



# Do you accurately measure and report the growing conditions of your controlled environment experiments?

## International Committee for Controlled Environment Guidelines

Conditions in controlled environment plant growth rooms and chambers should be reported in detail. This is important to:

- Allow replication of experiments on plants
- Compare results among facilities
- Avoid artefacts due to uncontrolled variables

The table below indicates the type and amount of information that should be measured and reported to meet these aims.

What to measure for accurate reporting	When to measure	What to report
<b>Temperature (°C)</b> Resistance, thermocouple or thermistor sensor (aspirated if in air)	At least once daily during light & dark periods	Mean & standard deviation
<b>Photoperiod &amp; PAR (h and <math>\mu\text{mol m}^{-2} \text{s}^{-1}</math>)</b> Quantum sensor for photosynthetically active radiation (PAR)	PAR: at start & end, and every 2 weeks	
<b>Atmospheric moisture (kPa or %)</b> Capacitance or dewpoint sensor, psychrometer, or IRGA	At least once daily during light & dark periods	
* <b>Carbon dioxide (<math>\mu\text{mol mol}^{-1}</math>)</b> IRGA (infrared gas analyser)	At least hourly	
* <b>Air velocity (<math>\text{m s}^{-1}</math>)</b> Vane or hot-wire anemometer	At least once during experiment	
<b>Liquid culture: pH</b> pH probe	Before and after pH correction	
<b>Liquid culture: conductivity (<math>\text{S m}^{-1}</math>)</b> Electrical conductivity meter	Before and after EC correction	
<b>Liquid culture: nutrients (<math>\text{mmol L}^{-1}</math>)</b>	Initial and daily, or when replenished	Ionic concentration
<b>Watering (L)</b>	Daily, or when added	Frequency, amount & type of solution
<b>Solid media: nutrients (<math>\text{mol kg}^{-1}</math>)</b>	When added or replenished	Form & amount added

\* Report if records are available, and always when it is a variable under investigation

**For more advice on measurement and reporting, consult the brochure:**  
International Committee for Controlled Environment Guidelines (2004) *Minimum guidelines for measuring and reporting environmental parameters for experiments on plants in growth rooms and chambers.*

The **International Committee for Controlled Environment Guidelines** includes representatives from the UK Controlled Environment Users' Group, the North American Committee on Controlled Environment Technology and Use (NCR-101), and Australasian Controlled Environment Working Group (ACEWG).