A novel nematode-based biocontrol solution for farmers against the fall armyworm

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1. University of Neuchâtel, Switzerland
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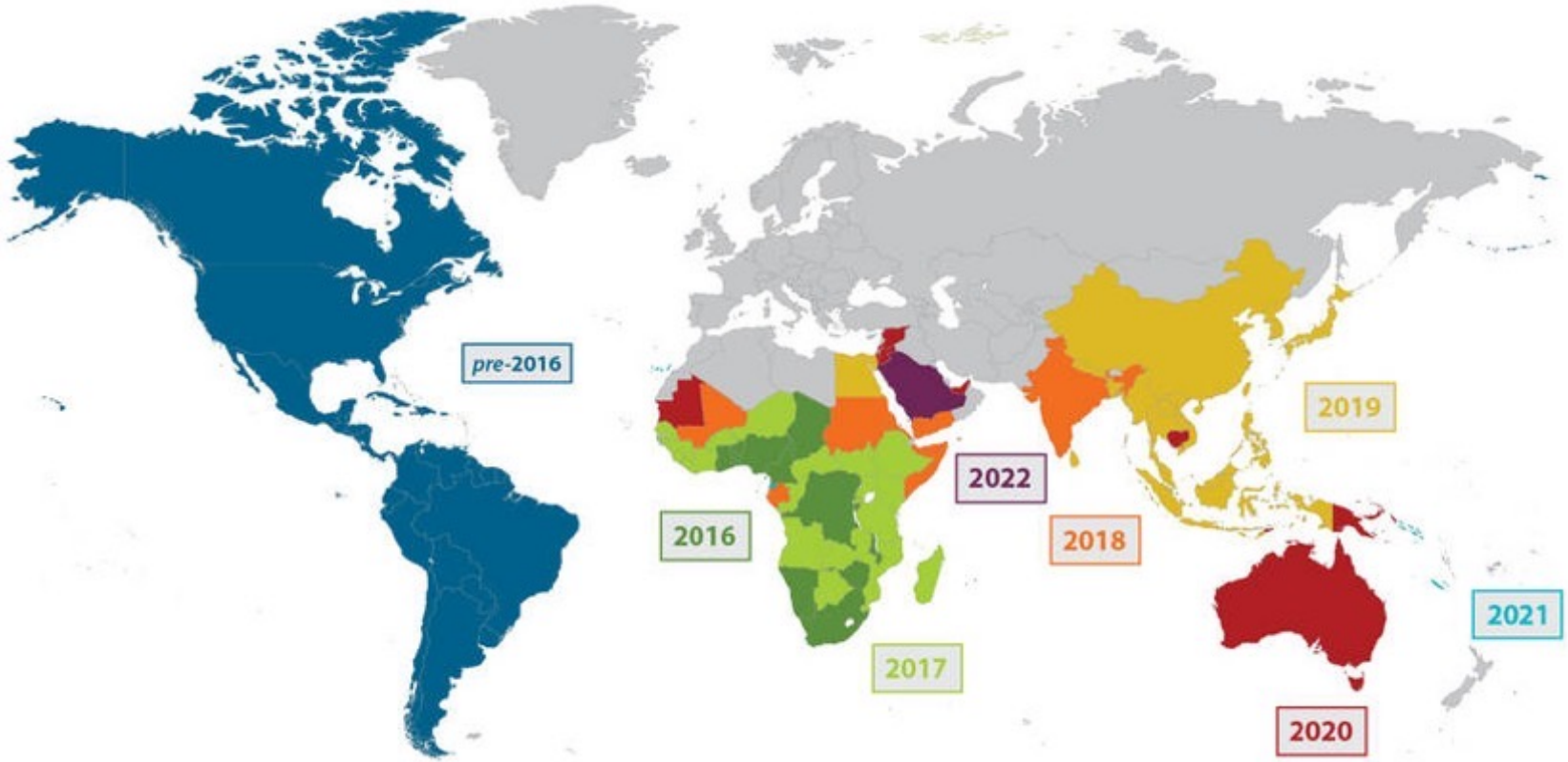
Fall Armyworm – *Spodoptera frugiperda*



