

## UK CONTROLLED ENVIRONMENT USERS' GROUP

### MINUTES OF 2008 ANNUAL GENERAL MEETING

The Annual General Meeting of the Controlled Environment Users' Group was held on Monday 8<sup>th</sup> September at West Park Centre, University of Dundee.

The UK CEUG Chairman, L D Incoll, opened the meeting at 20:20 hrs.

*Present:* L Benjamin, P Brooks, D Clark, A Cookson, R Darby, A De Boever, T Demetriades-Shah, J Franklin, P Gill, F Gilzean, M Grassie, L Hansen, M Hibbert, G Holmes-Henderson, M Hughes, L Incoll (Chairman), K Jansseune, H G Jones, A Morgan, C Nicoll, P Oakely, T Peloe, L Penketh, G Pitkin, S Porter, M Richardson, S Robertson, A Sim, D Skelton, M Stenning, G Taylor, J Theobald, B Trotter, G Waimann

*Apologies:* C. Fryars, E. Fryars, P. Goode, R. Natt, M. Pratt, K. Sawford, C. Tilley

#### **1. Minutes of the previous meeting at Brynamlwg, University of Wales, Aberystwyth, on 11 September 2007.**

The minutes of the previous meeting, which had been distributed to members earlier in the year, were approved unanimously as a true record of the proceedings (proposed G Waimann, Rothamsted Research; seconded G Holmes-Henderson, Syngenta).

#### **2. Matters Arising**

G Taylor (Weiss Gallenkamp) had asked the question as what 'recyclable' meant when related to fluorescent lamps. L Incoll (University of Leeds) had asked E van Echtelt (Philips) but had not received an answer. He will follow it up.

#### **3. Chairman's Report (L Incoll, University of Leeds)**

"The last year has seen much activity in the CEUG. Our North American colleagues (NCERA-101) organised an excellent third international conference on controlled environments on the subject of "Controlled Environment Agriculture" hosted by the Kennedy Space Centre in March to which we sent a 10-member delegation. The ICCEG published its second set of guidelines on "Guidelines for Measuring and Reporting Environmental Parameters for Experiments in Plant Tissue Culture Facilities" at the conference. The project took 4 years and we had members on the ICCEG's Tissue Culture sub-committee including its chairman. This report is being given to the AGM at our second ever 2.5 day workshop, this time on "Water and its measurement in Controlled Environments". Planning is in progress for interesting annual meetings in 2009 and 2010 and for the fourth international conference which we are hosting at Cambridge in 2012. Finally I am pleased to report that recruitment of new members has been higher than usual.

## **Recent Meetings**

### ***1. Aberystwyth 2007***

This meeting was a great success. Fifty six people attended of whom 41 were members. We had an excellent stimulating set of speakers and interesting visits to the CE facilities at the University and the now merged IGER and a memorable conference dinner looking out onto the Irish Sea across Aberystwyth town. Our thanks go particularly to R Darby for the planning and management that led to smooth organisation on the day despite incredibly incompetent conference office support, and for ending up with a significant credit balance, to M Fuller and J Franklin for the scientific programme, to the Financial Sub-committee for help with the trade exhibition and to others too numerous to list here.

### ***2. Florida 2008***

*The delegation:* A second round of applications for travel bursaries was arranged when only 7 out of 10 bursaries could be awarded. In the event, the three second-round awardees and one of the first-round awardees did not attend. Consequently M Fuller was asked to apply, was successful in meeting the criteria for an award and presented a poster on the new Tissue Culture guidelines in place of S. Millam. Three other members attended, L Incoll, G Taylor and A Cookson, making a European delegation of 10 people out of over 150. Regrettably an eleventh CEUG member could not attend the conference as he could not obtain a visa that would have allowed him to visit the Kennedy Space Center (KSC) Life Sciences Laboratory.

*The conference:* Delegates were comfortably accommodated in the Holiday Inn, Cocoa Beach, within walking distance of the Atlantic. Scientific sessions, poster displays and a trade exhibition were held in one of their ballrooms. The chaperoned visit to KSC Life Sciences Laboratory was mind boggling in the breadth of scientific problems associated with space science being investigated and Kennedy Space Center Visitor's Centre and tour of the launch area and assembly building, and especially the Saturn V Exhibition Hall, were awe inspiring. An all-day field tour of the foliage plant industry near to Orlando, which had replaced the citrus industry, was most stimulating. The thrill of a night time shuttle launch was an unexpected bonus. The natural environment around Cape Canaveral was impressive for its inland waterways, its wildlife – birds, dugongs and alligators, and its plants and natural ecosystems. All in all it was an excellent experience with great hospitality which was very well organised by G. Stutte. The bursary awardees did the UK CEUG proud with a set of well presented papers and posters.

