



UCD School of Agriculture and Food Science
Scoil na Talmhaíochta agus Eolaíocht an Chothaithe UCD

Pesticides and pollinators; non-target impacts of pesticides on biodiversity



Associate Professor Dara Stanley

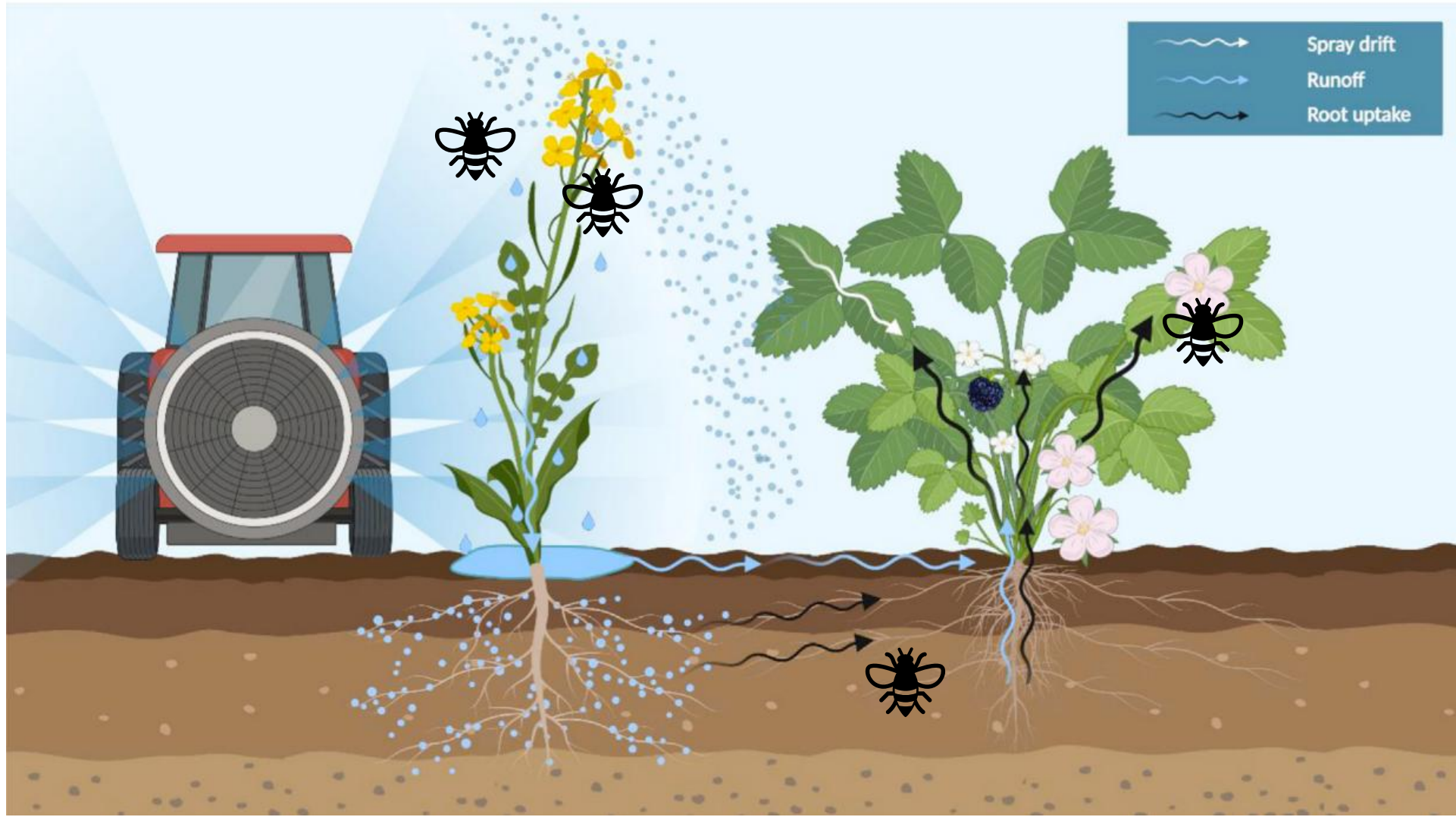
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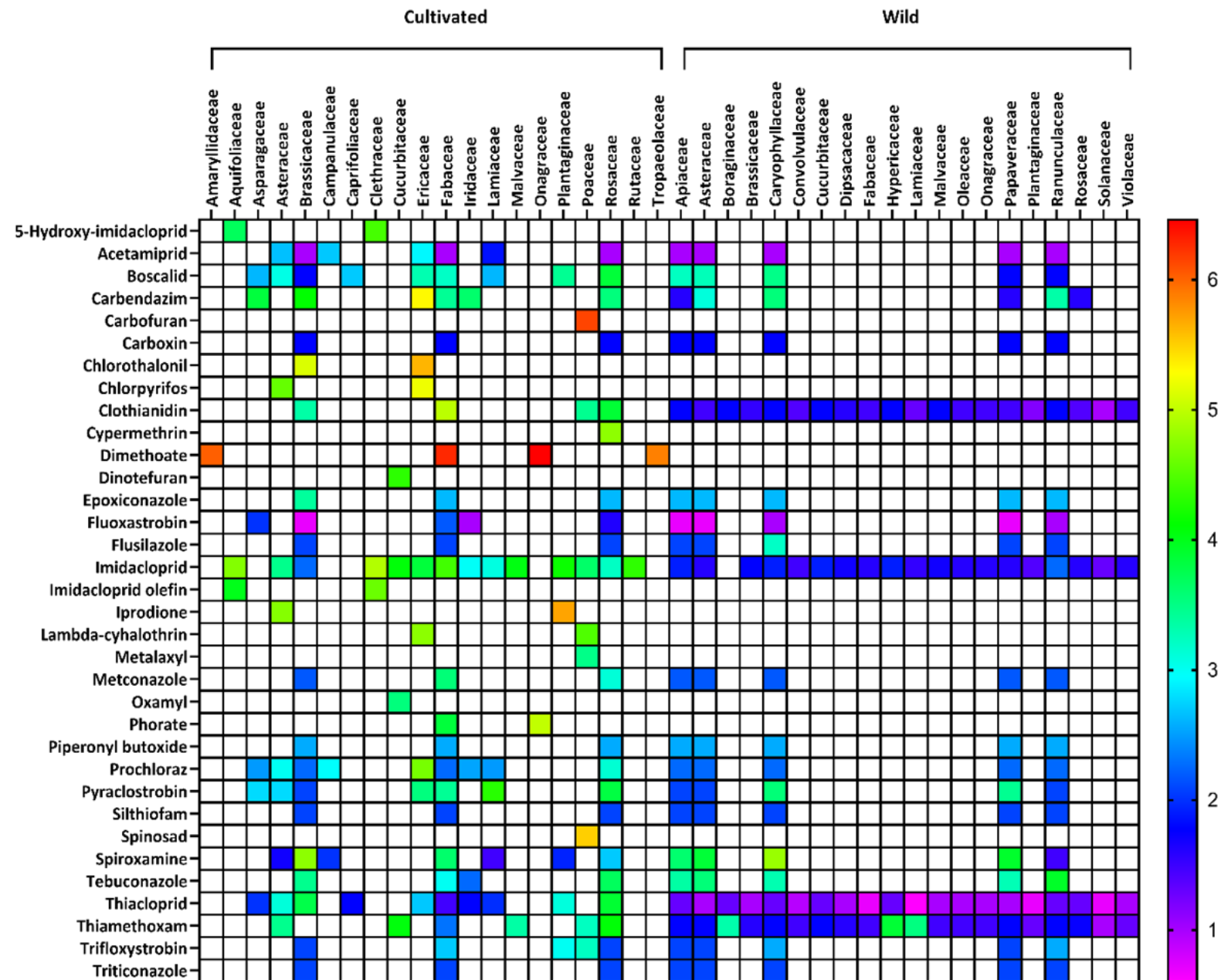
University College Dublin