FAO, 2022

Wikipedia.org

Wikipedia.org

- Up to 50% yield losses in Africa
- Representing US$ 2-6 billions per year (Day et al., 2017)

Fall Armyworm – *Spodoptera frugiperda*

- Substantial increase in insecticide use

asia.nikkei.com

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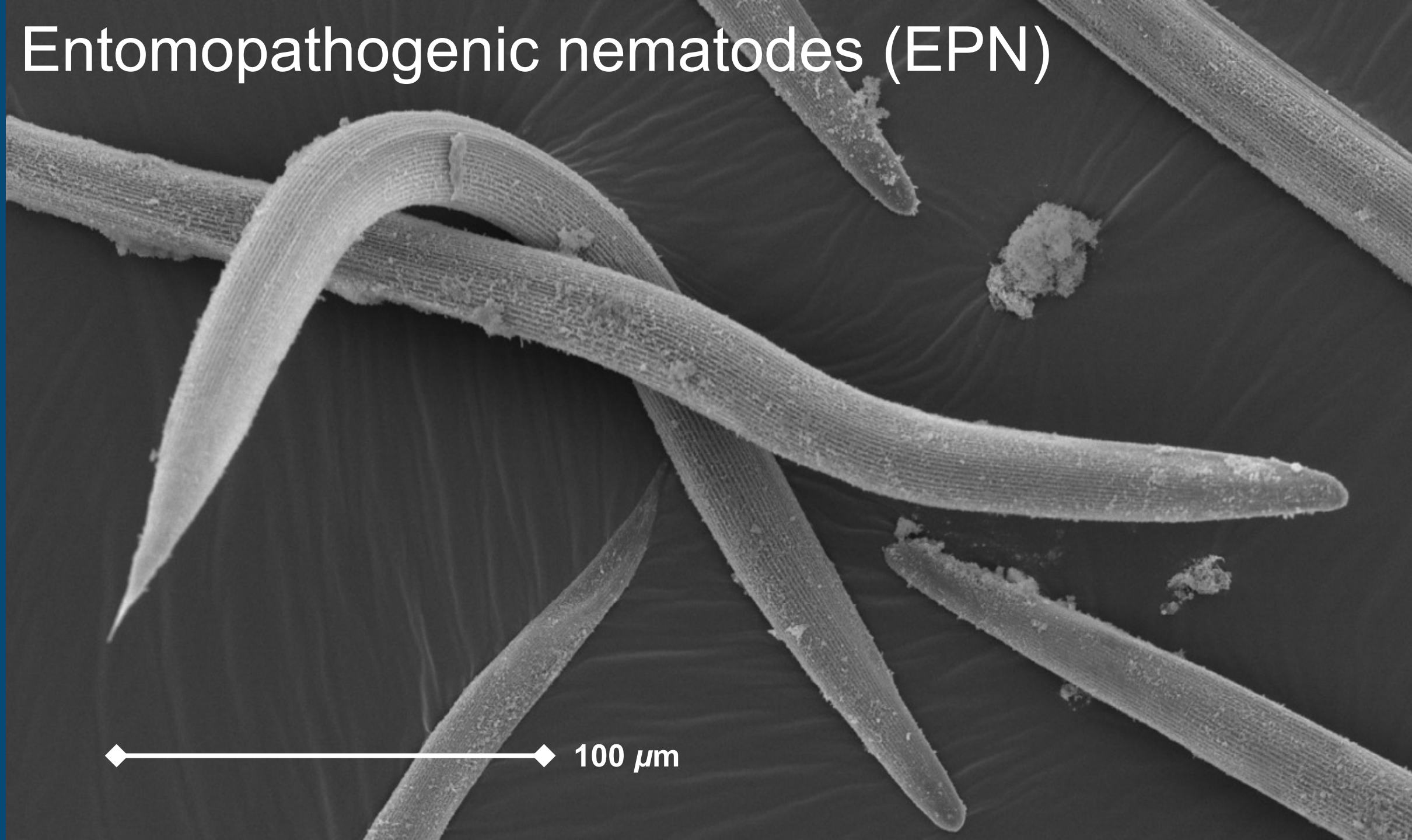
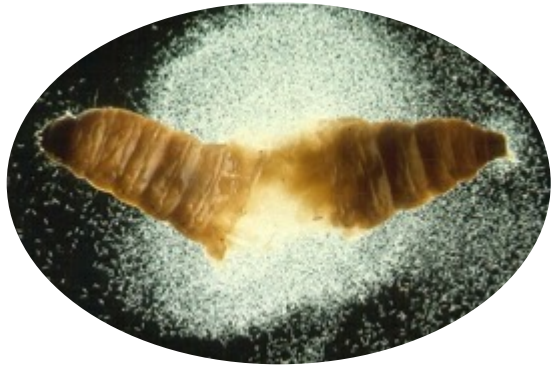
Entomopathogenic nematodes (EPN)



