

ERDF WATERR project



WATERR launch event

The 'Water Advisory Team for Efficient Resource Recovery' or 'WATERR' project was launched in January, at an event entitled "The future for water for the irrigation industry".

The project supports South East growers, and other high irrigation use businesses such as golf courses and nurseries, to enhance their profitability and competitiveness by improving their water availability and irrigation use efficiency. It aims to provide direct support to at least 125 businesses, representing over 20% of licensed irrigators in the region, with the target of achieving at least a 10% improvement in their irrigation water use efficiency.

Each participating business will receive an in depth 'Irrigation Business Review' Interview (IBR) to define their current irrigation water use performance, identify improvement opportunities and confirm project support priorities.

Based on these findings, the support programme will be rolled out in the period through to June 2015. This will include 1:1 support from specialist advisers and researchers, visits to 'Best Practice' demonstration sites and a series of 10 workshops designed to support growers to improve their water availability and irrigation use efficiency.

Results from initial research confirms that irrigators are keen to be involved in the project and that the proposed areas of support are important to their business. In particular the project will enable participating irrigators to:

- Understand how their own irrigation water use efficiency (WUE) compares with other irrigators within their own sector
- Receive information and guidance on which irrigation technologies and techniques have the greatest impact on WUE and financial returns
- Have a better understanding of the water supply / demand balance within their own catchment / region and how abstraction management might be improved to make more irrigation water available

- Learn about planned changes to the abstraction licensing system and have the opportunity to provide input to those involved in advising on the new legislation
- Receive advice on how to improve their own water availability, such as creating water storage reservoirs and rainwater harvesting
- Understand the latest developments in irrigation technologies and techniques from leading edge suppliers of irrigation equipment and water management services
- Learn from the experiences of other irrigators, including those in other sectors

The project is led by EMR with support from the Environment Agency and Kent County Council.

Paul Dracott, Project Manager: paul.dracott@emr.ac.uk
Mobile: 07597 104088

This project is part funded by the European Regional Development Fund (ERDF) as part of the South East ERDF Competitiveness Programme 2007-2013.



WANTED ALIVE!



10,000 gooseberry sawfly caterpillars

Michelle Fountain is seeking the help of growers and gardeners to find 10,000 live sawfly caterpillars feeding on gooseberry plants.

The caterpillars, which are pale green with distinctive black heads and rows of black spots are urgently required as part of a research project to identify their sex pheromone, to develop a monitoring trap.

Please pick them with leaves and pack them in a crush proof box with an air hole and some dry tissue paper and post to:

Dr Michelle Fountain
East Malling Research, New Road
East Malling, Kent, ME19 6BJ

For further information, please contact Michelle Fountain at michelle.fountain@emr.ac.uk or 01732 523749.

David Hilton Memorial Award

Dr Angela Berrie has been awarded the prestigious David Hilton Memorial Award for "services to the fruit industry in Kent and beyond". The award was presented by East Kent Fruit Society President, Simon Brice. It is an annual presentation set up in the name of fruit grower David Hilton who dedicated so much of his personal time to assist the fortunes of growers in East Kent. Previous recipients have included growers, managers, advisors, research scientists, technologists, lecturers and others from key industry roles.



Prestigious placement for EMR Chef

Our chef manager, Will Grint, has had a month's placement at the famous Fat Duck Restaurant in Berkshire, owned by Heston Blumenthal. Will competed against many other chefs to earn this prestigious work placement.



First winners of EMR-sponsored awards

Three Kent-based fruit growers have become winners of a new category, "Garden of England Champion Cherry and Soft Fruit" sponsored by EMR, at The Taste of Kent Awards.

- Cherries - Elverton Farms, Faversham for their Merchant variety
- Strawberries - Langdon Manor Farm, Faversham for their Jubilee variety
- Raspberries - Newmafruit, Chartham, Canterbury for their Glen Ample variety

The awards were presented by EMR Chief Executive, Prof. Peter Gregory, who commented "Fruit production is very much a high-tech part of British agriculture, with management and attention to detail needed to cover everything from varietal choice and the efficient use of nutrients through to looking after the fruit once it's been harvested. All three winners have excelled in delivering what the consumer wants."