### ***3. Dundee 2008***

As this workshop is still in progress, I will only make special mention of the success of P Gill and G Pitkin in encouraging Dundee City Council and Dundee & Angus Convention Bureau to sponsor the meeting. I have to remark also on their patience in coping with the not unexpected great difficulty of dealing with manufacturers' representatives and of the complete lack of consideration of delegates who expected to book for the workshop seven days or less before it started.

## Communications

### 1. 'UK-CEUG' JISCmail List

There has been more activity in the last year with more informative messages from the Executive Committee (28) and more messages from members (25) seeking help by asking questions that in some cases generated significant discussion. Eight subjects were discussed ranging from 'banana plants' to 'control of humidity'.

1. ? Banana Plants – R Natt (1 + 2 responses)
2. ? Light on/off sensors – L Penketh (1 + 1)
3. ? Sugarcane plants – J Franklin (1 + 2)
4. ? Envirolit CFL with reflector – T Pitman (1 + 4)
5. ? Squirrel proofing – D Rose (1 + 3)
6. ? Lighting – J Franklin (1 + 4)
7. ? Lighting – P Morley (1 + 1)
8. ? Control of humidity – L Penketh (1 + 1)
9. Surplus lamps on offer – D Rose (1)
10. Humidification speaker – P Gill (1)
11. News about Workshop – P Gill (3)
12. LSCP – J Franklin (1)
13. Refrigeration reports – G Waimann (4 messages)
14. News – L Incoll (10) and J Franklin (1)
15. News – A Agostino (1)
16. Tissue Culture Guidelines – L Incoll (4 + 3)

You may have noticed that I have adopted 'tinyurls' as a way of disseminating very long URLs (see <http://tinyurl.com>) in email messages. I hope that you find them more helpful than the sometimes very long ones in the past.

### 2. Website

The following existing pages have been modified and three new pages (Items 13, 17 and part of 1) have been added:

- a) Item 1: *About the CEUG*: Information was added about the 2008 international conference in Florida and about the new tissue culture guidelines. In April, J Boccon-Gibod provided a version in French which was added as a new page.
- b) Item 2: *About past and future meetings*: 2008 Dundee meeting announcement updated in May 2008 with the booking form included.
- c) Item 7: *Minutes of the Annual General and Discussion Meetings*: 2007 AGM minutes added on 8/5/08.
- d) Item 8: *Proceedings of the Scientific Meetings*: 2007 Proceedings added on 28/1/08.
- e) Item 13: New page added on 23/1/08 for *Light Sensor Calibration package*
- f) Item 15: *International Committee on Controlled Environment Guidelines*: Page updated on 14/4/08 consequent on publication of *Tissue Culture Guidelines*.
- g) Item 17: New *Tissue Culture Guidelines* page added on 29/1/08 but link to NCERA-101 page is not active yet.

Comments on the web site – its items, its ease of use and suggestions for new pages, are welcome.

## Membership

There has been a greater net increase in membership this year which again conceals a good number of new members offset by a smaller number of resignations, deletions and retirements than last year. We have three new overseas members. The Executive Committee invited E van Echtelt to join specifically to help raise our profile in the Netherlands. The new members from Australia and Belgium resulted from contacts made at the Florida International meeting.

Since September 2007

Category	Number
New members	12
Members resigned or removed	5
Net change	+7
Current total	177
No E-mail contact – <uk-ceug> JISCMail group (no e-mail address or unsubscribed)	5
Attended the 2007 meeting (members only)	41
<i>Overseas recruitment:</i>	
Australia - joined	1
Belgium - joined	1
Canada – joined	1
Germany – joined	
France – joined	
The Netherlands – joined	1
Spain – joined	

The Executive Committee has started an active recruitment campaign under the leadership of M Pratt.

## Publications

### *1. Recruitment poster*

The design of a full-sized recruitment poster for display at scientific meetings other than our own is temporarily stalled because we lack a good high resolution photograph of a large tissue culture facility.

### *2. CE Guidelines for tissue culture facilities*

In late 2007 I had to take over the chairmanship of the International Committee on CE Guidelines (ICCEG's) sub-committee on Tissue Culture Guidelines from S Millam when he moved to a new position at Chichester College. The TC guidelines were completed on schedule and published at the International Conference on Controlled

Environment Agriculture in Florida in March 2008. The ICCEG sub-committee also developed a small poster (A3 size) similar to the small poster that was developed for the 'Minimum Guidelines' for display in CE facilities and a large poster (A0 size) for presentation at scientific meetings. M Fuller presented the large poster at Florida on behalf of the ICCEG. It is now at an international meeting of *Arabidopsis* practitioners at Sutton Bonington. The CEUG plans to distribute copies of the leaflet and the small poster to interested members. Regrettably we are still waiting to receive the printed copies from P Austin in New Zealand.

