

UK CONTROLLED ENVIRONMENT USERS' GROUP

MINUTES OF THE 1996 BUSINESS MEETING

The annual meeting of the CE Users' Group was held on Tuesday 10th September 1996 in Badock Hall at the University of Bristol.

The meeting opened at 18.10 hours.

The Chairman L. D. Incoll opened the meeting, welcoming newcomers and explaining the purpose of the meeting.

Apologies were received from Richard Lefevre.

1. **Minutes of Previous Meeting**

The minutes of the 1995 meeting, held at the Warwickshire College of Agriculture, were approved.

2. **Matters Arising**

There were no matters arising from the minutes.

3. **Management, Staffing, Running Costs**

There was no discussion on these subjects.

4. **Maintenance, Servicing, Spares**

I. Pearman - Rothamsted, found chart recorder consumables expensive to procure. There were suggestions that he adapt ball-point or felt-tip pens or that he should invest in modern loggers which print their own charts. A. Nichols - JII, spoke of the variety of supplies available from Labdata Instruments. G. Crowhurst - HRI, Wellesbourne, offered to append to the minutes a list of suppliers used by HRI, while R Wertheim - Procema, offered to send Ian a sample pen.

G Taylor - Sanyo-Gallenkamp, asked about HRI, Wellesbournes' Saxcil upgrades. G. Crowhurst - HRI, Wellesbourne, said that they were happy so far but that the ultrasonic humidification was not yet completed.

C. Jerram - Imperial College at Silwood Park, has for disposal a quantity of Quartz Halide lamps which, after nine months use, would have reduced output but still be usable.

5. **Control Systems**

R. Quiring - Conviron, queried the effective accuracy of environmental sensors with regard to airflow, radiation and other effects. It was noted that R. Randall - Felpham, and G Taylor - Sanyo-Gallenkamp, are in the course of producing design data for a 'standard aspirated screen'.

6. Humidification and Irrigation

John Porter - RVAU, Denmark, asked about the control of vapour pressure deficit (vpd) when temperatures were changed. I. Pearman - Rothamsted, said that although % rh was often used as a control value it was wrong to use it as a variable with relevance to plants. It came out in discussion that, if chambers had no humidity control then it was impossible to set a constant value of vpd, but users should convert their recorded temperature and humidity data to vpd. G Taylor - Sanyo-Gallenkamp, offered to provide charts for temperature/humidity/vpd conversion if wanted and G. Etherington - Jencons, offered to send a brochure to be included with the minutes.

The chairman, pointed out that editors and writers might not always be aware of the monitoring and sampling arrangements which might affect the presentation of data.

J. Franklin - Rothamsted, asked if anyone had experience of Vaisala 50T humidity sensors which had an accuracy of $\pm 3\%$ rh, an output of 0-1 volt and cost around £78 each. R. Quiring - Conviron, said they had started to use them but did not have enough data to report. He was concerned about their reliability above 90% rh.

C. Newell - Axis Genetics, reported that they had experienced problems in setting up automatic irrigation systems in CE due to most products being designed for glasshouse use where some leakage might be acceptable. G. Crowhurst - HRI, Wellesbourne, said HRI were looking at products of Hoselock ASL which might be reasonably engineered and suited to CE applications. The chairman, said that drip systems should be possible but warned that water hardness or nutrient deposits could still cause blockages. H. Brown - AgrEvo UK, uses 'DGT Volumatic' and finds it reliable. R. Quiring - Conviron, said Conviron have used 'Gardena' and P. Henley - Aberystwyth, pointed out that the RS catalogue was a source of many suitable components, including the small bore tube 'Quick Release Connectors'. K. Chivers - Reading, uses systems from LBS.

7. Lighting

I. Pearman - Rothamsted, reported that tri-phosphor tubes were 'spiky' and some were more blue than others and hoped that it was not an ageing effect.

