

Agroecological and cropping systems-based approaches for conservation of natural enemies

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Natural Enemies of Pests

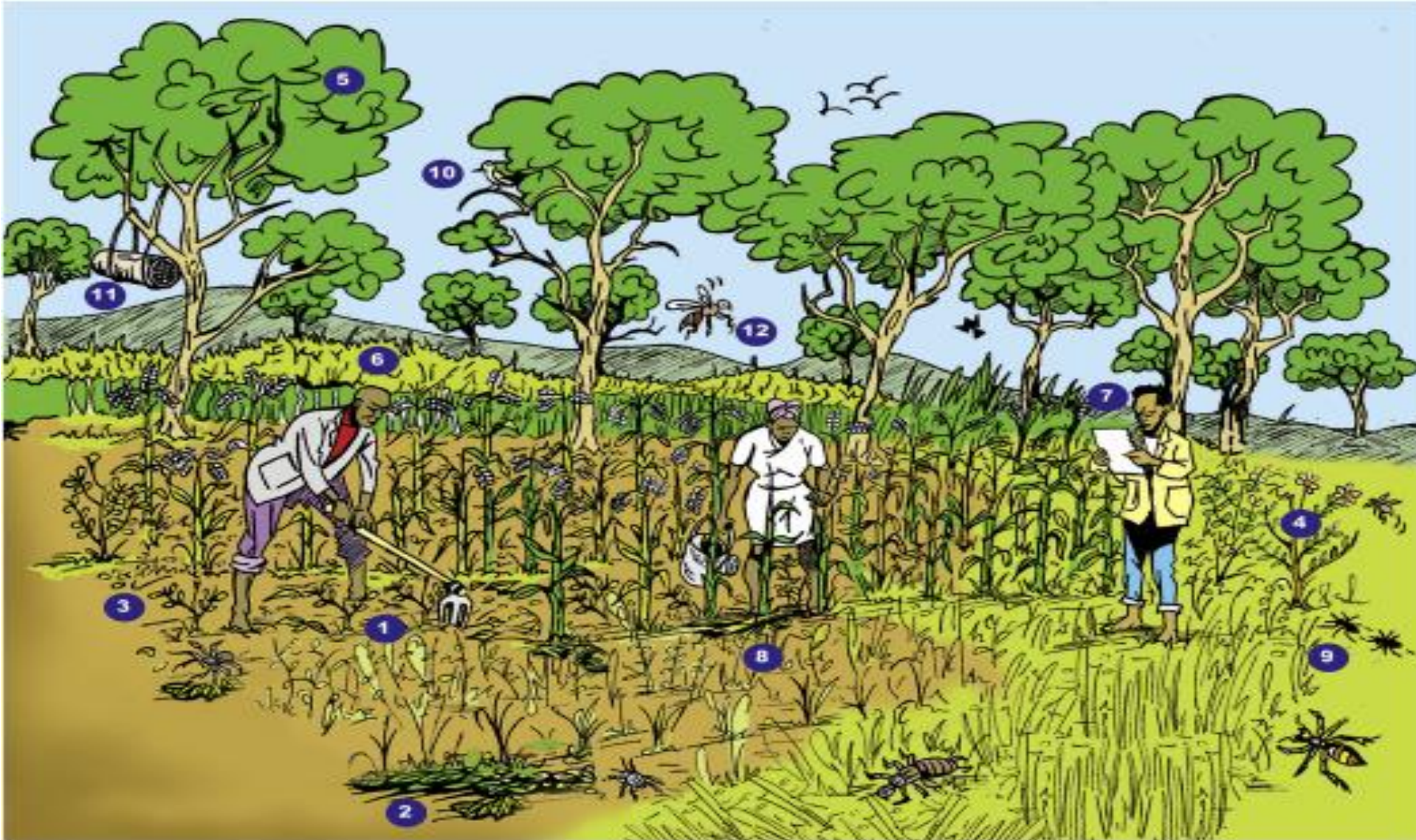
Parasitoids



Predators



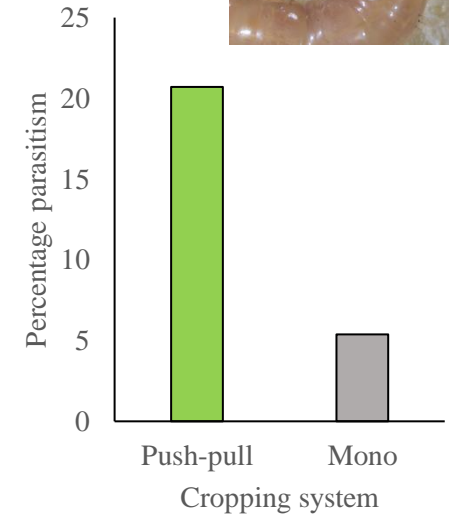
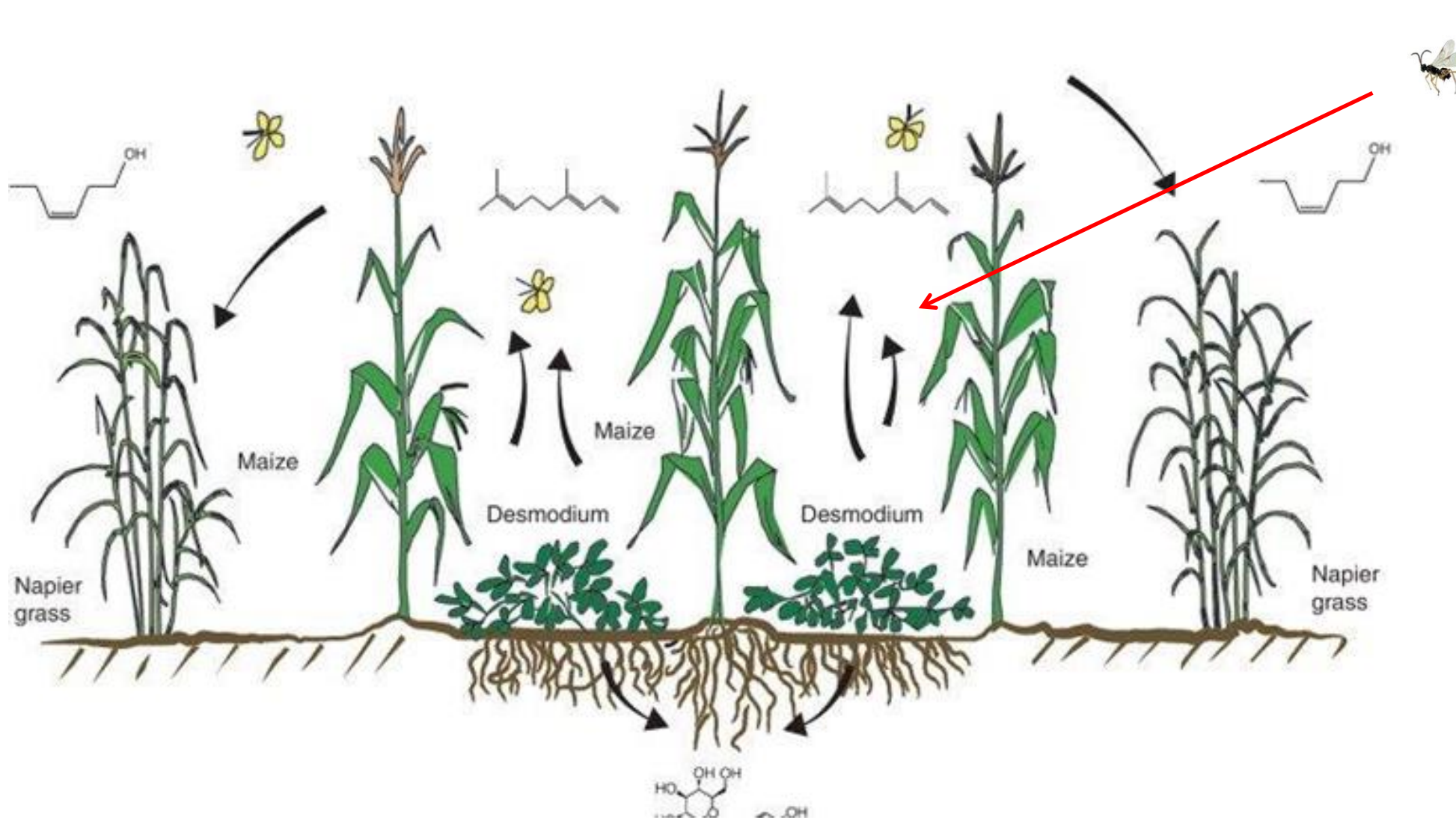
Habitats of Natural Enemies