www.stanleyecologylab.org



**Without bees they'll
all be off the menu**





Field realistic, sub-lethal impacts - experiments



Learning & memory

e.g. Thompson et al. (2023) JEB, Stanley et al. (2015) Scientific Reports



Reproduction

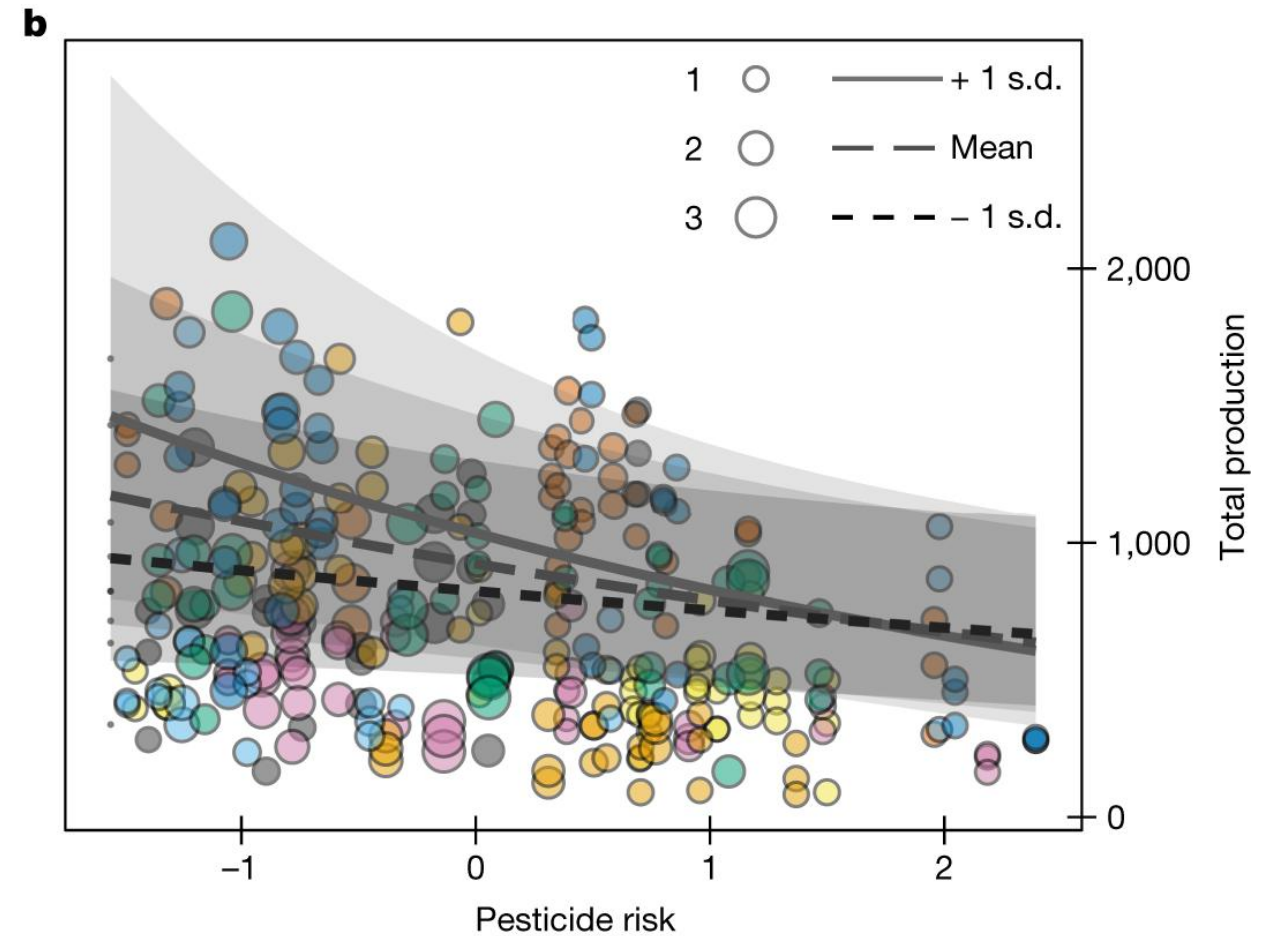
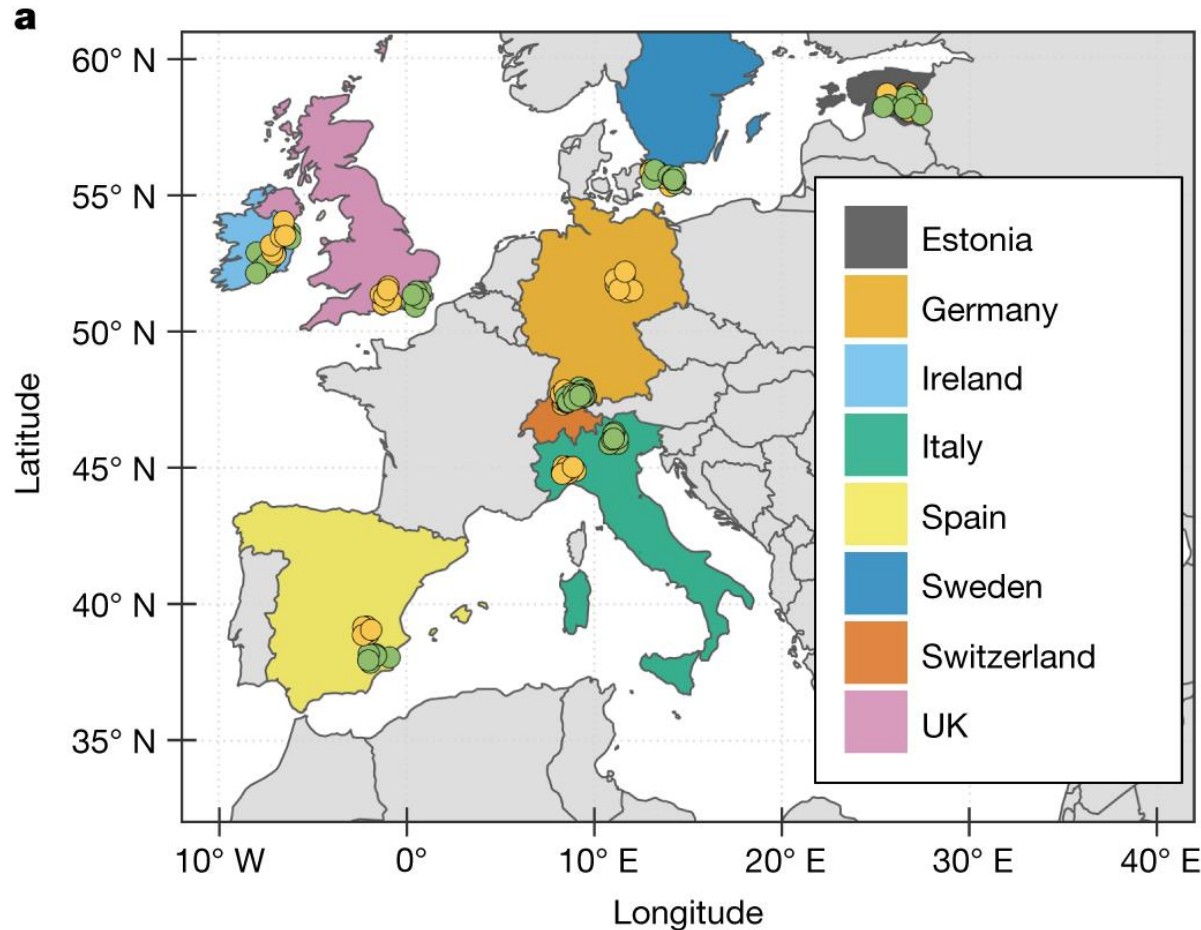
e.g. Rundolf et al. (2015) Nature



