

## CARBON DIOXIDE WITHIN CONTROLLED ENVIRONMENTS; THE COMMONLY NEGLECTED VARIABLE

M. Romer

McGill University Phytotron, Department of Biology, McGill University, 1205 Dr. Penfield Avenue, Montreal, Quebec, Canada H3A 1B1 (Email: [mark.romer@mcgill.ca](mailto:mark.romer@mcgill.ca))

The option to measure and control carbon dioxide levels within controlled environment chambers has been commercially available for over a decade. Despite this fact, relatively few controlled environment users choose to purchase or even utilise this option when it is available on their equipment.

Routine measurements taken at the McGill University Phytotron have shown pronounced fluctuations and significant variability of CO<sub>2</sub> levels between replicate growth chambers, between plant developmental stages and over the course of diurnal and seasonal cycles. Since elevated and below-ambient CO<sub>2</sub> levels have well documented effects on physiological, morphological and developmental aspects of plant growth, poor control of this variable must influence experimental results and the validity of research findings. At the McGill University Phytotron, chamber-mounted Infra-Red Gas Analysers are utilised in combination with simple scrubbers and injected CO<sub>2</sub> gas to control and stabilise ambient CO<sub>2</sub> levels. Typical long-term results demonstrate consistent CO<sub>2</sub> control at a level of  $\pm 10 \mu\text{mol mol}^{-1}$ . A description of the materials, maintenance requirements and costs associated with routine control of this variable will be presented.