Habitat Diversification through cropping systems

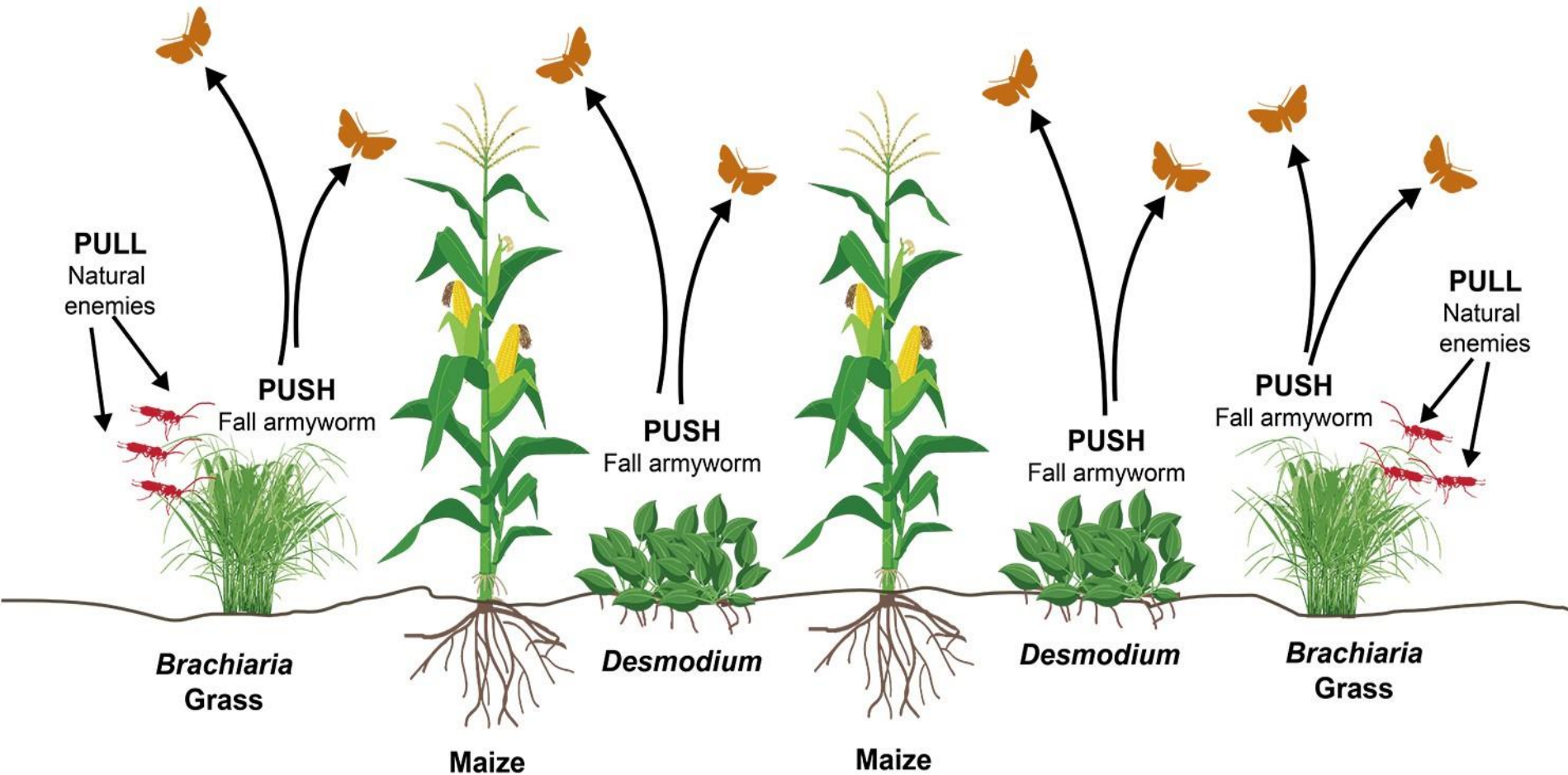


Push-Pull cropping system increases parasitism



Khan et al. 1997 Nature

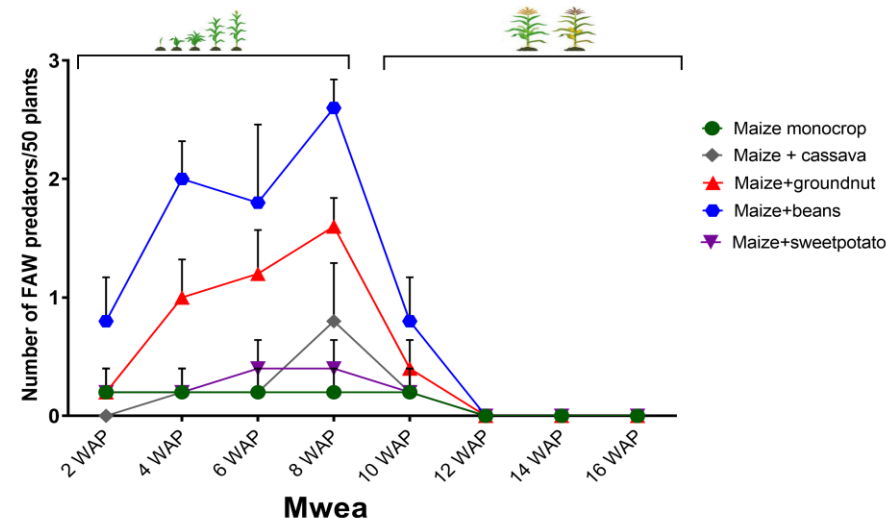
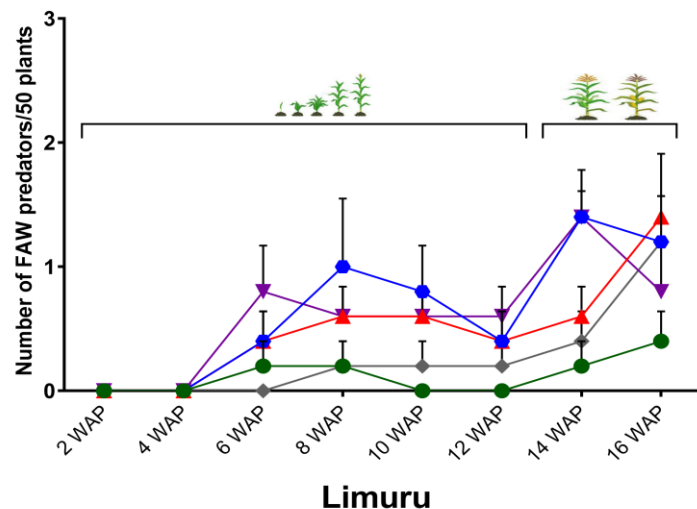
Push-Pull cropping system increases FAW natural enemies



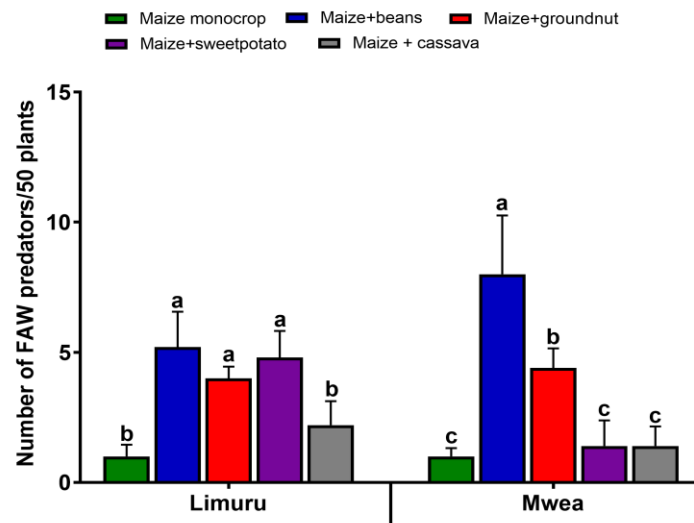
Sobhy et al 2022 Front. Ecol. Evol.