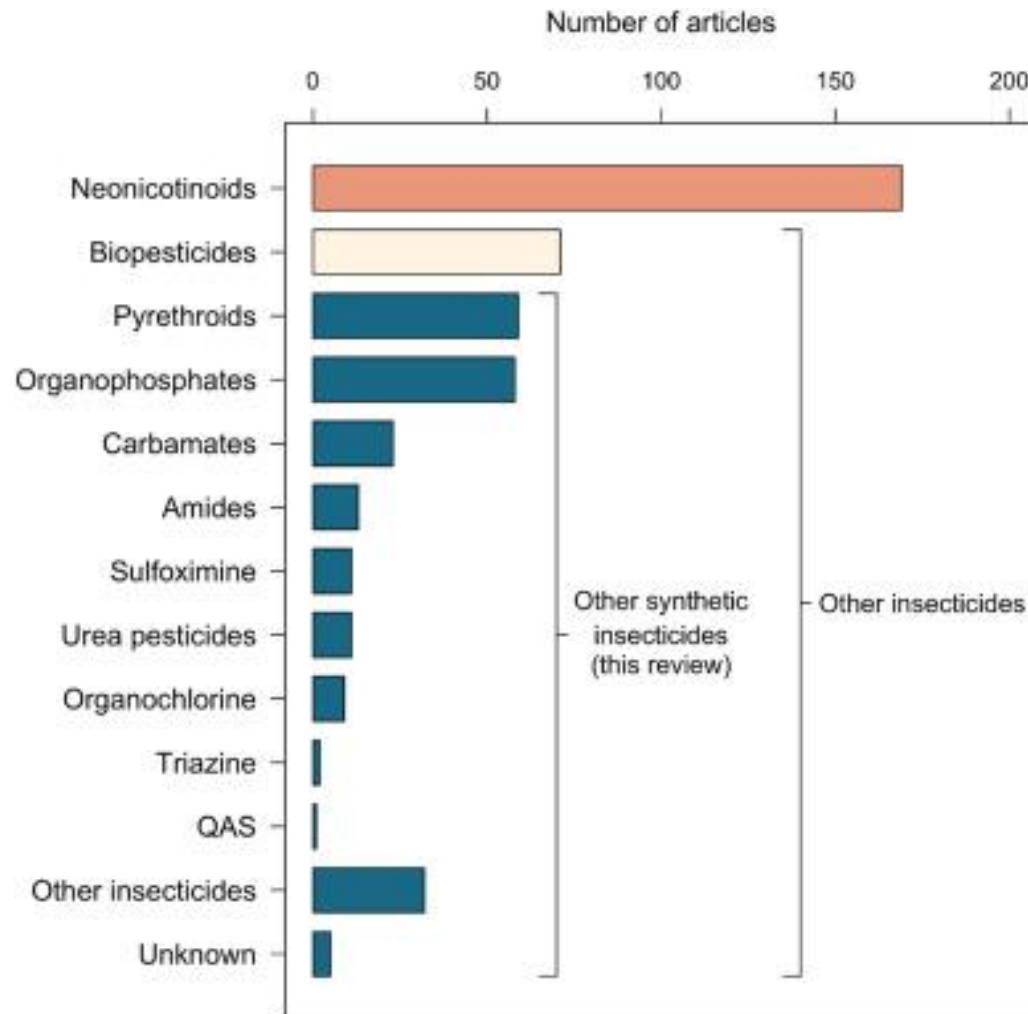
Flower visitation and pollination

e.g. Stanley et al. (2015) Nature
O'Reilly et al. (2023) J App Ecol

Field realistic, sub-lethal impacts - field

