

Inhibitory and
Stimulatory Use of
Biofumigant
Extracts for Control
of *Globodera*
pallida



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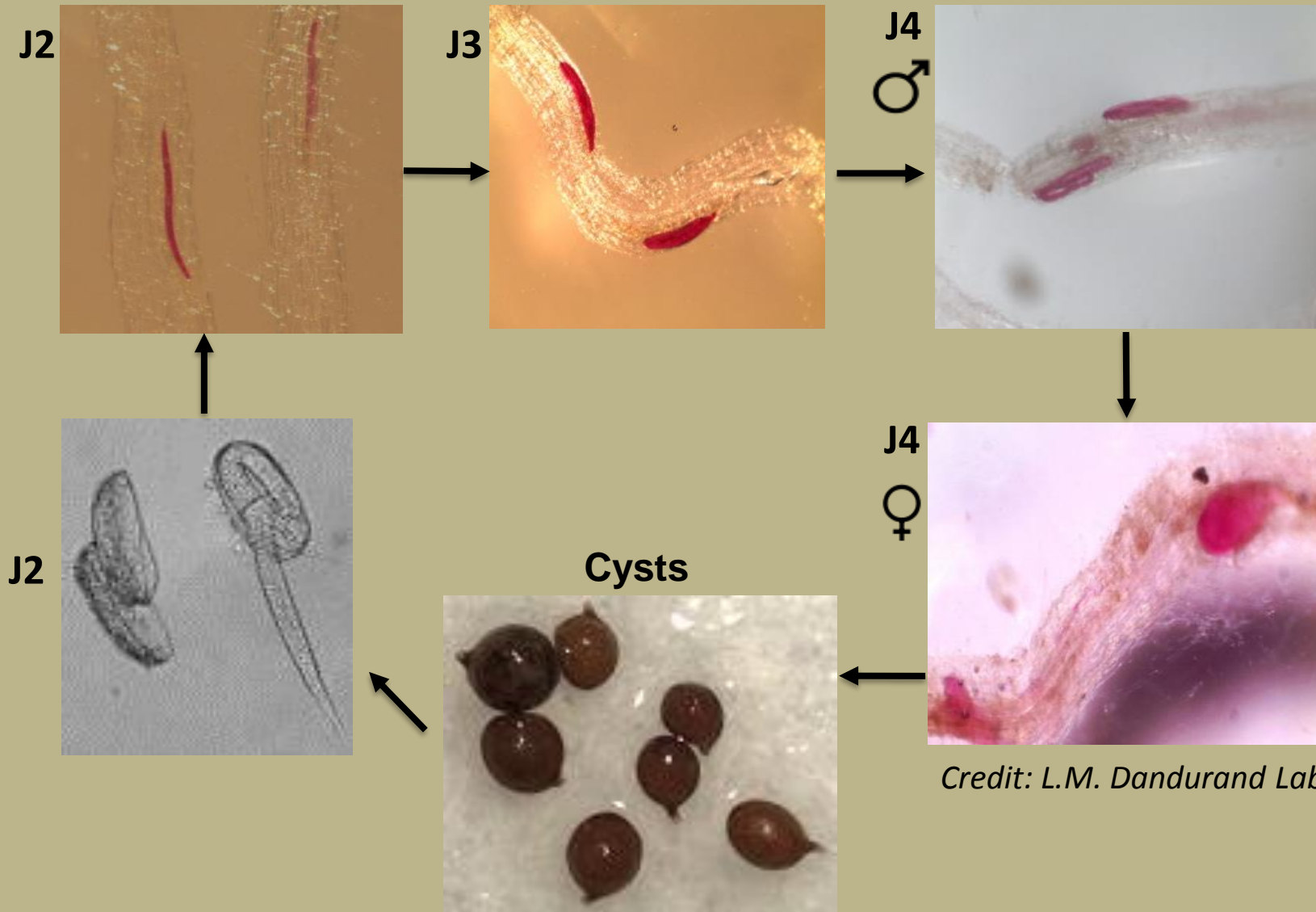
Globodera pallida

- Sedentary, endoparasitic
- Host range within *Solanum* genus
- Up to 80% yield loss
- Can remain dormant for 30+ years



