Enhancing *Pinus radiata* health and vigour

- Tony Reglinski, Mike Spiers, Joe Taylor & Nick Gould, HortResearch.
- The project goal is to integrate the use of chemical elicitors, biological control agents and plant nutrients to enhance the health and vigour of *P. radiata* seedlings and cuttings.
- Technologies will be adapted for use in forest nurseries to improve plant vigour, establishment and pest and disease resistance.

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Induction of Resistance to Disease

Elicitors

- naturally occurring chemical compounds that trigger inducible plant defences
- elicitor-treated plants respond more rapidly and intensely to attempted infection
- induced resistance is non-specific and can be local or systemic

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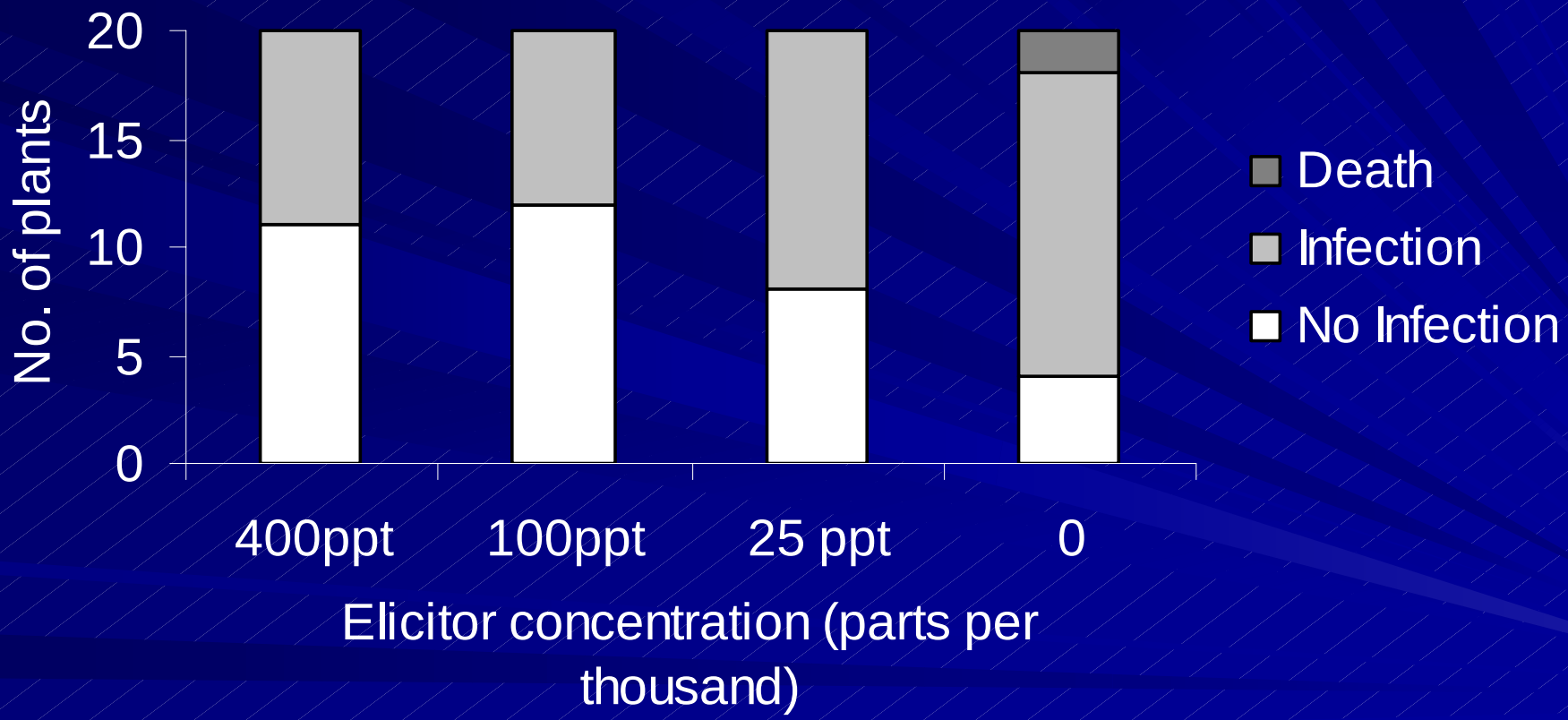
Elicitor application reduces infection to *Sphaeropsis sapinea*

(one application, 7 days before inoculation)



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Is there a cost to the plant ?

