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# ERDF 'WATERR' Project

## Irrigation Business Review Findings: Kent Growers

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# 'WATERR' Project Objectives



**To support South East irrigators to improve their profitability and competitiveness by improving water availability and use efficiency**

- ◆ Opportunities to improve water availability
- ◆ Improve collaboration to optimise catchment water management
- ◆ Identify and Promote Irrigation Best Practice and Leading technologies :
  - ◆ Increase yields
  - ◆ Improve produce quality / prices
  - ◆ Reduce irrigation costs
- ◆ Improve the environmental footprint of South East river catchments



# 'WATERR' Project Irrigation Business Reviews

## In depth interviews involving 100 growers (20% of South East licenced irrigators) to :

- ◆ Assess Current irrigation water availability and use efficiency
- ◆ Impact on production / yields, pricing and financial returns
- ◆ Identify 'Best Practice' technologies and techniques
- ◆ Improvement Opportunities / Barriers
- ◆ Grower Support Needs, and Priorities
- ◆ Confirm 'WATERR' Project Support Programme



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# 'WATERR' Project Irrigation Business Reviews



## IBRs by Catchment / Region

|               |                         |            |
|---------------|-------------------------|------------|
| <b>Kent :</b> | <b>Medway</b>           | <b>13</b>  |
|               | <b>North Kent</b>       | <b>13</b>  |
|               | <b>Stour</b>            | <b>21</b>  |
|               | <b>Romney Marsh</b>     | <b>5</b>   |
|               | <b>Kent Total</b>       | <b>52</b>  |
|               | <b>Sussex</b>           | <b>8</b>   |
|               | <b>Hants/ IOW</b>       | <b>13</b>  |
|               | <b>Arun</b>             | <b>15</b>  |
|               | <b>Chichester</b>       | <b>7</b>   |
|               | <b>Thames</b>           | <b>6</b>   |
|               | <b>South East Total</b> | <b>101</b> |



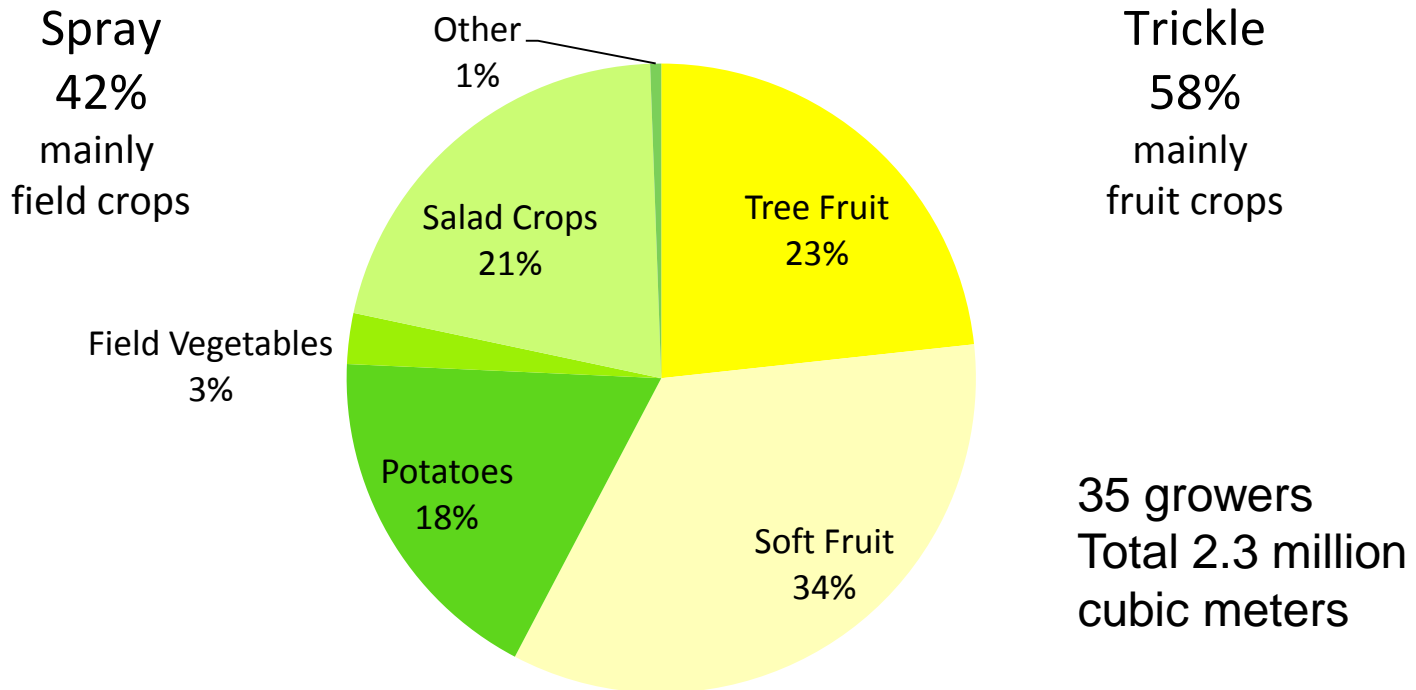
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## Kent Growers – Main irrigated crops % irrigation use (by volume)





