



# COMPUTERS AND ELECTRONICS IN AGRICULTURE

An International Journal

## AUTHOR INFORMATION PACK

### TABLE OF CONTENTS

---

●	<b>Description</b>	<b>p.1</b>
●	<b>Audience</b>	<b>p.1</b>
●	<b>Impact Factor</b>	<b>p.1</b>
●	<b>Abstracting and Indexing</b>	<b>p.2</b>
●	<b>Editorial Board</b>	<b>p.2</b>
●	<b>Guide for Authors</b>	<b>p.4</b>



ISSN: 0168-1699

### DESCRIPTION

---

*Computers and Electronics in Agriculture* provides international coverage of advances in the development and application of **computer hardware**, software, **electronic instrumentation**, and **control systems** for solving problems in **agriculture**, including agronomy, horticulture (in both its food and amenity aspects), forestry, aquaculture, and animal/livestock farming.

The journal publishes original papers, reviews, and applications notes on topics pertaining to advances in the use of computers or electronics in plant or animal agricultural production, including agricultural soils, water, pests, controlled environments, structures, and wastes, as well as the plants and animals themselves. Post-harvest operations considered part of agriculture (such as drying, storage, logistics, production assessment, trimming and separation of plant and animal material) are also covered. Relevant areas of technology include artificial intelligence, sensors, machine vision, robotics, networking, and simulation modelling.

#### Benefits to authors

We also provide many author benefits, such as free PDFs, a liberal copyright policy, special discounts on Elsevier publications and much more. Please click here for more information on our [author services](#).

Please see our [Guide for Authors](#) for information on article submission. If you require any further information or help, please visit our [Support Center](#)

### AUDIENCE

---

Agricultural Engineers, Food Technologists, Environmentalists and Economists concerned with applications of computers and electronics to agriculture and related industries.

### IMPACT FACTOR

---

2018: 3.171 © Clarivate Analytics Journal Citation Reports 2019

## ABSTRACTING AND INDEXING

---

Current Contents - Agriculture, Biology & Environmental Sciences  
Engineering Village - GEOBASE  
EMBiology  
Geographical Abstracts  
Human Geography  
Science Citation Index Expanded  
AGRICOLA  
BIOSIS Citation Index  
Agricultural Engineering Abstracts  
Computer and Control Abstracts  
Computer and Information Systems Abstracts Journal  
Electrical and Electronics Abstracts  
Engineering Index  
Scopus  
Elsevier BIOBASE

## EDITORIAL BOARD

---

### *Editors-in-Chief*

**John K. Schueller (Chair Editor)**, University of Florida, Gainesville, Florida, USA  
**Spyros Fountas**, Agricultural University of Athens, Athens, Greece  
**Yong He**, Zhejiang University, Hangzhou, China  
**Angela Ribeiro**, Center for Automation and Robotics, Madrid, Spain  
**Daniel Schmoldt**, U.S. Department of Agriculture (USDA), Madison, Wisconsin, USA  
**Stephen Symons**, Canadian Grain Commission, Winnipeg, Manitoba, Canada  
**Qin Zhang**, Washington State University, Prosser, Washington, USA

### *Associate Editors*

**Andrew Higgins**, Commonwealth Scientific and Industrial Research Organisation (CSIRO), Dutton Park, Queensland, Australia  
**Tomás Norton**, KU Leuven, Leuven, Belgium  
**Chenghai Yang**, U.S. Department of Agriculture (USDA), Agricultural Research Service (ARS), Weslaco, Texas, USA

