

Climate Change: Influence of elevated carbon dioxide (CO₂) and ozone (O₃) on pollen production and future allergic airway diseases

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Future elevated levels of CO₂ will stimulate growth of plants that produce windborne pollen, resulting in greater levels and increased antigenicity of pollen which will increase allergic airway diseases (AAD). In spring, this will include pollen from trees, such as birch (*Betula*) and oaks (*Quercus*) and grasses such as timothy (*Phleum pratense*). In summer, this will include primarily ragweed (*Ambrosia artemisifolia*). This has been demonstrated in growth chamber studies. Elevated levels of O₃ will also co-occur with elevated CO₂ in the future. Ozone adversely affects photosynthesis and reduces growth. This has also been demonstrated in growth chamber studies. It has been suggested that elevated CO₂ will protect plants from O₃ injury allowing growth and pollen production to occur at the same rate as with elevated CO₂ alone. This has not been investigated in any depth. To answer this question we have been exposing timothy and ragweed plants in exposure chambers to current ambient and predicted future levels of CO₂ and O₃ alone and in combination. Early indications are that elevated CO₂ can reduce O₃ injury in timothy and ragweed, but not completely. Biomass and pollen response is similar to that found for ambient levels of CO₂ and O₃.