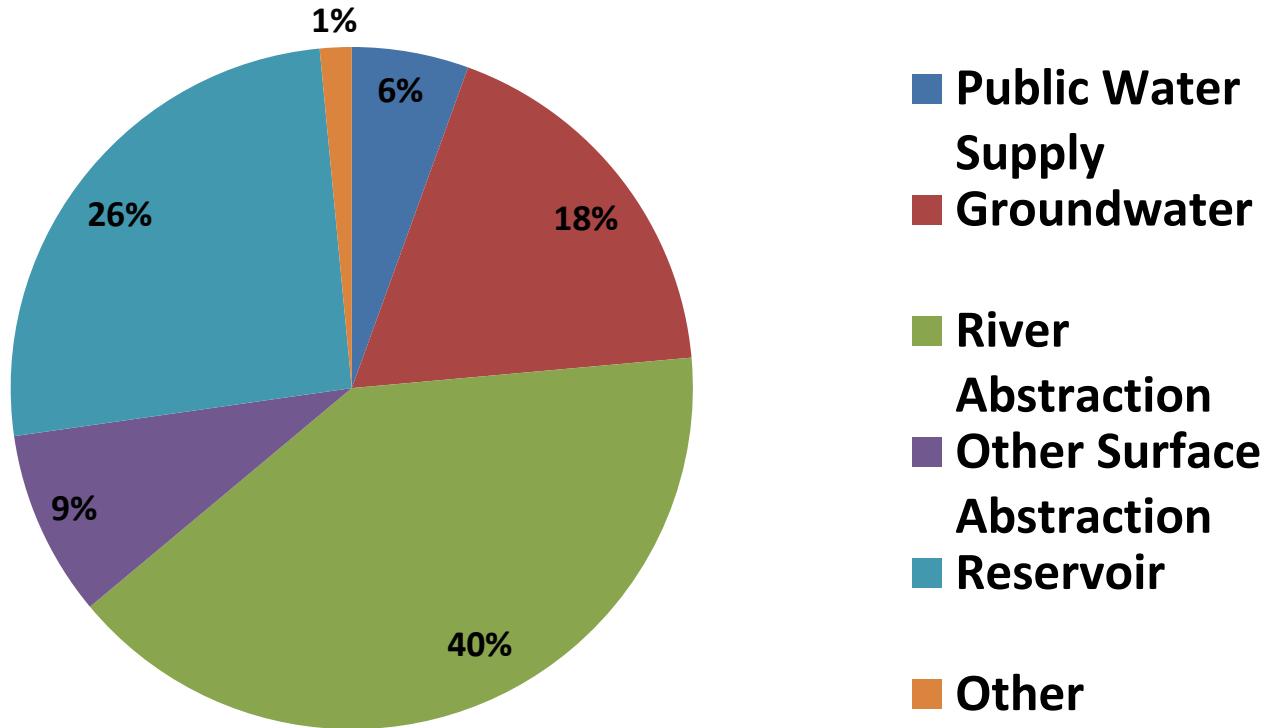
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## Irrigation Water Applied by Source – Kent Irrigators (2013)





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## Irrigation Business Reviews



### Kent IBR Responses : Irrigation Equipment and Management

- Majority of growers using trickle irrigation for tree and soft fruit and rain gun / spray booms for potatoes / field vegetables/ salad crops
- Irrigation is complex, time consuming and labour intensive : optimisation requires careful management of all the variables
- Equipment malfunction time consuming and impacts performance : aim to use latest equipment /regular monitoring and servicing
- Larger producers using computerised systems , but problems integrating the different monitoring / decision making tools
- Monitoring soil moisture content critical for scheduling : increasing use of probes but seen as an area for improvement / simplification
- Need to be able to monitor performance more easily : lack of meters an issue
- Staff training critical to optimise systems but lack of CPD type courses