### *Editorial Advisory Board*

**V.I. Adamchuk**, University of Nebraska at Lincoln, Lincoln, Nebraska, USA  
**J-M. Aerts**, KU Leuven, Leuven, Belgium  
**Y. Ampatzidis**, California State University at Bakersfield, Bakersfield, California, USA  
**J. Bontsema**, Wageningen Universiteit, Wageningen, Netherlands  
**C. Brewster**, Aston University, Birmingham, UK  
**D. Cui**, Zhejiang University, Hangzhou, China  
**L. Fu**, Northwest A&F University, Yanling, China  
**Y. Ge**, University of Nebraska at Lincoln, Lincoln, Nebraska, USA  
**J.W. Hofstee**, Wageningen Universiteit, Wageningen, Netherlands  
**H. Hogeveen**, Wageningen Universiteit, Wageningen, Netherlands  
**D. Karayel**, Akdeniz University, Antalya, Turkey  
**M. Karkee**, Washington State University, Prosser, Washington, USA  
**M. Kassler**, Michael Kassler & Associates Pty Ltd, Northbridge, New South Wales, Australia  
**F. Kuhlmann**, Institut für Landwirtschaftliche Betriebslehre, Giessen, Germany  
**D. Li**, China Agricultural University, Beijing, China  
**R. Linker**, Technion - Israel Institute of Technology, Haifa, Israel  
**K. Lokhorst**, Livestock Research Wageningen UR, Wageningen, Netherlands  
**G.E. Meyer**, University of Nebraska at Lincoln, Lincoln, Nebraska, USA  
**R.H. Mohtar**, Purdue University, West Lafayette, Indiana, USA  
**R. Morais dos Santos**, Universidade de Trás-os-Montes e Alto Douro, Vila Real, Portugal  
**T. Oksanen**, Aalto University, Espoo, Finland  
**J.W. Oltjen**, University of California, Davis, Davis, California, USA  
**M. Pastell**, Natural Resources Institute Finland (Luke), Helsinki, Finland  
**R.E. Plant**, University of California, Davis, Davis, California, USA  
**L. Rong**, Aarhus University, Aarhus, Denmark  
**S. Sankaran**, Washington State University, Pullman, Washington, USA  
**S Shibusawa**, Tokyo University of Agriculture and Technology, Tokyo, Japan

**K.A. Sidduth**, U.S. Department of Agriculture (USDA), Agricultural Research Service (ARS), Columbia, Missouri, USA

**E.J. van Henten**, Wageningen Universiteit, Wageningen, Netherlands

**G. van Straten**, Wageningen Universiteit, Wageningen, Netherlands

## GUIDE FOR AUTHORS

---

### *Your Paper Your Way*

We now differentiate between the requirements for new and revised submissions. You may choose to submit your manuscript as a single Word or PDF file to be used in the refereeing process. Only when your paper is at the revision stage, will you be requested to put your paper in to a 'correct format' for acceptance and provide the items required for the publication of your article.

**To find out more, please visit the Preparation section below.**

### INTRODUCTION

*Computers and Electronics in Agriculture* provides international coverage of advances in the development and application of computer hardware, software, electronic instrumentation, and control systems for solving problems in agriculture, including agronomy, horticulture (in both its food and amenity aspects), forestry, aquaculture, and animal/livestock farming.

The journal publishes original papers, reviews, and applications notes on topics pertaining to advances in the use of computers or electronics in plant or animal agricultural production, including agricultural soils, water, pests, controlled environments, structures, and wastes, as well as the plants and animals themselves. Post-harvest operations considered part of agriculture (such as drying, storage, logistics, production assessment, trimming and separation of plant and animal material) are also covered. Relevant areas of technology include artificial intelligence, sensors, machine vision, robotics, networking, and simulation modelling.

### *Types of paper*

1. Original research papers
2. Review articles
3. Application notes
4. Book reviews

Original research papers should report the results of original research. The material should not have been previously published elsewhere, except in a preliminary form.

Review articles should cover subjects falling within the scope of the journal which are of active current interest. They may be submitted or invited.

An Application note is a short but complete description of a specific application, which will not be included in a later paper. It should not occupy more than 4 printed pages (about 8 manuscript pages, including figures, tables and references).

Book reviews will be included in the journal on a range of relevant books which are no more than 2 years old.

Unsolicited reviews will not usually be accepted, but suggestions for appropriate books for review may be sent to one of the Editors-in-Chief.

### *Submission checklist*

You can use this list to carry out a final check of your submission before you send it to the journal for review. Please check the relevant section in this Guide for Authors for more details.

### **Ensure that the following items are present:**

One author has been designated as the corresponding author with contact details:

- E-mail address
- Full postal address

All necessary files have been uploaded:

*Manuscript:*

- Include keywords
- All figures (include relevant captions)
- All tables (including titles, description, footnotes)
- Ensure all figure and table citations in the text match the files provided
- Indicate clearly if color should be used for any figures in print

*Graphical Abstracts / Highlights files* (where applicable)

*Supplemental files* (where applicable)

Further considerations

- Manuscript has been 'spell checked' and 'grammar checked'
- All references mentioned in the Reference List are cited in the text, and vice versa
- Permission has been obtained for use of copyrighted material from other sources (including the Internet)
- A competing interests statement is provided, even if the authors have no competing interests to declare
- Journal policies detailed in this guide have been reviewed
- Referee suggestions and contact details provided, based on journal requirements

For further information, visit our [Support Center](#).

