

Writing a paper for a scientific journal

Jens Streibig & Jon Marshall

Why publish research?

- scientific communication
- precedence
- career advancement
- personal satisfaction

Course plan

1. Welcome
2. Why publish? When? Where?
3. What and How? – the structure of a paper
4. Research first, or the other way round?
4. Presentation of papers
5. Discussions
6. The science of statistics and data presentation
7. Submission, review and responding to decisions

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 such 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 *Alopecurus stertilis*, were found at lower cover where potential grass strips were present. Sown grass strips enhanced boundary plant diversity,

particularly by increasing polycarpic species. Maize strips had a small influence on the weed flora of the crop edge, possibly reducing weed cover, but had no influence on flora of field centres. Field size and landscape context did not affect weed assemblages, which did not vary with field-to-field variability, though crop type was an important influence. Grass margins did not exclude rare arable weed species and may be a threat to their margins are sites where such species are known to occur in the seedbank. With this exception, grass strips had a positive influence on boundary flora diversity and rare weed species in arable landscapes.

Keywords: agri-environment scheme, field margin buffer strip, dispersal, biodiversity, rare weed species, landscape, *Alopecurus stertilis*, *Ellygista repens*.

MARSHALL EJP (2009). The impact of landscape structure and sown grass margin strips on weed assemblage in 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 fertilizer 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 (Klejn & 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 crop on adjacent commercial cropping are minimal. While there is debate as to the effectiveness of many a environment scheme, e.g. Klejn *et al.* (2001), a number of field margin manipulations are effective. For example sown grass margin strips encouraged plant diverse adjacent boundaries on one farm (Moonen & Marshall 2003), conservation headlands with reduced agrochemical inputs enhance some bird species and butterflies (Ra 1985; Dover, 1996) and uncropped wildlife strips, with tillage is practiced but crops are not sown, can exclude rare arable weeds (Crotty *et al.*, 2006).

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



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Agriculture, Ecosystems and Environment 89 (2002) 5–11

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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 agricultural fields. 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 biodiversity. Field margins may also have important cultural roles as part of our landscape heritage, e.g. in 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 as pesticide application, have effects on the flora. Some margin flora may spread into crops, becoming field weeds 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 of higher trophic levels, notably farmland birds, in 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 the flora and entomopods indicates mostly beneficial effects through conduct 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 (DNRA, 1976; Bazin and Schmitz, 1994; Buisel and Baudry, 1999), field margins comprise the major semi-natural habitats. In this paper, the margins and their interactions with adjacent are reviewed with the objective of assessing relative benefits for agriculture and the environment. The definitions of field margins are variously diverse. Here, the term field margin is used as defined by Marshall (1987) and defined whole of the crop edge, any margin strip or the semi-natural habitat associated with the field. The original definitions were based on the

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But.....

It is not easy.

Writing in a second language puts you at a disadvantage

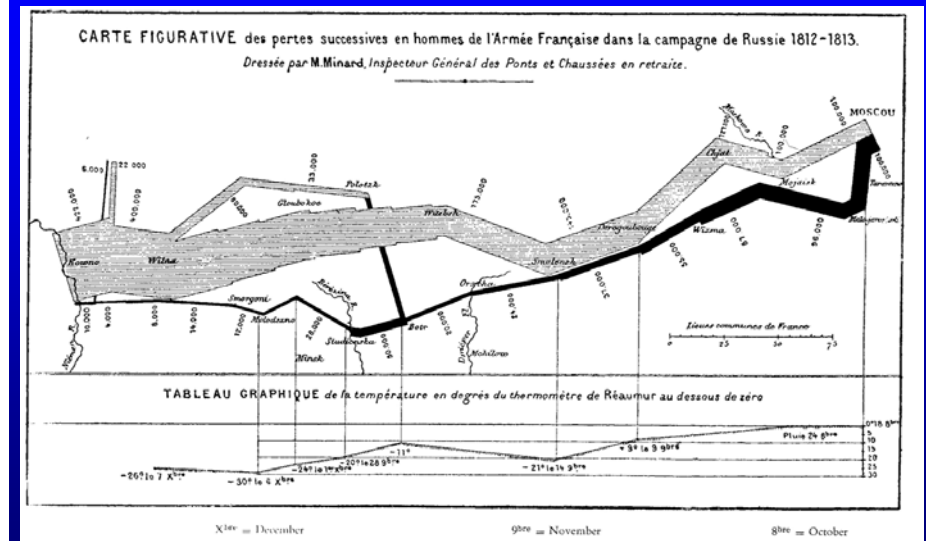
So.....

