Managing light, CO$_2$, and temperature for photosynthetic optimization
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Research objective
Develop photosynthetic response curve families for light and CO$_2$ and evaluate optimization of these parameters

Expt 1: Evaluate plants acclimated to different DLIs (5, 10, and 15 mol·m$^{-2}$·d$^{-1}$)

Expt 2: Evaluate plants acclimated to different temperatures (14, 21, and 28 °C)

Results
Expt 1
- ↑ CO$_2$ from 200 to 400 ppm substantially ↑ $P_n$ at PAR ≥ 200 µmol·m$^{-2}$·s$^{-1}$ for all three DLIs (smaller ↑ as CO$_2$ ↑ > 400 ppm)
- Monitor CO$_2$ and strive to maintain ambient concentrations at plant level

Expt 2
- $P_n$ ↑ as ambient temp ↑ (to a lesser extent from 21 to 28 °C)
- ↑ CO$_2$ from 200 to 600 ppm yielded ↑ $P_n$ at all three temps

Takeaways
- You can attain similar rates of $P_n$ with different combinations of light intensity and CO$_2$
- Choosing the ideal combination for your facility will depend on time of year, plant species, and costs