## **BEFORE YOU BEGIN**

### ***Ethics in publishing***

Please see our information pages on [Ethics in publishing](#) and [Ethical guidelines for journal publication](#).

### ***Studies in humans and animals***

If the work involves the use of human subjects, the author should ensure that the work described has been carried out in accordance with [The Code of Ethics of the World Medical Association](#) (Declaration of Helsinki) for experiments involving humans. The manuscript should be in line with the [Recommendations for the Conduct, Reporting, Editing and Publication of Scholarly Work in Medical Journals](#) and aim for the inclusion of representative human populations (sex, age and ethnicity) as per those recommendations. The terms [sex and gender](#) should be used correctly.

Authors should include a statement in the manuscript that informed consent was obtained for experimentation with human subjects. The privacy rights of human subjects must always be observed.

All animal experiments should comply with the [ARRIVE guidelines](#) and should be carried out in accordance with the U.K. Animals (Scientific Procedures) Act, 1986 and associated guidelines, [EU Directive 2010/63/EU for animal experiments](#), or the National Institutes of Health guide for the care and use of Laboratory animals (NIH Publications No. 8023, revised 1978) and the authors should clearly indicate in the manuscript that such guidelines have been followed. The sex of animals must be indicated, and where appropriate, the influence (or association) of sex on the results of the study.

### ***Declaration of interest***

All authors must disclose any financial and personal relationships with other people or organizations that could inappropriately influence (bias) their work. Examples of potential conflicts of interest include employment, consultancies, stock ownership, honoraria, paid expert testimony, patent applications/registrations, and grants or other funding. Authors should complete the declaration of interest statement using [this template](#) and upload to the submission system at the Attach/Upload Files step. If there are no interests to declare, please choose: 'Declarations of interest: none' in the template. This statement will be published within the article if accepted. [More information](#).

### ***Submission declaration and verification***

Submission of an article implies that the work described has not been published previously (except in the form of an abstract, a published lecture or academic thesis, see '[Multiple, redundant or concurrent publication](#)' for more information), that it is not under consideration for publication elsewhere, that its publication is approved by all authors and tacitly or explicitly by the responsible authorities where the work was carried out, and that, if accepted, it will not be published elsewhere in the same form, in English or in any other language, including electronically without the written consent of the copyright-holder. To verify originality, your article may be checked by the originality detection service [Crossref Similarity Check](#).

### ***Preprints***

Please note that [preprints](#) can be shared anywhere at any time, in line with Elsevier's [sharing policy](#). Sharing your preprints e.g. on a preprint server will not count as prior publication (see '[Multiple, redundant or concurrent publication](#)' for more information).

### ***Use of inclusive language***

Inclusive language acknowledges diversity, conveys respect to all people, is sensitive to differences, and promotes equal opportunities. Articles should make no assumptions about the beliefs or commitments of any reader, should contain nothing which might imply that one individual is superior

to another on the grounds of race, sex, culture or any other characteristic, and should use inclusive language throughout. Authors should ensure that writing is free from bias, for instance by using 'he or she', 'his/her' instead of 'he' or 'his', and by making use of job titles that are free of stereotyping (e.g. 'chairperson' instead of 'chairman' and 'flight attendant' instead of 'stewardess').

### **Changes to authorship**

Authors are expected to consider carefully the list and order of authors **before** submitting their manuscript and provide the definitive list of authors at the time of the original submission. Any addition, deletion or rearrangement of author names in the authorship list should be made only **before** the manuscript has been accepted and only if approved by the journal Editor. To request such a change, the Editor must receive the following from the **corresponding author**: (a) the reason for the change in author list and (b) written confirmation (e-mail, letter) from all authors that they agree with the addition, removal or rearrangement. In the case of addition or removal of authors, this includes confirmation from the author being added or removed.

Only in exceptional circumstances will the Editor consider the addition, deletion or rearrangement of authors **after** the manuscript has been accepted. While the Editor considers the request, publication of the manuscript will be suspended. If the manuscript has already been published in an online issue, any requests approved by the Editor will result in a corrigendum.