- Some mechanisms involved in mediating plant defence are also associated with the general stress response.
- It has been suggested that repeated elicitor application may adversely effect plant development.
- Physiological parameters were monitored in *P. radiata* seedlings after elicitor treatment.

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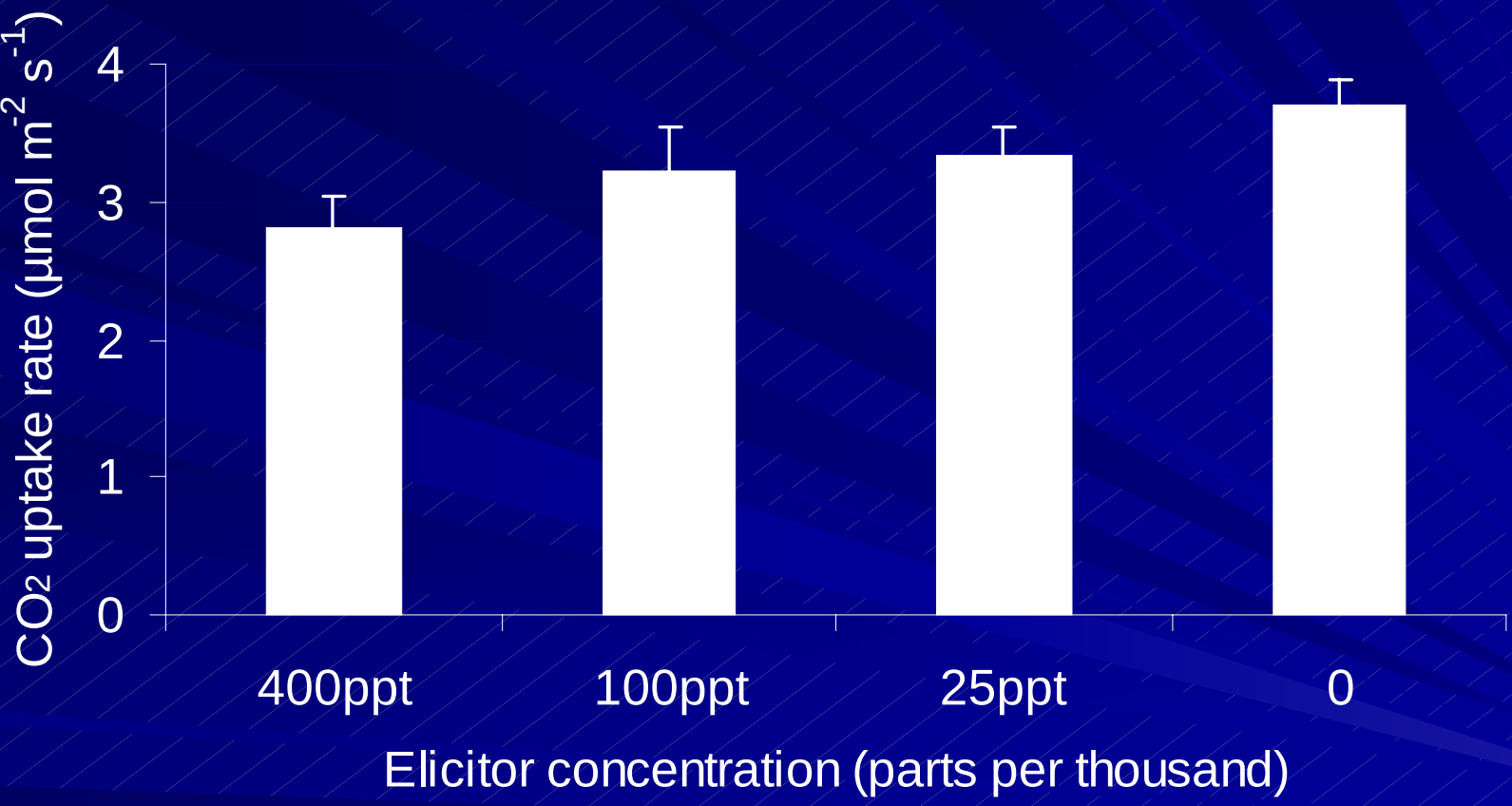
Early responses to elicitor treatment – reduction in photosynthesis



