WEED RESEARCH

An International Journal of Weed Biology, Ecology and Vegetation Management

# Writing scientific publications in international journals and how to present statistical analysis of data.


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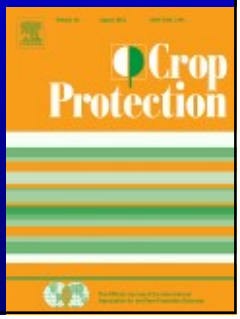


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# Scientific publications and why statistics?

- If you do not publish the research, it has never been done!
- Understanding applied statistics makes you understan the philosophy of the sciences.

2

# My preamble

- Write the paper before you commence experiments!
- A graph often says more than 1000 words!
- For international journals, you must do the experiment at least twice

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## Why publish research?

- scientific communication
- precedence
- career advancement
- personal satisfaction

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- **Course plan**

- The peer review process – what is it and how does it work?
- Journal style
- The structure of a paper:
  - Title page,
  - Summary, Keywords,
  - Introduction,
  - Materials & Methods,
  - Results + Discussion,
  - Acknowledgements,
  - References,
  - Tables, Figures,
  - Appendices,
  - Supplementary information
- Writing English – good and bad practice
- The science of statistics and data presentation
- Submission
- After submission: decisions, responding to reviewers
- The final publication stages – copy-editing, proofs
- Questions

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**The impact of landscape structure and sown grass margin strips on weed assemblages in arable crops and their boundaries**

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Received 24 August 2007
Revised version accepted 21 August 2008

**Summary**

A paired-field study was made in southern England in arable fields, each with or without sown 6-m wide grass margin strips. Seven field pairs were located in each of small, intermediate and open landscapes, which were based on mean field size. Ground cover, plant species diversity and assemblages were assessed in crop centres, crop edges and non-crop field boundaries. The data were used to test for effects of sown grass margins, differences in field location, impacts on rare weed species and for landscape effects on weed assemblages. Significantly higher plant species diversity was found in boundaries protected by buffer strips. Annual weeds associated with field edges, notably *Anisantha sterilis*, were found at lower cover where perennial grass strips were present. Sown grass strips enhanced boundary plant diversity, particularly by increasing polycarpic species. Mar strips had a small influence on the weed flora of the cr edge, possibly reducing weed cover, but had no influen on floras of field centres. Field size and landsc context did not affect weed assemblages, which sh marked field-to-field variability, though crop type v an important influence. Grass margins did not enha rare arable weed species and may be a threat to them margins are sited where such species are known to oc in the seedbank. With this exception, grass strips ar positive influence on boundary flora diversity and red margin weeds in arable landscapes.

Keywords: agri-environment scheme, field marg buffer strip, dispersal, biodiversity, rare weed speci landscape, *Anisantha sterilis*, *Elytrigia repens*.

MARSHALL EJP (2009). The impact of landscape structure and sown grass margin strips on weed assemblages arable crops and their boundaries. *Weed Research* 49, 107–115.

**Introduction**

There have been significant changes in farming practices over the past 50 years in north-western Europe (Stoate *et al.*, 2002), including increased fertiliser use, more winter sowing of crops, rather than spring sowing, and more efficient weed and pest control. Many agri-environment support schemes have been initiated across most European countries as a means of financially supporting farmers and of encouraging more environmentally sound land management (Kleijn & Sutherland, 2003). A number of scheme prescriptions are based on the management of field margins (Marshall & Moonen, 2002), aimed at benefiting both fauna and flora. Manipulation of non-crop habitat is an attractive option for farmers, if impa on adjacent commercial cropping are minimal. Wh there is debate as to the effectiveness of many ag environment schemes, e.g. Kleijn *et al.* (2001), a numl of field margin manipulations are effective. For exam sown grass margin strips encouraged plant diversity adjacent boundaries on one farm (Moonen & Marsh 2001), conservation headlands with reduced agrochemi inputs enhance some bird species and butterflies (Ran 1985; Dover, 1996) and uncropped wildlife strips, wh tillage is practised but crops are not sown, can enha rare arable weeds (Critchley *et al.*, 2006).

Research on rare weed species indicates that mi such annual species are most likely to be found at

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ELSEVIER

Agriculture, Ecosystems and Environment 89 (2002) 5–21

Agric Ecosys Enviro

www.elsevier.co

Field margins in northern Europe: their functions and interactions with agriculture

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**Abstract**

Most agricultural landscapes are a mosaic of farmers' fields, semi-natural habitats, human infrastructures (e.g occasional natural habitats. Within such landscapes, linear semi-natural habitats often define the edges of agricu This paper reviews the role and interactions within and between the flora of these elements. In temperate, intensive such field margin habitats, which historically had true agricultural functions, now are important refugia for biod manmade habitats, field margins may also have important cultural roles as part of our landscape heritage, e.g Britain. Whilst field margins are not usually specific habitat types, they contain a variety of plant communities in structures. These may range from aquatic elements to ruderal and woodland communities.

Studies demonstrate a variety of interactions between fields and their margins. Agricultural operations, such and pesticide application, have effects on the flora. Some margin flora may spread into crops, becoming field wee also have a range of associated fauna, some of which may be pest species, while many are beneficial, either as crop or as pest predators. The biodiversity of the margin may be of particular importance for the maintenance o higher trophic levels, notably farmland birds, at the landscape scale. Margins contribute to the sustainability of by enhancing beneficial species within crops and reducing pesticide use. In northwestern Europe, a variety of enhance diversity at field edges have been introduced, including sown grass and flower strips. The impact of th flora and arthropods indicate mostly beneficial effects though conflicts exist, notably for the conservation of rare species. © 2002 Elsevier Science B.V. All rights reserved.