Entomopathogenic nematodes

Locally isolated from soils

Can be easily mass produced



Actively infest caterpillars

Safe for farmers and the environment

Steps

1. Isolate local nematodes
2. Identify highly virulent nematodes strains
3. Incorporate nematodes into formulations
4. Evaluate efficacy of nematodes in laboratory trials
5. Evaluate efficacy of nematodes in field trials

Formulations

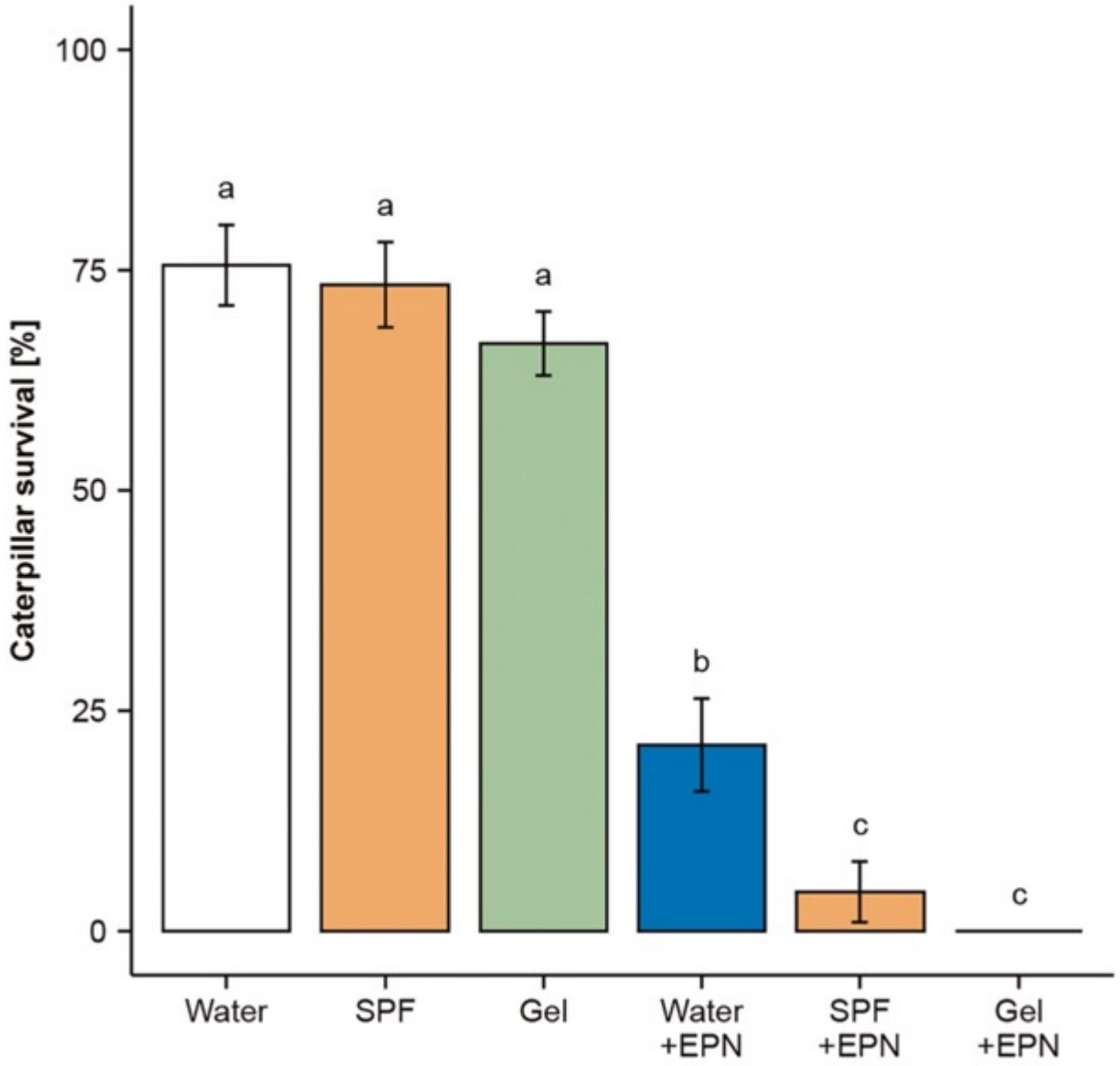
Water Surfactant Gel