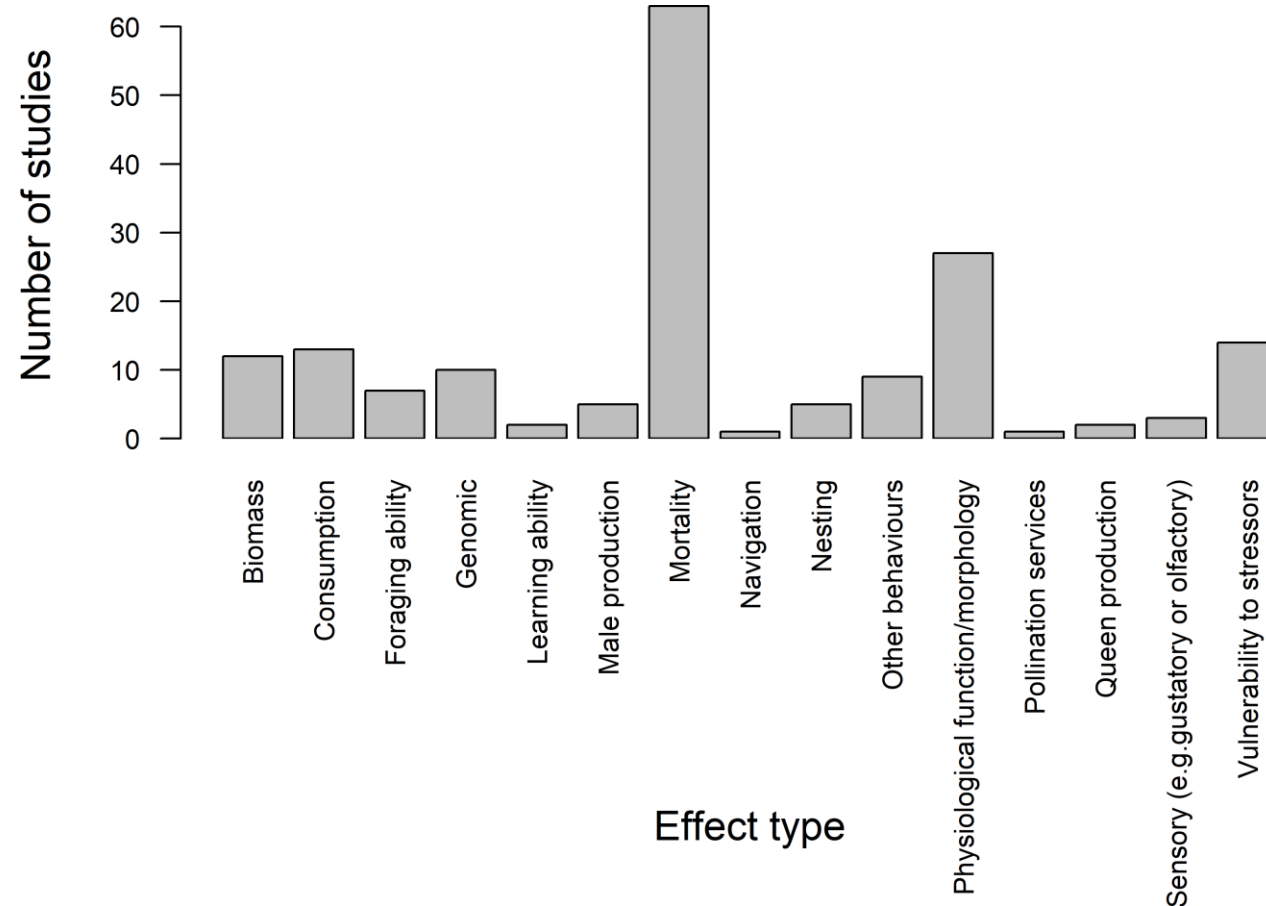


What we know - insecticides



Over 1500 publications

What we know – fungicides and herbicides

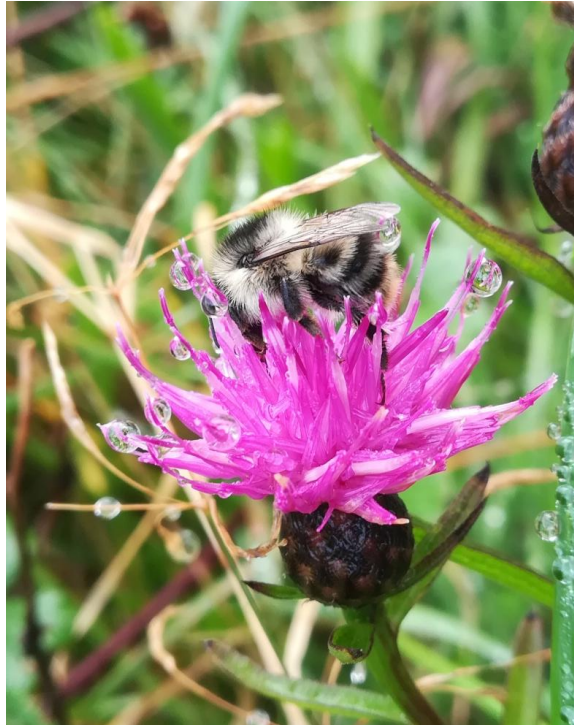