Credit: Ulrich Zunke, University of Hamburg

Life Cycle of *G. pallida*



Control of *G. pallida*

- Soil Fumigation
 - Methyl bromide
 - Use halted in 2015
 - Drawbacks
 - Toxicity
 - Persistence in soil



Credit: L.M. Dandurand

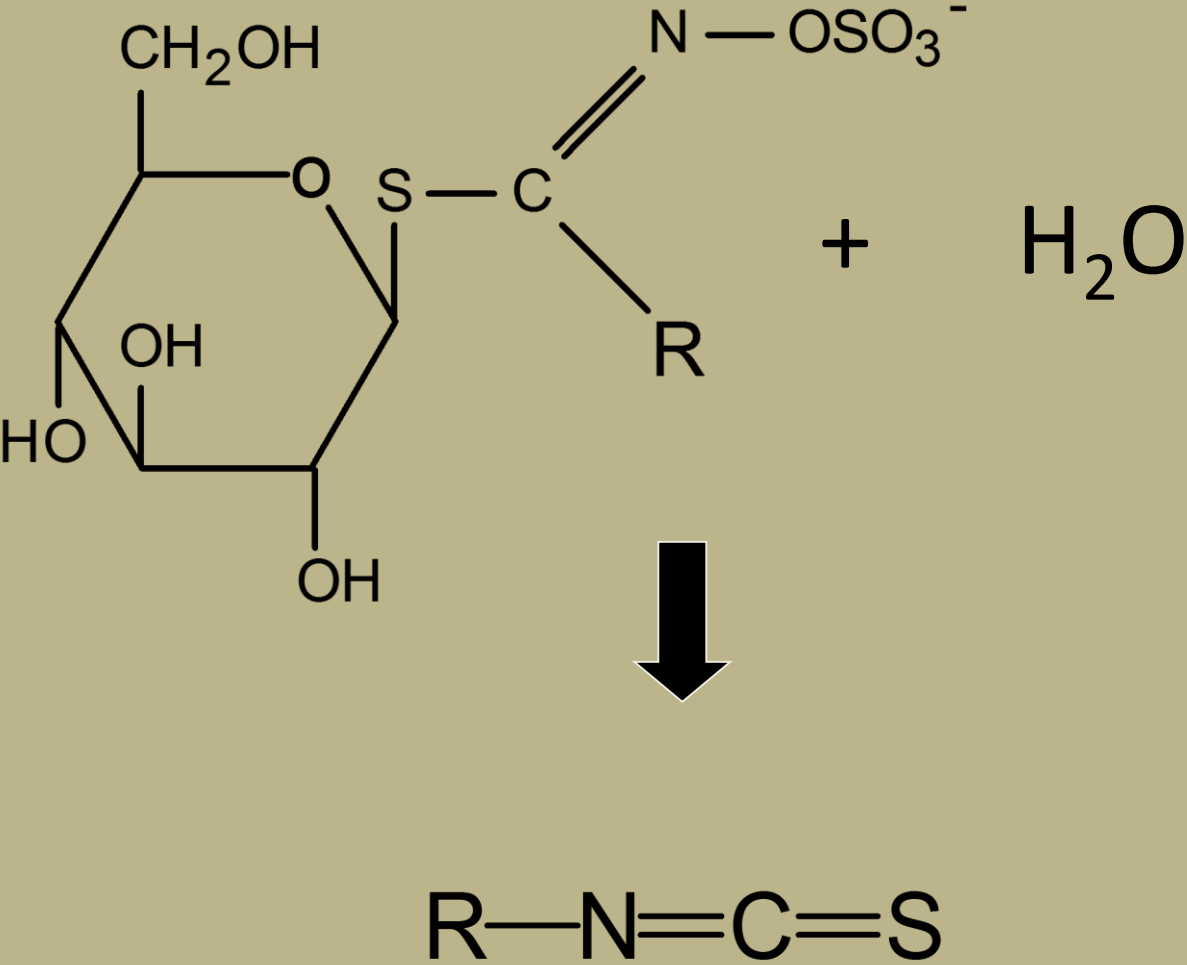
Mustard Seed Meal as a Biofumigant

- Excess OM from oil pressing
- Contains glucosinolates
 - *Brassica juncea*
 - Sinigrin
 - *Sinapis alba*
 - Sinalbin