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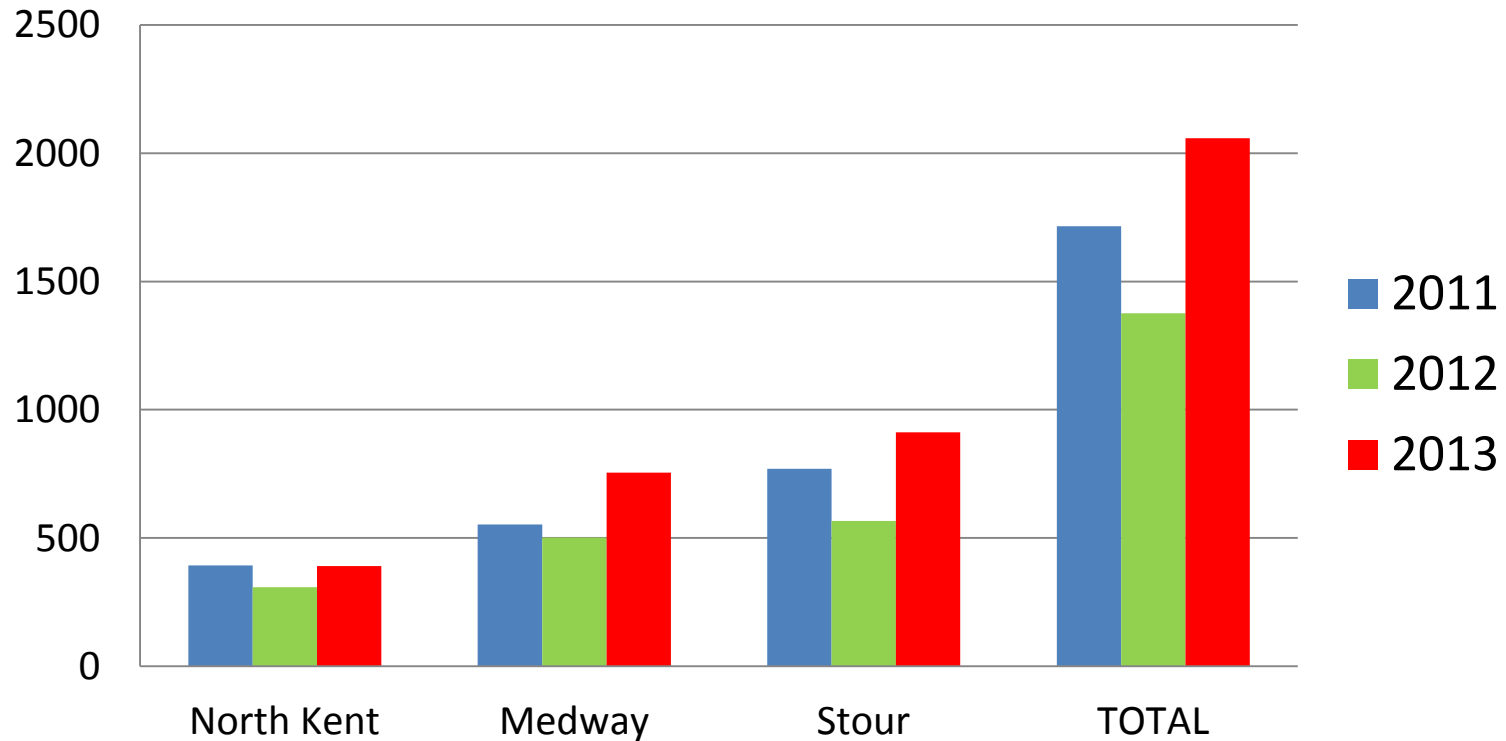
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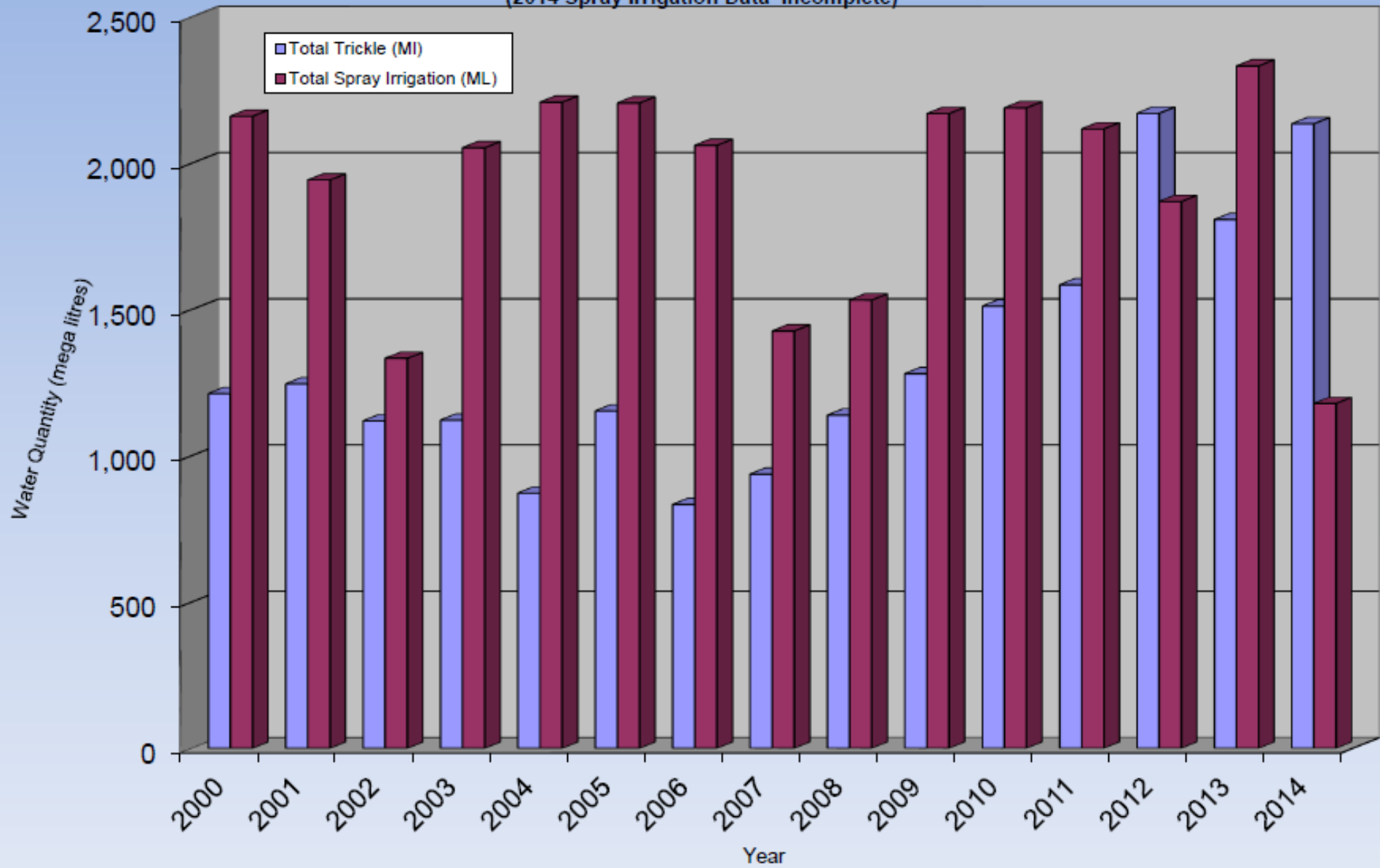
## Kent IBR findings: Water Use 2011-2013