Laboratory trials

Results after six days

Fall armyworm + Water (control)	Fall armyworm + EPN in gel
	

Laboratory trials



→ Caterpillar survival is considerably reduced by EPN treatment

Fallet et al., 2022. *Biol Control*

Field trials

Rwanda 2020 & 2022

- Rwanda 2020 – single application
- Rwanda 2022 – repeated applications every two weeks (3-4 applications in total)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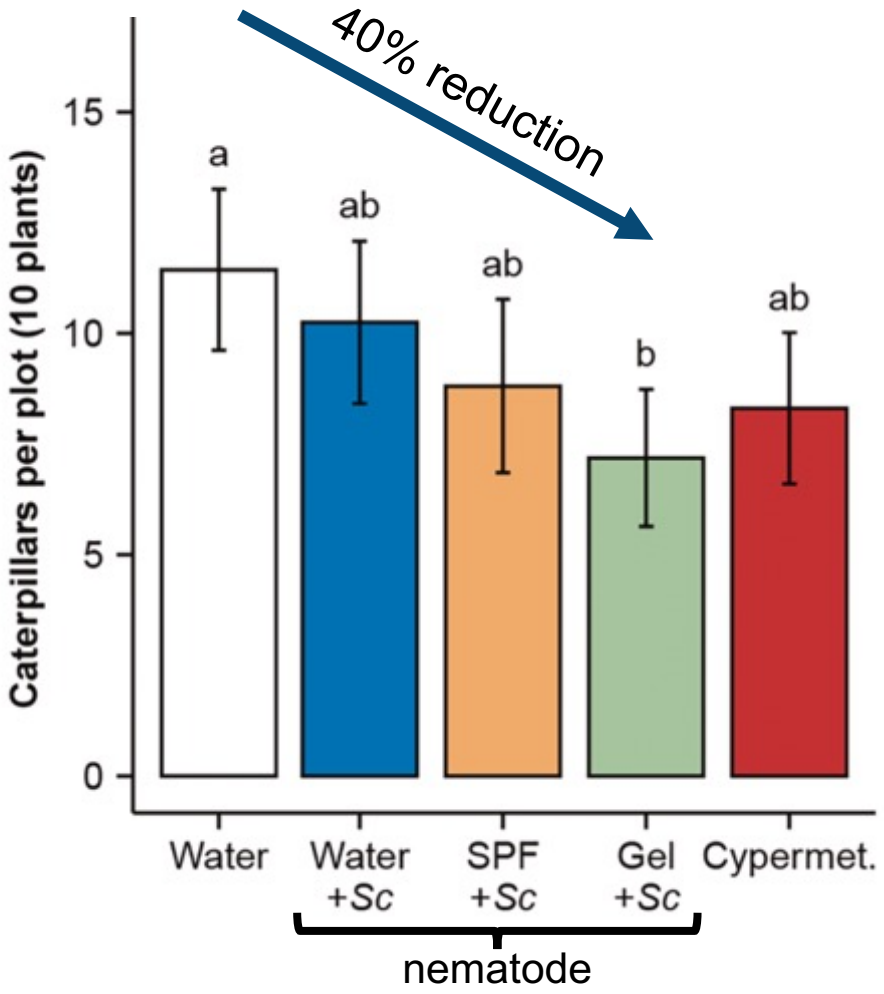
12
5