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

Napoleon's march on Moscow



When to publish?

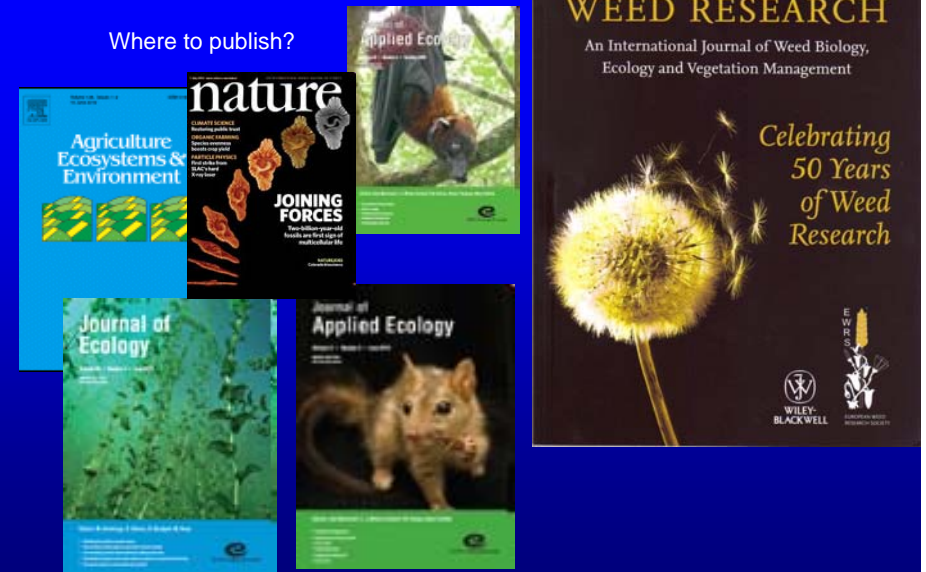
When the results are available and analysed

When the hypotheses or research questions are clear

When to start writing?

Sooner rather than later!

Where to publish?



Target a Journal

Investigate which journal is appropriate for the work you want to report (its remit).

- Agronomy vs Agricultural Science
- Science vs Economics vs Management

For example, a paper that reports crop yields following weed control, but not weed responses, may not be appropriate for *Weed Research*, but might be appropriate for *Crop Science*

Choosing a journal

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

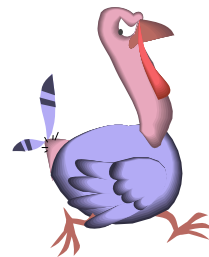
- check the Author Guidelines and look at the journal Table of Contents

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

Target a Journal

Find out about the Journal style :

- structure of paper
- unit conventions
- statistics conventions
- reference citation and format
- (= don't annoy the editor and reviewers)



What to publish?

How to publish?

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

Responding to review reports
Acceptance
Typesetting
Proof correction
Publication
Reprints.

The criteria Editors use for accepting manuscripts for publication are originality, relevance, scientific rigour and the clarity of presentation. The journal accepts approximately 26% of submitted manuscripts and the time taken from submission to publication is about 12 months.

Peer Review

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

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

In *Weed Research*, the Editor-in-Chief also has a report from the expert Subject Editor

Ethical considerations

- Ownership
- Plagiarism
- Double publication
- Conflicts of interest
- Funding
- Ethical approvals

What is a scientific paper?

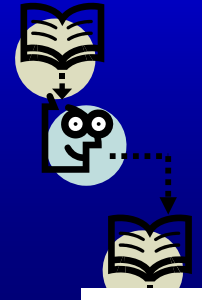
The difference between a paper and a report :

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



What is a paper about?