### **Future Meetings**

Next year our Rothamsted Research colleagues, led by J Franklin, are organising our annual meeting on the subject of "CEs for Containment". M Stenning and the CEUG Executive have started to organise the 2010 annual meeting on the subject of "CEs for conservation: from genotype to ecosystem" hosted by the University of Sussex and with plans to visit the Millennium Seed Bank at Wakehurst Place. I am pleased to report that the Annual Meeting of NCERA-101 and the Australasian Group, ACEWG, agreed to our proposal to hold the fourth international CE conference at Cambridge in September 2012. An international organising committee has been formed from members of the three groups with Colin Denston as the local organiser.

### **Light Sensor Calibration Package (LSCP)**

I regret that this project stalled in the last year and we did not progress from being almost ready to go in September 2009 until the LSCP was advertised for loan on the 30<sup>th</sup> of June this year. The response to that announcement has been unbelievably poor.

Finally I wish to express my gratitude to the Executive Committee members for their continuing support of me and the UK CEUG and in particular to the individuals whose names I have mentioned above and whose involvement in Group affairs will be apparent in the proceedings of the annual general meeting. In particular I value greatly the support of our secretary, J Franklin, of our treasurer, P Gill, and also of the Financial Sub-committee of A Morgan, G Taylor and G Pitkin whose recruitment of sponsors and trade exhibitors enables us to finance many of the activities that I have mentioned above. Of course we are grateful to our 12 commercial sponsors and to trade exhibitors for that support."

The chairman commented that the 'Water' Workshop was 'a meeting in progress' but felt it had been a great success so far. The report was approved unanimously (proposed M Stenning, University of Sussex; seconded G Taylor, Weiss Gallenkamp).

## **4. Secretary's Report (J Franklin, Rothamsted Research)**

"As in previous years, the Executive Committee met twice during the year at Rothamsted. Much of the business of the committee is conducted via email messages however the Executive Committee, as trustees of a charity must meet twice a year to progress the business of the group. The group is grateful to Rothamsted Research for provision of its facilities for meetings.

During the year the secretary completed the annual return to the Charity Commission. This is an annual return, completed on-line soon after the annual general meeting and is available at. <http://tinyurl.com/3lrghh>

During the year the committee clarified the position regarding membership of the group, what was a manufacturer member and what was an ordinary member. Manufacturer members are only those who manufacture plant growth rooms or cabinets or glasshouses.

Much of the business of the Executive Committee is focussed on the annual meeting and the planning of future meetings. At our last meeting in June apart from finalising details for this meeting we were firming up the details of this year's meeting in Dundee as well planning the 2009 meetings in Hertfordshire and 2010 in Sussex.

The International Meeting held this year in Florida at Cocoa Beach was a great success with 10 members attending from this group. The Tissue culture guidelines were launched at this meeting. A high point of the meeting was the award to Lynton Incoll of a 'Significant Contributor' award by the NCERA 101, our North American Contributors. The award was 'In appreciation of your valuable leadership to develop controlled environment user guidelines and your efforts to further the goals of NCERA-101'.

It was agreed that the next International meeting will be held in Cambridge in 2012. The executive committee is forming a group to organise this meeting.

As Secretary I would again like thank Lynton for all the work he does as chairman of the group. This includes most of the 'secretarial' work for which I am grateful."

A round of applause was given to L Incoll (University of Leeds) on his award for 'Significant Contributor' that he received at the International Conference on 'Controlled Environment Agriculture' in Florida, March 2008. The report was approved unanimously (proposed G Pitkin, SCRI; seconded A Morgan, Warwick HRI).

## **5. Treasurer's Report for financial year 2007/2008 (P Gill, SCRI)**

The 2007 conference, held jointly at the University of Wales (Aberystwyth) and the Institute of Grassland & Environmental Research, showed a surplus of £605.51 (Annex C). The income from the eight trade stands (£2,800.00) was paid into central funds, some of which was used to cover speakers' expenses (£528.21) and the cost of the AGM (£80.00).

The cost of the two executive meetings this year was slightly higher at £1,196.26 than in 2006/07 (£1,014.14), due to higher travel costs and some differing attendees at the meetings (Annex B). This year the cost of running the AGM, £89.64, is added to this account.

