

### The Importance of Irrigation to Growers

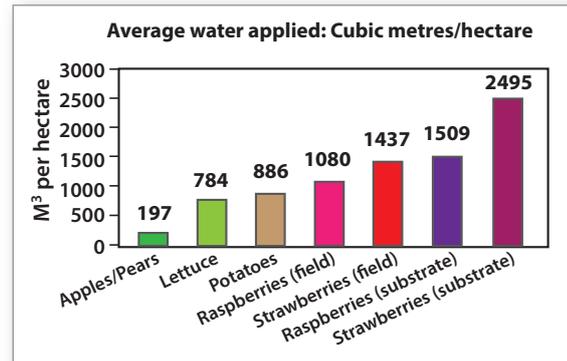
In depth interviews with 110 irrigators across the South East of England have shown that:

- Over 70% of growers regard irrigation as 'Crucially Important' to their business
- There is typically a 2 to 4 fold difference in water use efficiency between growers
- There is strong correlation between optimising irrigation water use and financial returns

## field strawberries

### Strawberries need lots of water

The **WATER R** Project research confirmed that, like other soft fruit crops, strawberries are particularly demanding in terms of irrigation water requirements. Average use of over 1400 cubic metres per hectare for field-grown strawberries was higher than for any other field crops in the research.



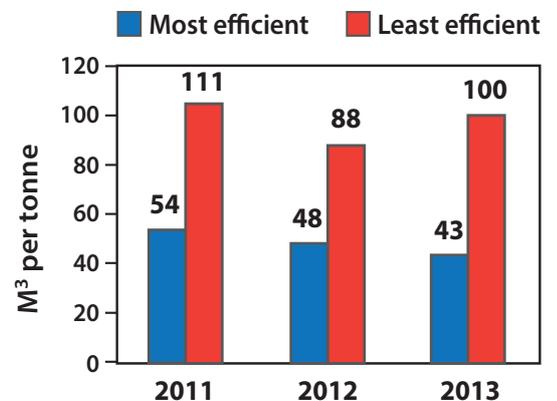
### Strawberry Water Use Efficiency and Financial Returns

On average, field strawberry growers use 79 cubic meters of irrigation water per tonne of crop produced. However, there was on average a 2 fold difference in water use productivity between growers, ranging from 48 up to 102 cubic meters per tonne produced.

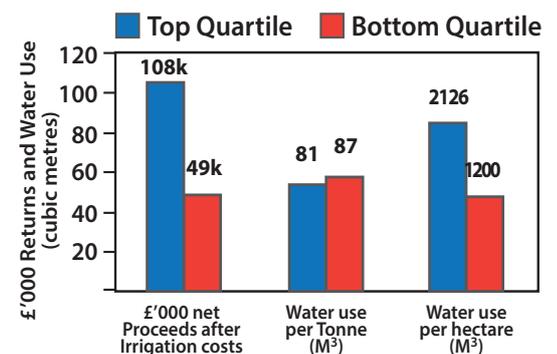
There was also a strong correlation between water use efficiency and financial returns:

- Top Quartile growers in terms of financial returns achieved net proceeds after irrigation costs of £108,000 per hectare on average, compared with £49,000 for Bottom Quartile producers
- On average, Top Quartile producers used 7% less water per tonne of strawberries produced than Bottom Quartile growers
- However, on average they also used 77% more water per hectare. This may reflect higher planting densities, but it also indicates that optimising water volumes is more important than water use efficiency per se, in maximising yields and financial returns
- The marketable yields of Top Quartile producers, at 28 tonnes per hectare on average, were double those of Bottom Quartile growers. However, they also achieved 8% higher prices per tonne on average, suggesting that optimising irrigation volumes also helps to deliver better fruit quality and marketability