Diversified cropping systems increase abundance of natural enemies

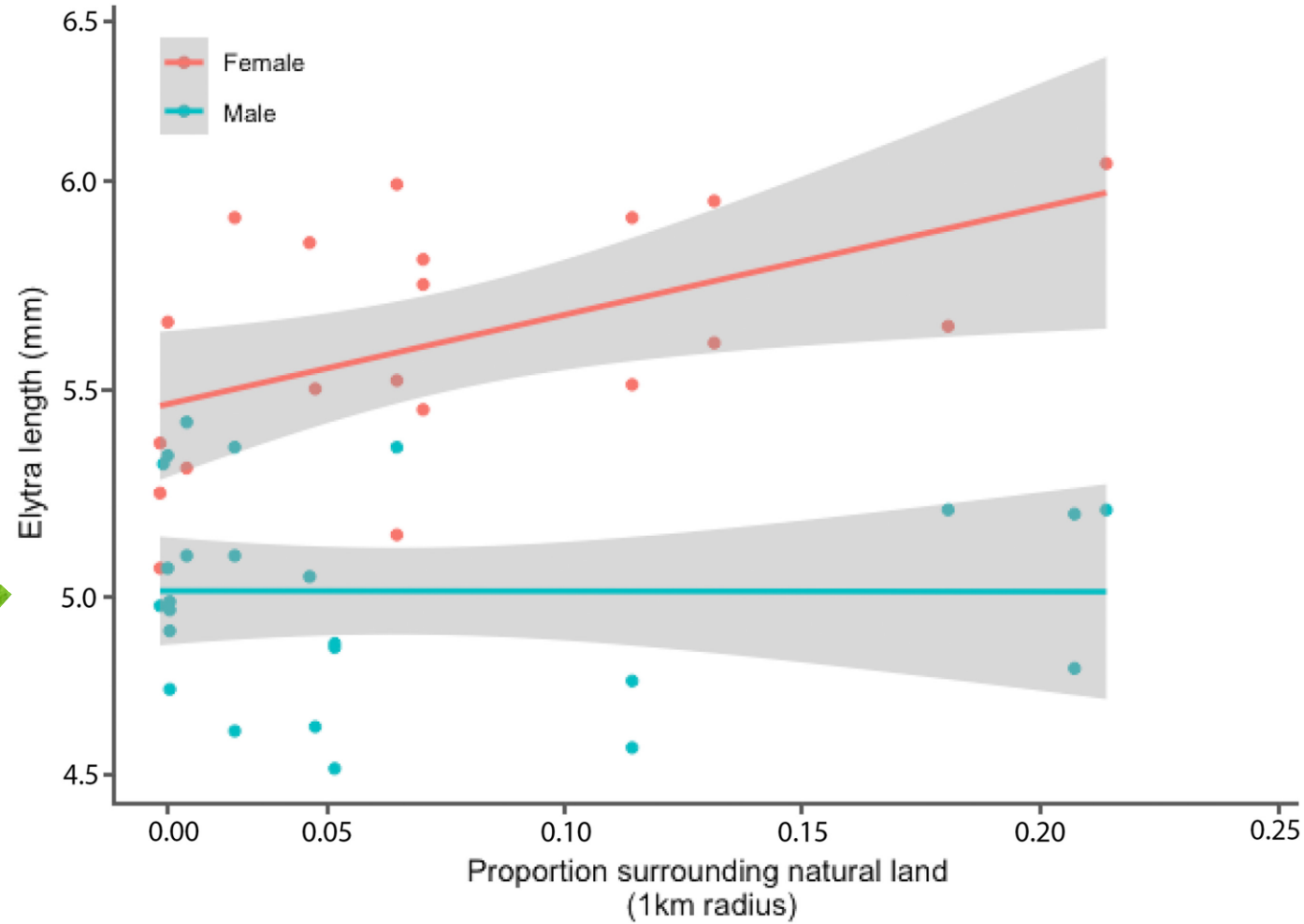
Number of FAW predators across sampling weeks