### **Copyright**

Upon acceptance of an article, authors will be asked to complete a 'Journal Publishing Agreement' (see [more information](#) on this). An e-mail will be sent to the corresponding author confirming receipt of the manuscript together with a 'Journal Publishing Agreement' form or a link to the online version of this agreement.

Subscribers may reproduce tables of contents or prepare lists of articles including abstracts for internal circulation within their institutions. [Permission](#) of the Publisher is required for resale or distribution outside the institution and for all other derivative works, including compilations and translations. If excerpts from other copyrighted works are included, the author(s) must obtain written permission from the copyright owners and credit the source(s) in the article. Elsevier has [preprinted forms](#) for use by authors in these cases.

For gold open access articles: Upon acceptance of an article, authors will be asked to complete an 'Exclusive License Agreement' ([more information](#)). Permitted third party reuse of gold open access articles is determined by the author's choice of [user license](#).

### **Author rights**

As an author you (or your employer or institution) have certain rights to reuse your work. [More information](#).

*Elsevier supports responsible sharing*

Find out how you can [share your research](#) published in Elsevier journals.

### **Role of the funding source**

You are requested to identify who provided financial support for the conduct of the research and/or preparation of the article and to briefly describe the role of the sponsor(s), if any, in study design; in the collection, analysis and interpretation of data; in the writing of the report; and in the decision to submit the article for publication. If the funding source(s) had no such involvement then this should be stated.

*Funding body agreements and policies*

Elsevier has established a number of agreements with funding bodies which allow authors to comply with their funder's open access policies. Some funding bodies will reimburse the author for the gold open access publication fee. Details of [existing agreements](#) are available online.

### **Open access**

This journal offers authors a choice in publishing their research:

#### **Subscription**

- Articles are made available to subscribers as well as developing countries and patient groups through our [universal access programs](#).
- No open access publication fee payable by authors.

- The Author is entitled to post the [accepted manuscript](#) in their institution's repository and make this public after an embargo period (known as green Open Access). The [published journal article](#) cannot be shared publicly, for example on ResearchGate or Academia.edu, to ensure the sustainability of peer-reviewed research in journal publications. The embargo period for this journal can be found below.

#### **Gold open access**

- Articles are freely available to both subscribers and the wider public with permitted reuse.
- A gold open access publication fee is payable by authors or on their behalf, e.g. by their research funder or institution.

Regardless of how you choose to publish your article, the journal will apply the same peer review criteria and acceptance standards.

For gold open access articles, permitted third party (re)use is defined by the following [Creative Commons user licenses](#):

#### *Creative Commons Attribution (CC BY)*

Lets others distribute and copy the article, create extracts, abstracts, and other revised versions, adaptations or derivative works of or from an article (such as a translation), include in a collective work (such as an anthology), text or data mine the article, even for commercial purposes, as long as they credit the author(s), do not represent the author as endorsing their adaptation of the article, and do not modify the article in such a way as to damage the author's honor or reputation.

#### *Creative Commons Attribution-NonCommercial-NoDerivs (CC BY-NC-ND)*

For non-commercial purposes, lets others distribute and copy the article, and to include in a collective work (such as an anthology), as long as they credit the author(s) and provided they do not alter or modify the article.

The gold open access publication fee for this journal is **USD 2800**, excluding taxes. Learn more about Elsevier's pricing policy: <https://www.elsevier.com/openaccesspricing>.

#### *Green open access*

Authors can share their research in a variety of different ways and Elsevier has a number of green open access options available. We recommend authors see our [open access page](#) for further information. Authors can also self-archive their manuscripts immediately and enable public access from their institution's repository after an embargo period. This is the version that has been accepted for publication and which typically includes author-incorporated changes suggested during submission, peer review and in editor-author communications. Embargo period: For subscription articles, an appropriate amount of time is needed for journals to deliver value to subscribing customers before an article becomes freely available to the public. This is the embargo period and it begins from the date the article is formally published online in its final and fully citable form. [Find out more](#).

This journal has an embargo period of 24 months.

#### *Elsevier Researcher Academy*

[Researcher Academy](#) is a free e-learning platform designed to support early and mid-career researchers throughout their research journey. The "Learn" environment at Researcher Academy offers several interactive modules, webinars, downloadable guides and resources to guide you through the process of writing for research and going through peer review. Feel free to use these free resources to improve your submission and navigate the publication process with ease.

#### *Language (usage and editing services)*

Please write your text in good English (American or British usage is accepted, but not a mixture of these). Authors who feel their English language manuscript may require editing to eliminate possible grammatical or spelling errors and to conform to correct scientific English may wish to use the [English Language Editing service](#) available from Elsevier's Author Services.

