

**Bouma, T.J., Nielsen, K.L., Eissenstat, D.M. and Lynch, J.P. 1997. Soil CO<sub>2</sub> concentration does not affect growth or root respiration in citrus or bean. *Plant, Cell & Environment*. 20: 1495-1505.**

***Abstract***

Contrasting effects of soil CO<sub>2</sub> concentration have been reported on root respiration rates during short-term exposure and on plant growth during long-term exposure. Here we examine the effects of both short- and long-term exposure of soil CO<sub>2</sub> on root respiration of intact plants and plant growth for bean (*Phaseolus vulgaris* L.) and citrus (*Citrus volkameriana* Tan. & Pasq.). For rapidly growing bean, the growth and maintenance component of root respiration were separated to determine if they differ in sensitivity to soil CO<sub>2</sub>. Respiration rates of citrus roots were unaffected by the CO<sub>2</sub> concentration used during the respiration measurements (200 and 2000 μmol mol<sup>-1</sup>), regardless of the soil CO<sub>2</sub> concentration during the previous month (600 and 20 000 μmol mol<sup>-1</sup>). Bean plants were grown with their roots exposed to either a natural CO<sub>2</sub>-diffusion gradient, or to an artificially maintained CO<sub>2</sub> concentration of 600 or 20 000 μmol mol<sup>-1</sup>. These treatments had no effect on shoot and root growth. Growth and maintenance respiration of bean roots were also unaffected by CO<sub>2</sub> pre-treatment and the CO<sub>2</sub> concentration used during the respiration measurements (200 to 2000 μmol mol<sup>-1</sup>). We conclude that soil CO<sub>2</sub> concentrations in the range likely to be encountered in natural soils does not affect root respiration in citrus and bean.