Building resilient habitat networks: implementing Green Infrastructure with native wild plants

Lessons from LIFE PollinAction

LIFE PollinAction

LIFE19 NAT/IT/000848

IL PROGETTO GODE DEL CONTRIBUTO FINANZIARIO LIFE DELL'UNIONE EUROPEA

Simone Preo

Ca' Foscari University of Venice

Agronomist and Junior Researcher at Ca' Foscari University of Venice, Italy

e-mail: simonemarino.preo@unive.it

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Where?

- Italy (Veneto and FVG regions);
- Spain (Aragon).

Four different settings:

1) Agricultural areas (15 farms);
2) Urban areas (6 municipalities);
3) Road infrastructure (1 motorway);
4) Seminatural areas (12 sites).

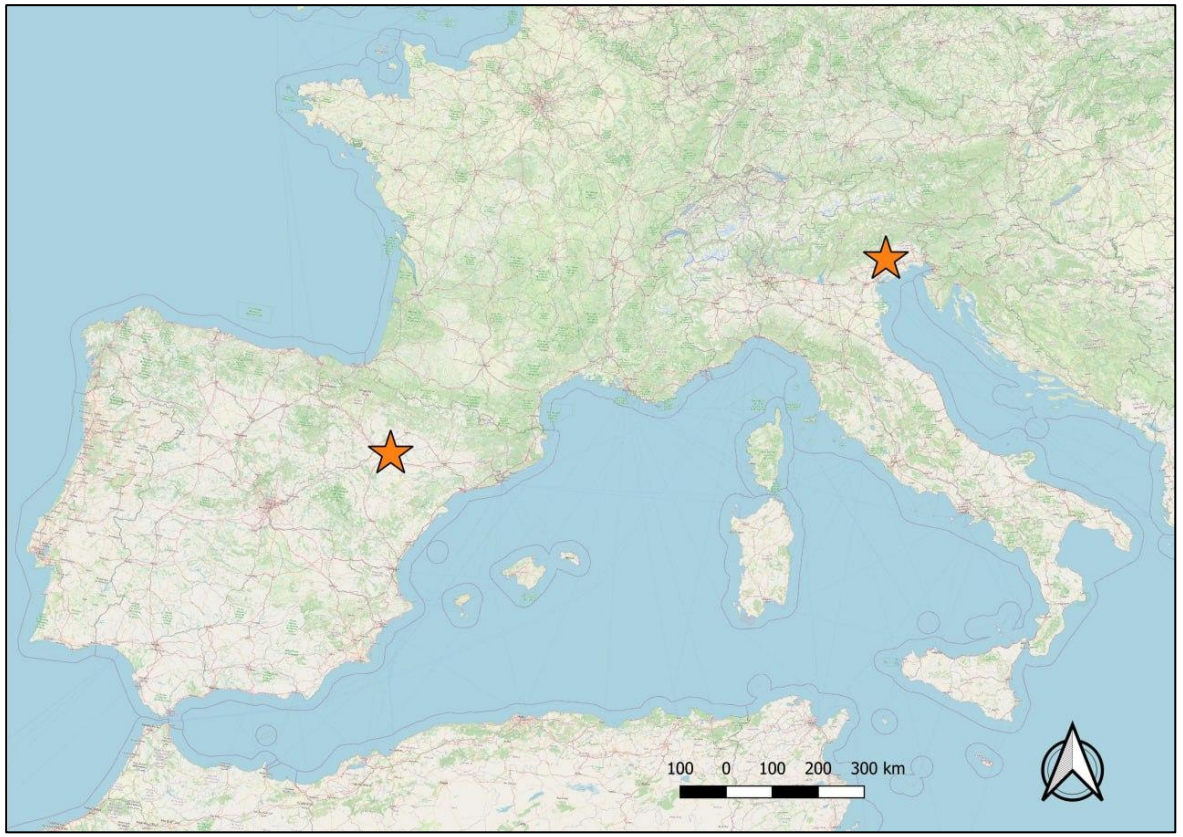
Objective:

Mitigate the pollination crisis.