Number of FAW predators across treatments

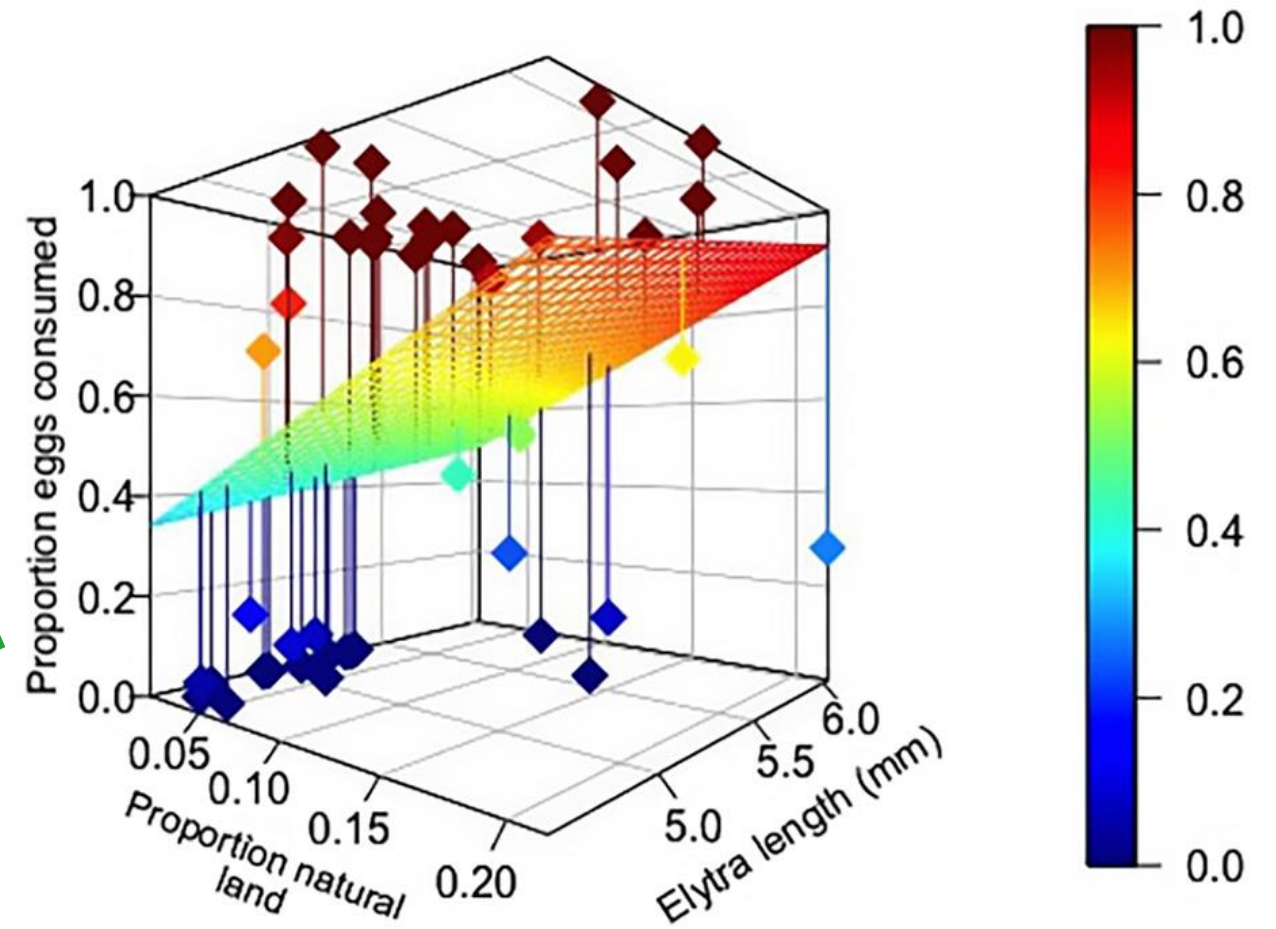


Landscape/cropping system complexity increases predator size



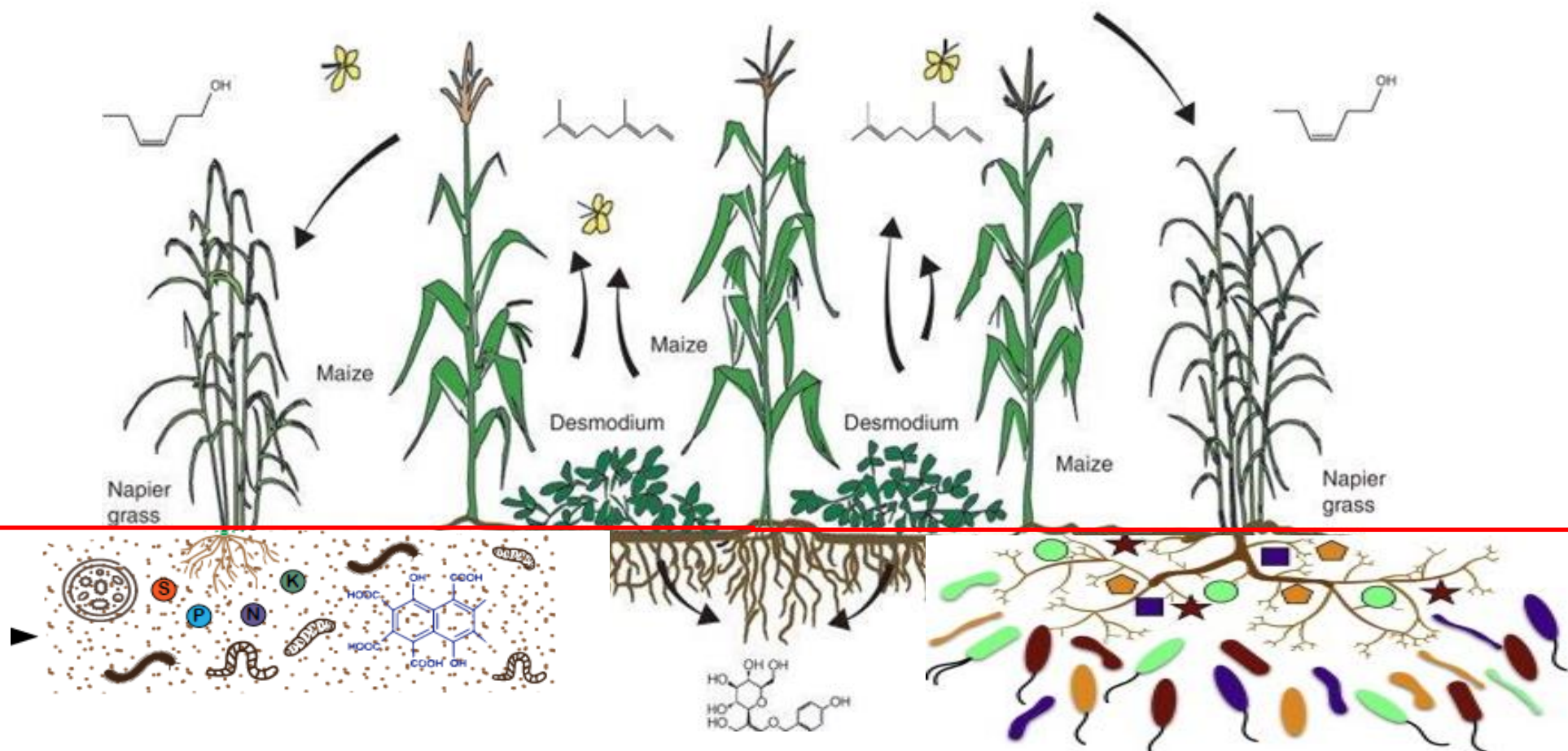
Salzberg et al., 2022 *Entomol. Expl. Appl.*