Seven travel bursaries of £350 were awarded to members to attend the 3<sup>rd</sup> International Controlled Environment meeting in Florida in March 2008. Two

members (Franklin and Natt) did not take the full award and donated the balance of £91.20 to CEUG funds.

The Financial Sub-committee has organised sponsorship for 2007/08 and at 31<sup>st</sup> July £1,494.50 had been received. The sponsorship rate is currently £350 per annum. One electronic transfer from outside the UK was subject to bank charges by the issuing bank.

The final balance for the financial year is £14,737.29 compared with that for 2006/07 of £7,028.63 (Annex A). The high figure is due to income from sponsorship and fees for the Water Workshop. This figure will decrease significantly when invoices are presented from West Park for accommodation and Discovery Quay for the conference dinner.

The point was raised as to whether the committee was able to give gift aid and claim the tax back; it was noted that CEUG was not VAT registered. G Taylor (Weiss Gallenkamp) and the financial sub-committee would investigate this further. The report was approved unanimously (proposed G Holmes-Henderson, Syngenta; seconded L Benjamin, Rothamsted Research).

## 6. Election of the committee

As only two nominations had been received (P Gill - SCRI and G Holroyd - Lancaster University) for the three vacancies, they were duly elected to the committee.

Position	Person	Proposed	Seconded
Treasurer	P. Gill (SCRI)	G. Pitkin	A. Thain
Committee member	G. Holroyd (University of Lancaster)	N. Paul	I. Dodd

Regarding the remaining vacancy, anyone interested in serving on the committee should contact L. Incoll, J Franklin or P Gill.

## 7. Future Meetings

See table below for scheduled meetings to 2010 and provisional plans after 2010.

### a) *Annual Meeting on “CEs for Containment”, Rothamsted Research, 15 & 16 September 2009 (J Franklin)*

As usual this will be an overnight meeting with delegates staying in the Holiday Inn after a lunchtime start and a series of four talks in the afternoon followed by the AGM in the evening. The following morning there will be a tour of the CE facilities at Rothamsted, but this is unlikely to include a tour of the Containment Area which by then will be at containment level 3. A video presentation could be shown instead. Julian indicated that there is a wide range of controlled environment facilities from a wide range of manufacturers, good glasshouse and insectary facilities and an opportunity to see the new long-term storage facilities, with experiments that have run for 150 years.

He reported that he is looking for speakers from Plant Health and Seeds Inspectorate, Health & Safety Executive (Matthew Penrose - unconfirmed at present) and a speaker from Rothamsted to talk about the containment level 3 facility. He is still looking for a fourth speaker and was open to suggestions. One possibility was a talk on water treatment by UV by a member of Rothamsted who had recently written a paper on this topic.

*Schedule of future meetings - scheduled and provisional*

<b>Date</b>	<b>Venue</b>	<b>Comments</b>
2009	<b>Rothamsted Research</b>	(will be 11 years since last visit) <b>Theme:</b> "CEs for containment". Organiser: J Franklin
2010	University of Sussex	New site. <b>Theme:</b> "CEs for conservation: from genotype to ecosystem". Organiser: M Stenning
2011	York University / CSL or University of Sheffield	(will be 12 years since last visit) New site
2012	September (second week), University of Cambridge	International Controlled Environment Conference. <b>Theme:</b> "?". Organiser: C Denston
2013	John Innes Centre, Norwich	(will be 12 years since last visit)
2014	Syngenta, Jealott's Hill	(will be 12 years since last visit)
2015	University of Lancaster	(will be 12 years since last visit)
2016	<b>Fiftieth Anniversary Meeting</b>	

b) *Annual Meeting on "CE's for conservation from genotypes to ecosystems, University of Sussex, 2010 (M Stenning)*

M Stenning reported that it will be a two half-day conference. The first half day will be at the University of Sussex for talks on seed gene banks and the ability for long-term storage. Speakers may include Prof Sue Hartley from the University, who had worked on ecology at various levels in CEs. It was hoped to have speakers from around the world, including someone from the Netherlands, who is bringing invertebrates and invertebrates into CEs, and from the Svalbard Seed Bank in the Arctic. The accommodation will be in the university's halls of residence. The AGM will also be held there.