- A scientific investigation – ‘tell a detective story’
- Introduction (sets it up)
- Materials & Method (how you did it)
- Results (what happened)
- Discussion (what it means)



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

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](#)

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”.

Starting out:

Research first or writing first?

Instructions for Authors

Writing

Editing

Submission

Plan the paper



Identify the main message

Select what tables and figures are needed to illustrate the 'story'

Plan the results section

Cut out anything not relevant to this story

The structure of a scientific paper

Title page

Summary

Keywords

Introduction

Materials & Methods

Results

Discussion

Acknowledgements

References

Tables

Figures

Appendices

Supplementary information

Writing order

- Title page
- Methods
- Results – tables and figures
- Introduction
- Discussion
- At the end, write the Summary

Please follow the Instructions to Authors

- Use the template, if there is one provided

Why?

Because the paper has to be in the journal style for publication

Save the editor from extra work

Shade avoidance: an integral component of crop–weed competition

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Received 4 August 2009
Revised version accepted 26 January 2010

Summary

Crop–weed competition is comprised of both resource dependent and resource independent processes. While many studies have focused on the role that resource dependant competition plays in reducing crop yields, few have investigated whether resource independent effects may contribute to these losses. In this study, we identify the red-to-far-red ratio as a variable that contributing to resource independent competition and tested the hypothesis that the expression of shade avoidance in response to weeds reduces maize fitness (i.e., kernel number) in the absence of resource dependent competition. Seedlings were grown in a field fertigation system under two light quality environments: an ambient and a low red-to-far-red ratio environment,

which were designed to simulate weed-free and weedy conditions respectively. Plants that expressed classic shade avoidance characteristics set fewer kernels per plant and partitioned less biomass to the developing ear. Shade avoidance also doubled the plant-to-plant variability in these yield parameters (i.e., kernel number and harvest index) without affecting the mean or frequency distribution of shoot biomass at maturity. We propose that shade avoidance should be viewed as an integral component of the process of competition. This resource independent response precedes and conditions the crop seedling for the onset of resource dependent competition.

Keywords: *Zea mays*, maize, corn, light quality, red-to-far-red ratio, fitness, kernel number, harvest index.

PAGE ER, TOLLENAAR M, LEE EA, LUKENS L & SWANTON CJ (2010). Shade avoidance: an integral component of crop–weed competition. *Weed Research* **50**, 281–288.

Title
Summary
Keywords

These are the most important parts of a paper

- because they are the most read
- because they are used by search engines

Write the title first

Write the Summary last

Title Page:

This should give the title of the article, the names and initials of each author, the department and institution to which the work should be attributed, the name, address, international telephone and fax numbers and e-mail address of the author for correspondence and proofs, and a short title of 40 characters or less if the paper title exceeds this limit. Up to two lines of keywords (not key phrases) should be listed below the summary. Please include a total word count.

Summary:

This should not exceed 230 words, giving a concise picture of the work, its results and conclusions. This is the most important section of the paper and should be edited carefully. It should contain a concise summary of the approach, the results, the conclusions and the implications of the results for both practical management and theoretical science. Wording along the lines of: "the results are discussed" is unacceptable. Latin names should be without attributions.

We are looking for specific final sentences that describe the implications of the work for a) scientific theory and research and b) practical weed science and management.

What is new – important – and needs to be published in this journal?

Introduction

Weed competition in crops is a major challenge to agricultural production worldwide. Excluding environmental variables, yield losses in maize (*Zea mays* L.) are caused primarily by competition from weeds (Rajcan & Swanton, 2001; Subedi & Ma, 2009). It is well established that weeds need to be removed shortly after crop emergence, in order to avoid unacceptable yield losses (Nieto *et al.*, 1968; O'Donovan *et al.*, 1985; Kropff & Spitters, 1991). To this end, studies that have determined weed density thresholds or the critical period for weed control have made invaluable contributions to our understanding of the timing and effect of crop-weed competition (Hall *et al.*, 1992; Van Acker *et al.*, 1993;

Swanton *et al.*, 1999; Evans *et al.*, 2003). However, few of these studies have attempted to explain why weed competition occurs when it does, nor the mechanism through which yield is lost.

