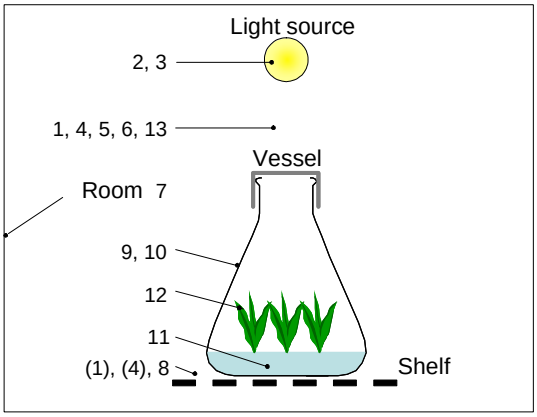
Do you accurately measure and report the growing conditions of your tissue culture experiments?

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_2 concentration
7.	Room - properties	( )	*Optional measurement*

Here is an example† of a report suitable for publication:

"The experiment was conducted in a walk-in growth room (model, manufacturer) (11.2 m^2 floor area and 2.1 m ceiling height), with horizontal air circulation through perforated sidewalls and four stacked steel-mesh shelves (24 m^2 total shelf space). Sufficient outdoor make-up air was provided to maintain ambient CO_2 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^{-2} s^{-1} 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^{-1} sucrose, 5 g L^{-1} of activated charcoal and 8 g L^{-1} 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."

† 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
PAR (400-700 nm, µmol m^{-2} s^{-1}) and photoperiod (h) Quantum sensor for photosynthetically active radiation (PAR)	PAR: at start of experiment and every 4 weeks; Photoperiod: also at start	Mean & standard deviation (SD)
Air temperature (°C) Resistance, thermocouple or thermistor sensor (aspirated)	At least once daily during light & dark periods; at least 1 h after changeovers	
Atmospheric moisture (RH, %; or VPD, kPa) Capacitance or dewpoint sensor, psychrometer or IRGA	At least once daily during light & dark periods; at least 1 h after changeovers	
Air circulation	At start of experiment	Describe in words **
Room & cabinet properties		
Shelf properties		
Vessel specifications		
Vessel alignment		
Culture medium		
Number of explants		
Atmospheric CO_2 concentration (µmol mol^{-1}) * IRGA (infrared gas analyser)	Daily but only if CO_2 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.*

Also available at http://ncr101.montana.edu/Guidelines/TC-guidelines.htm