#### *Submission*

Submission to this journal proceeds totally online and you will be guided stepwise through the creation and uploading of your files. The system automatically converts source files to a single PDF file of the article, which is used in the peer-review process. Please note that even though manuscript source files are converted to PDF files at submission for the review process, these source files are needed for further processing after acceptance. Authors can upload their article as a LaTeX, Microsoft (MS) Word,

WordPerfect, PostScript or Adobe Acrobat PDF document. All correspondence, including notification of the Editor's decision and requests for revision, takes place by e-mail removing the need for a paper trail.

#### *Referees*

Please submit, with the manuscript, the names, addresses and e-mail addresses of 4 potential referees. Note that the editor retains the sole right to decide whether or not the suggested reviewers are used.

#### *Additional Information*

**Manuscripts should be prepared with numbered lines, with wide margins and double-spacing throughout, i.e. also for abstracts, footnotes and references. Every page of the manuscript, including the title page, references, tables, etc. should be numbered. However, in the text no reference should be made to page numbers; if necessary, one may refer to sections. Avoid excessive use of italics to emphasize part of the text.**

## **PREPARATION**

### **NEW SUBMISSIONS**

Submission to this journal proceeds totally online and you will be guided stepwise through the creation and uploading of your files. The system automatically converts your files to a single PDF file, which is used in the peer-review process.

As part of the Your Paper Your Way service, you may choose to submit your manuscript as a single file to be used in the refereeing process. This can be a PDF file or a Word document, in any format or layout that can be used by referees to evaluate your manuscript. It should contain high enough quality figures for refereeing. If you prefer to do so, you may still provide all or some of the source files at the initial submission. Please note that individual figure files larger than 10 MB must be uploaded separately.

#### *References*

There are no strict requirements on reference formatting at submission. References can be in any style or format as long as the style is consistent. Where applicable, author(s) name(s), journal title/book title, chapter title/article title, year of publication, volume number/book chapter and the article number or pagination must be present. Use of DOI is highly encouraged. The reference style used by the journal will be applied to the accepted article by Elsevier at the proof stage. Note that missing data will be highlighted at proof stage for the author to correct.

#### *Formatting requirements*

There are no strict formatting requirements but all manuscripts must contain the essential elements needed to convey your manuscript, for example Abstract, Keywords, Introduction, Materials and Methods, Results, Conclusions, Artwork and Tables with Captions.

If your article includes any Videos and/or other Supplementary material, this should be included in your initial submission for peer review purposes.

Divide the article into clearly defined sections.

**Please ensure the text of your paper is double-spaced and has consecutive line numbering - this is an essential peer review requirement.**

#### *Figures and tables embedded in text*

Please ensure the figures and the tables included in the single file are placed next to the relevant text in the manuscript, rather than at the bottom or the top of the file. The corresponding caption should be placed directly below the figure or table.

### **Peer review**

This journal operates a single blind review process. All contributions will be initially assessed by the editor for suitability for the journal. Papers deemed suitable are then typically sent to a minimum of two independent expert reviewers to assess the scientific quality of the paper. The Editor is responsible for the final decision regarding acceptance or rejection of articles. The Editor's decision is final. [More information on types of peer review.](#)

### **REVISED SUBMISSIONS**

### *Use of word processing software*

Regardless of the file format of the original submission, at revision you must provide us with an editable file of the entire article. Keep the layout of the text as simple as possible. Most formatting codes will be removed and replaced on processing the article. The electronic text should be prepared in a way very similar to that of conventional manuscripts (see also the [Guide to Publishing with Elsevier](#)). See also the section on Electronic artwork.

To avoid unnecessary errors you are strongly advised to use the 'spell-check' and 'grammar-check' functions of your word processor.

### **Article structure**

#### *Subdivision - numbered sections*

Divide your article into clearly defined and numbered sections. Subsections should be numbered 1.1 (then 1.1.1, 1.1.2, ...), 1.2, etc. (the abstract is not included in section numbering). Use this numbering also for internal cross-referencing: do not just refer to 'the text'. Any subsection may be given a brief heading. Each heading should appear on its own separate line.

#### *Introduction*

State the objectives of the work and provide an adequate background, avoiding a detailed literature survey or a summary of the results.

