

Strawberry growers could save £millions in reduced water and fertiliser costs

reports Brian Lovelidge

If the results of the five-year Hort LINK project on improving water use efficiency could be reproduced by growers they would save many £millions worth of water and fertiliser and improve their fruit quality too.

The big problem is how to persuade them to adopt the approach that EMR's Dr Mark Else and his colleagues have developed that basically entails irrigating when the soil is much drier than is conventional.

That question was posed at an HDC-organised demonstration on Andrew Chesson's Manor Farm, Ightham, Kent in June where Dr Else's regime is being compared for the second year running with that of the grower. The regime is also being trialled this year by the Hall Hunter Partnership, New Farm Produce and R and J.M. Place. Demonstrations for local growers were also held on the latter two growers' farms.

HDC communications manager Scott Raffle said that, now the project is ending, the matter of how its findings can be adopted across the industry has to be addressed. The consortium supporting the project, which includes EMR, EM Limited, Earthcare, BerryWorld, Berry Gardens, South East Water, M&S, Waitrose, HDC, Defra, Soil Moisture Sense and



EMR's Dr Mark Else, whose work has shown that growers are using far too much water.

LINK Collaborative Research, needs to discuss how to commercialise the findings.

However, Berry Gardens' Richard Harnden reckoned that the research results "are not something that can be transferred without careful thought", particularly since growers use a range of irrigation systems. As a result it needed a staged approach. He considered that the savings available to growers utilising the research findings "are terrific".

The savings achieved in the development trials at EMR were more or less repeated at Manor Farm last year with main season Elsanta, when the experimental irrigation system was compared with

Chesson's own regime.

"Our yield of class I fruit was slightly higher than Andrew's and the Brix level much the same, but the firmness of our primary fruit was 50% better," maintained Dr Else. "By the end of the season we had saved about 40% of the water and 30-35% of the fertiliser, so it was a very successful first year. This year we have continued our work here and moved it to three other farm sites on different soil types."

Dr Martin Wood of Earthcare Technical, who has been working on the project with Dr Else and Soil Moisture Sense's Peter White, explained that the scheduling of irrigation in the trial is based on soil

wetness. Early on this was measured with a capacitance type of probe that produced volumetric water content readings. Two years ago, however, a new type of Decagon sensor became available that measures how tightly moisture is held in the soil or "how hard the plant has to suck to get the water out". This device has the advantages of being very easy to use and giving accurate readings across all soil types.

In the trial five of these sensors per bed in each tunnel were buried 30cm deep in the beds and the readings recorded by loggers with telemetry and the data recorded three times a day.



Dr Martin Wood of Earthcare Technical holds a sample of soil from one of the trial's beds.

Earlier work at EMR had determined how dry the soil can become without impairing crop performance and, based on this, "we advise Andrew and the others when to irrigate the trial tunnels". The growers use their own irrigation regimes in the control tunnels. Another type of sensor buried in the beds registers irrigation events.

Dr Else added: "We dry the soil down and if we go too far we start to impair fruit quality and if we go further the plants start to wilt.

Obviously we don't want to do this. We can tell when the plant is beginning to suffer by looking at the stomata that start to close when the soil gets too dry. Also leaf length is a very sensitive indicator of how dry the soil is. We're also interested in the photosynthetic rate because photosynthesis produces sugars and flavour compounds."

After the first five weeks or so of this season's Chesson trial with Cordelia, the plants receiving the two irrigation regimes (his and Dr Else's) had performed more or less identically, although the leaves of the water-restricted plants in the trial tunnels were just beginning to suffer reduced growth. However, this was affordable because it was not affecting overall photosynthetic capacity, said Dr Else. The big difference was that at the halfway stage the trial tunnels had received 32% less water than Chesson's.

At this point there was quite a marked difference in the feel and appearance of soil from the beds receiving the two regimes. Dr Wood estimated that the trial regime soil contained some



The soil dibber that Andrew Chesson is using here will probably be obsolete next year.

17% moisture and Chesson's 22%, the former being dry enough to require irrigating.

All of the growers attending the event considered that the soil from the trial beds was too dry

and they would not have allowed their soil to reach that stage. That would have resulted in excessive water and fertiliser use. "What we want to get across is that, although the perception is that the soil is too dry, the



Soil samples from trial and control beds showed a marked difference in moisture content and appearance. The fine soil is the drier of the two.

Discover the benefits of homegrown recycling

We recycle waste horticultural films at our UK facilities to create recycled products with a lower carbon footprint.

If you have waste horticultural film to dispose of, call 01685 846 155 or email recycle@bpipoly.com

bpi.recycled products www.bpipoly.com





The Decagon soil moisture sensor that Andrew Chesson hopes to be using next year.

plant notices no difference at all," asserted Dr Else.

Chesson admitted: "Most growers tend to overwater on a precautionary basis and we are guilty of doing the same thing. But if you are feeding to an EC [as virtually all growers do] the more water you apply the more feed you use. So if you can save say 20% of the water you're looking at a 20% saving in your feed bill and that's pretty substantial."

What he has learned from Dr Else's work is that everyone can run their crops a bit drier to advantage, he affirms. Yet, if they could feel the soil at the moisture content recommended by Dr Else, most growers would say that it's too dry.

Chesson, who grows 14ha of strawberries including 4ha on substrate - half on tabletops and half on Mypex-covered beds, is impressed by the trial's 2010 results in terms of water and fertiliser savings, although there was little or no difference in the yield, fruit size and quality of the trial and control fruit.

He said that he would be happy to adopt the EMR system commercially next

year. This will mean using a continuous soil moisture monitoring system so that he knows "exactly what's going on everywhere in the field all the time". The soil would also need to be of uniform quality across the field.

Manor Farm's irrigation system involves a man going round once a week taking soil samples from the beds in each block with a dibber. Based on the feel of the samples Chesson assesses how moist they are on a scale of one to 10, five being



One of the tunnels of Cordelia that's involved in the trial at Manor Farm.

ideal. Anything below five requires irrigating. "This is very rough and ready method," he said. "I like the new Decagon sensor and next year I think I will use it."

His main variety is Elsanta plus small areas of Elegance, Finesse, Cordelia, Caramillo and Amesti. All are grown under polytunnels apart from Elegance, the first of which he planted in early May. This is said to have very good rain tolerance "and so we thought we

would try it in the open".

The farm's water supply comes from a borehole drilled in 1976 and enlarged a year later. The flow has always been sufficient for Chesson's needs, even in drought years, although until now no drought has been as severe as 1976's. "It's not dried up yet and generally its water level recovers very quickly," he said. "The water is quite hard [pH 7.4] and so we have to acidify it for our substrate crops." ◆

TUNNEL MACHINERY

Hoop Transporters, Leg Insertion Tools,
Polythene Retrieval Machines, Hydraulic Tray
Carriers, Screw Anchors ... **Everything** you need
for cost-effective Tunnel Growing
of soft fruit.



HOP ENGINEERING (KENT) LTD

AGRICULTURAL & GENERAL ENGINEERS

Top, Soft and Ground Crop Sprayer Engineers

Tel: Maidstone 01622 842516 Fax: 01622 844052

E-mail: hopengeering@btconnect.com



The Oast House, Elderden Farm, Chart Hill Road, Staplehurst, Tonbridge, Kent, TN12 0RW