VEGEDURABLE 2



VegeDurable 2 is a collaborative EU-Interreg funded project between EMR and partners in Kent, Lower Normandy and Brittany, which aims to improve production practices for crops in the region. This includes reducing inputs of fertilisers, pesticides and natural resources, such as water, without impacting the competitiveness of the growers.

As part of this project, EMR is concentrating on improving and optimising water and nutrient use and developing sustainable pest and pathogen control strategies, focusing on lettuce, leek and strawberry crops.

In lettuce, we have established the parameters for developing production methods that improve water use efficiency, and derived irrigation set points for pot grown and field grown lettuce. Different irrigation regimes are now being tested in the field, and physiological parameters such as stomatal conductance and photosynthesis along with plant fresh weight at harvest and rate of degradation during shelf-life are being used to develop guidelines for optimising water use efficiency so that marketable yield is not affected.

Arbuscular mycorrhizal fungi (AMF) have been shown to increase plant tolerance to water stress and also improve nutrient uptake in some crops. Within this project we demonstrated that water use efficiency and nutrient uptake were increased in strawberry plants when AMF were incorporated into the coir bags. The effect of AMF use on lettuce is currently under investigation.

SCIENCE

Enhancing biocontrol of soil-borne diseases and soil dwelling pests

Fungal biocontrol agents (BCAs) such as *Trichoderma* species have been used to suppress diseases caused by soil-borne pathogens such as *Sclerotium cepivorum* causing white rot in onions. Similarly, BCAs termed entomopathogenic fungi (EPF) have been used against a range of soil dwelling pests such as larvae of vine weevil (*Otiorhynchus sulcatus*).

The main problem in obtaining effective disease or pest control has been the development of a cheap delivery method that can achieve and maintain sufficiently high inoculum levels of BCAs, in root zone soil or growing media.

BCAs are conventionally produced in sterile media containing various carbon and nitrogen sources, so there is no competition with other fungi that may be present on unsterilised substrates. The volume cost of BCA inocula produced on sterile substrates is typically $\times 10^4$ greater than the volume cost of growing media, which restricts the economic application rate of BCAs in growing media or soil.

Several fungal BCAs have the capacity not only to parasitise their pathogen or pest hosts, but also to colonise suitable organic matter saprophytically. Applying BCAs in a low cost organic carrier material could potentially lead to



Metarhizium spores



White rot

high and sustained soil populations and effective disease or pest control. Green waste compost (GWC) is an abundant source of carbon-rich organic matter, a potential nutrient source for *Trichoderma* species and similar fungal BCAs. Spent mushroom compost (SMC) and brewery yeast waste are widely available sources of fungal chitin, the same structural material of insect cuticle, and therefore a potential nutrient source for EPF.

The aim of research at EMR has been to investigate the effect of co-application of BCAs and organic amendments on the subsequent population of BCAs in soil or growing media, and their potential for sustained levels of soil-borne disease and soil dwelling pest control.

An outline of the experiments conducted, can be found in an extended article on the EMR website.

It was concluded that amending soils or growing media with a combination of BCAs and organic carrier materials has the potential to increase the initial population of BCAs and their subsequent survival, resulting in improved disease or pest control over BCAs used in isolation. Disease and pest control in the field needs to be tested on a range of pathogen infected or pest infested soil types. Potted plant experiments are needed to validate the results of the laboratory EPF bioassays on pest populations.

Ralph Noble, Jean Fitzgerald, Andreja Dubrovic-Pennington
Projects funded by Defra, HDC, Horticulture LINK

Within the frame of developing sustainable pest and pathogen control strategies we are assessing whether plants under water stress are more or less susceptible to damage by pests. Pests feeding on plants cause the plants to produce volatiles that can be used by predators to find their prey. We aim to determine if plants under water stress produce the same or different volatiles to those produced when the plant is under attack by pests as this may affect the development of biocontrol strategies.

We have also studied the fungal population structure of leek rust in relation to host plant genotypes. Results showed that there are significant differences between groups of rust lesions sampled from different cultivars. This host-related difference in fungal populations suggested the possibility of using cultivar mixtures to reduce rust development in the crop. Preliminary field results showed that rust development in mixtures of leek cultivars was reduced by 20-40%, compared to monocultures of susceptible cultivars. Large scale experiments are needed to confirm these findings.