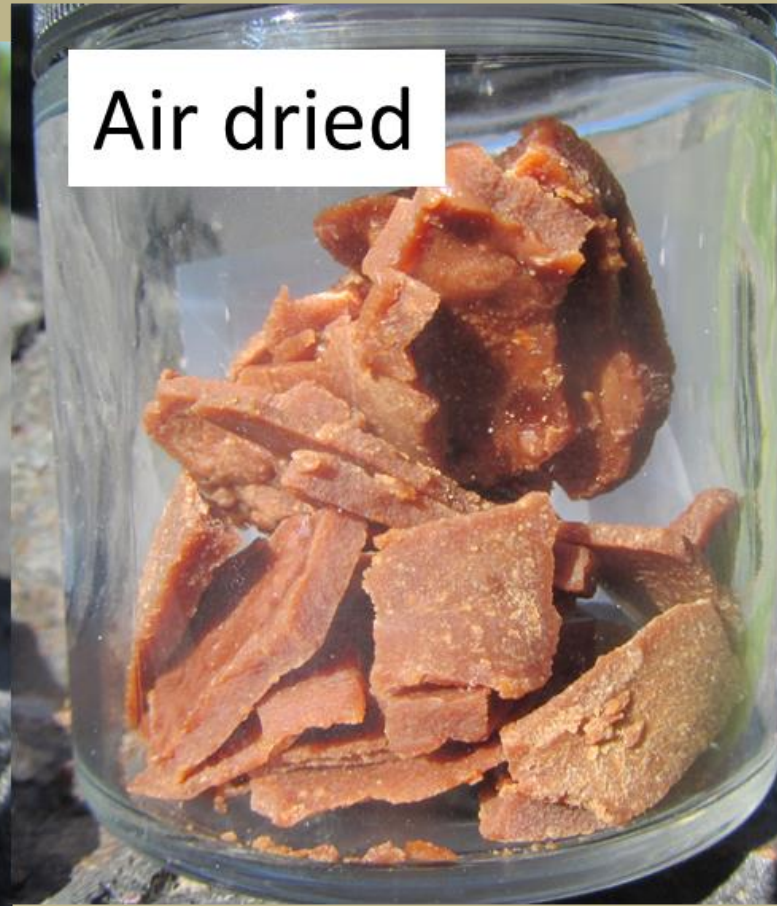
Credit: M. Morra

Glucosinolates



Credit: Matthew Morra

Seed Meal Extracts



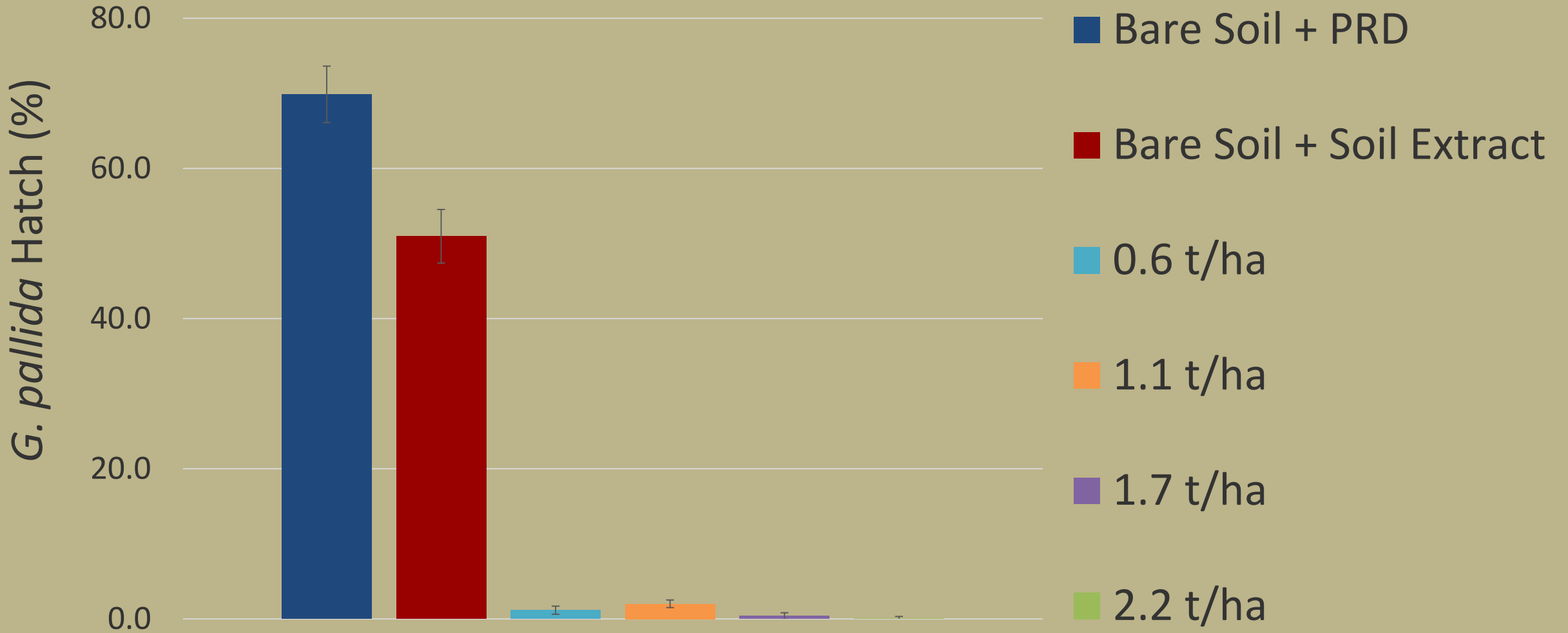
Credit: M. Morra

