# Long-term changes in field margin vegetation in North-western France

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**Abstract**

Field margins have considerable ecological significance in agriculture-dominated landscapes by supporting biodiversity and associated services. However, agricultural changes during mid-20th century led to their drastic loss with a serious threat for farmland biodiversity. Few attempts have been made to examine the long-term dynamics of multiple field margin vegetation communities at the landscape scale. More than 300 field margins were resurveyed in northern Brittany (France) to assess long-term change in the structure and composition of vegetation communities over a 21-year period. Values of $\alpha$-, $\beta$- and $\gamma$-diversity were compared between the two surveys. Changes in species composition and richness were examined with management factors. Metacommunity structure was identified and changes in metacommunity composition were related to plant traits. Analyses indicated that $\alpha$-diversity increased over time, gaining ˜ 10% over the period whereas $\gamma$–diversity decreased, with the total number of species falling from 308 in 1994 to 284 in 2015. Change in $\beta$-diversity revealed biotic homogenization. Plant community composition shifted over time, associated with an increase in "competitive" species and in mean Ellenberg N and R values. A consistent trend towards fewer light-demanding species, rare and specialist species was also observed. The structure of field margin vegetation community was Clementsian at both survey times, indicating species sorting. Analysis of potential structuring mechanism revealed a significant influence of management practices. This provides evidence of the impact of management practices on vegetation community of field margins at different scales and highlights challenge for their conservation.

**Keywords:** farmland biodiversity, long, term monitoring, vegetation change, conservation, biotic homogenization, management practice, plant functional traits

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