, in turn, put huge demands on our limited water supplies while increasing pollution risks and could strain agricultural systems to breaking point.

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Climate change

Changes in weather patterns are leading to more frequent droughts, increased temperatures, and altered precipitation patterns, all of which are negatively affecting water availability for agriculture.

This problem isn't just restricted to the hotter regions of the world. All nations now face extreme weather events and even here in the typically wet UK, we continue to see new weather records set each year with droughts becoming more frequent.

By 2050, up to 50% more water may be required to meet agricultural needs globally, yet water resources are becoming scarcer.

Couple this with the challenge that artificially irrigated crops can use up to 300% more water than necessary, and we are in danger of running out of the water we need.

Water pollution

Years of intensive food production has led to compacted and depleted soils around the world which has led to leaching and run-off of fertilisers and pesticides that pollute waterways. In some instances, the water pollution issue has been exacerbated by poor management of effluent from livestock producers and food manufacturers too.

This water pollution inevitably reduces the availability of clean freshwater. This not only affects food production but also increases the costs of water treatment for manufacturers.

Implications for UK food manufacturing

Many of these challenges won't be new to business leaders in the sector, but the challenges associated with water use in agriculture have far-reaching implications for UK food manufacturing.

These include:

1. **Supply Chain Disruptions**

Reduced water availability could ultimately lead to crop failures or lower yields, causing volatility in the supply of key ingredients. This threatens the stability and pricing of food products, especially for water-intensive ingredients such as grains, fruits, and vegetables.

2. **Rising Costs**

Water scarcity may drive up the cost of agricultural products and water-intensive ingredients, squeezing profit margins for food manufacturers. The increased cost of sourcing, transportation, and processing could have a direct impact on pricing strategies.

3. **Regulatory Pressures**

Governments worldwide are increasingly focused on water conservation and may impose stricter regulations on water usage in food production and manufacturing. This could include water-use quotas, taxes on excess water consumption, or stringent environmental compliance laws.

4. **Reputation and Sustainability**

Consumers are becoming more conscious of the environmental footprint of their food, including water use. Companies that fail to address water sustainability in their supply chains may face reputational risks and loss of consumer trust.

The reality is that many of these challenges are already impacting food producers around the world.
Many growers already face stringent restrictions on the amount of water they can draw to irrigate their crops and this means thousands of acres of growing land have been abandoned because there just isn't enough water available to grow crops on the land effectively.

To date, most countries have simply opted to ration the amount of water growers can use when they have been faced with drought.

However, this is short-term thinking and fails to recognise the future challenges.

Similarly, the media coverage around the issue to date has simply focussed on the water crisis itself, rather than what must be done to solve the problem.

Now is the time for us to turn our attention to viable, long-term solutions that ensure we can protect our precious water resources while growing the food we need.

Conflicts in the Ukraine and the Middle East have also firmly cast the spotlight on the need for national food security. Here in the UK, we must ensure we can feed our growing population in a sustainable way that protects our water supplies and the food production sector.

Recommendations for cutting water use in food

Too much of what we see is focused on the problem, but the entire food production and manufacturing system must now turn its attention to finding solutions.

There isn't one simple fix, but we must adopt a range of new technologies to make much more efficient use of water in agriculture.

Water impacts us all, both socially and economically, but water restrictions on growers severely impact their ability to produce food.

This is a short-term solution that will impact food prices around the world.

Stakeholders, investors and growers in every country around the world must look to new technology, data and AI, improved irrigation systems, new drought resistant crops and smarter crop input technologies to get the solutions they need to overcome the challenge.

To address the water use challenges and secure long-term business sustainability, UK food manufacturers should consider the six strategies outlined here.

Adopt water efficient practices

Collaborate with farmers to promote efficient irrigation techniques, such as drip irrigation or soil moisture monitoring systems, to reduce water waste in agriculture. Encourage your supply chain to use water saving crop input technologies, such as Aqualatus®.

Invest in water-efficient technologies and processes within manufacturing facilities to reduce water consumption. This may include recycling wastewater or using closed-loop systems in production.

Look to strengthen your supply chain resilience

Work closely with suppliers to understand water use throughout the production cycle of key ingredients. Encourage or incentivise suppliers to adopt water-efficient farming practices.

Diversify ingredient sourcing to reduce dependence on regions vulnerable to water shortages.

> **Water restrictions on growers severely impact their ability to produce food.**

Recommendations for cutting water use in food

Engage in sustainable agricultural initiatives

Support sustainable agricultural practices that conserve water, such as agroecology, crop rotation, and planting drought-resistant crops.