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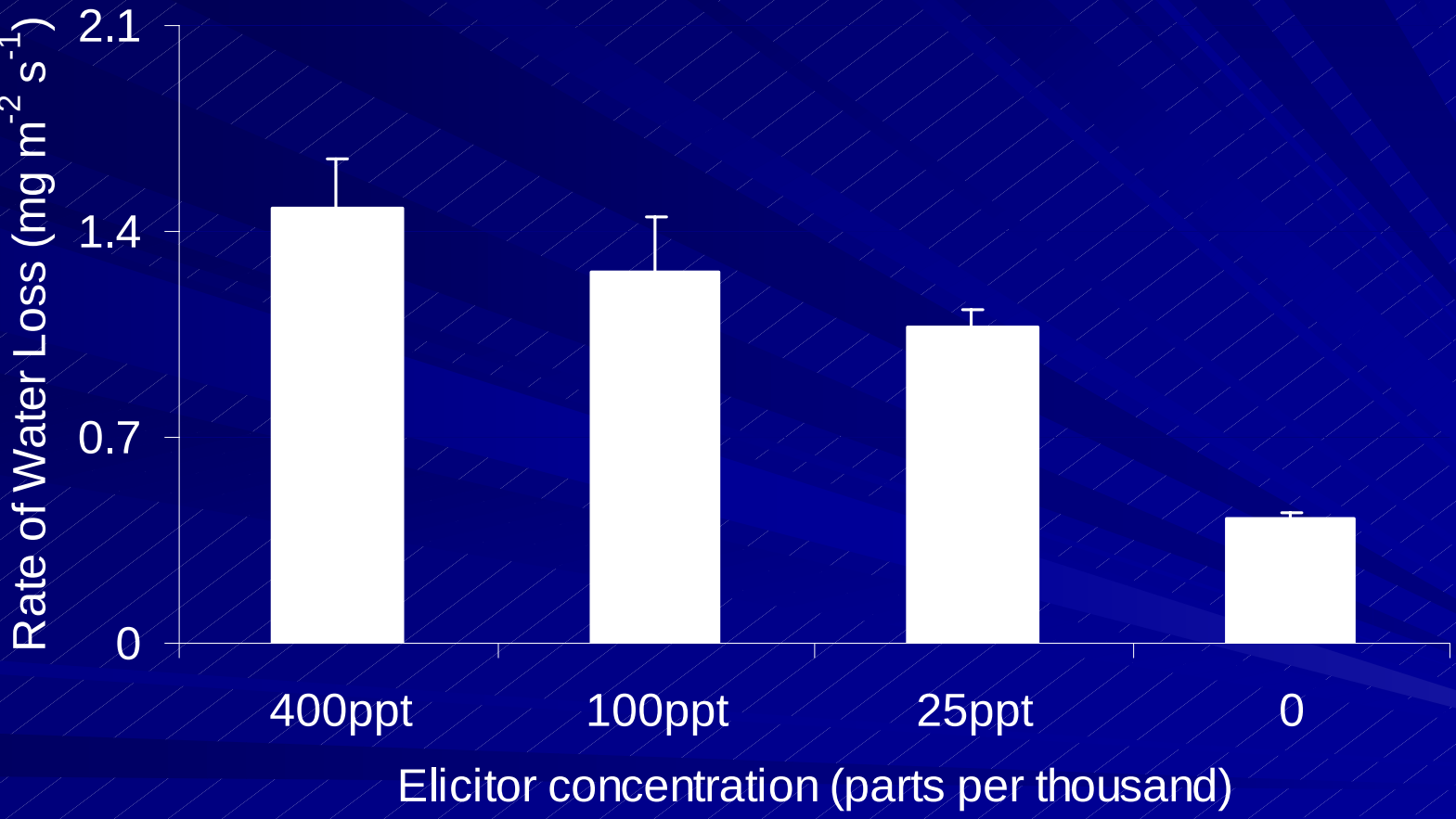
Early responses to elicitor treatment – water loss from needles