J. Franklin - Rothamsted, was concerned that HQI lamps varied in their spectral output in the blue, green and violet areas. A. Nichols - JII, has had 13/14-year-old Osram (WOTAN) 400W HQI lamps which, although of reduced energy output, were still of constant spectral output. G Taylor - Sanyo-Gallenkamp, suggested that there might be manufacturing variations and that the tolerances might be due to the fact that lamps are mostly manufactured for human visual benefit and not for accurate plant science.

G Crowhurst - HRI, Wellesbourne, reminded users of 'total microclimates' for both flora and fauna that insects, in particular, were often adversely affected by standard mains frequency lighting and should therefore receive artificial light from either DC or high frequency systems.

I. Pearman - Rothamsted, said they had changed to high frequency lighting with an energy saving of approximately 1 kW per cabinet.

H. Brown - AgrEvo UK, asked what might be involved in facilities for trying out and comparing different lighting systems. I. Baker - Vindon Scientific, & G Taylor - Sanyo-Gallenkamp, both offered help.

The chairman, said that users often needed guidance on the quality and the energy levels of their lighting requirements for experiments. R. Quiring - Conviron, reminded users that their lighting installations would inevitably affect their heating and cooling designs. After some discussion it was summarised that, whatever the design, all light is finally heat.

8. Instrumentation, Sensors, Monitoring

J. Franklin - Rothamsted, asked if anyone had experience of the new Vaisala CO₂ analyser as he was concerned about its limitations. R. Quiring - Conviron, said they had started to use them but had not yet sufficient data to be able to comment. I. Baker - Vindon Scientific, said it was a good unit for alarm or similar applications.

There followed some general discussion on uniformity of temperature, humidity and light within CE chambers but with no general conclusions other than that higher specifications cost more to achieve.

9. Heat Reclamation and Energy Management

R. Hughes - Long Ashton, mentioned that they now bought their electricity from the cheapest provider and hoped that everyone else did the same.

10. Fabric, Glazing, Reflective Materials

There was general discussion on the relative merits of various types of plastics and glass with regard for their properties of spectral filtration, thermal insulation and durability without degradation. I. Baker - Vindon Scientific, said various plastics like MAKROLON could be used to pass UV-B. I. Pearman - Rothamsted, said PERSPEX, as used in Saxcil cabinets, was opaque to infra-red. C. Murgatroyd - Newcastle, uses TEFLON for its thermal properties.

11. New Equipment, Recent Advances

The chairman introduced R. Quiring from Conviron in Canada who then spoke at some length on the development of multi-tier rooms and chambers, and, on the subject of sensors, said that M. Dixon of the University of Guelph, Canada, had successfully grafted micro-sensors onto plants for the measurement of temperature, humidity, airflow, CO₂ and ultrasound. He felt that he might, on his return, be able to forward some information. J. Caseley - Long Ashton asked if the multi-tier system was suited to replication.

12. Plant Growth Problems

The chairman, said that there is a Phytotoxicity and Biocompatibility testing service available through Brunel University the details of which are appended below.

13. Safety

I. Baker - Vindon Scientific, asked if everyone was aware that there is now a Health and Safety Executive Guide (HSG70) on the subject of *Legionella*.

14. Treasurers Report

The treasurer, A. Nichols, read his report of 28 August 1996 which revealed a closing balance of £2860.08. It was moved by A. Morgan and seconded by G. Crowhurst both of HRI, Wellesbourne, that this report, subject to audit, be accepted as read. Carried unanimously.

15. Any Other Business: Communications

The meeting was reminded that R. Woodfin - HRI, Wellesbourne, had previously suggested that the e should have a World Wide Web site. The chairman, distributed a large set of topics proposed by R. Woodfin for such a site, and remarked on the potential problems of financing and managing a site. He proposed to prepare a home page and to mount it at Leeds as a "starter". That home page could provide hypertext links to other pages (as required) and sites e.g. to the Web pages of manufacturers of controlled environment rooms and cabinets. The North American controlled environment committee, NCR-101, does not yet have a Web Site. However they do have a listserver (email) established by the headquarters of the ASHS society which is restricted to ASHS members. If any of our members are members of ASHS, then the L. Incoll can supply a contact address.