'000s cubic meters – total for 32 growers





Trickle & Spray Irrigation Trend Comparisons  
(2014 Spray Irrigation Data Incomplete)





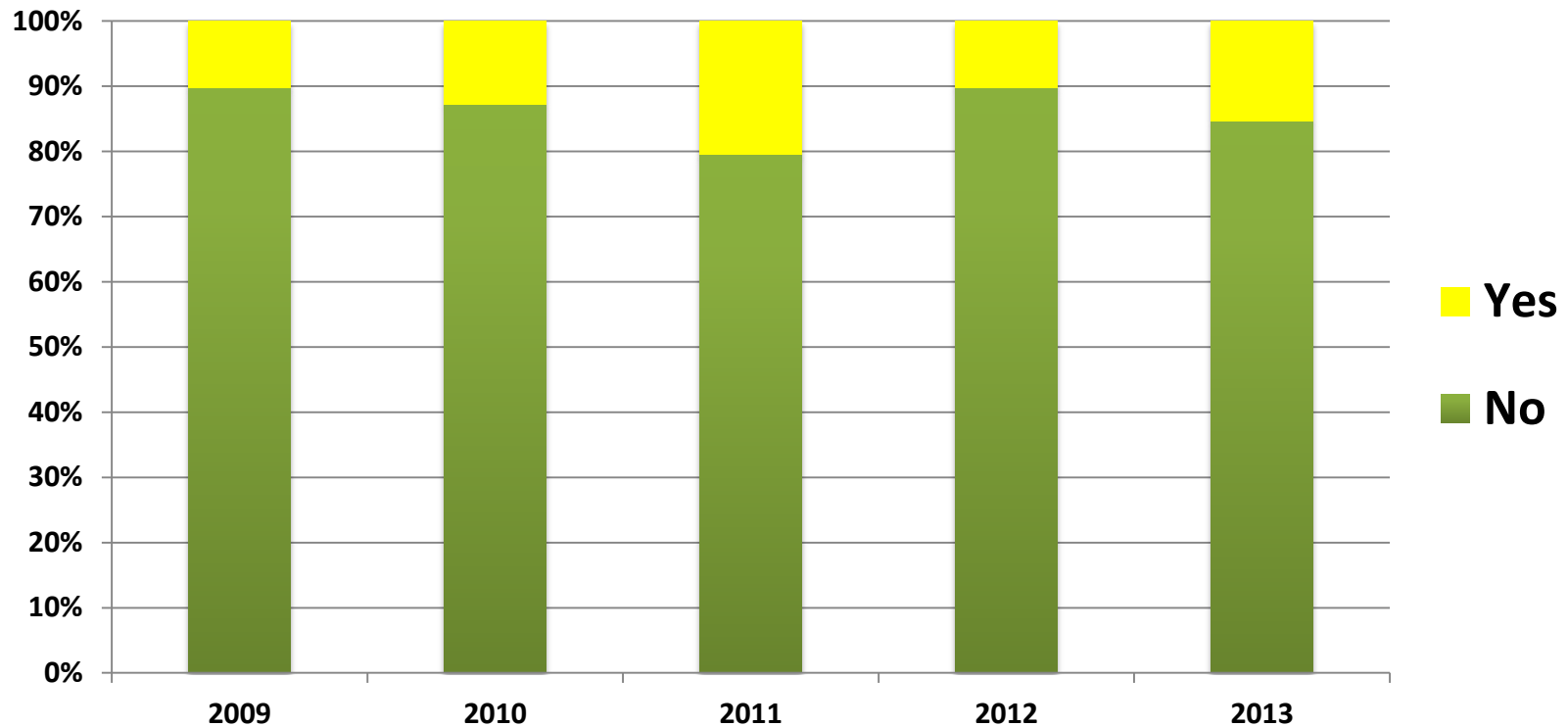
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# 'WATERR' Project Irrigation Business Reviews