89 publications

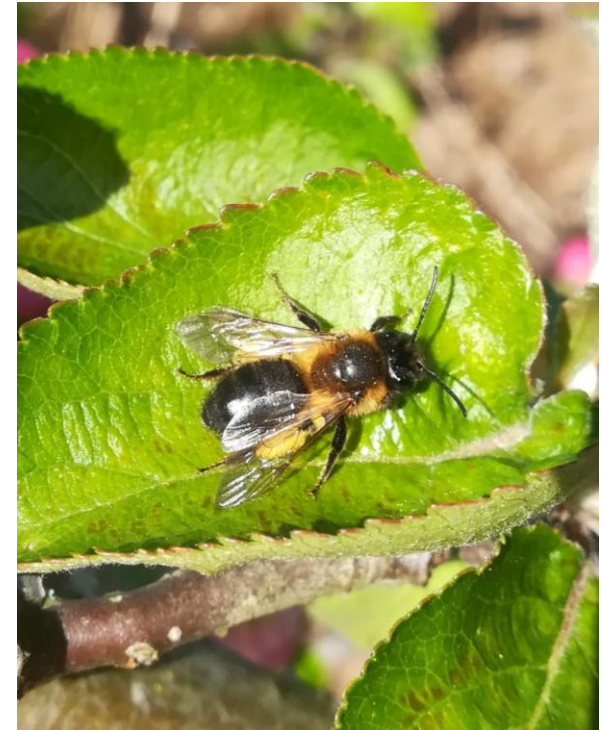
What we know – bee species



Honeybees



Bumblebees



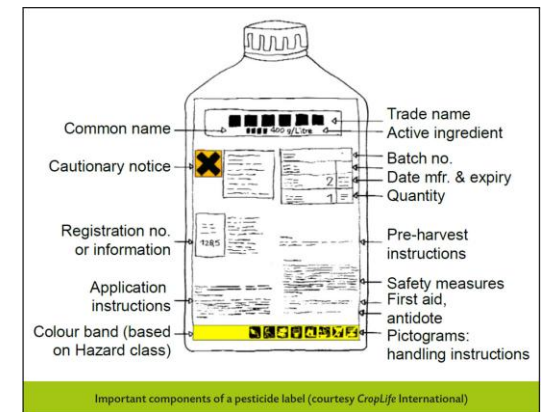
Solitary bees

What can we do?