Join initiatives such as Water UK or Water Wise to enhance water stewardship in agricultural supply chains. Look to partner with companies that specialise in water saving technologies to help drive efficiencies through the supply chain and your manufacturing processes.

Focus on innovation and alternative inputs

Invest in research and development to explore alternative ingredients that require less water or can be produced using innovative, water-saving methods.

Explore regenerative agriculture practices that improve soil health and water retention, reducing the need for external irrigation.

Collaborate with stakeholders

Engage with local governments, industry bodies, and environmental organisations to contribute to water management strategies and policies that support sustainable agricultural practices.

Collaborate with other food manufacturers and agribusinesses to share best practices, drive collective action on water sustainability, and influence policy-making.

Enhance transparency & reporting

Improve transparency on water use across the supply chain and communicate efforts to stakeholders, including consumers, investors, and regulators.

Consider implementing a water footprint labelling system to inform consumers about the water impact of products, which could also encourage water-efficient production practices.

Reducing water use in agriculture by 50%

Everyone has a role to play in developing solutions and my business, Engage Crop Solutions, has developed a transformational water technology called Aqualatus® that allows growers to cut water use by half while still maintaining crop quality.

We are working with a number of food production businesses around the world and, after ten years of trials, Aqualatus® has proved to cut water usage by 50% while maintaining or even improving plant health and crop yields.

For food manufacturers, this means they can slash their water footprint in half. Not only does this help to protect against supply chain issues and price increases, but it also helps to accelerate environmental and sustainability goals.

Aqualatus® is applied to irrigation systems and is a sophisticated blend of liquid polymers which contain billions of microscopic structures that adhere to soil particles and slow the gravitational movement of water and promotes lateral movement, thereby increasing the moisture-holding capacity of the soil.

Surface runoff and evaporation are almost completely eradicated and gravitational movement is dramatically slowed.

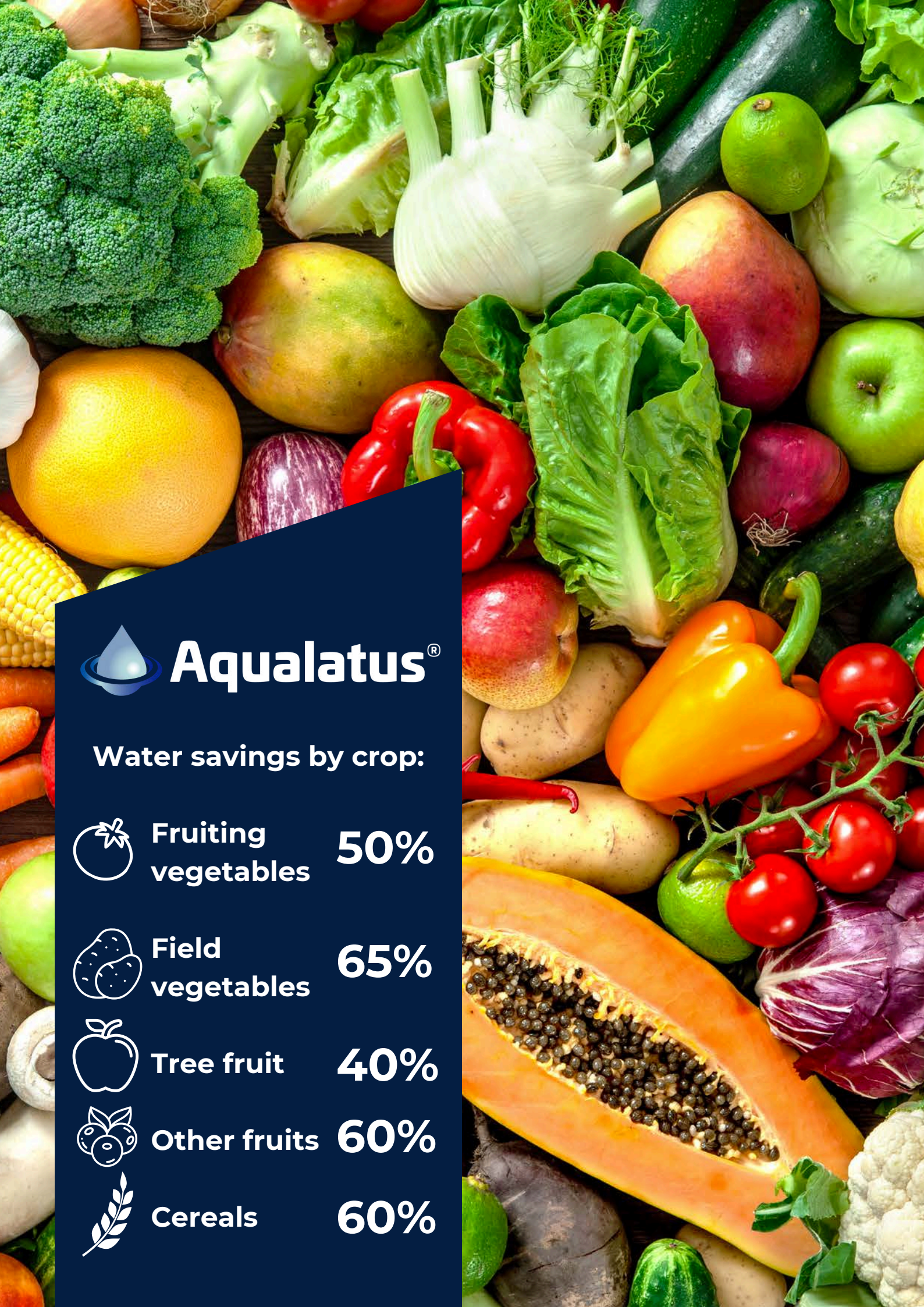
Reducing this natural water loss allows for irrigation volumes to be much lower and timings to be shorter as the soil is more retentive.