#### Water Productivity



#### £ Returns and Water Use



## Irrigation Best Practice: Grower Perspectives

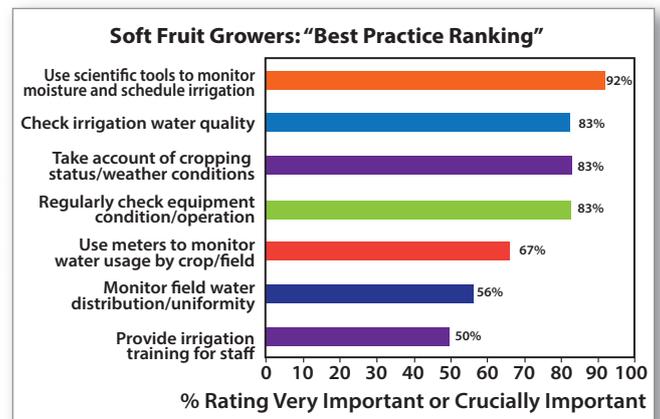
'Best Practices' regarded as most important in optimising irrigation performance and financial returns:

- Using scientific tools to monitor soil and substrate moisture levels to optimise scheduling was ranked as 'very' or 'crucially important' by over 90% of growers. There is, therefore, extensive use of probes and computerised systems to optimise irrigation frequency and duration
- Taking account of crop status and weather conditions was similarly rated by 83% of growers.

However, growers need better integration of these technologies with other scheduling and application systems

- Regularly checking irrigation equipment condition and operation was also highly ranked by over 80% of growers. Equipment malfunction can be extremely costly and growers emphasised the importance of

using the latest systems and undertaking regular monitoring and servicing



## Optimising Water Use in Field Strawberries – Latest Research Findings

Matching crop demand for water with supply can be difficult in the changeable UK climate and due to the high economic value of soft fruit, some growers have tended to over-irrigate as an insurance policy. However, this can lead to excessive vegetative growth, increased disease pressure, and fruit with reduced consumer health benefits and shelf-life, along with associated increases in waste fruit. Berry flavour profiles (eating quality) can also be reduced because key compounds are diluted by the high water content.

New production methods that improve water use efficiency and utilise 'best practice' are needed to improve the economic and environmental sustainability of the sector. Work carried out by EMR in a HortLINK project demonstrated that in scientific field experiments, irrigation scheduling strategies for field-grown 'Elsanta' were developed that delivered water savings of 85% without reducing Class 1 yields and improved aspects of fruit quality. In grower trials in 2010 and 2011, water savings of between 3 and 36%

were achieved and fertiliser savings of between 3 and 19% were delivered by the new Grower Test Regime. Yields of Class 1 fruit were increased under the Grower Test Regime by 5-18% and berry flavour, assessed by professional taste panels, was also improved. Values of Water Productivity (litres of water used to produce 1 Kg Class 1 fruit) in our grower trials ranged from 30-37 under the commercial irrigation regimes and from 25-28 under the Grower Test Regime. In 2012, the average industry WP value was 45. The technology package was developed further and a smartphone App is available to help growers schedule their irrigation more effectively.

In addition to improving on-farm water and fertiliser use efficiencies, effective irrigation scheduling will also deliver savings in fertiliser and energy costs. Many soft fruit growers have high employee costs and so the new National Living Wage announced in the Summer Budget 2015 will impact greatly on profit margins unless remedial steps are taken to improve the efficiency of

production and harvesting. Research at EMR has shown that strawberry canopy areas can be manipulated using precision irrigation and that plant leaf area can be reduced by 40% without affecting Class 1 yields or quality. In addition to reducing disease pressure and improving light penetration, the reduced canopy is also likely to make fruit more visible and therefore, facilitate speedier picking and reduce time spent harvesting.

### Summary

Irrigation is complex and time consuming. Maximising returns requires optimisation of many variables, in particular soil moisture monitoring, irrigation frequency and duration. As one grower put it:

*"It's about getting the right amount of water to where it's required at the right time."*

**This factsheet highlights the specific irrigation performance of field strawberries growers participating in the WATERR Project 'Irrigation Business Review' interviews and covers 15 irrigated crops over the period 2011 to 2013.**

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