The second half day will be at Wakehurst Place, a satellite of Kew Gardens, which is approx 20 miles from the university, and will require travelling by coach or car. There will be an opportunity to see the Millennium Seed Bank facilities at Wakehurst Place and view the extensive grounds, which is a gene bank in its own right with plants from different continents. The trade stand exhibition will be staged here. Keith Manger of Wakehurst Place is helping with the local organisation.

c) *International Conference on CE's, University of Cambridge 2012 (C Denston)*

L Incoll reported that an organising committee has already been set up with people from USA, Australasia and Europe. He had recently visited Cambridge with J Franklin (Rothamsted Research) and met with C Denston, who was to submit an updated report for this meeting if it was appropriate. It wasn't, so this report gives the current position. It was hoped that delegates would stay at Downing College, which could be expensive. International visitors will find travelling on a par with travel to Florida and should come prior to the meeting. There are big developments at Cambridge with new facilities to be completed by 2012. As well as a visit to the Botanical Garden with interesting glasshouse facilities, the American group who are more research-based, will have the opportunity of a field trip to places that are at the forefront of CE agriculture in East Anglia. L Incoll advised members that he is still looking for ideas and for what might be topical in four years time.

## 8. **Light Sensor Calibration Package (J Franklin & I Pearman)**

J Franklin conveyed his and I Pearman's apologies for the delay in getting this package 'off the ground'. It is now in use and the first leasee, G Holmes-Henderson (Syngenta), had received it but there were no further bookings. It is now at the stage where it will need to be sent back to B Trotter (Skye Instruments) to get it calibrated. All the booking information is on the UK CEUG website. J Franklin will send another reminder via the JISCmail. Booking is easy using the website diary and once completed an order form should be sent. If you have not got any light sensors of your own, you can hire the package to record light levels in your CE or glasshouse. There is a well tested user interface package. B Trotter (Skye Instruments) said that she had a photograph that could be used on our mailings or on advertising leaflets at conferences and could perhaps be distributed with the AGM minutes. L Incoll expressed his disappointment at the lack of uptake on borrowing the calibration package in the face of promised support. M Stenning (University of Sussex) asked if the equipment was here, but was told it is currently out on hire. B Trotter did have a smaller version with her at the workshop.

## 9. **Open discussion on the following CE topics**

### *Maintenance, servicing & spares*

L. Hansen (University of Reading) reported that there are still some Saxcil cabinets at the University of Reading. A Morgan (Warwick HRI) said that they also had nine similar cabinets.

### *Humidification & irrigation*

L Incoll (University of Leeds) highlighted that humidification was the topic of this meeting and irrigation was the topic being discussed in the lectures the following day.

### *Lighting*

J Franklin (Rothamsted Research) raised the question of whether anyone was using LED lighting at high photon irradiances of 400-500  $\mu\text{mol m}^{-2} \text{s}^{-1}$ ? He asked the question because he had talked to a research group at the University of Paris, who claimed they had built a water-cooled three-colour LED array, area 1.2 metres squared, producing 600  $\mu\text{mol m}^{-2} \text{s}^{-1}$ , and in which they could alter the spectral composition. The claimed efficiency of conversion of electrical to light energy (PAR)

was 30%. He did not know at what distance from the array light was measured. He has asked them for more details which he will pass on to the group.

G Holmes-Henderson (Syngenta) raised the point that seed companies in the Netherlands use LEDs to illuminate seedlings ( $300 \mu\text{mol m}^{-2} \text{s}^{-1}$  at plant level and the lights are very close to the plants) because they needed a good daylight spectrum. G Taylor (Weiss Gallenkamp) asked what was the advantage of LEDs for general plant lighting when their efficiency was not better than that of fluorescent lamps and there were large amounts of heat to dissipate. There was no advantage in capital cost or running cost. Capital costs of £20,000 per square metre were quoted as well as the need to water cool the LEDs for light in excess of  $340 \mu\text{mol m}^{-2} \text{s}^{-1}$  at plant level. He was told by G Holmes-Henderson (Syngenta) that LED systems were being developed for tissue culture use and a prototype TL-LED tube is being developed for direct replacement of TL fluorescents; see <http://www.flowmagic.nl/>. There was a further discussion of dissipation of heat from LEDs at the end of which both G. Taylor and J. Franklin observed that LED life could be severely reduced if they were accidentally allowed to overheat.

A Morgan (Warwick HRI) asked if anyone used LEDs for far red enhancement. He explained that he had previously used 36 watt 4 ft far red tubes, but that they were now unavailable. G Taylor (Weiss Gallenkamp) said they are commercially available in continental Europe but not in the UK. A. Morgan was advised to put the question via the JISCmail mailing list.

#### *Heating, reclamation and energy management*

J Franklin (Rothamsted Research) observed that their energy costs had gone up 30% in the last three months. He asked if everyone was experiencing the same problem. Were they carrying on as before or seriously looking at energy saving? G Pitkin (SCRI) said they had identified at SCRI that high energy usage was from a large number of  $-80 \text{ }^\circ\text{C}$  and domestic freezers as well as supplementary glasshouse lighting. P Gill (SCRI) said there was need to avoid having to register for the government's carbon-trading scheme which is to be based on the energy usage in 2008. Organisations which use more than 6,000 MW will have to register and trade carbon credits.