Lab Trials

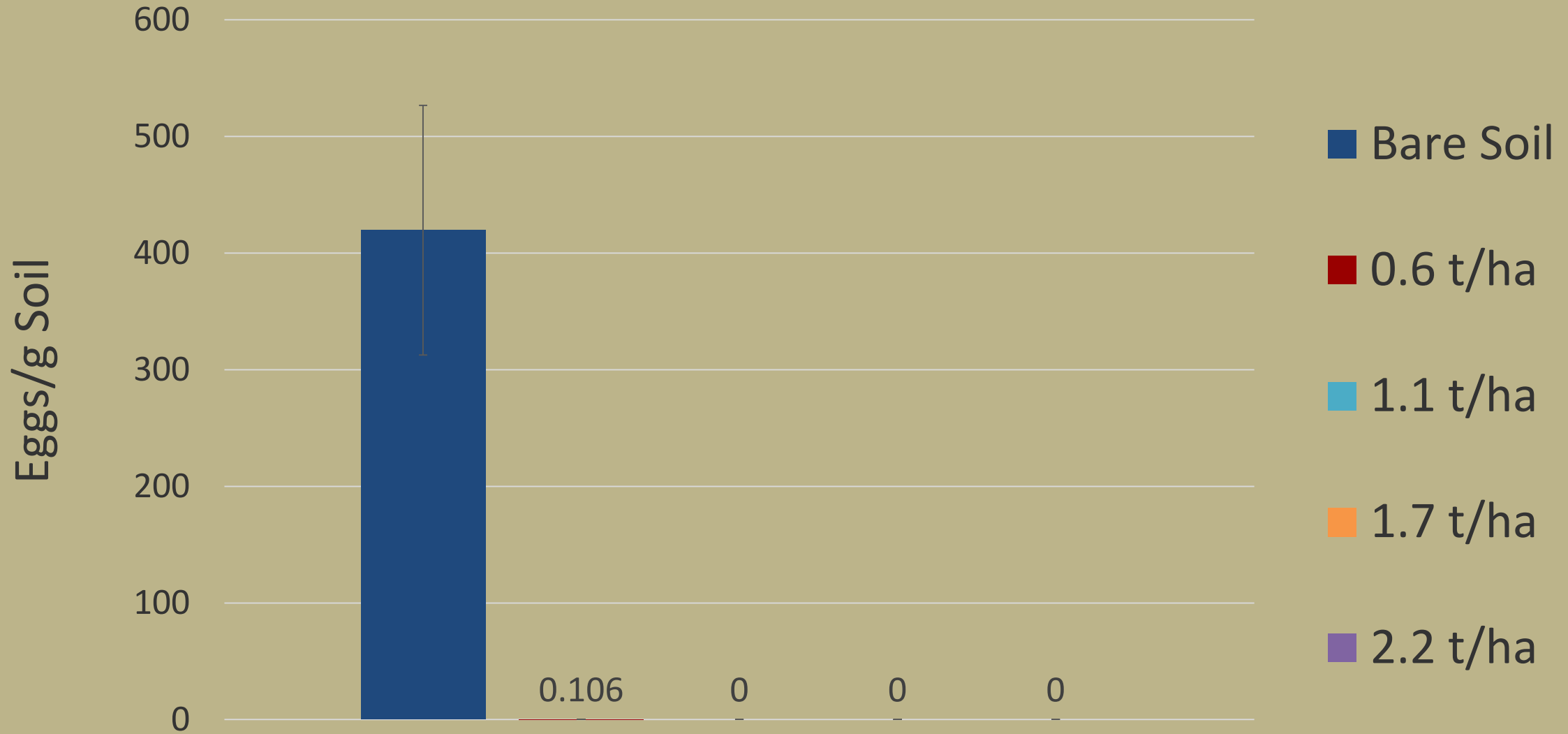
- Magenta Vessel Biofumigation
 - 2-week exposure
 - Hatching, egg count, and viability assays
 - Greenhouse reproduction bioassay