## Restrictions on Use of Licence in Past 5 Years, Kent Irrigators





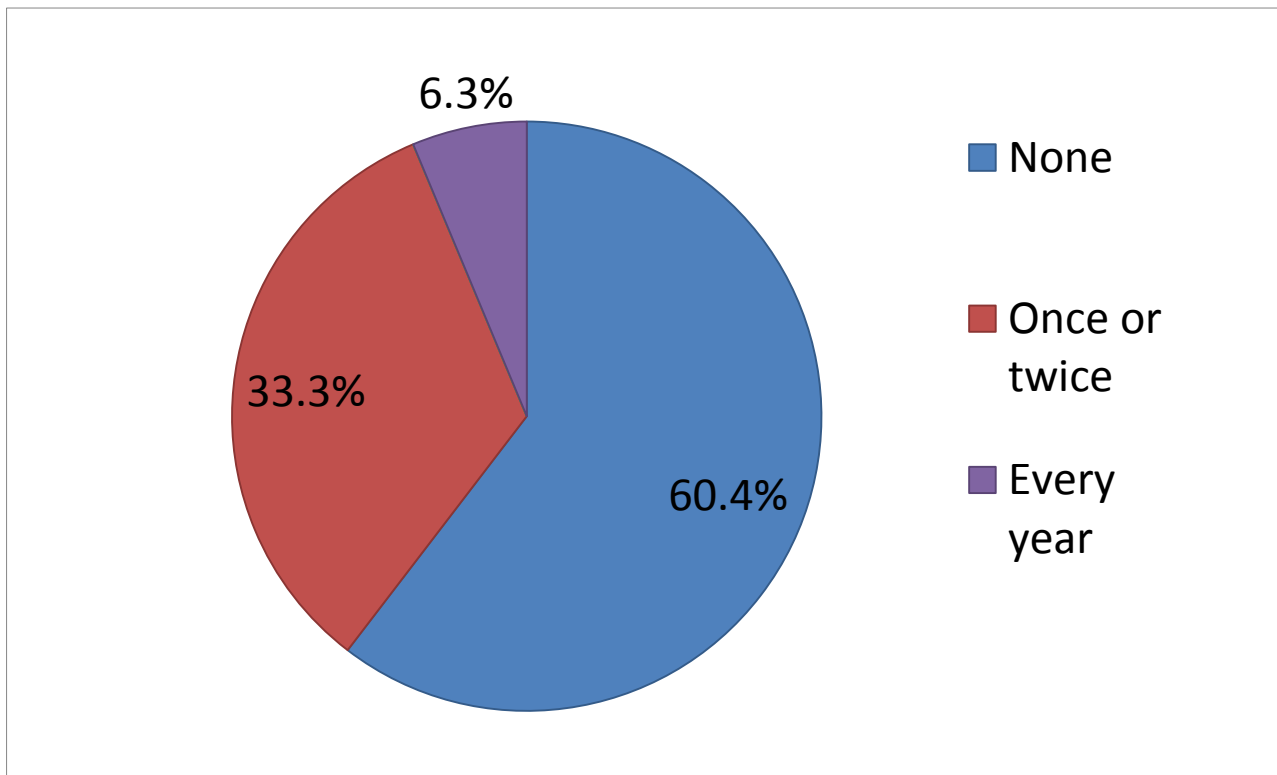
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# 'WATERR' Project Irrigation Business Reviews



## Impact of Limited Water Availability on Irrigator Businesses in Past 5 Years – Kent Irrigators





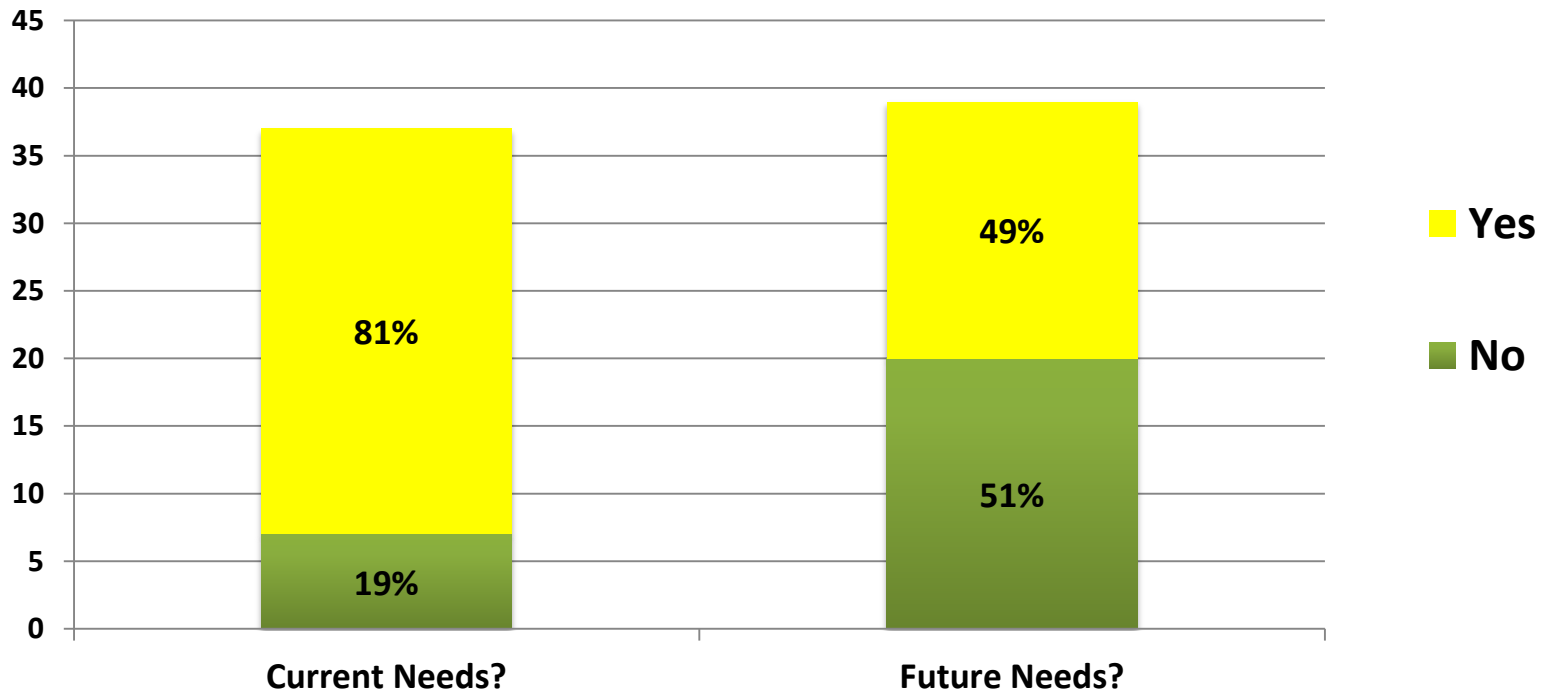
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## Adequacy of Abstraction Licence for Current & Future Needs Kent Irrigators