J Franklin explained that energy bills will be looked at and if you are in an organisation over a certain size (he thought paying in excess of £500k for the year) then you will have to register for carbon credits. A baseline of your energy usage as of the current year 2008-9 will be taken and, as of 2010, if you use more than that, you would have to buy carbon credits i.e. you would get a tax on your energy bill. The implication is that if you use less and have credits, you will be able to sell those carbon credits. He asked if anyone else had identified savings and highlighted that Rothamsted Research was to turn the temperatures down in the laboratories.

M Stenning (University of Sussex) said they had to buy a combined heat & power system for their heating system, which meant they were able to generate 25% of their electricity. J Franklin said Rothamsted Research did this already. M Stenning said they were also buying a big windmill to generate another quarter of the heating bill – they were still awaiting planning permission.

L Incoll (University of Leeds) then referred back to the matter of -80°C freezers and posed the question whether it would be better to have one large room rather than a dozen small cabinets? There was a safety concern about people walking into a -40°C room. G Waimann (Rothamsted Research) explained how it was difficult to achieve these states with conventional refrigeration as ultra-low temperature systems generally worked on a cascade system. To build a walk-in -80°C room was just not feasible.

G Waimann then raised the point that you have to look at energy as something on your site that could be moved around especially with heating and cooling processes. He highlighted how in the glasshouses you could store the heat generated during the day and use it at night, and store the cool air at night this would reduce the cooling demand during the day and enable load lopping (this was the long-term aim at Rothamsted Research).

L Hansen (PEL, University of Reading) informed the meeting that he had been looking at electricity costs at the Plant Environment Laboratory (PEL) being charged by the university. He explained that they are paying £300-£400 per month because the University has locked the PEL into a deal with the electricity supplier whereby they are guaranteed a 170 kW supply. This involves a very high standing charge but a low rate per unit of energy. If consumption is low in one month they feel they are effectively paying for energy that they do not need. Consequently there is no incentive to save energy. He asked if this was a common arrangement? G Waimann replied that energy companies are in the business of selling energy. He observed that the electricity in the UK should be running at 230 volts but for most people it was at 240 volts; a reduction in voltage generally results in a reduction in power use, therefore less power sold by the energy providers. J Franklin explained that Rothamsted Research had a contract to pay x pence per kWh but if energy production costs went up, the supply company could levy a surcharge. L Incoll then asked the North American colleagues present if they had any observations on energy use? T Demetriades-Shah (LI-COR Biosciences) said that in America there was no free competition and the amount you pay was constant whether you use more or less energy.

*Fabric, glazing, reflective materials*

L Incoll asked G Taylor (Weiss Gallenkamp) if there was anything new in these areas or was it a mature technology? He replied "Yes, it was" but there was scope for the installation of new environmentally-friendly materials, although they were not commercially viable at present. L Incoll then talked about the Eden Project solution to glazing and the new buildings in Beijing, 'The Pillows of Plastic'. G Taylor said that in his experience, the problem with Tedlar, a fluoropolymer, was its poor ultra violet resistance when used beneath discharge lamps. J Franklin added that he had been speaking to J Roy at Montpellier and was told they are using Teflon to coat the solar domes they are building because it is transparent to UVA which they wanted to have as an experimental variable in ecosystem research. Their new Ecotron will be online in Jan/Feb 2009 with 14 solar domes (each 3 m diameter.) arranged in a semi-circle, with nothing in the end ones to remove the edge effect on plant growth. They have a sunken pit into which a soil core can be inserted using a crane system which also enables them to remove the light weight superstructure of the dome first. Half of the funding comes from local government which invests in local research. He did not

know if that type of local investment was widely available in the UK though Rothamsted Research had been given £50-100k to build a CE building by the East Anglia Development Agency.

*New Equipment, recent advances*

J Franklin spoke about the advances in LED arrays but still thought it would be another five years before their efficiency would make them a viable proposition. He explained how NASA was prepared to put money into this development which was being carried out by Orbitech. He explained how the European Space Agency were involved in this type of work in Europe but not currently investing in it. G Waimann stressed the advancement in LEDs was phenomenal. L Incoll then spoke about Applied Optotech, who had been at the light workshop in 2004 but had subsequently closed down. They had been talking about having LEDs printed in sheets that would be fixed to the ceiling and would do away with directional lighting units. G Taylor explained that the tiny LEDs that G Waimann was talking about were already available and the heat output in large arrays was many kilowatts. He said that his observation of LEDs in torches was of a piercing direct light but very poor reflected light.