The chairman also proposed a managed mailing list for exchange of ideas and information. It would be subscribed to by members and based at Leeds. He asked that participants notify him of their e-mail addresses so that he could try out the idea.

16. Date and Place of Next Meeting

It is intended that the next meeting will be held at SCRI Dundee on the 16th and 17th September 1997. Peter Gill would endeavour to provide some travel information for participants. The chairman, suggested that, in view of the healthy state of Group finances, a speaker might be invited from abroad.

The chairman then proposed a vote of thanks to the Long Ashton team for organising the two days' events and also to Bristol University for their accommodation and catering. The chairman also thanked the press-ganged, beer-bribed recorders for their efforts. The recorders announced their retirement from the "job".

The meeting closed at 20.15 hours.

George Crowhurst & Alan Morgan (HRI, Wellesbourne) Recorders
November 25, 1996

Appendix:**1. Phytotoxicity / Biocompatibility Testing Service**

Dr Jane Babb,
Brunei Institute for Bioengineering,
Brunei University, Middlesex UB8 3PH

Tel: 01895-271206
Fax: 01895-274608

LIST OF PARTICIPANTS
UK CONTROLLED ENVIRONMENTAL USERS' GROUP MEETING 1996
AT LONG ASHTON RESEARCH STATION, UNIVERSITY OF BRISTOL

J.R. Aldous	John Innes Centre	C. Jerram,	Centre for Population Biology, Silwood Park
I. Baker	Vindon Scientific	R.N. Lefevre	IACR-Rothamsted
M.R. Balcam	John Innes Centre		
A.C. Bell	Applied Plant Science Division, Department of Agriculture for Northern Ireland	R.A.C. Mitchell	IACR-Rothamsted
		A. Morgan	HRI, Wellesbourne
		C.J. Murgatroyd	University of Newcastle
T.M. Bezemer	Imperial College at Silwood Park	C.A. Newell	Axis Genetics
G. Bignell	Nickerson Biocem	A.C.H. Nichols	John Innes Centre
A.F. Burtenshaw	Sussex University	R.G. Parkinson	IACR-Long Ashton
		I. Pearman	IACR-Rothamsted
K.E. Chivers	University of Reading	J.R. Porter	RVAU, Denmark
D. Cridland	Vaisala (UK)		
A.E. Cross	IIBC, Silwood Park	R. Quiring	Controlled Environments Ltd. Winnipeg, Canada
G.E. Crowhurst	HRI, Wellesbourne		
P. Curtis	John Innes Centre		
G. Etherington	Jencons (Scientific)	R.E. Randall	Bognor Regis, West Sussex,
		M.J. Reay	HRI, Efford
R.S. Farley	Rotronic Instruments	B.M. Roberts	HRI, East Mailing
J. Franklin	IACR-Rothamsted	D.L. Rose	University of Sheffield
V.J. Fordsham	Vindon Scientific		
		K.R. Sawford	IACR-Broom's Barn
P.A. Gill	Scottish Crop Research Institute, Invergowrie	A. Sim	Macaulay Land Use Research Institute
D.J. Gillham	Agrevo UK	P.H. Stratton	Zeneca Agrochemicals
A.R. Glasscock	ITE, Monks Wood		
P.D. Greenslade	ITE, Monks Wood	G.K. Taylor	Sanyo Gallenkamp
J.P. Grime	NERC Unit of Comparative Plant Ecology, Sheffield	A T Trocian	Hitech Instruments
		P R Turner	IACR-Long Ashton
		D E Warne	Axis Genetics Pic
S.E. Hansford	Sheffield University	R.A.P. Wertheim	Procema Ltd.
P.C.F. Henley	University of Wales, Aberystwyth	D. Wildman	Centre for Population Biology, Imperial College at Silwood Park
R.F. Hughes	IACR-Long Ashton		
		A.L. Williams	Sanyo Gallenkamp
L.D. Incoll	University of Leeds	B.J. Wilson	Wye College, Wye