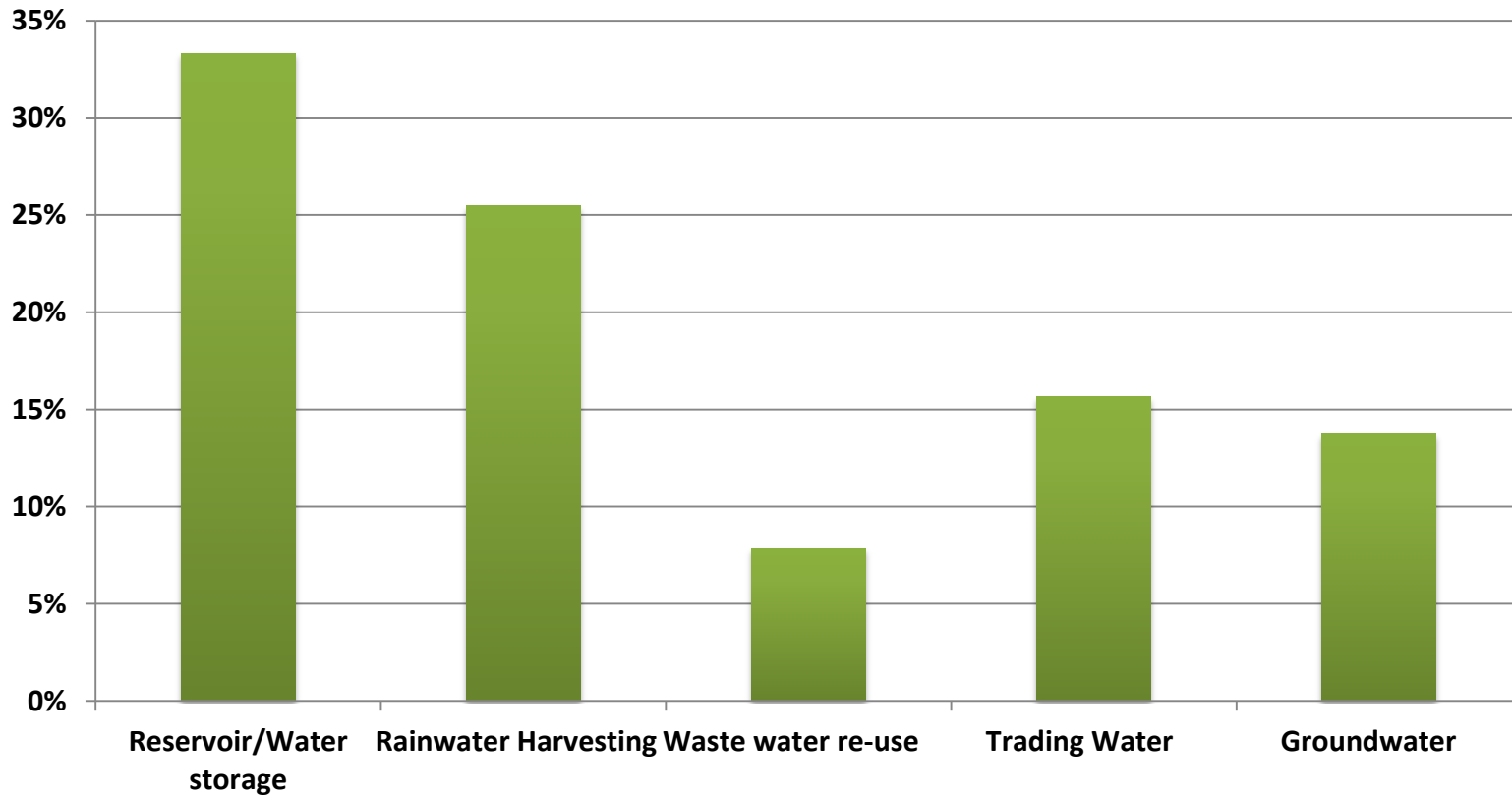
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## Kent Irrigators : Plans to Increase Water Availability (%)





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## Irrigation Business Reviews



### **Kent IBR Responses : Water Availability - Issues and outlook**

- Availability restrictions impacted nearly 40% of growers over the last 5 years , and licensed volumes not sufficient for future requirements for most growers.
- Abstraction Reform a major concern : if future licenses are not fixed / for limited periods only, future investment decisions very difficult
- Trickle irrigators v. concerned at lack of info. on removal of exemption
- Irrigation water use increasing and most growers planning to increase capacity : reservoirs , rainwater harvesting and new boreholes
- Many growers using mains supply to top up supply during droughts (10 – 15% ) but expensive and looking to avoid by increasing capacity
- EA and Planners constraining new reservoir construction : typically takes 18 to 24 months for approval
- Water trading not used, but number of growers acquiring / plan to acquire licenses from neighbouring farms .