Field trials

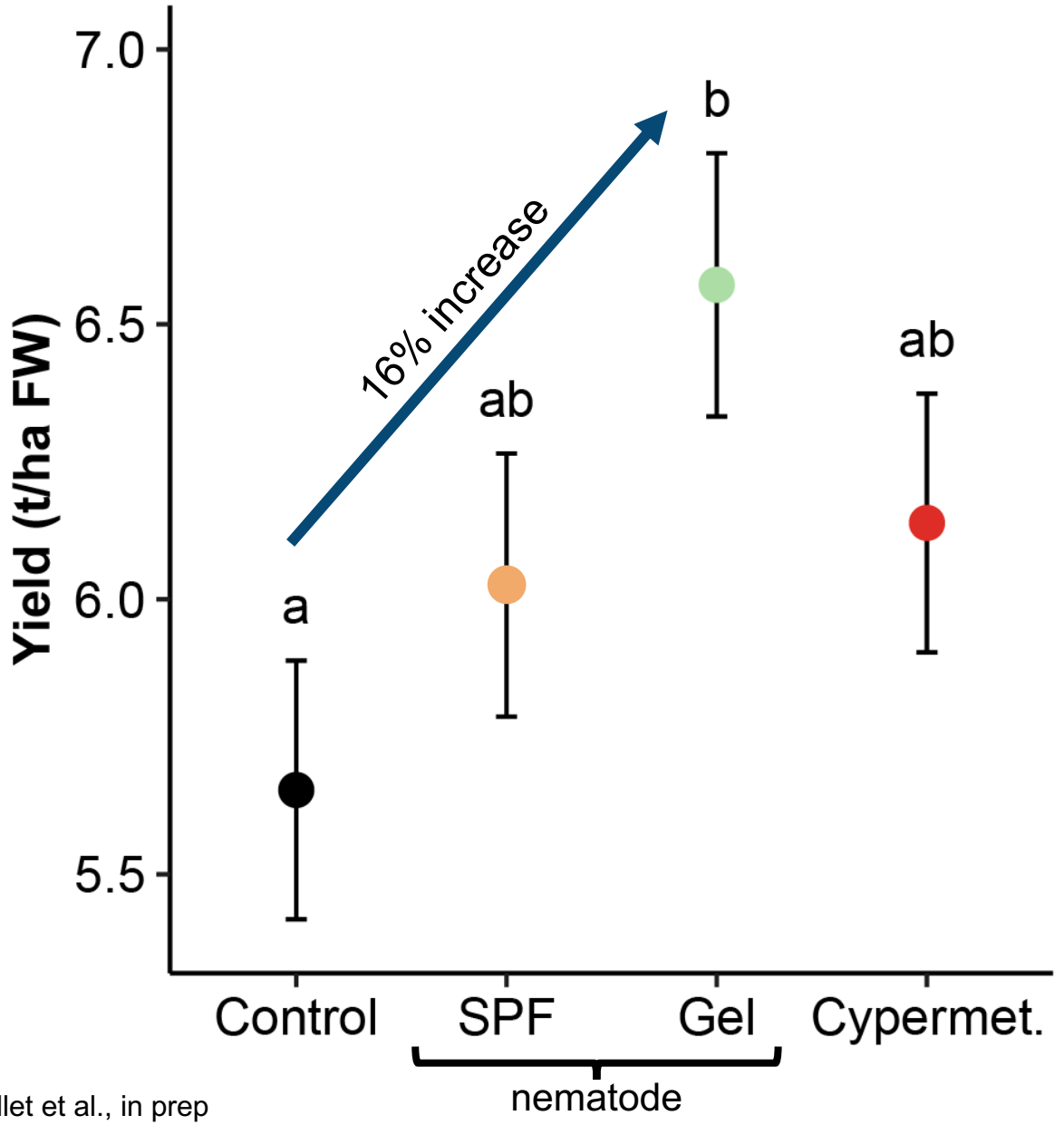


→ EPN treatment can reduce FAW infestation

→ EPN treatment can be as effective as cypermethrin

Fallet et al., 2022. *Biol Control*

Field trials



Fallet et al., in prep

Conclusion

→ EPN have great potential against FAW

→ More frequent applications?

→ Addition of EPN protectants and/or FAW attractants

→ EPN can be produced locally, without relying on external sources

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fundamental and applied research in chemical ecology

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