When?

From September 2020 to March 2025.

Who? Public and private partners.



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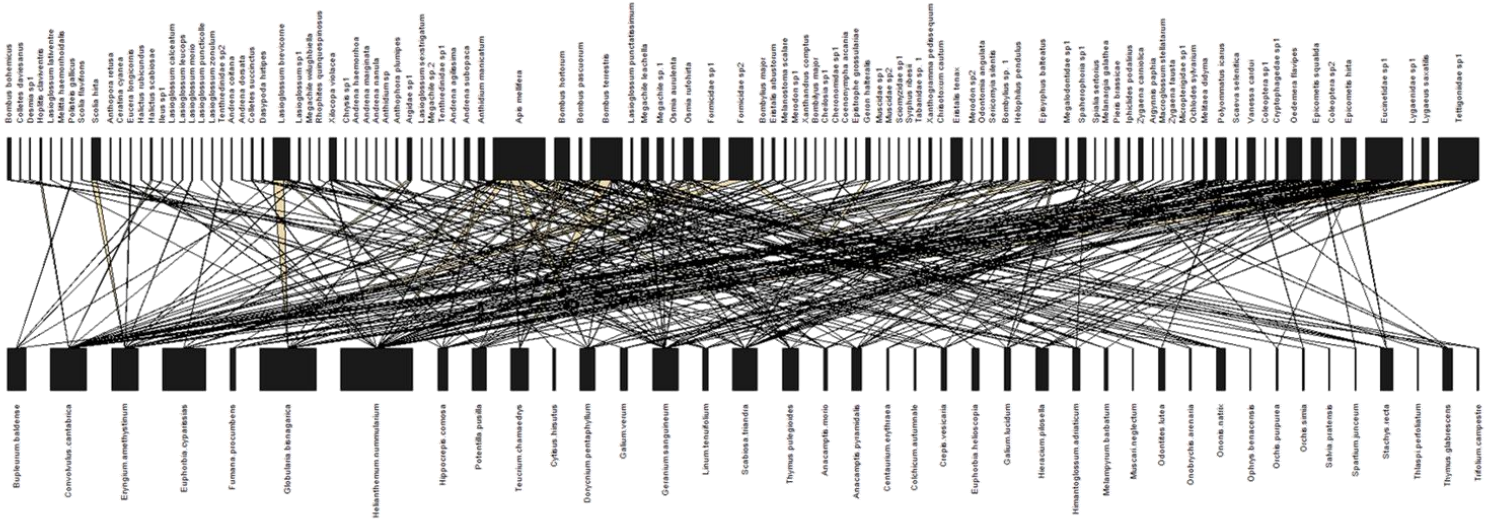
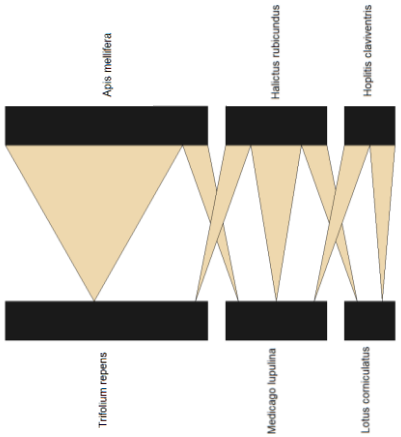
We tackled the main cause of pollination crisis, that is human-driven **landscape simplification** (agricultural intensification and urbanization).



