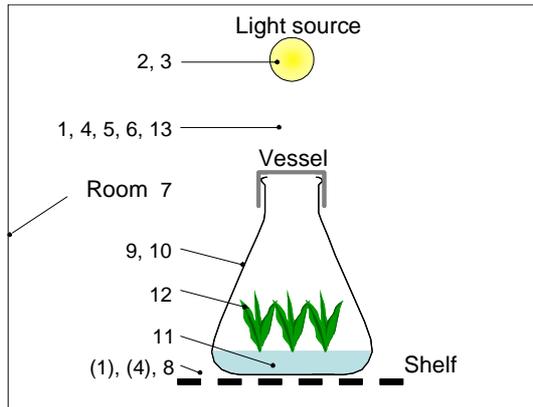


# Do you accurately measure and report the growing conditions of your tissue culture experiments?

Conditions in controlled environment tissue culture facilities should be reported in detail. This is important to:

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

## Where to measure



**Key to Figure:**

1. Radiation	8. Shelf - properties
2. Light source - properties	9. Vessel - properties
3. Photoperiod	10. Vessel - alignment
4. Air temperature	11. Culture medium
5. Atmospheric moisture	12. Number of explants
6. Air circulation	13. CO <sub>2</sub> concentration
7. Room - properties	( ) Optional measurement

Here is an example<sup>†</sup> of a report suitable for publication:

“The experiment was conducted in a walk-in growth room (model, manufacturer) (11.2 m<sup>2</sup> floor area and 2.1 m ceiling height), with horizontal air circulation through perforated sidewalls and four stacked steel-mesh shelves (24 m<sup>2</sup> total shelf space). Sufficient outdoor make-up air was provided to maintain ambient CO<sub>2</sub> concentrations in the room. Cool white fluorescent lamps (model, manufacturer) mounted 40 cm above each shelf provided an average photosynthetically active radiation (PAR) of 50 (SD ±7) μmol m<sup>-2</sup> s<sup>-1</sup> above the culture vessels during the 16-h photoperiod. Air temperature above the culture vessels was 25/20 (SD ±1)°C during the light/dark period. Relative humidity above the culture vessels was 67 (SD ±10)%.

Ten plantlets were cultured in 200 mL glass Erlenmeyer flasks closed with a translucent plastic cap. Each flask contained 40 mL of medium with Murashige and Skoog (1962) basal components, 30 g L<sup>-1</sup> sucrose, 5 g L<sup>-1</sup> of activated charcoal and 8 g L<sup>-1</sup> agar. The pH of the medium was adjusted to 5.8. The flasks were in a single layer on each shelf with sufficient spacing to allow adequate air movement around each flask. No environmental parameters were recorded inside the flasks.”

<sup>†</sup> From the brochure *Guidelines for measuring and reporting environmental parameters for experiments in plant tissue culture facilities*. See below.

What to measure for accurate reporting	When to measure	What to report
<b>PAR (400-700 nm, μmol m<sup>-2</sup> s<sup>-1</sup>) and photoperiod (h)</b> Quantum sensor for photosynthetically active radiation (PAR)	PAR: at start of experiment and every 4 weeks; Photoperiod: also at start	Mean & standard deviation (SD)
<b>Air temperature (°C)</b> Resistance, thermocouple or thermistor sensor (aspirated)	At least once daily during light & dark periods; at least 1 h after changeovers	
<b>Atmospheric moisture (RH, %; or VPD, kPa)</b> Capacitance or dewpoint sensor, psychrometer or IRGA	At least once daily during light & dark periods; at least 1 h after changeovers	
<b>Air circulation</b>	At start of experiment	Describe in words **
<b>Room &amp; cabinet properties</b>		
<b>Shelf properties</b>		
<b>Vessel specifications</b>		
<b>Vessel alignment</b>		
<b>Culture medium</b>		
<b>Number of explants</b>		
<b>Atmospheric CO<sub>2</sub> concentration (μmol mol<sup>-1</sup>) *</b> IRGA (infrared gas analyser)	Daily but only if CO <sub>2</sub> enrichment is installed within facility	Mean & standard deviation (SD)

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

\*\* For details of what to describe and **for more advice on measurement and reporting, consult the brochure:** International Committee for Controlled Environment Guidelines (2008) *Guidelines for measuring and reporting environmental parameters for experiments in plant tissue culture facilities*.