Landscape/cropping system complexity increases predation rates

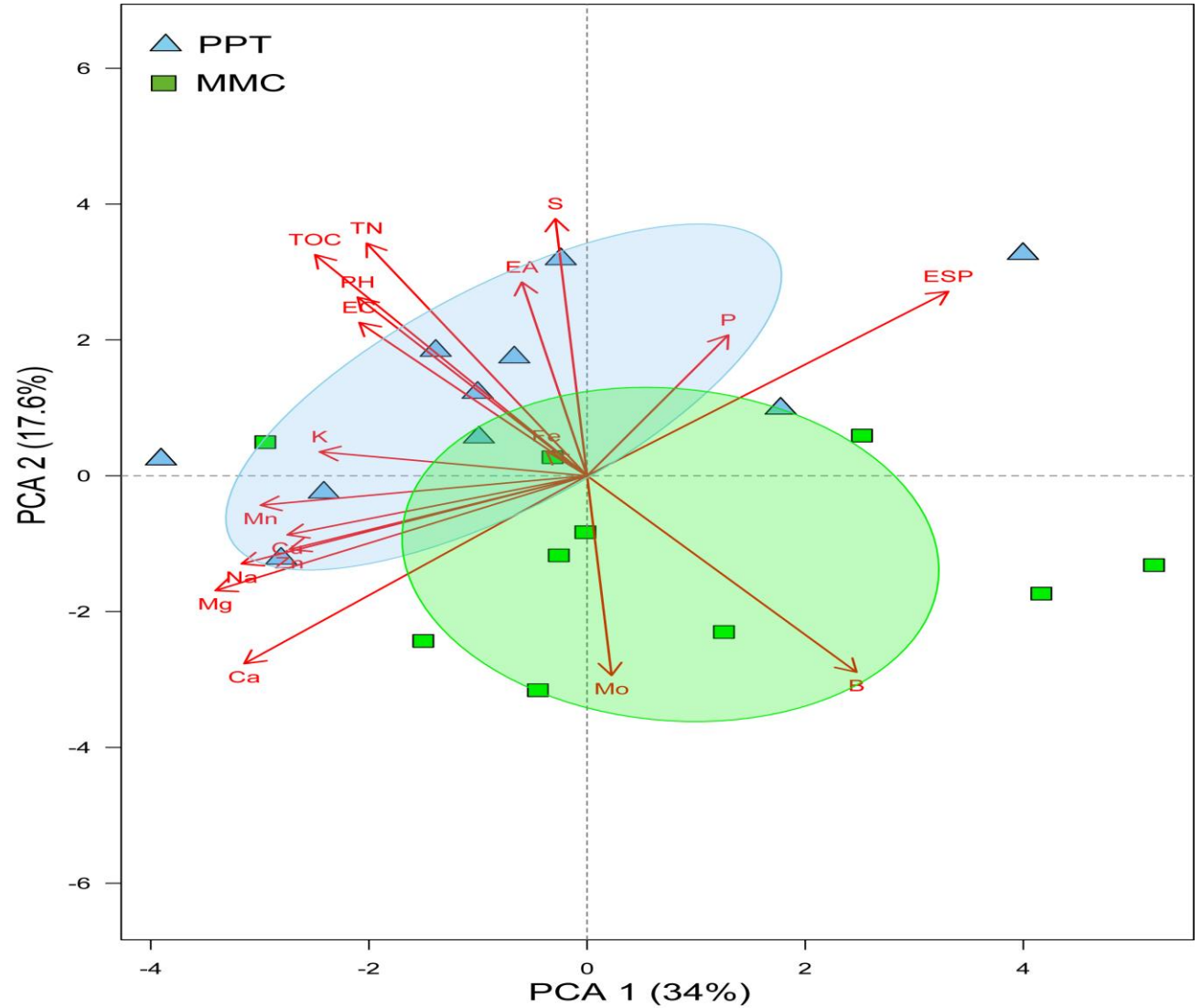


Salzberg et al., 2022 Entomol. Expl. Appl.