Competition is traditionally viewed as a series of interrelated events involving both resource dependent and resource independent processes (Harper, 1977). Resource dependant processes, such as direct competition for light, water and nutrients, have been the focus of the majority of competition studies. While there is no doubt that resource limitation is a major factor influencing yield losses from weed competition, several authors have also suggested that resource independent effects, including hormonal and light signalling, may play important roles in determining the onset and

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Introduction

- Introduces the topic
- reviews the work that has been done
- asks the research question

Key point:

End the Introduction with a hypothesis or question that the paper tests

Pose the question – then the Methods that follow describe how you set out to answer the question

Materials and methods

Plant material and growth conditions

Using a model experimental system, we tested the hypothesis that exposure to early weed presence reduces maize fitness in the absence of resource dependent competition. The experiment was conducted over two growing seasons (2007, 2008) at the Arckell Research Station (43°53'N, 80°18'W and 325 m a.s.l.) near Guelph, ON, Canada. A University of Guelph maize hybrid (cv. CG108 × CG102, Lee *et al.*, 2000, 2001) was selected for the experiment and perennial ryegrass (*Lolium perenne* L.) was used as a surrogate weedy competitor. Experimental units consisted of two maize seedlings planted in 28-cm diameter, 22 L plastic pails that were filled with a baked clay medium (Turface MVP®; Profile Products LLC, Buffalo Grove, IL, USA). These units formed part of a field fertigation system that has been used for over two decades to enable maize growth to maturity in the field under controlled water and nutrient conditions (Tollenaar & Migus, 1984). Maize plants were irrigated two to four times per day using a nutrient solution described by Tollenaar (1989). The duration and fre-

Materials and Methods

Write this after the Title page

A reader should be able to repeat the work, more or less exactly, from the information provided in the Methods

Results

Results should be separate from Discussion

Results are presented objectively

- Discussion can be more subjective

Do not repeat data in both tables and figures

Check the statistical requirements of the journal

- *Weed Research* prefers SEDs and degrees of freedom

Results

The classical effects of shade avoidance were expressed under the conditions of our field experiment. Among the effects documented during early seedling development was an increase in plant height in the weedy treatment. The difference between treatments was largest shortly after emergence and decreased as the seedlings developed (Fig. 1A). We also observed a reduction in the number of visible leaf tips beginning 12 days after emergence (DAE; Fig. 1B). By the time the treatments were removed (30 DAE), the weed-free treatment had on average 1.1 leaves more than the weedy treatment (Fig. 1B). At this point, plants in the weedy treatment had accumulated 11% less leaf area (LA), 12% less leaf biomass and 10% less total biomass when compared with plants in the weed-free treatment.

Discussion

What do the results mean?

Put the results in context of other published results

What are the implications?

What problems occurred?

What improvements could be made?

What more needs to be done?

5. DISCUSSION

To our knowledge, this is the first study examining the shape of the relationship between biodiversity and land-use intensity. We linked a biodiversity estimate to a management indicator on a large number of agricultural fields across Europe, thereby covering the full range from very extensive to extremely intensive land use. After differences in environmental conditions had been accounted for, we found evidence that plant species richness declined with increasing land-use intensity. Furthermore, we found that exponential functions more accurately described plant species richness than linear or unimodal functions. This implies that effects of land-use change are most pronounced in species-rich extensively

Then

- Iterate Introduction and Discussion to ensure you achieved what you stated as the purpose of the work !

Acknowledgements

References

Tables and figures

Supplementary information

Follow the Instructions for Authors

help the Editor

Writing order

- Title page
- Methods
- Results – tables and figures
- Introduction
- Discussion
- At the end, write the Summary

References

Pay great attention to the references

- Cite correctly
- Cite in the journal style
- If you use reference software, choose the appropriate output format (some are downloadable)

After you have written the paper

- Put it in a drawer and read it a week later as if it was from someone else.
- Ask a colleague to read it.

