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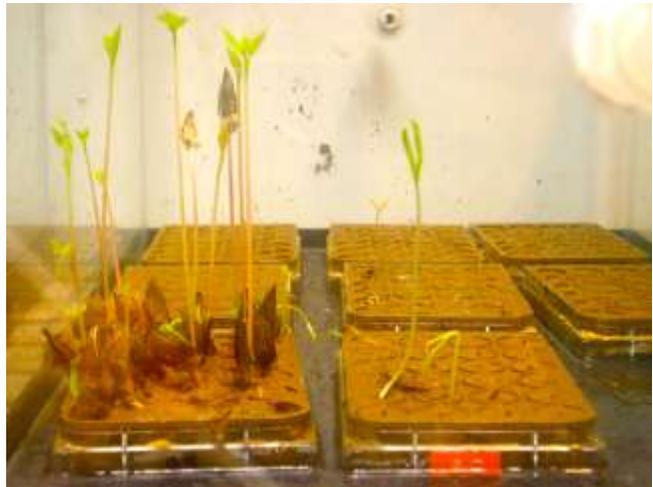
THE EFFECT OF CARBON DIOXIDE ON STEM ELONGATION IN 17 WOODY SPECIES

Easson, Leanne, Dr. Ed Reekie

Department of Biology, Acadia University, Wolfville, NS

When seeds germinate under the surface of the soil, they use their seed reserves for energy to elongate rapidly and reach light, allowing them to photosynthesize. It is generally accepted that the presence or absence of light acts as a signal for elongating seedlings. However, in addition to the change in light availability, elongating seedlings are also exposed to a CO₂ gradient. Deep in soil, microorganism and root respiration cause a CO₂ efflux. The CO₂ concentration decreases

within the litter layer, and again above the litter layer. It is possible that seedlings could use this gradient as a developmental signal. I examined the effect of CO₂ on seedling elongation in 17 species of trees and shrubs of various seed sizes under low light conditions. I found that small seeded species respond positively to elevated carbon dioxide, while small seeded species respond negatively. A possible explanation for the results of my study is that small seeded species need to reach the surface of the soil before seed reserves are depleted, and therefore elongate rapidly when exposed to high CO₂ concentrations. In contrast, previous studies have shown that large seeded species are able to have higher rates of photosynthesis when in high CO₂ and low light, possibly offering an explanation for the negative elongation response to elevated CO₂.



Leanne Easson graduated from West Kings District High School in Auburn, NS in 2007. Upon graduation from West Kings, Leanne received an entrance scholarship and the renewable Robert C. and Ola Swim Memorial Award from Acadia University, which she has maintained over the past four years. Leanne is currently completing her Honours in Biology thesis. She received an undergraduate Natural Sciences and Engineering Research Council award to fund her research, which was completed under the supervision of Dr. Ed Reekie. Leanne has also been involved in the Sensory Motor Instructional Leadership Experience (S.M.I.L.E.) program at Acadia, and is currently the Vice President Finance of the Acadia Biology Society. Following graduation, Leanne hopes to begin a Doctor of Dental Surgery program.