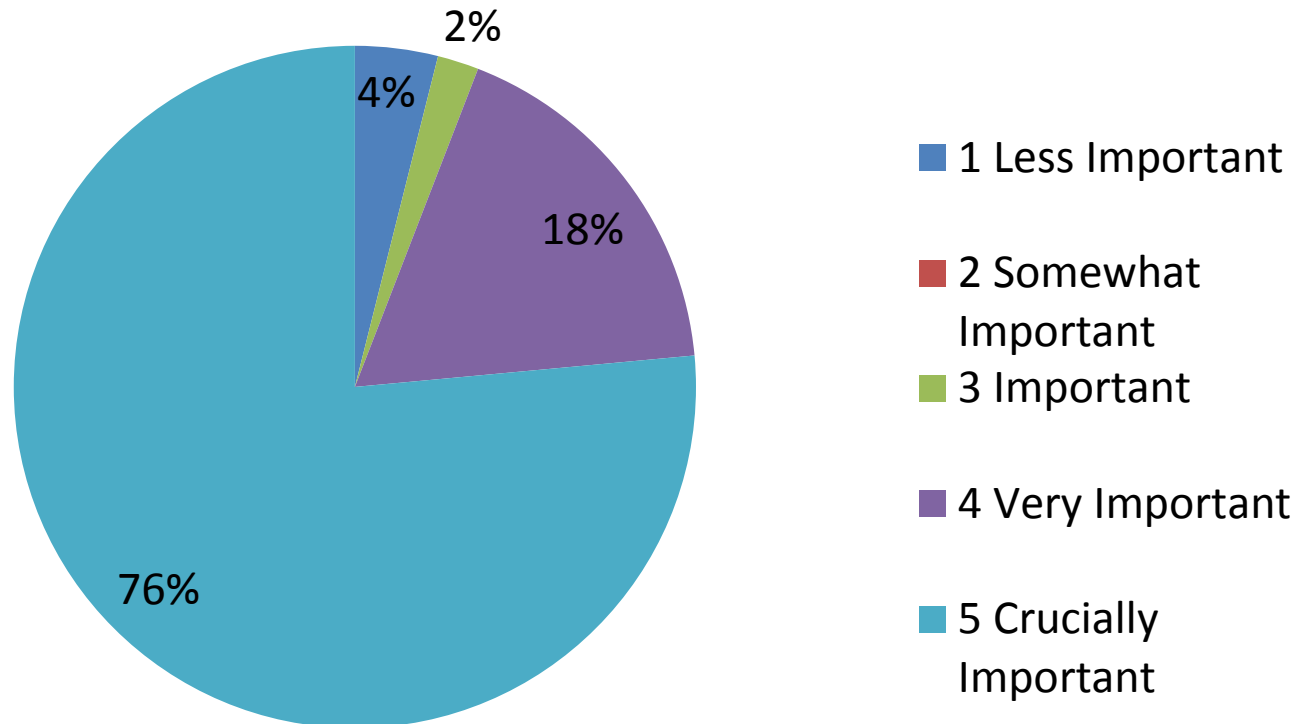
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## Importance of Irrigation to Business Performance Kent Irrigators





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## Irrigation Business Reviews



### Irrigator Performance Summary - Water Use Efficiency : 2011–13

|                       | Water Applied  |                    | Crop Yields         |                | Irrigation Productivity |                       |
|-----------------------|----------------|--------------------|---------------------|----------------|-------------------------|-----------------------|
|                       | (M3 / Hectare) |                    | (Tonnes / Hectare.) |                | (M3 /Tonne )            |                       |
|                       | Average        | Range              | Average             | Range          | Average                 | Top v Bottom Quartile |
| <b>Potatoes</b>       | <b>886</b>     | <b>115 - 1,775</b> | <b>41</b>           | <b>20 - 56</b> | <b>22</b>               | <b>12 - 34</b>        |
| <b>Strawberries :</b> |                |                    |                     |                |                         |                       |
| - Field               | 1,437          | 244 - 2,400        | 19                  | 5 - 34         | 79                      | 58 - 99               |
| - Substrate           | 2,495          | 1,275 - 3,942      | 32                  | 18 - 45        | 82                      | 49 - 108              |
| <b>Raspberries:</b>   |                |                    |                     |                |                         |                       |
| - Field               | 1,080          | 543 - 1,523        | 10                  | 7 - 17         | 114                     | 87 - 134              |
| - Substrate           | 1,509          | 650 - 2,600        | 13                  | 10 - 20        | 111                     | 43 - 166              |
| <b>Apples / Pears</b> | <b>197</b>     | <b>22 – 860</b>    | <b>25</b>           | <b>13 - 40</b> | <b>7</b>                | <b>3 - 14</b>         |





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# 'WATERR' Project

## Irrigation Business Reviews



### Irrigator Performance Summary - Financial Returns : 2011–13

£ per Hectare

**Irrigation Cost      Gross Proceeds      Net Financial Benefit (Est.)**

**% of Proceeds**

|                       |              |                |                |            |
|-----------------------|--------------|----------------|----------------|------------|
| <b>Potatoes</b>       | <b>791</b>   | <b>8,084</b>   | <b>3,904</b>   | <b>48%</b> |
| <b>Strawberries :</b> |              |                |                |            |
| <b>- Field</b>        | <b>1,024</b> | <b>74,371</b>  | <b>31,368</b>  | <b>42%</b> |
| <b>- Substrate</b>    | <b>2,867</b> | <b>106,383</b> | <b>103,516</b> | <b>97%</b> |
| <b>Raspberries:</b>   |              |                |                |            |
| <b>- Field</b>        | <b>1,138</b> | <b>66,464</b>  | <b>51,291</b>  | <b>77%</b> |
| <b>- Substrate</b>    | <b>2,527</b> | <b>74,091</b>  | <b>71,564</b>  | <b>97%</b> |
| <b>Apples / Pears</b> | <b>327</b>   | <b>15,334</b>  | <b>2,257</b>   | <b>15%</b> |

