

The structural classification of field boundaries in Mediterranean arable cropping systems allows the prediction of weed abundances in the boundary and in the adjacent crop

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Summary

Boundary structure can hinder or facilitate disturbance of the boundary vegetation by farming practices, such as herbicide and fertiliser drift and occasional cultivation; this may affect their potential role as a weed reservoir. It would be relevant for researchers, farmers and legislators to know whether relationships exist between boundary structure and weed abundance and frequency in boundaries and adjacent fields. In this study, we present a classification of arable field boundaries based on five descriptors: presence of a bank, width, percentage cover of woody and evergreen perennials (WEP), presence of a stonewall and presence of trees. Five types of boundaries are identified, ranging from structurally simple ones (flat, narrow, dominated by annual species) to structurally complex ones (presence of a bank, more than 3 m wide, dominated by WEP). Data from three Spanish regions were used to validate this classification, and the five boundary classes contained different plant communities. Structurally simple, flat and narrow boundaries contained many of the weed species found also in the field centre and with high abundance. More complex, wider boundaries with a slope and a WEP >60%, had a lower probability of hosting the main weeds present in the field centres. Assessment of weed frequency and abundance gave complementary information. The proposed classification of field boundaries may be easily used by farmers and allows adjustment of field margin management to risks posed by the field boundary, in terms of hosting common weeds of arable crops.

Keywords: field margins, bank, perennial species, width, multivariate analysis, non-metric multidimensional scaling, functional traits, growth form.