High landscape heterogeneity → pollination process is guaranteed



Low landscape heterogeneity:
→ pollination process is compromised

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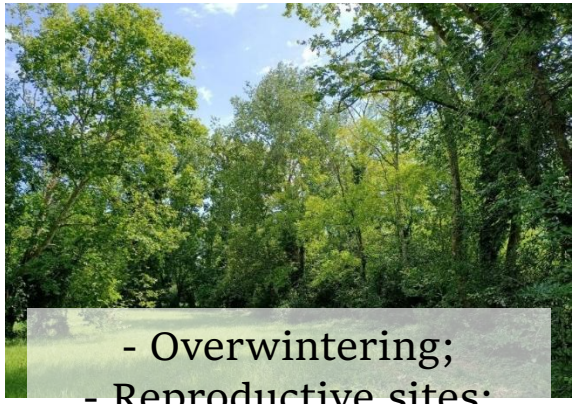
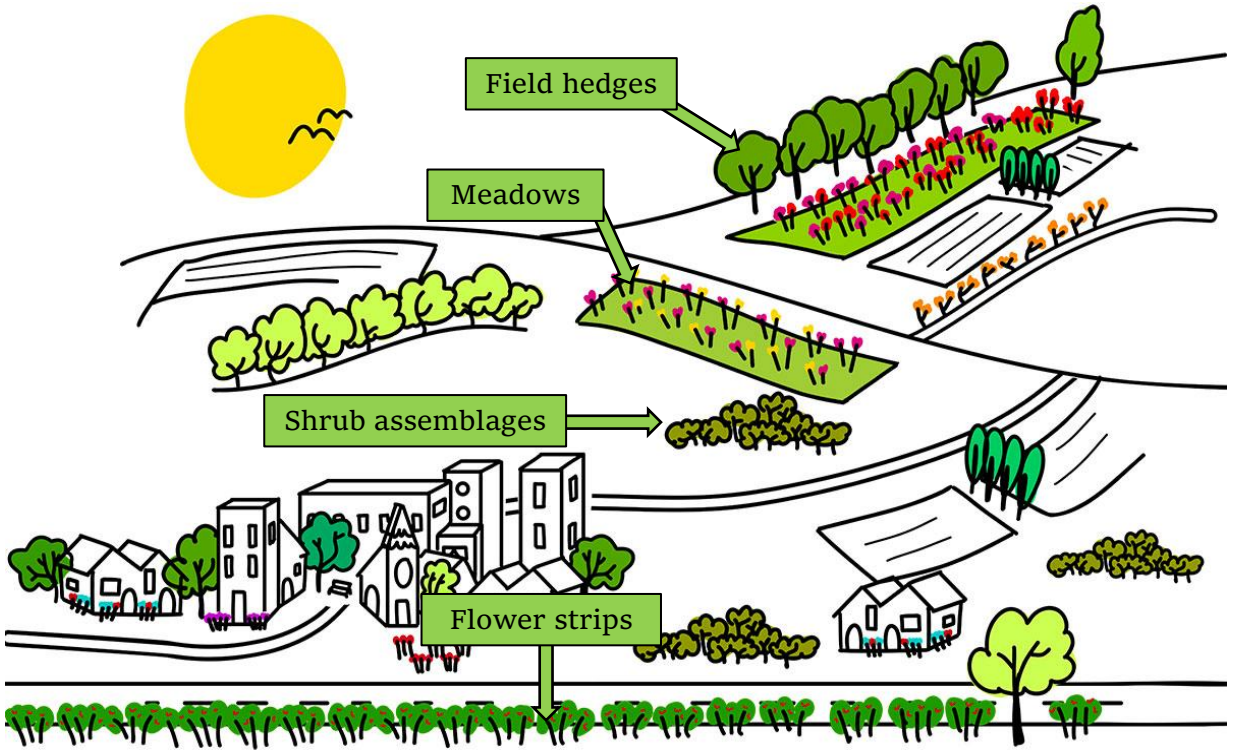
How to achieve the goal? With a well-planned Green Infrastructure (G.I.)



- Overwintering;
- Reproductive sites;
- Resource providers in early spring.



- Overwintering;
- Reproductive sites;
- Resource providers in spring and summer.

A network of natural and semi-natural areas to increase landscape spatial and temporal heterogeneity, modular and easily replicable.

