*Supplementary materials for*

**Network science: applications for sustainable agroecosystems and food security**

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**Table S1. Examples of how networks have previously been used to answer applied questions in agriculture.**

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| **Agricultural system** | **Network type** | **Research question** | **Reference** |
| Meadow | Plant-pollinator | What is the network structure of a quantitative mutualistic network? | Memmott (1999) |
| Arable fields (Pea, Wheat Triticale and Oilseed rape) | Herbivore-parasitoid | To what extent are Aphidiinae parasitoids shared between in- and off-crop habitats? | Dercoles *et al.* (2014) |
| Tomato fields (organic and inorganic) | Plant-herbivore | Do organic and inorganic tomato crops have different levels of crop damage (herbivory)? | Letourneau & Goldstein (2001) |
| Arable fields, pasture and livestock | Plant-herbivore-parasitoid | Are ecological networks in organic and inorganic farms different, and do organic farms have higher parasitoid species richness? | Macfadyen *et al.* (2009) |
| Abandoned field (Rush meadow) | Herbivore-parasitoid-hyperparasitoid | What is the structure of aphid-parasitoid networks in an abandoned field? | Müller *et al.* (1999) |
| Semi-natural grasslands in agroecosystems (abandoned, extensively managed and intensively managed) | Plant-pollinator  Plant-herbivore | How interaction networks respond to land use change (abandonment and intensification)? | Shinohara *et al.* (2019) |
| Barley fields | Predator-prey (extra- and intra-guild) | How does food web specialisation vary within cropping season? | Roubinet *et al.* (2018) |
| Wheat fields (organic and inorganic) | Herbivore-parasitoid-hyperparasitoid | How do spatio-temporal changes induced by agricultural intensification produce changes in community structure and ecosystem functioning? | Gagic *et al.* (2012) |
| Agricultural landscapes at national scale | Plant-pollinator (inferred) | Do traits enabling persistence in highly agricultural landscapes confer robustness to potential future perturbations on inferred plant–pollinator networks?" | Redhead *et al.* (2018) |
| Arable fields | Invertebrate predation food webs | Does crop type and genetically modified crops influence the core-periphery structure of networks. | Ma *et al.* (2019) |
| Semi-natural grasslands in agroecosystems (grassland restored) | Plant-pollinator | How land use intensification influences the structure of networks? | Marrero *et al.* (2014) |
| Arable fields | Plant-pollinator | How local conditions and landscape structure at multiple scales influences the plant-pollinator networks? | Moreira *et al.* (2015) |
| Agricultural lands and semi-natural grasslands | Pollen transport | How agricultural land management influences the diversity of pollen transported by pollinators? | Marrero *et al.* (2017) |
| Traditional maize-based polyculture in Mexico (milpa fields) | Co-occurrence network of soil microbial communities | What is the composition and structure of soil prokaryotic communities and how they change along the cropping season? | Rebollar *et al.* (2017) |
| Plastic shelters in watermelon plantation field | Co-occurrence network of soil microbial communities | How does the microbial community recover after fumigation and organic fertilizer application for *Fusarium* suppression? | Ge *et al.* (2021) |
| Kiwifruit orchards | Co-occurrence network of soil microbial communities | How does the community composition change under long-term organic fertilization regimes? | Liu *et al.* (2020) |
| Arid soils under grazing disturbance | Co-occurrence network of soil microbial communities | How does the network change in soil under grazed and non-grazed conditions? | Marcos *et al.* (2019) |
| Organically and conventionally organic field soils | Co-occurrence network of microbial soil communities | How does different agricultural management practices select for different bacteria and fungal species and communities? | Hartmann *et al.* (2015) |
| Arable fields | Caterpillar-parasitoid food webs | How do food web parameters differ in perennial and annual crops? | Avalos *et al.* (2020) |
| Rice fields \*agroforests | Plant-bee pollination networks | How different agricultural systems (rice fields and agroforests) and landscape affect pollinator communities and networks? | Hass *et al.* (2018) |
| Farms in a gradient of agricultural intensification | Cavity nesting bees–plants and wasps–prey and bees/wasps–antagonists | How agricultural intensification affects different groups of species and different types of interactions? | Martínez‐Núñez & Rey (2021) |
| Farms in a gradient of agricultural intensification | herbivore-plant-pollinator networks | How agricultural intensification gradient changes network structure and robustness to local extinctions? | Morrison *et al.* (2020) |
| Farms in a gradient of agricultural intensification | Pollination and herbivory networks | Does agricultural intensification have different impacts on the network topology of mutualistic and antagonistic networks? | Morrison & Dirzo (2020) |
| Herbaceous semi‐natural habitats | Plant-pollinator networks | How enhancing key floral resources may promote conservation of rare species and economically important crop pollinators? | Sutter *et al.* (2017) |
| Oilseed and ley managed habitats | Host-parasitoid | How does land-use intensity impact the potential for apparent competition within and between crop habitats | Miller *et al.* (2021) |

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