Submission!

Login at <http://mc.manuscriptcentral.com/wre>

The screenshot shows the login page for the Weed Research manuscript submission site. The browser address bar displays <http://mc.manuscriptcentral.com/wre>. The page features a 'Log In' section with fields for 'User ID' and 'Password', and a 'Password Help' section for email verification. A 'New User?' section is also visible. The page includes the 'ScholarOne Manuscripts' logo and the 'WEED RESEARCH' header. At the bottom, there is a copyright notice: 'ScholarOne Manuscripts™ v4.2.1 (patent #7,237,767 and #7,263,633). © ScholarOne, Inc., 2009. All Rights Reserved. ScholarOne Manuscripts is a trademark of ScholarOne, Inc. ScholarOne is a registered trademark of ScholarOne, Inc. Terms and Conditions of Use ScholarOne Privacy Policy Get Help Now'.

The screenshot shows the user interface after logging in. The browser address bar displays <http://mc.manuscriptcentral.com/wre>. The page features a 'Get help' link and an 'Edit account' link. The 'Main Menu' includes 'Author Center', 'Reviewer Center', and 'EIC Center'. A 'Resources' section lists 'Instructions & Forms', 'User Tutorials', 'System Requirements', and 'Home Page'. The page includes the 'ScholarOne Manuscripts' logo and the 'WEED RESEARCH' header. At the bottom, there is a copyright notice: 'ScholarOne Manuscripts™ v4.2.1 (patent #7,237,767 and #7,263,633). © ScholarOne, Inc., 2009. All Rights Reserved. ScholarOne Manuscripts is a trademark of ScholarOne, Inc. ScholarOne is a registered trademark of ScholarOne, Inc. Terms and Conditions of Use ScholarOne Privacy Policy Get Help Now'.

“... the journal is enjoying an increasing reach across the globe. There are welcome indications that there are increasing submissions from Asia and the Near East. As a global journal, it is important that every scientist from every country feels that they have access to the journal and can publish in it.”

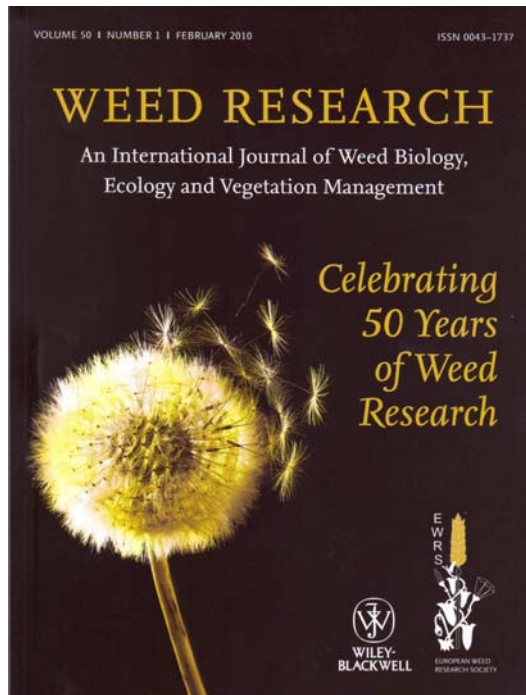
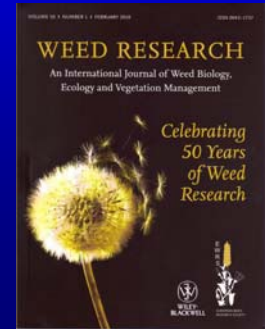
Jon Marshall, *Weed Research* 50, 1-4 (2010)

Weed Research

An international Editorial Board

- most do not have English as a first language
- all look for good science first

If you succeed in being published, you will have overcome significant challenges and you should be proud of the result



A international journal with submissions from across the world.

An international Editorial Board of expert editors, supported by Statistical Consultants and assisted by reviewers from over 30 countries.

Please consider submitting your work.

ISI Impact factor = 2.033
- your journal

What happens when a paper is submitted?

An understanding of what happens will help in preparing the paper and in responding to decisions from journals