Seed Meal Extract Hatching Assay



Reproduction Bioassay

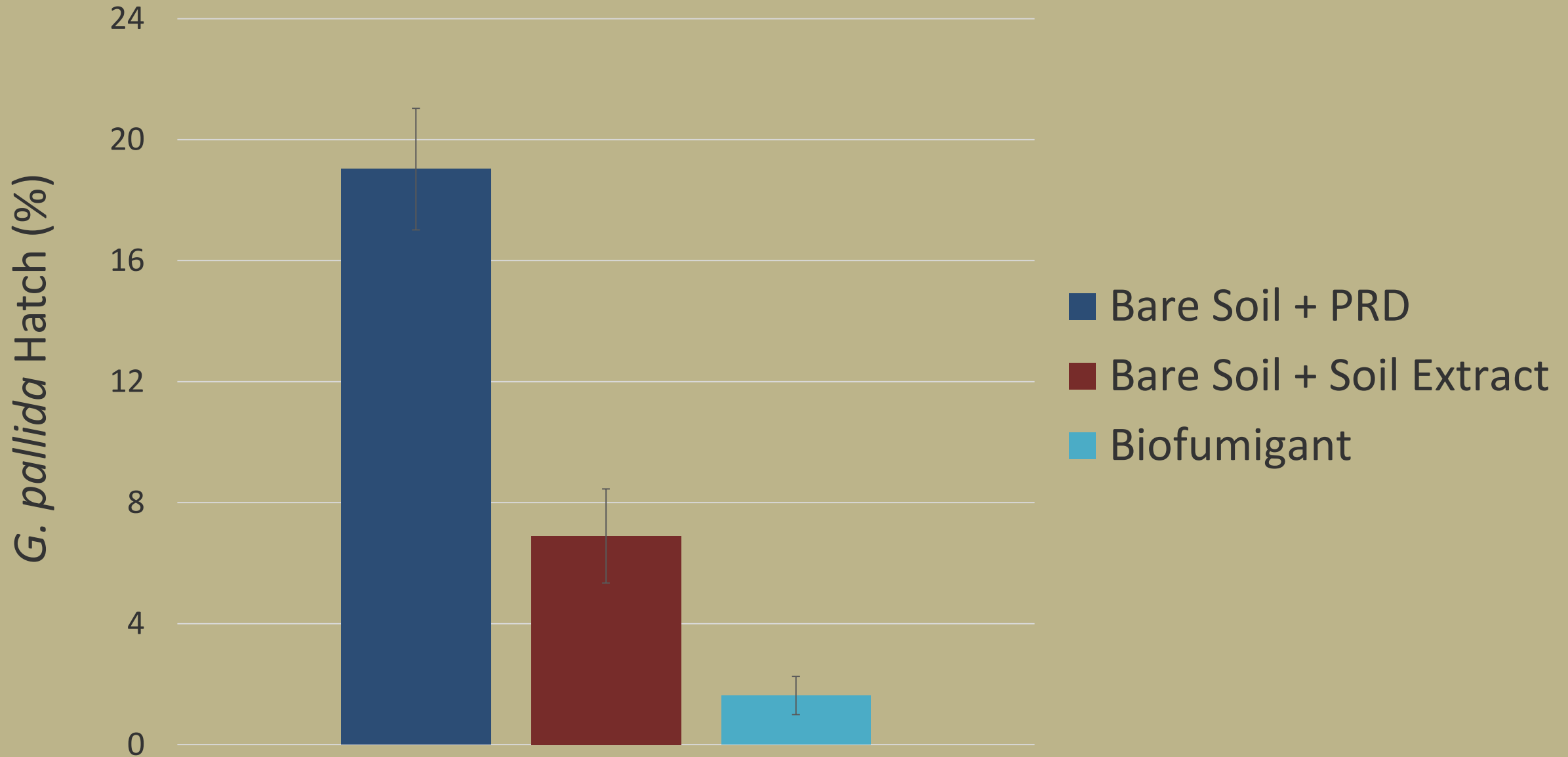


Field Trials

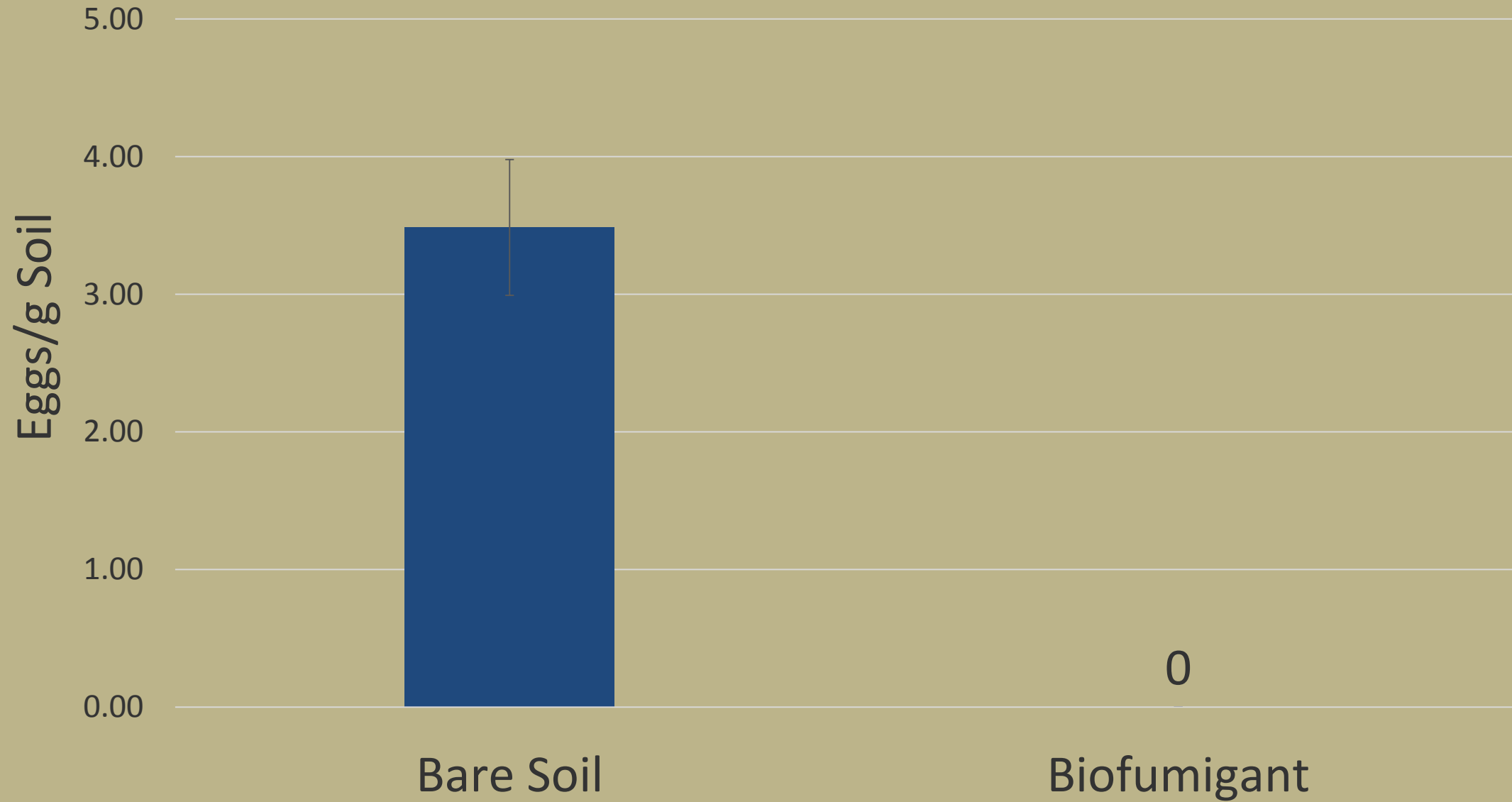
- 2016
 - Effectiveness of *B. juncea* in field
 - 2.2 t/ha
- 2017
 - Effective rate of *B. juncea*
 - Spring and fall trials
 - 0.6 t/ha and 2.2 t/ha