By using this technology, growers can also significantly cut the risk of leaching, thereby helping to protect our watercourses from any contamination.

Aqualatus® is not a wetter, which breaks down water surface tension or a hydrogel which swells to absorb water. It is a unique technology that has been designed and developed to specifically move and save water in soil. No other product is as well tested or trialled and, critically, it is completely environmentally-safe in the soil, unlike many others that aim to do something similar.

By using Aqualatus,® growers can confidently cut their irrigation cycles by half and still see exceptional results without any loss of crop development, yield and quality. The technology also ensures farmers and growers can make savings in fertiliser and energy costs too, with the reduction in irrigation cycles and helping to improve the soil quality.

> **For food manufacturers, this means they can slash their water footprint in half**



Aqualatus®

Water savings by crop:

Fruiting vegetables	50%
Field vegetables	65%
Tree fruit	40%
Other fruits	60%
Cereals	60%

Conclusion

Water scarcity poses a significant risk to food production and, consequently, to the UK food manufacturing industry.

As climate change and population growth increase the pressure on global water resources, businesses must take proactive steps to mitigate the challenges of water use.

By adopting water-efficient practices, strengthening supply chain resilience, and supporting sustainable agriculture, UK food manufacturers can protect their operations from future disruptions and contribute to a more sustainable food system.

Addressing these challenges today will not only help secure long-term profitability and improve the industry's reputation for environmental responsibility but will also positively impact financial and environmental audits.

Looking ahead and the debate around water and food production will inevitably rage on. However, we need to all work together to find a solution - there's little value in focusing on the crisis itself and who is to blame.

We have to find ways to save water and I believe Aqualatus® will be transformational in helping us to achieve that goal together.

Aqualatus® is a valuable solution for growers around the world, enabling them to reduce the water use by half with an environmentally-sound technology that will deliver vibrant crops and, crucially, deliver a return 10 to 20 times greater than the investment.

Collaboration on issues of this magnitude are key and we're keen to find industry partners to work with who can help us to bring this solution to key markets and help tackle the water crisis.

If you'd like to talk about how we can work together to deliver water savings through your supply chain and create a more sustainable food production system, please feel free to contact me at peter.blezard@engagecropsolutions.com

> **Addressing these challenges today will not only help secure long-term profitability and improve the industry's reputation for environmental responsibility but will also positively impact financial and environmental audits.**

To talk about working together to improve your water footprint, email Engage Crop Solutions founder director Peter Blezard for an informal chat.

peter.blezard@engagecropsolutions.com

Scan the QR code to see more info

Aqualatus®

Helping growers cut irrigation cycles by half while maintaining plant health and improving crop yields

Aqualatus is transforming agriculture around the world.
It is a pioneering crop input technology that is applied to irrigation systems and improves the moisture-holding capacity of the soil. Growers can confidently cut irrigation cycles by half and still see exceptional results without any loss of crop development, yield and quality. It also delivers further savings in fertiliser and energy costs too.

- Aqualatus can cut agricultural water use by 50%
- Provide water security for farmers and growers
- Proven technology across 10 years of trials

Save water, increase your yields and grow your profits with Aqualatus

To find out how Aqualatus can transform your growing operation, visit engagecropsolutions.com or email our Founder Director Peter Blezard at peter.blezard@engagecropsolutions.com

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We are seeking partners to help deliver the benefits of Aqualatus to farmers and growers.
To talk about working together, email our Founder Director Peter Blezard at peter.blezard@engagecropsolutions.com