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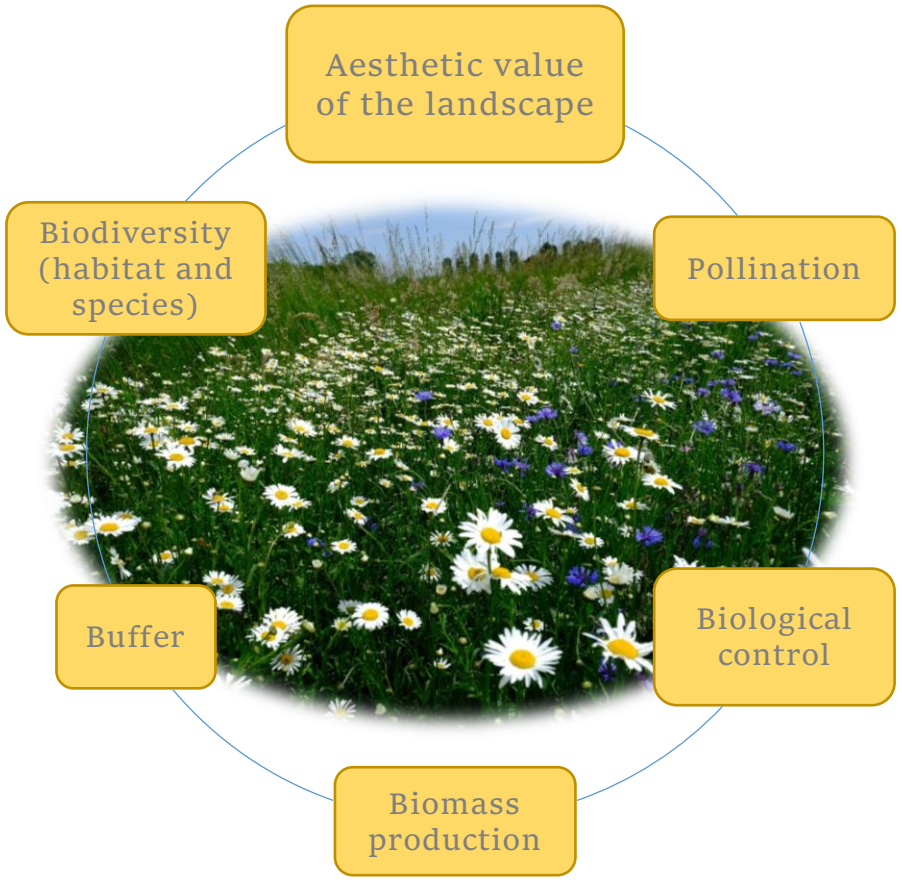
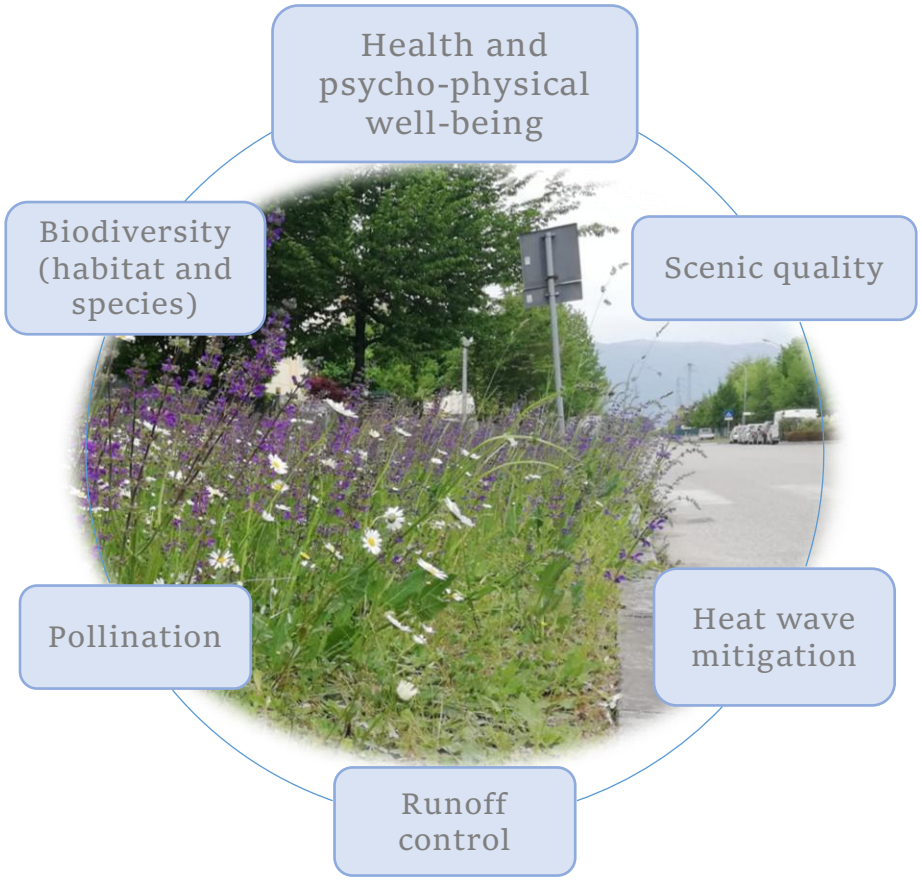
G.I. in one keyword: Multifunctionality