Mike Davies, Jean Fitzgerald, Xiangming Xu



Chief Executive's Update

Last July the government chose EMR as the location to release their AgriTech Strategy – a

series of actions designed to strengthen the UK's agricultural and horticultural businesses leading to a world-class, innovative industry. Since then EMR has been playing a full part in contributing to the strategy, and partnering businesses that value the research and science that we can bring to them.

Firstly, we have been part of two winning teams that secured funds from the "Catalyst Fund" to develop innovative products, and we have recently been successful in the second round of the competition with five bids that have now been invited to progress to full proposals. We are very proud of our record in securing these private/public partnership bids and EMR is a leader in this area of research bidding.

Secondly, we have been working with the Horticulture Innovation Partnership (HIP) and British Growers in the development of a proposal for an "Innovation Centre" for Fresh and Prepared Produce. This was the second major funding element of the government's strategy and we were

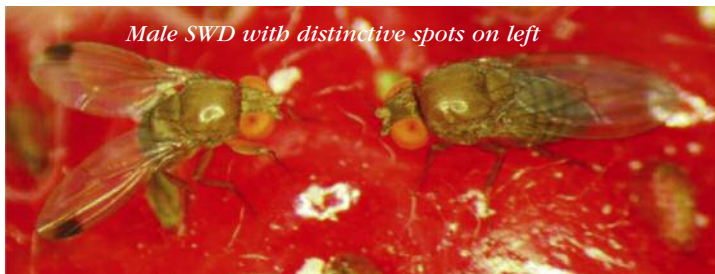
determined that at least some element of the £90 million available should come to our business sector. Industries making up this industry (including fruit, flowers, vegetables, mushrooms, herbs and potatoes) have responded enthusiastically to the HIP's initiative and we now have a good indication of the industry's requirements from such a Centre. A recent meeting with potential research providers and consultancy and advisory companies resulted in good engagement and, in the next few weeks, we shall be engaged in drafting a bid to the government for funding. There is still a long way to go in winning funding, but I think that all involved can be proud of the purposeful way in which this project has been approached.

Fruit Focus takes place at EMR every July and is another occasion on which the innovation essential to modern fruit growing enterprises can be demonstrated to a wider audience. I have had the privilege of visiting several growers through visits with the East Kent Fruit Society and always return from them enthused by the commitment of the individuals in this industry and their openness to share their good ideas with their colleagues. I know that our staff at EMR have learned much from these visits and that it is now informing our future research activities. So thank you to you for assisting us to raise our game and I hope to see some of you at the East Kent Fruit Society's visit to EMR on 11 November this year.

Prof. Peter J. Gregory

UPDATE

Early monitoring and action throughout soft fruit season urged for SWD



The Spotted Wing Drosophila (SWD) Research and Monitoring Programme, led by EMR and the James Hutton Institute (JHI), has shown that whilst very small numbers have been found in commercial cropping areas, greater numbers were trapped in woodland and hedgerows recently and, therefore, growers should start monitoring for SWD early. SWD could be more prevalent this season due to the mild winter and early spring.

The application of good hygiene practices, coupled with appropriate control treatments, have prevented the non-native fruit fly from increasing to a level, where it poses any threat to the quality of the fruit.

The most effective way to control SWD is weekly monitoring using 'Dros-Attract' bait in 'Droso' traps, combined with approved controls and appropriate management of non-marketable fruit waste.

The programme aims to increase understanding of SWD's behaviour under UK conditions and help growers manage the fly as effectively as possible. In 2014, research will continue to monitor SWD behaviour, seek to optimise fruit disposal and sampling methods, and conduct more control trials to build on the options available to growers.

For more information, visit www.hdc.org.uk/swd. The SWD Research and Monitoring Programme is jointly funded by British Summer Fruits, Defra, the East Malling Trust, the Horticulture Development Company and the Worshipful Company of Fruiteers.