*Keywords:* Agriculture; Agrochemicals; Boundary; Dispersal; Field margin; Flora; Hedge

**1. Introduction**

Field margins are a key feature of agricultural landscapes, present in some form at the edges of all agricultural fields (Marshall, 1988). In some landscapes, e.g. the bocage of northern France (INRA, 1976; Bazin and Schmutz, 1994; Burel and Baudry, 1999), field margins comprise the majo semi-natural habitats. In this paper, the r margins and their interactions with adjace ture are reviewed with the objective of ass relative benefits for agriculture and the en

The definitions of field margins are var etymology of the structures of field edges diverse. Here, the term field margin is ad Greaves and Marshall (1987) and defi whole of the crop edge, any margin strip the semi-natural habitat associated with th The original definitions were based on

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0167-8809/02/$ – see front matter 
PII: S0167-8809(01)00315-2

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But…….

It is not easy.

Writing in a second language puts you at a disadvantage

So…….

How can you “level the playing field”?

The answer is to understand the process,

make it easy for editors, reviewers and readers,

follow the journal requirements, use colleagues, native English speakers or professional services as editors

……and do the best science

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What is the story?

Identify hypotheses or research questions

Plan how to present the results

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When to publish?

When the results are available and analysed

When the hypotheses or research questions are clear

When to start writing?

Sooner rather than later!

Before you do the experiments!

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Where to publish?


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Choosing a journal

**Subject matter** – is the material within the scope of the journal?

- check the Author Guidelines and look at the journal Table of Contents

**Impact** – aim to publish your work in the highest impact relevant journal

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# Target a Journal

Find out about the Journal style :

- structure of paper
- unit conventions
- statistics conventions
- reference citation and format
- (= do not annoy the editor and reviewers)

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# What is a scientific paper?

The difference between a paper and a report :

- *Report* - here are some results (and some conclusions)
- *Scientific Paper* - here is a scientific investigation (hypothesis/ experiment/analysis interpretation)
- Importance of discussion

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## A journal paper is different

It is not a scientific report

It is not a thesis

It has a message

It needs to be relevant beyond the location and timescale of the research

It does not present everything that you did, so you need to select what is put in and what is left out

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**Peer Review**

-What is it? A mechanism that has the objective of ensuring what is published is correct, properly done and clearly communciated

- Editors seek at least two independent and objective reports of a paper, ideally from experts in the field

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The publishing process and peer-review – an outline of the process with *Weed Research*

Submission
Paper check
Allocation to an expert Subject Editor
Selection of reviewers
Reviewer reports
Recommendation
First decision from the Editor-in-Chief

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Responding to review reports
Acceptance
Typesetting
Proof correction
Publication
Reprints - pdfs

The criteria Editors use for accepting manuscripts for publication are

- originality,
- relevance,
- scientific rigour and
- clarity of presentation.

The journal accepts approximately 5% - 95% of submitted manuscripts and the time taken from submission to publication is about ca be long.

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**Ethical considerations**

- Ownership
- Plagiarism; self-plagarism
- Double publication
- Conflicts of interest
- Funding
- Ethical approvals

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## What is a paper about?

- A scientific investigation – 'tell a detective story'
- Introduction (sets up the question)
- Materials & Method (how you answered it)
- Results (what happened)
- Discussion (what it means)

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## What should you publish?

## - first, look at the Author Guidelines

**Author Guidelines**

**Content of Author Guidelines**:
1. General
2. Ethical Guidelines
3. Submission of Manuscripts
4. Manuscript Types Accepted
5. Manuscript Format and Structure
6. After Acceptance

**Relevant Documents**: Exclusive Licence Form, Colour Work Agreement Form

**Useful Websites**: Submission Site, Articles published in Weed Research, Author Services, Blackwell Publishing's Ethical Guidelines, Guidelines for Figures, Word Document Template

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## What should you publish? - scope

"Original and innovative research papers relevant to weed biology, ecology and management are sought. There should be sufficient material presented so that the information is of wider interest than just for local conditions. Thus, single experiments are unlikely to be acceptable. Research should cover sufficient temporal and spatial variation to be able to make sound generalisations. For example, evaluation of herbicide efficacy should be over more than one year at more than one site or soil type".

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## Allelopathy

This is a difficult area for *Weed Research*, so "in the case of allelopathy studies, the journal will only take papers that investigate the phenomenon under field-like conditions".

Simple studies of germination in Petri dishes are not enough – because the results have so little relevance to weed management and field conditions with soil interactions. There have been many hundreds of studies of plant extracts on germination, but few if any practical outcomes have been developed.

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"Original and innovative research"

What does that mean?

New work

But same approach on new species or new situation?

Ask the question: Is this work of interest to and important for weed scientists in other countries?

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**How much work?**

Work to be published needs to be relevant beyond the specific location and conditions of the research. In other words, the results should allow generalisation to other crops, seasons, soils etc.

This is a truth with modifications. Try compare papers written in English, Spanish, Persian papers etc?

To be able to do this safely, work needs to have been repeated or replicated in time and/or space.

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## Journal Style

Why are journal all different?

– a good question, but if the submission is not in the correct style, it will annoy the editors

Look at the Author Guidelines

Look through a recent issue of the journal

Use a template, if it is available

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6. The structure of a paper:
   Title page, Summary, Keywords, Introduction, Materials & Methods, Results, Discussion, Acknowledgements, References, Tables, Figures, Appendices, Supplementary information

7. Writing English – good and bad practice

8. The science of statistics and data presentation

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