*Plant growth problems, pest, diseases*

L Incoll started the discussion on how most of the pest & disease research was on animal health problems which involved huge amounts of money being diverted from other research areas. A discussion was then started on Western Flower Thrip and how they were still a problem. J Franklin then raised the problem of loss of current pesticides and fungicides with the proposed EU regulation changes. He had concerns especially over the banning of some mildew fungicides. They never use enough of some pesticides and fungicides because of the large package size, so a lot is thrown away on reaching the expiry date; or they have to produce a risk assessment as to why they have continued to use it beyond the expiry date. It was felt this was a common problem buying 10 kilos when only 10 g was needed. Finally L Hansen (University of Reading) explained he was a keen user of Savona as a contact killer for any insect pest.

L Incoll then offered anyone the chance to raise any other issues. G Waimann (Rothamsted Research) asked if anyone had any influence over their existing refrigeration plant. If plant is more than eight years old it's likely to be charged with Refrigerant 22 (HCFCs). The use of virgin Refrigerant 22 will be banned on the 1<sup>st</sup> January 2010 and only recycled R22 will be permitted, therefore recycled R22 will be increasingly rare and potentially expensive (if available at all), until the ban on the use of all HCFCs from the 1<sup>st</sup> January 2015. Therefore people should have a strategy in place for the plant's replacement, either by retrofitting or, if the plant has a limited life span, by its replacement. S Andrews asked if there had been an e-mail about energy efficiency requiring plant to have inspections, to which G Waimann stated that he had circulated an email on this subject: Energy Performance of Buildings Directive (EPBD) regulations, with a link to a document at: <http://www.communities.gov.uk>. G Waimann provided a brief on the directive. Anything over 12 kW would have to be inspected. *One or more* air-conditioning units *within* a building controlled by a single person are considered to comprise a single system. The person who *controls* the *operation* of the system is the person who controls the *technical function* of the system (e.g. at Rothamsted, G Waimann or a member of his team), not someone who

can just alter the temperature. The inspections are required on all systems put into service *on or after* 1<sup>st</sup> January 2008. The first inspection must take place within the next five years. For other systems where the rated output is more than 250 kW (this may be the accumulated output of a number of systems), the first inspection must happen by 4<sup>th</sup> January 2009. For other air-conditioning systems, where the effective rated output is more than 12 kW, the first inspection must happen by 4<sup>th</sup> January 2011. J Franklin then asked how this would tie into CE rooms which were a part of a building and not a process (A note from G Waimann: The definition of an AC system according to the guidance notes issued by <http://www.communities.gov.uk> *A guide to air-conditioning inspections for buildings: 1.3 para 7* is: An air-conditioning system refers to any system where refrigeration is used to provide cooling for the comfort of occupants. This would exclude separate refrigeration provided **solely** for the process applications such as cold stores, pharmaceutical production etc.) A discussion then followed between S Robertson (Warwick HRI) and S Andrews. It seemed unclear whether individual CE rooms would have to be included in this inspection (note: see above definition). G Waimann then explained that, under the 'F' Gas Regulations, anyone who employed refrigeration engineers internally must ensure that the engineers hold an appropriate Refrigerant Safe Handling Certificate. New qualifications to encompass the 'F' Gas Regulations should be available from July 2008 however, due to difficulties in the provision of adequate training, it is likely an extension to July 2011 will be granted. C&G 2078 or CITB equivalent will continue to be the **only** legal national requirement for F gas refrigerant handling. It would be prudent for your engineers to obtain the new qualification as soon as the training becomes available. Not only would engineers have to be qualified, but the company (such as ours) employing them will also have to obtain a Company F Gas Certificate. Again the deadline may be extended until July 2011. If so, companies will need to be issued with an interim certificate by July 2009. It is equally important to ensure that any external refrigeration engineers working for companies carrying out work on your site carry refrigerant handling qualifications. Many carry an ID card with their photo; ask to see it. S Robertson and G Waimann then had a discussion on the problems of safe handling of refrigerants but there was a major problem in sourcing the relevant training. G Waimann stressed people should be aware of this legislation and look at their plant and be aware of these dates and have a strategy in place.

S Andrews (John Innes Centre) asked that refrigeration be put on the agenda as a topic for future meetings. L Incoll agreed to do so. The list of topics may need to be reviewed as people wanted the open discussion in the meeting but seemed not prepared to say anything. He then brought the open discussion to a close and thanked everyone for taking part.