Cropping system diversification improves soil health as habitat for natural enemies

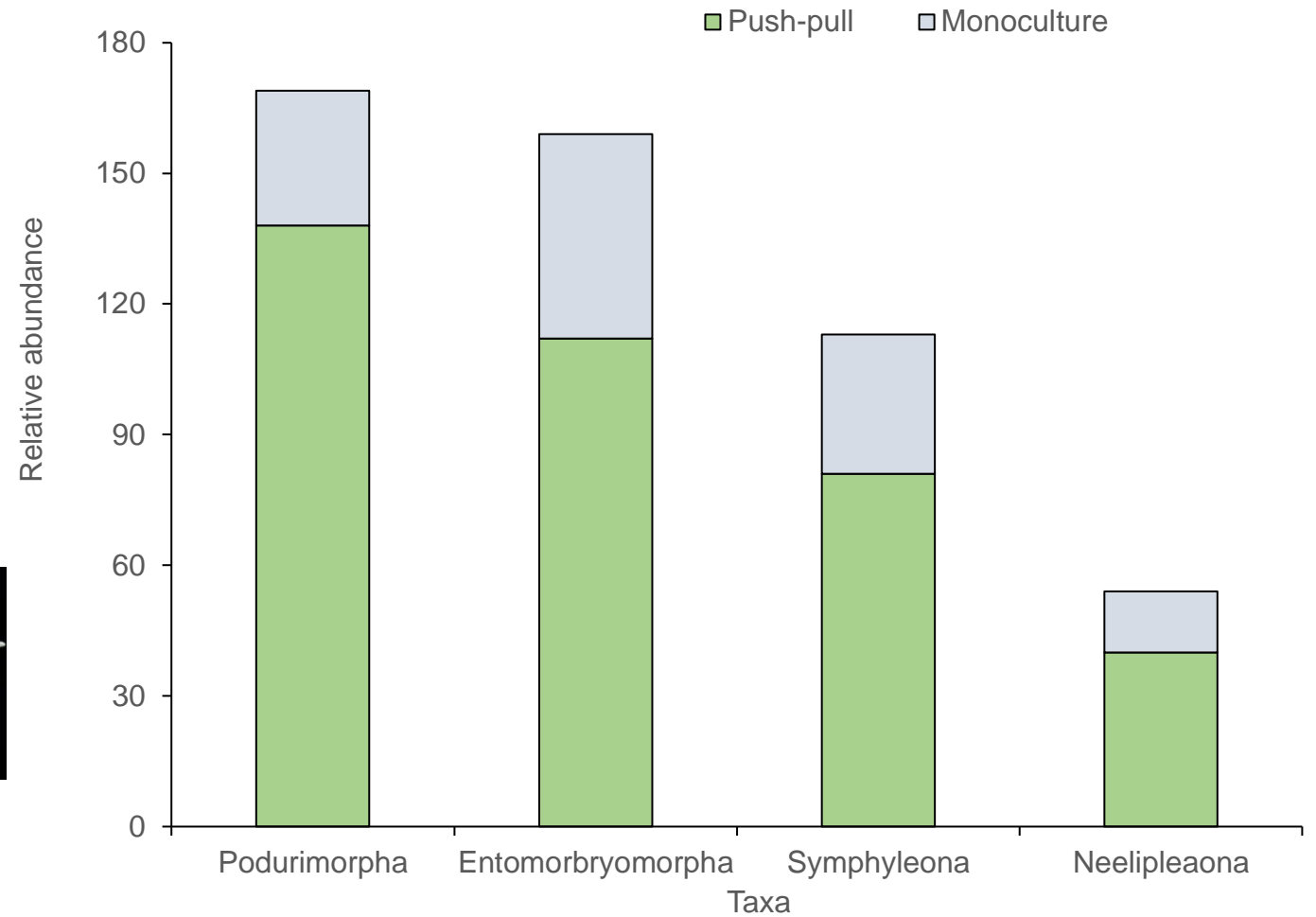
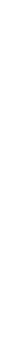