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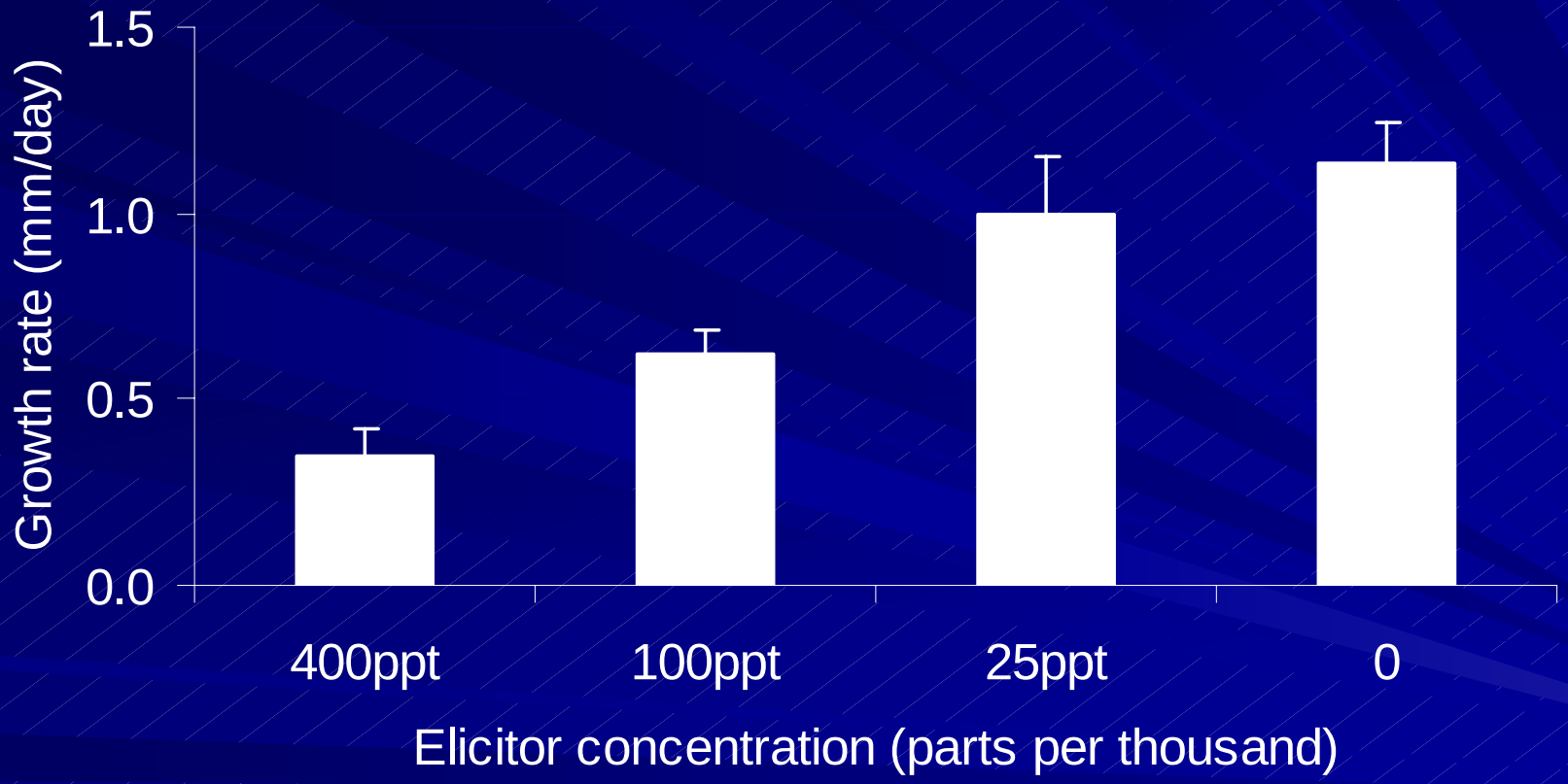
Repeated application can result in reduced growth rate (3 applications at weekly intervals)



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Summary

- Elicitor treatment can induce resistance to fungal infection.
- Elicitor treatment causes a transient reduction in photosynthesis and increased water loss from needles.
- Repeated elicitor application results in reduced growth rate.
- Experiments are in progress to better understand the potential ‘cost’ of induced resistance.
- Integrated use of elicitors and mineral elements to enhance plant health is being investigated.

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