**10. Any other matters not included in the above agenda items (including the Executive Officers' reports)**

L Incoll then asked that the group record their appreciation to the work of G Pitkin, P Gill and their team of helpers and to P. Gregory for supporting the idea of his staff spending a lot of time in making this such a successful and enjoyable meeting. The group then showed their appreciation by applause to the local team.

L Incoll then asked for any other matters. G Waimann returned to the discussion on refrigeration and said that any system put into service on or after 1 January 2008,

must be inspected within five years. One or more air conditioning units within a building technically controlled by a single person are considered to comprise a single air conditioning system for purposes of the regulation.

The meeting closed at 22:20 h.

W. Patterson, Minutes Secretary  
29<sup>th</sup> September 2008

*Annexe A*

**UK Controlled Environment Users' Group**  
**Accounts for the financial year 1st August 2007 to 31st July 2008**

***Royal Bank of Scotland account, Dundee (10081698)***

<b>Balance b/f at 1st August 2007</b>		<b>£7,028.63</b>
<b>INCOME</b>		
2006 Silwood Park conference	£76.75	
2007 Aberystwyth conference (incl. stands)	£3,754.89	
2008 Dundee workshop	£9,293.00	
2007 Mailing sponsorship	£1,500.50	
2008 Mailing sponsorship	£1,494.50	
Bank interest	£100.93	
		<b>£16,220.57</b>
<b>EXPENDITURE</b>		
2007 Aberystwyth conference	£378.36	
2008 Dundee workshop	£3,090.34	
2008 Mailshot	£200.20	
Executive committee meetings & AGM	£1,265.90	
USA Conference - travel bursary	£2,358.80	
USA Conference - chairman	£903.36	
Office services (stationery, etc.)	£314.95	
		<b>£8,511.91</b>
<b>Balance c/f at 31st July 2008</b>		<b>£14,737.29</b>

Peter Gill & Graham Pitkin  
21<sup>st</sup> August 2007

*Annexe B*

**UK Controlled Environment Users' Group**  
**Accounts for the financial year 1st August 2007 to 31st July 2008**

***Cost of Executive Committee meetings & AGM***

<b>AGM held at Aberystwyth on 11<sup>th</sup> September 2007</b>		
Minutes & auditor	£69.64	
Room hire – Brynamlwg	£20.00	
		£89.64
<b>Meeting held at Rothamsted Research on 9<sup>th</sup> January 2008</b>		
Travel	£357.29	
Accommodation	£160.00	
		£517.29
<b>Meeting held at Rothamsted Research on 18<sup>th</sup> July 2008</b>		
Travel	£478.97	
Accommodation	£200.00	
		£678.97
<b>Total</b>		<b>£1,285.90</b>

Peter Gill & Graham Pitkin  
8<sup>th</sup> September 2008

**Note.** The total AGM costs for 2007 were itemised at £69.64 on the statement distributed at the AGM because Brynamlwg room hire of £20.00 had been omitted by mistake. The error was pointed out to members and the above statement therefore includes the £20 expenditure.

## Annexe C

**UK Controlled Environment Users' Group**  
**Financial statement for the Aberystwyth meeting**  
**11<sup>th</sup> & 12<sup>th</sup> September 2007**

<b>1</b>	<b>CONFERENCE ACCOUNT</b>		
	<b>INCOME</b>		
	Registration	£1,034.00	
	Accommodation & subsistence	£5,063.59	
			<b>£6,097.59</b>
	<b>EXPENDITURE</b>		
	Reception	£165.58	
	Photocopying (paper & toner)	£37.31	
	1 <sup>st</sup> mailing	£106.48	
	Document bags, badges, 2 <sup>nd</sup> mailing ( <i>free of charge</i> )	£0.00	
	Coach	£130.00	
	Arts Centre dinner	£1,398.50	
	University accommodation/residence charges	£3,383.66	
	IGER teas	£88.13	
	Staffing & portorage	£94.82	
	Chairman's visit to Aberystwyth	£87.60	
			<b>£5,492.08</b>
	<b>BALANCE</b>		<b>£605.51</b>
<b>2</b>	<b>CENTRAL ACCOUNT</b>		
	<b>AGM</b>		
	Minute Secretary	£60.00	
	Room hire - Brynamlwg	£20.00	
			<b>£80.00</b>
	<b>TRADE STANDS</b>		
	8 @ £350	£2,800.00	
	Speakers' travel expenses	£227.46	
	Speakers' accommodation & subsistence	£300.75	
			<b>£3,328.21</b>
	<b>TOTAL</b>		<b>£3,408.21</b>

Peter Gill & Graham Pitkin  
9<sup>th</sup> June 2008