Cropping system diversification positively impacts soil as an habitat



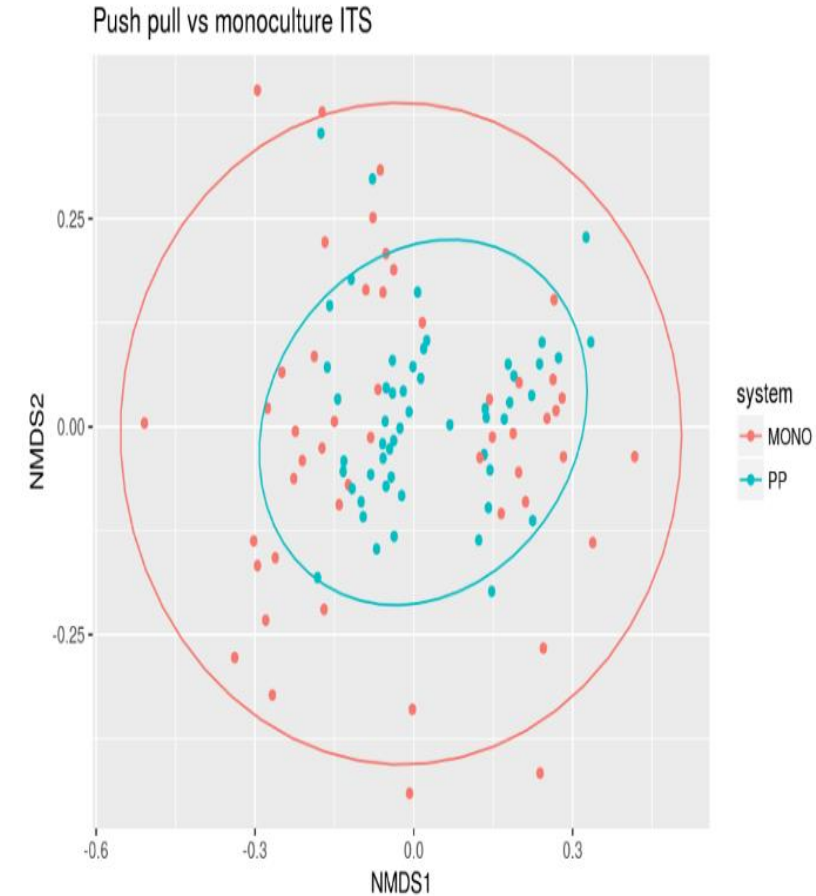
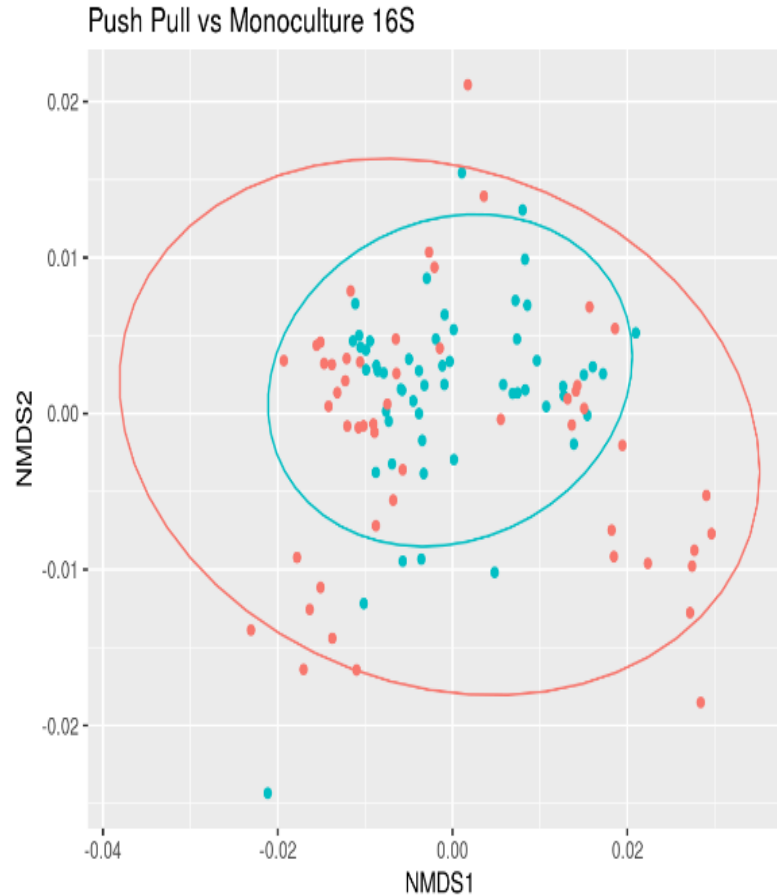
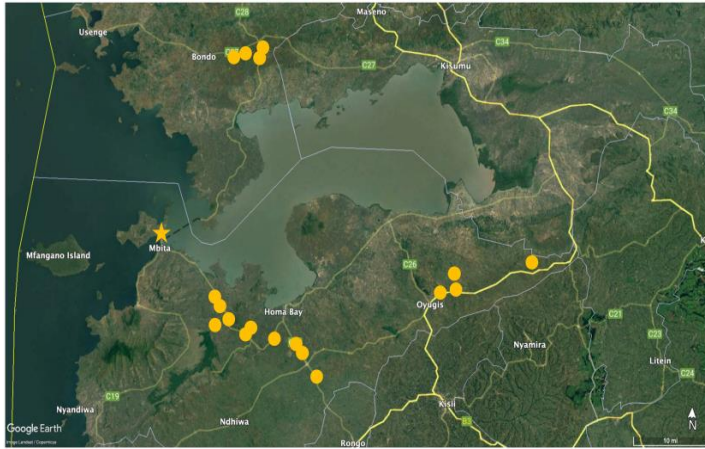
- ❖ Clear soil physico-chemical properties and their association with cropping systems

Cropping system diversification positively impacts soil biota



- ❖ Higher abundance of collembolans associated with PP cropping systems

Cropping system diversification impact on soil biota: Microbiome



- ❖ Cropping system diversification favours ecological important soil microbes

Conclusion



❖ Habitat diversification is an integral part of conservation of biological control agents



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