Website relaunched

EMR's website was relaunched in February, with a new, uncomplicated design that makes it easier for collaborators and customers to learn about EMR's world class science, scientists and services. Find us at www.emr.ac.uk



Dr Antje Kunert



Antje commenced employment with East Malling Services in April, in the role of Project Coordinator. Antje provides essential support to coordinate a technical team under the direction of a programme manager or technical lead in the winning and delivering of projects.

Following a degree in Agricultural Sciences, Antje specialised in plant breeding and biotechnology. After her PhD, she took a postdoctoral position at the Technische Universität, München, before moving on to the Bavarian State Research Centre for Agriculture, Friesing, Germany. Most recently she has worked as a Research Scientist at Cropmark Seeds in Christchurch, New Zealand.

previously held positions as a Senior Laboratory Technician at the Severn Trent Laboratories, and as a Research Technician at the University of Warwick.

Dr Bo Li



Bo commenced his employment with EMR in June, as a Bioinformatician. Bo holds a BSc in optics and electrical engineering (Beihang University, Beijing, China), an MSc in digital signal and image processing (Cranfield University) and he recently completed a PhD in hyperspectral imaging (Teeside University). While at Teeside University, Bo also held the position of Research Associate applying hyperspectral imaging and machine learning techniques to identifying and estimating the age of blood stains.

IOBC Working Group Integrated Control of Plant-Feeding Mites, Cyprus. Sept 9-13, 2013

The meeting focused on the use of predatory mites and in particular how to



enhance the local environment to encourage and increase numbers in different crops. Discussions included encouraging natural flora between rows of orchard trees to increase available pollen and alternative prey for predators; rootstock effects on defensive hormones through feeding activity by leaf feeding mites; the need for predatory mites from culture to adapt over a period of time and the learning ability of predatory mites. Attention was also given to sampling, assessment and culture of predatory mites and pesticide resistance in cultures produced by different suppliers.

Michelle Fountain

Sponsored by Worshipful Company of Fruiterers



Dr Charlotte Nellist

Charlotte commenced employment with EMR in June, as a Plant Molecular Biologist/Pathologist.

Charlotte holds a BSc in Bioscience (University of Leeds), an MSc in Plant Bioscience for Crop Production (University of Warwick) and a PhD in Plant and Environmental Sciences (University of Warwick) where she studied 'the deployment and mechanism of broad-spectrum resistance to turnip mosaic virus in *Brassica rapa*'. She has

Dr Helen Cockerton



In June, Helen took the position of Molecular Plant Breeder. Helen holds a PhD in Plant and Environmental Sciences (University of Warwick) and a Biology BSc (Hons) (University of York). Her PhD focused on mechanisms of herbicide resistance in weeds, specifically resistance to glyphosate. It included seven months working at Syngenta where she gained experience across three disciplines: plant science, molecular biology and biokinetics.

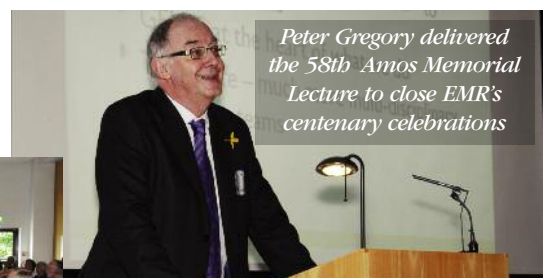
Diary Dates 2014

- 23 Jul. Fruit Focus
- 21 Sept. Bradbourne House Open Day
- 15-16 Oct. National Fruit Show, Detling
- 11 Nov. East Kent Fruit Society visit to EMR
- 20 Nov. EMRA/HDC Soft Fruit Day

EVENTS & VISITS



Representatives of Co-op Farms (left). Michelle Fountain talks to Sevenoaks U3A (below)



Peter Gregory delivered the 58th Amos Memorial Lecture to close EMR's centenary celebrations



EMR's team of cyclists relax following the London to Brighton cycle ride. The team raised a fantastic £2489 for the British Heart Foundation (below)



University of Kent, Canterbury (left). Hadlow Rural Community School (right)



For further information, please contact:
Tel: 01732 843833, Fax: 01732 849067, Email: enquiries@emr.ac.uk