

# Beyond biomass: How cropping systems shape insect biodiversity on marginal lands

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## Introduction

This study, part of the EU MIDAS project, investigates insect biodiversity in strip intercropping systems on marginal lands in Serbia, Spain, and Italy, with comparisons to adjacent monoculture fields.

This research is part of a four-year experiment. The results shown here are from the 2023 and 2024 samplings.

## Methodology

Insects were collected in two cropping systems in three different countries, using sweep nets, malaise traps and pitfall traps. Marginality conditions varied from: very dry (Spain), steep sloping (Bologna) to saline wetland conditions (Serbia).

## Cropping systems



strip intercropping  
(Bologna, Italy)

Rows included (different combinations per site): Miscanthus, Safflower, Crambe, Hemp, Melilotus, Lavender, White Mustard, Sorghum or Castor



monoculture  
(Novi sad, Serbia)

Monocultures compared in the three countries were wheat, alfalfa and maize

## Insect collection



malaise trap

pitfall trap

sweep net

Total insect biomass was quantified and the species were identified through DNA metabarcoding methods

## Field locations



strip intercropping field site  
(Soria, Spain)

## Results and Discussion

Results from 2023 show that the species richness observed in sweep net catches was consistently higher in strip intercropping systems compared to monocultures.

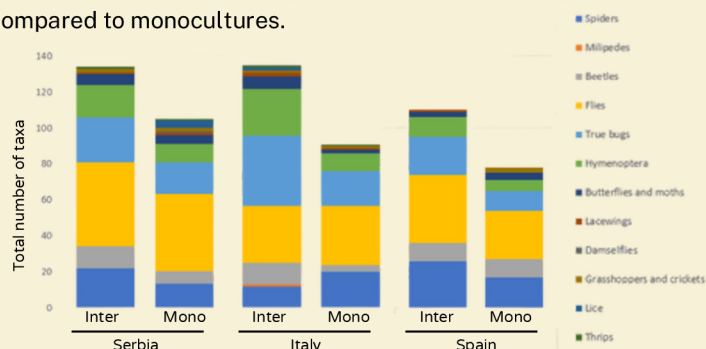


Figure 1. Number of insect taxa in sweep net collections in strip intercropping compared to monocultural cropping systems in three countries in 2023

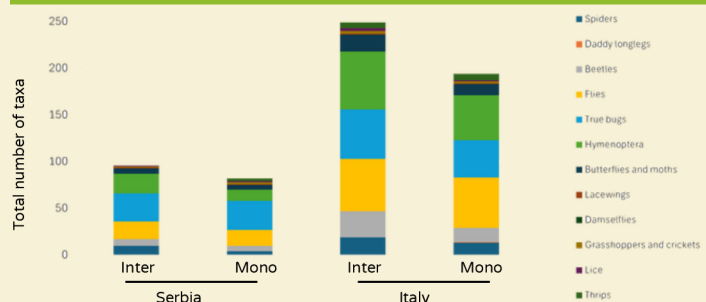


Figure 2. Number of insect taxa in sweep net collections in strip intercropping compared to monocultural cropping systems in three countries in 2024 (Spanish results not yet available)

The total number of taxa found in sweepnet catches indicate that strip intercropping systems may foster a more diverse insect community, including pollinators and other beneficial species.

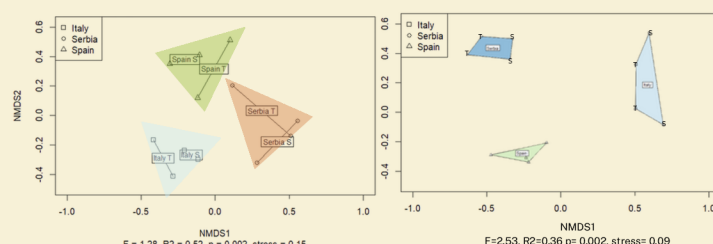


Figure 3. Insect communities in Malaise traps in three different countries in 2023 (left) and 2024 (right)

## Conclusion and next steps

The insect communities varied greatly between countries, and were even distinguishable between cropping systems and trap types. Generally, more taxa are found in the strip intercropping systems- though in future trials more collections will be held at different timepoints to underpin the impact of multiple blooming periods in the row-cropping systems.

MIDAS focuses on non-edible crops cultivated for biomass production, using innovative cropping systems like strip intercropping and agroforestry to enhance biodiversity while supporting biobased applications, such as biochemicals and biomaterials