

Increased agricultural landscape diversity enhances post-dispersal weed seed predation (Biological Interactions in Arable Land-Grassland-Forest Continuums and their Impact on the Ecosystem Functions, 7th International Symposium on Integrated Field Science)

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# Increased agricultural landscape diversity enhances post-dispersal weed seed predation

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Agricultural biodiversity provides many ecological services, including pest control, and supports sustainable crop production. Post-dispersal seed predation is one of the main causes of weed seed mortality and could contribute to biological weed control (Westerman *et al.* 2003, 2005). However, the extent of post-dispersal weed seed predation in monsoon Asia, including Japan, must be quantified before it can be implemented as a form of weed control. Furthermore, it is necessary to understand the relationship between seed predation and landscape structure. Landscape features may influence the degree of seed predation because the components of non-crop areas (such as field margins, grassland, set-aside areas, and forest) in agricultural landscape are important habitats for seed predators and provide population sources for field colonization (Menalled *et al.* 2000). In this study, we investigated the rate of post-dispersal weed seed predation and the seed predators in contrasting agricultural landscapes.

The rate of post-dispersal seed predation of Italian ryegrass (*Lolium multiflorum*), an exotic winter annual weed that has invaded both experiment sites, was compared between simple (a wheat-soybean double-cropped field in a large-scale farming area) and complex (a traditional terraced paddy) agricultural landscapes in Shizuoka Japan. The cumulative seed predation rate during three months after Italian ryegrass seed shed (from August to October) was 46 % (average predation rate per two weeks = 9 %) in the field interior and 82 % (23 %) in the field margin in the large scale farm, and 99 % (47 %) in the field margin in the terraced paddy. The main seed predators were invertebrates (crickets and carabid beetles) and vertebrates (rodents or birds) in the large scale farm, and invertebrates (crickets and carabid beetles) in the terraced paddy. The results of this study indicate that the rate of post-dispersal seed predation in the complex agricultural landscape is higher than the simple landscape.

## References

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