

HYDROGEN FERTILIZATION: IS THIS A BENEFIT OF LEGUMES IN ROTATION?

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Hydrogen gas (H_2) is a natural and unavoidable byproduct of biological nitrogen fixation and in most agricultural legumes, it is released into the soil around the nitrogen-fixing root nodules. In a typical legume crop at peak growth, up to 7000 litres or more of H_2 are produced per ha per day, representing an energy loss from the crop equivalent to 5% of its net photosynthetic carbon gain. Dr. Layzell will summarize what has been learned about H_2 production by legumes and its effects on soils, including the building of soil carbon stocks, the impact on nitrous oxide (N_2O , a potent greenhouse gas) emissions, and the enhancement in the growth and yield of both legumes and non-legumes. Plant growth enhancement coupled with microbial changes in soils following ' H_2 fertilization' may - for the first time - provide an explanation of why legumes promote the growth of subsequent crops. The presentation will end with a discussion of efforts to develop new inoculants that could provide "crop rotation in a bottle": the benefits of crop rotation without having to change crops.