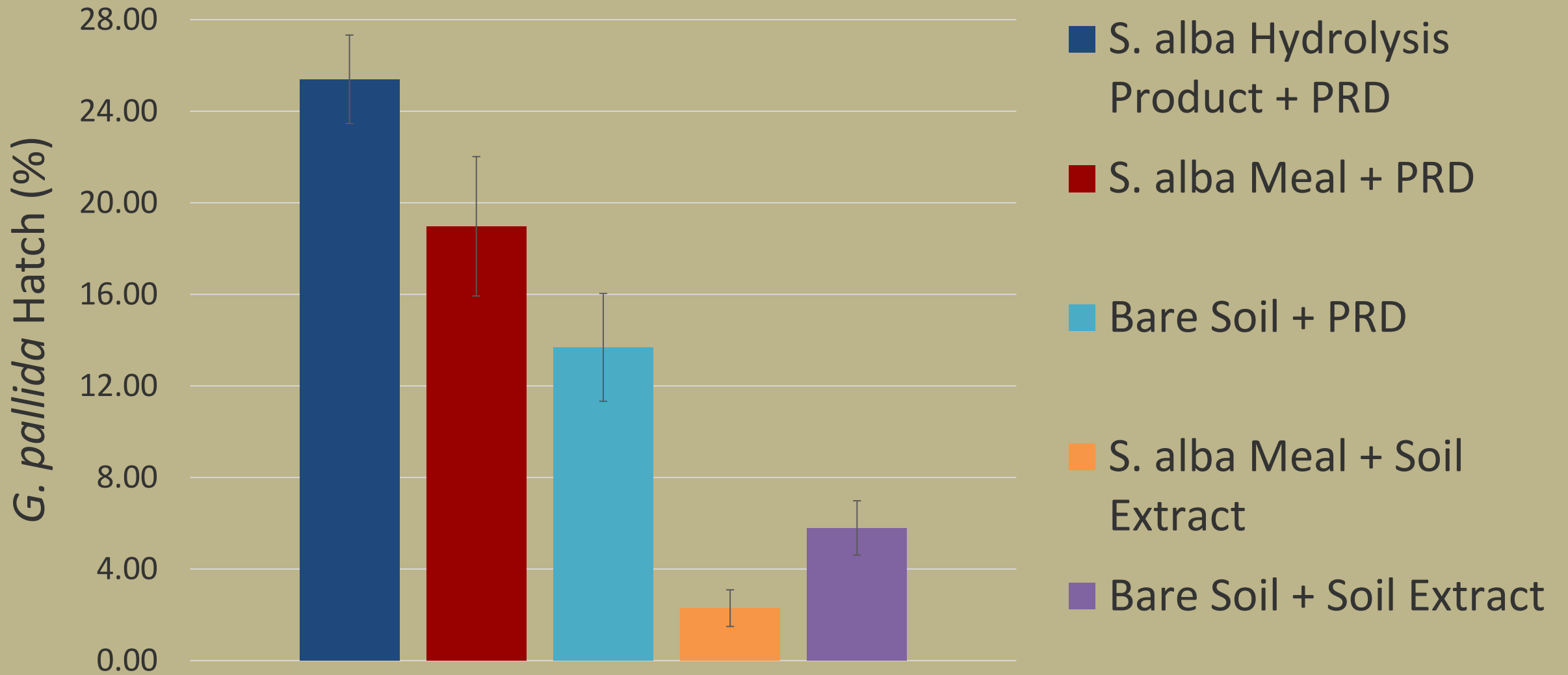
Field 2016 Hatching



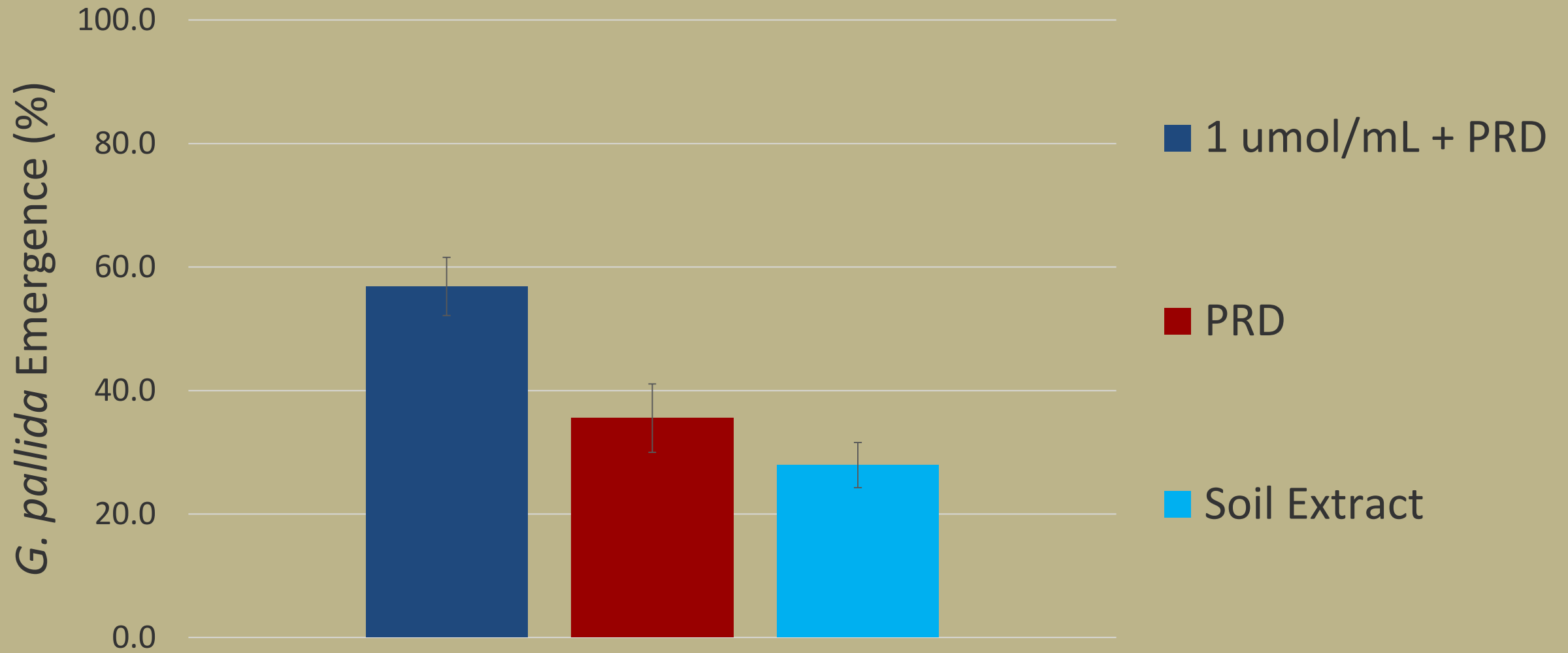
Reproduction Bioassay



S. alba Lab Hatching Assay



Hydrolysis Product - Direct Stimulus



Summary

- *B. juncea*
 - 100% eradication at 2.2 t/ha
- *S. alba*
 - Enhanced hatch in conjunction with PRD
 - Effective at 1 $\mu\text{mol/mL}$



Credit: M. Morra

Acknowledgments

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