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## Introduction

Environmental Schemes have been **supporting the creation and maintenance of field margins differently**; in northern Europe, it has been mainly promoted by seeding a field stripe with flowers or other plant species to promote insect abundancy.

In many parts of **southern Europe**, especially in dryland and in hilly areas, **there is still a quite extense network of structures** separating field portions to favour rainfall infiltration.

Unfortunately, **mechanisation and some land consolidation programmes have menaced** these boundaries; moreover **they often receive herbicide drift** when the nearby cereal fields are sprayed.

The **new CAP 2023-27 promotes the conservation and establishment of such structures (>2 m wide and >25 m long)**.

**What kind of plant species can be expected** in these boundaries depending on their age and on the management of the nearby fields? **Do weeds have protagonism** in these boundaries?

## Objectives

The aim of this work is to compare which plants are abundant and frequent in three different situations:

- (1) **New boundaries (NB)** established next to organic farms
- (2) **Traditional (old) boundaries in conventional farms (CB)** and
- (3) **Traditional (old) boundaries next to organic farms (OB)**.

## Materials and Methods

**Location:** Zuera (Zaragoza), Aragón, north-eastern Spain.

**Sampling period:** April-May, to facilitate species identification.

**Environment:** dryland winter cereal; semi-arid climate (mean yearly rainfall: 346 mm); calcareous and gypsum soils.

**Data analysis:** ANOVA and Tukey mean separation test (using R v4.2.2.).



NB



CB



OB

Field boundary	Mean boundary width (m)	Sampled boundary portion	Sampled boundaries (#)	Sampling year
<b>NB</b> (new boundaries, 4-10 years old)	8	2x2 m (4 replicates)	8	2008-14
<b>CB</b> (old boundaries next to conventional fields)	2.2	2x2 m (3 replicates)	7	2013+14
<b>OB</b> (old boundaries next to organic fields)	2.9	The complete boundary	9	2023

## Results

- ❖ **Total species richness** was similar for all boundaries but significantly **higher for 10 year-old NB compared to CB** (Fig 1A).
- ❖ Weed species richness, percentage of weeds in the total species number and total plant ground cover **were very similar for all boundaries** with no significant differences between them (Fig 1 B, C, D).
- ❖ Weed species cover and percentage of weed cover on the total ground cover **was higher for OB** and very similar for the other cases.

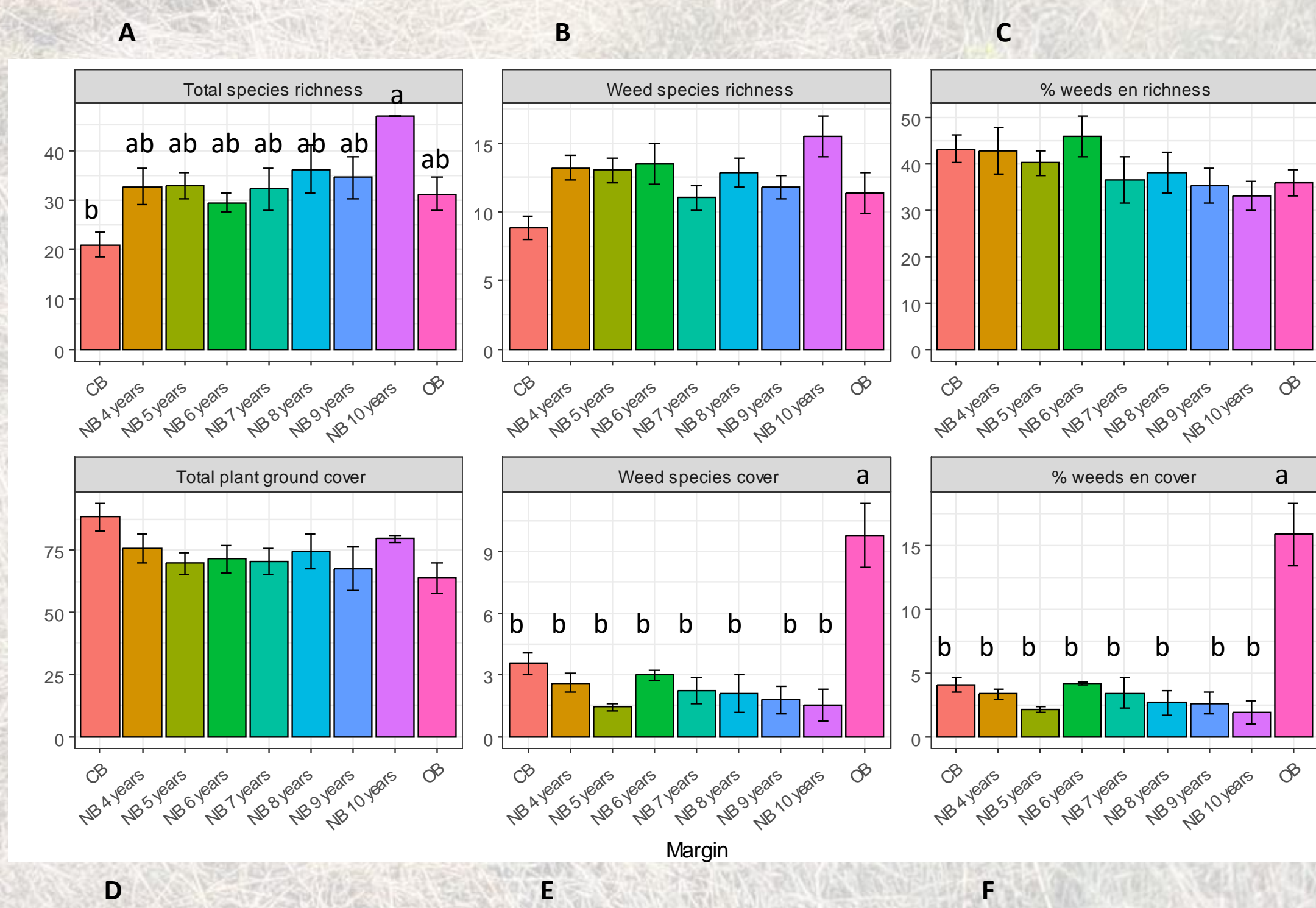
## Discussion

- ❖ **More species tended to be found in traditional boundaries** (decades old) next to organic fields compared to adjacent herbicide-treated fields; drift seems to reduce diversity.
- ❖ Around **40% of the species found were common weeds** regardless of the boundary age and of the management of the adjacent fields.
- ❖ The **higher weed cover in OB** (below 10%) can be due to the sampling method (complete boundary was surveyed) and also due to the extreme dry period 2022-23. Data of subsequent years are needed to confirm these findings.

See also: <https://doi.org/10.1007/s10980-022-01544-3> Landscape Ecology 38, 479–500 (2023)

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**Figure 1:** Total species richness, weed species richness and percentage of weeds in the richness (above). Total plant ground cover, weed species cover and percentage of weeds in the ground cover (down) in the different boundaries.