# 'WATERR' Project

## Irrigation Business Reviews

### **Kent IBR Responses : Best Practice / New Technology Uptake**

- Larger growers using most of the Best Practice activities identified in the IBR and most were ranked Important or Very Important
- Soil moisture monitoring to improve scheduling seen as key to optimisation, but most growers feel it is an area for improvement
- Supermarkets/processors/POs conducting irrigation research and expect growers to optimise to improve produce quality / consistency / shelf life
- Water quality also important for soft fruit / salad producers : river pollutants a problem and most having to treat
- New technologies / practices: precision irrigation scheduling (soil and substrate) , transient stress techniques, digital / thermal imaging to monitor crop status , integrated grower decision making support systems, new substrates, drought tolerant varieties, waste water recycling,



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# 'WATERR' Project

## Irrigation Business Reviews



### IBR Responses : Irrigation Advice and Support Needs

- More information is needed on planned changes to the Abstraction Licensing system , particularly concerning removal of the trickle exemption.
- Given the increasing complexity of irrigation operations , more staff training is needed but there is a lack of suitable courses
- Many growers mentioned the need for more crop specific information / advice and the need for local 'on the ground' support
- In the absence of government support, many growers use equipment and service providers for advice, but more integrated support is needed
- Many growers work closely with research organisations such as EMR , but there is a need to translate this knowledge into practical, commercial use

# 'WATERR' Project

## Irrigation Business Reviews

## Irrigator Support Needs / Priorities

### Ranking / % of Irrigators Rating Important or Very Important

1. Learning from the experiences of other irrigators ( 77%)
2. Learning about planned changes to Abstraction Licensing System (72%)
3. Understanding which technologies/ techniques have the most impact on irrigation water use efficiency and financial returns (67%)
4. Visits to sites which demonstrate irrigation Best Practice ( 67%)
5. Understanding how own water use efficiency compares with other abstractors (58%)
6. Direct 1:1 support from irrigation specialists ( 58%)
7. Collaborative opportunities to improve catchment management and water demand / supply balance (52%)

## Workshops

### Water Availability :

- ◆ Abstraction Licensing Reform ( Defra / EA engagement )
- ◆ Collaborative opportunities to improve catchment water availability/ management including growers, EA, KCC ( September 2015)
- ◆ Options to access untreated water supplies from Southern and South East Water

### Irrigation Use Efficiency

- ◆ Crop specific workshops covering: potatoes, top fruit (Apples/Pears and cherries), soft fruit ( strawberries and raspberries) , and hardy nursery stock (June to September 2015)
- ◆ Findings from IBRs / Best Practice impact and information on leading edge technologies from EMR / Suppliers ( integrated decision making tools, moisture monitoring, precision irrigation / added value ).



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# 'WATERR' Project Planned Support Programme



## Best Practice Demonstrations

- See leading edge technologies / Best Practice techniques in commercial use  
(June to Sept 2015)



## Specialist Advice

- 1:1 support from EMR specialists
- Workshops / Demonstrations to include leading technology suppliers and water management advisers



## Best Practice Dissemination

- Case Studies , Fact sheets , and Guides





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# 'WATERR' Project Planned Support Programme



## Future Plans – New Project Proposal

### UK Centre for Water Efficient Technologies at EMR Objectives

Bring together leading irrigation researchers, equipment and services providers at EMR to:

- Research, develop and commercialise an integrated portfolio of technologies and systems for the tree and soft fruit sector
- Deliver a step change in irrigation water use efficiency, productivity and financial returns .
- Promote business growth throughout the supply chain





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# Proposal : EMR Centre for Water Efficient Technologies



## Case For Action : 'WATERR' Project Findings

In depth interviews with over 100 South East irrigators :

- Irrigation is critical for food production and business performance:
  - 75% rank irrigation as 'Crucially Important' to their business
  - Field Irrigation typically delivers 30% increase in yields and similar improvement in quality / prices
- 2 to 3 fold difference in grower water use efficiency/productivity
- Shortage of local advice : growers need crop specific, 'hands on' advice on more efficient technologies for the fruit sector.
- Equipment suppliers a key source of information but equipment often not compatible and integrated / total system support needed.
- Research organisations need to focus more on translating new technologies into commercial use





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# Proposal : EMR Centre for Water Efficient Technologies



## Case For Action : Irrigation Supply Company Research

KCC 'Fusion' Project research: opportunities for development in Kent

- Sector consists of mainly small, specialist companies covering diverse irrigation technologies and systems
- Most suppliers are located outside of Kent
  - Only 22 of 100 companies identified are currently in Kent
  - Fruit sector important, but not as large as East Anglian field vegetable market and suppliers lack size for local representation
- Suppliers have technologies to significantly improve water use efficiency and irrigation performance but commercialisation requires:
  - Direct grower engagement: 'research extension, training and support'
  - Collaboration and 'integration through the supply chain'



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# Proposal : EMR Centre for Water Efficient Technologies



## Project Strategy

- Create an Irrigation Centre with the research, development and commercialisation infrastructure and critical mass required for suppliers to locate in Kent
- Engage directly with growers, Producer Organisations and Retailers to ensure technologies developed meet the needs of the horticultural fruit sector / supply chain
- Develop integrated / compatible products and systems
- Support commercialisation by raising awareness of the commercial benefits of improved water use through grower trials, crop specific workshops, demonstrations, training and 1: 1 support .



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# Proposal : EMR Centre for Water Efficient Technologies



## Project Outputs

### Resource Efficiency / Environment

- **Significant improvements in irrigation water use efficiency**
- **Improved water efficiency = less pressure on river catchments/ water resources and associated habitats**

### Business Growth

- **Leading edge irrigation technologies and systems developed and commercialised for Kent's tree and soft fruit industry**
- **New irrigation businesses located at EMR and jobs created**
- **Improved irrigator water productivity , yields , produce quality and commercial returns**