EFFECTS OF OZONE AND CO_2 ON THE GROWTH AND PHYSIOLOGY OF ASPEN

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During the past three years, we have examined the effects of ozone (O_3) and carbon dioxide (CO_2), alone and in combination, on the growth and physiology of trembling aspen (*Populus tremuloides* Michx.). We have conducted several single growing season exposures of potted plants and a three growing season exposure with trees planted in the ground. All studies have been conducted in open-top chambers. Our research demonstrated that aspen is highly sensitive to ozone and that there are strong genotypic differences in response to ozone. Seasonal exposures of 70 to 100 ppm-h have a significant negative impact on height, diameter, leaf and branch retention, and above ground biomass. The O_3 sensitivity appears stable as aspen trees reach flowering age. CO_2 administered at 150 ppm above background levels did not compensate for the adverse ozone effects. Photosynthesis measurements over all growing seasons and with multiple genotypes suggest that CO_2 may increase the O_3 sensitivity of otherwise tolerant aspen clones. We are currently developing an unchambered O_3 exposure system to more closely simulate forest conditions.

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