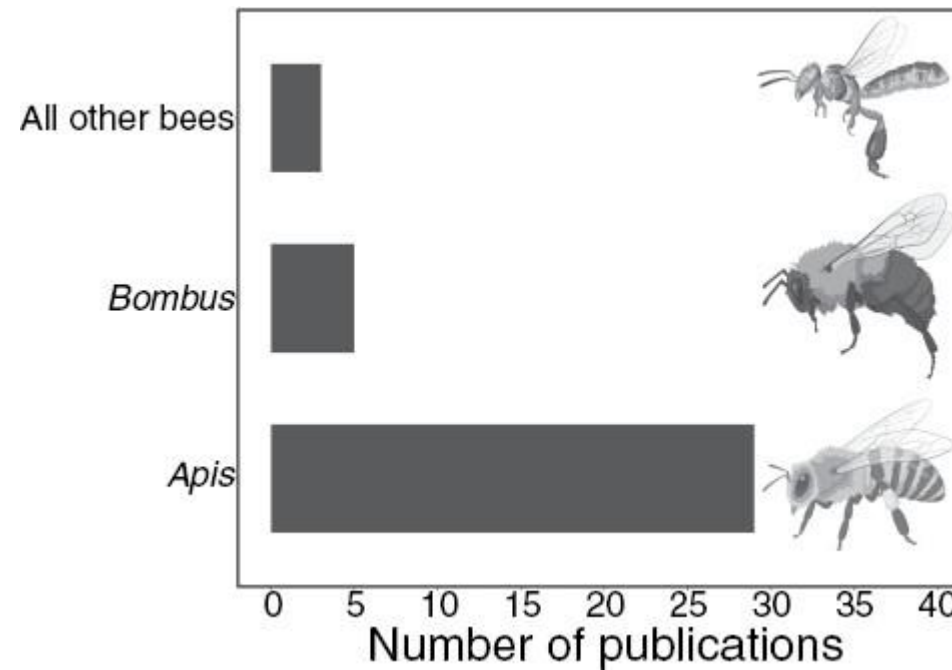
- **Reduce**
 - e.g. IPM, organic farming, agroecology, reduction targets
- **Make their use safer**
 - Improve risk assessment
 - Mitigation measures



Mitigation measures



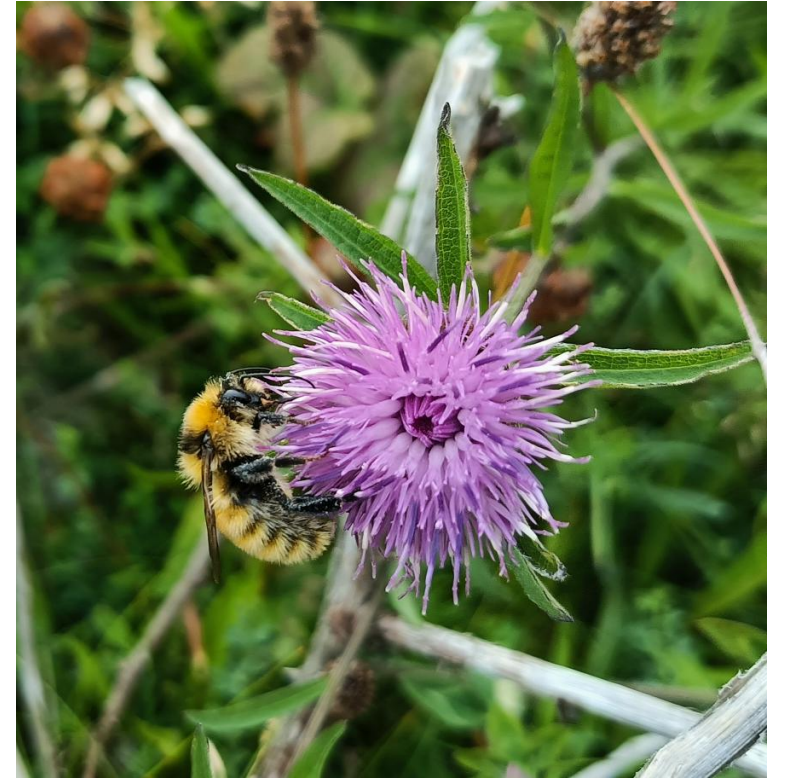
Straw, Kelly & Stanley (2023)
Ecotoxicology & Environmental Safety



Straw & Stanley (2023) *Journal of Economic Entomology*

Summary

- Pesticides have non-target effects
- Residues in nectar, pollen, soils
- Sub-lethal effects on bees
- Not all bee species the same
- Mitigation measures followed, but not strongly based on evidence



Policy recommendations

- Sub-lethal impacts and more than honeybees in risk assessment
- Post-approval monitoring
- Mitigation measures
- Alternatives
- Bees in agricultural, but also urban and other contexts





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Acknowledgements

- Protects Project: <https://www.ucd.ie/agfood/protects/>
- Suspoll Project: <https://www.ucd.ie/agfood/suspoll/>
- ProPollSoil Project: <https://propollsoil.eu/>
- Collaborators
- Funders

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