- Improvement of multiple ecosystem functions;
- Delivery of many Ecosystem Services (not only related to pollinators);
- Positive effects on local economy and society.

Agricultural areas



Urban areas



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How to achieve the goal? Two sets of complementary actions.

Habitat restoration/creation

- Conversion of arable crops and rural/urban marginal areas into key habitats for pollinators (e.g., species-rich grasslands) → about 22 ha;
- Improvement of extant species-poor grasslands → about 475 ha;
- Creation of hedgerows → about 15 km;
- Creation of flower strips → about 8 ha;
- Creation shrub assemblages → about 2 ha.

Policy implementation

- Design and implementation of PES (Payments for Ecosystem Services) schemes;
- Revision of RDP (Rural Development Program) measures;
- Definition of close-to-market solutions;
- Definition of compensation/management measures in urban and infrastructure contexts at the local scale.

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LIFE PollinAction approach is built on **Nature based solutions**

↓

Native plant species are the secret:

plant species evolved within the geographical area in which they are found.

The features of their success:

- They better ensure the success of restoration interventions and their long-term duration;
- Their employment improve the genetic variability of wild populations, contributing to conserve species and ecotypes;
- As they co-evolved with native pollinators, they are crucial for the survival of many insect species.

⚠ These features are not proper of exotic plant species.

Exotics can develop invading capacity:
rapid growth, large amounts of seeds, high colonizing capacity in disturbed environment and capacity of disruption of pollination networks.

Easy, but where to find native plant species?

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The PollinAction supply chains:

Surface to restore

Wide area? → Habitat improvement/creation with hay or brush harvested seed → Database of donor sites → Hay/brush harvesting → Introduction in nature

Smaller area? → Habitat improvement/creation with seeds or seedlings → Database of native plant wild populations → Plant production in specialized nurseries → Introduction in nature

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Making demand and supply meet: how we developed a market

Permanent species-rich meadows → (mowing) → Hay → High quality feed ration → Livestock → High quality dairy products

Hay → (harvesting) → Brush harvested seed → Habitat restoration

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Not only creation: timing of implementation and management are key aspects

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An example:

	JAN		FEB		MAR		APR		MAY		JUN		JUL		AUG		SEP		OCT		NOV		DEC	
	I-II	III-IV	I-II	III-IV	I-II	III-IV	I-II	III-IV	I-II	III-IV	I-II	III-IV	I-II	III-IV	I-II	III-IV	I-II	III-IV	I-II	III-IV	I-II	III-IV	I-II	III-IV
Creation and Management of Wildflower Strips																								
Soil Preparation																								
1. Surface plowing of the soil																	■	■						
2. Harrowing of the soil																	■	■						
3. Second harrowing after the germination of weed species																		■	■					
Strip Creation																								
Planting of seedlings in soil blocks																				■	■	■		
Seeding of seed mixtures																				■	■			

Differences in intervention success across sites may be linked to how the interventions are implemented and managed.

→

Best practice: be aware of

- time of planting;
- excessive mowing;
- mowing timing (e.g., before flowering);
- etc.

Take a look to our project guidelines:
www.lifepollinaction.eu → MEDIA → DOWNLOAD

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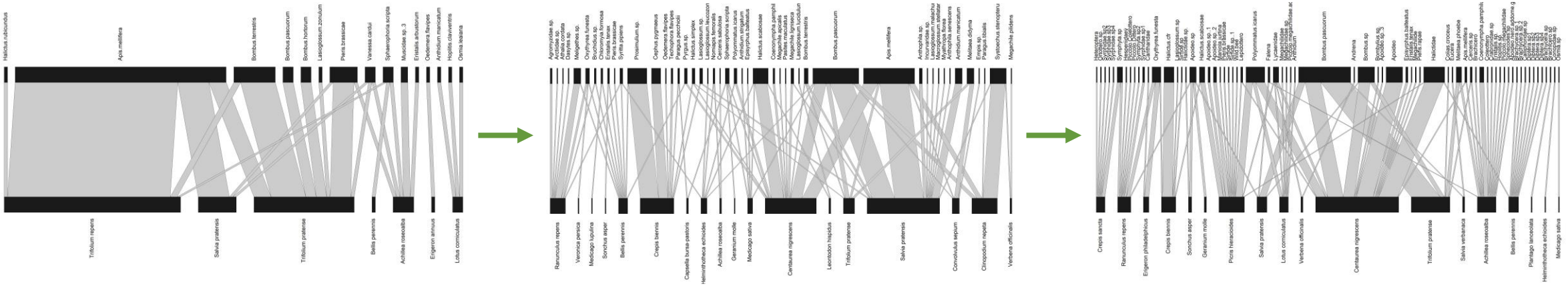
Management influences the complexity of pollination networks

Examples of
good management
of interventions



2021 2022 2023

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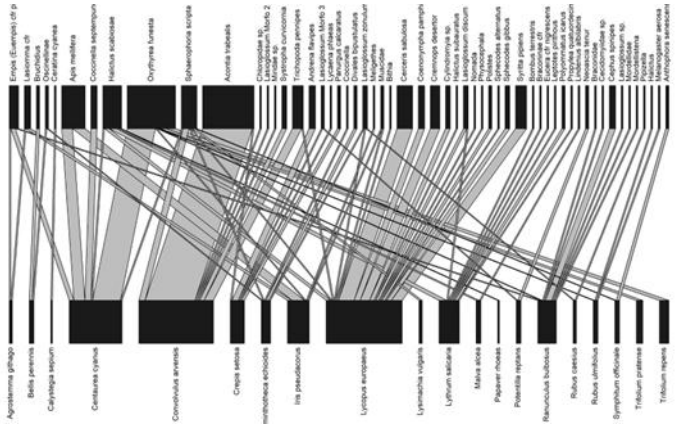
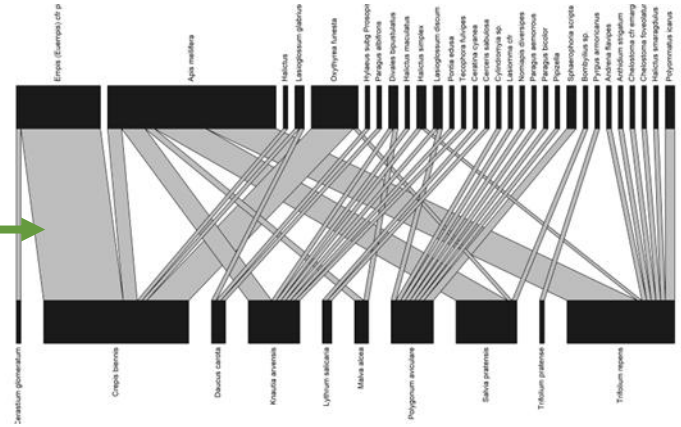
Management influences the complexity of pollination networks

Examples of
bad management
of interventions

Absence of a
pollination network
(interventions in
arable crop lands)





2020

2022

2023

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