**Additional sections Background and/or Literature may be necessary, but only if these aspects of the work cannot be adequately covered in the Introduction.**

#### *materials and methods*

This section is necessary if your paper involves experimentation. Provide sufficient detail to allow the work to be reproduced. Methods already published should be indicated by a reference: only relevant modifications should be described. However, work published in Computers and Electronics in Agriculture will often not comprise a straightforward experimental investigation or testing of a hypothesis. Therefore, rather than Materials and Methods, other section headings may be appropriate.

e.g. one or more of:

Design Requirement

Measurement Requirement

Control Requirement

Specification of . . .

Development of . . .

Software Development

A section headed Performance Evaluation or Validation or Assessment may then be appropriate.

#### *results*

is expected for all experimental work. Results should be clear and concise; and report only your work, i.e. comparisons with other work from cited literature should be set out in the subsequent section Discussion.

#### *Discussion*

This should explore the significance of the results of the work, not repeat them. A combined *Results and Discussion* section may be appropriate, but if this is adopted it is essential to maintain clarity as regards which results/achievements are your work and which are the work of others. Avoid extensive citations and discussion of published literature.

#### *Conclusions*

The main conclusions of the study may be presented in a short Conclusions section.

#### *Appendices*

If there is more than one appendix, they should be identified as A, B, etc. Formulae and equations in appendices should be given separate numbering: Eq. (A.1), Eq. (A.2), etc.; in a subsequent appendix, Eq. (B.1) and so on. Similarly for tables and figures: Table A.1; Fig. A.1, etc.

### **Essential title page information**

- **Title.** Concise and informative. Titles are often used in information-retrieval systems. Avoid abbreviations and formulae where possible.

- **Author names and affiliations.** Please clearly indicate the given name(s) and family name(s) of each author and check that all names are accurately spelled. You can add your name between parentheses in your own script behind the English transliteration. Present the authors' affiliation addresses (where the actual work was done) below the names. Indicate all affiliations with a lower-

case superscript letter immediately after the author's name and in front of the appropriate address. Provide the full postal address of each affiliation, including the country name and, if available, the e-mail address of each author.

- **Corresponding author.** Clearly indicate who will handle correspondence at all stages of refereeing and publication, also post-publication. This responsibility includes answering any future queries about Methodology and Materials. **Ensure that the e-mail address is given and that contact details are kept up to date by the corresponding author.**

- **Present/permanent address.** If an author has moved since the work described in the article was done, or was visiting at the time, a 'Present address' (or 'Permanent address') may be indicated as a footnote to that author's name. The address at which the author actually did the work must be retained as the main, affiliation address. Superscript Arabic numerals are used for such footnotes.

### Highlights

Highlights are mandatory for this journal as they help increase the discoverability of your article via search engines. They consist of a short collection of bullet points that capture the novel results of your research as well as new methods that were used during the study (if any). Please have a look at the examples here: [example Highlights](#).

Highlights should be submitted in a separate editable file in the online submission system. Please use 'Highlights' in the file name and include 3 to 5 bullet points (maximum 85 characters, including spaces, per bullet point).

### Abstract

A concise and factual abstract is required which should not be longer than 400 words. The abstract should state briefly the purpose of the research, the principal results and major conclusions. An abstract is often presented separately from the article, so it must be able to stand alone. For this reason, References should be avoided, but if essential, then cite the author(s) and year(s). Also, non-standard or uncommon abbreviations should be avoided, but if essential they must be defined at their first mention in the abstract itself.

### Graphical abstract

Although a graphical abstract is optional, its use is encouraged as it draws more attention to the online article. The graphical abstract should summarize the contents of the article in a concise, pictorial form designed to capture the attention of a wide readership. Graphical abstracts should be submitted as a separate file in the online submission system. Image size: Please provide an image with a minimum of 531 × 1328 pixels (h × w) or proportionally more. The image should be readable at a size of 5 × 13 cm using a regular screen resolution of 96 dpi. Preferred file types: TIFF, EPS, PDF or MS Office files. You can view [Example Graphical Abstracts](#) on our information site.

Authors can make use of Elsevier's [Illustration Services](#) to ensure the best presentation of their images and in accordance with all technical requirements.

### Keywords

Immediately after the abstract, provide a maximum of 6 keywords, using American spelling and avoiding general and plural terms and multiple concepts (avoid, for example, 'and', 'of'). Be sparing with abbreviations: only abbreviations firmly established in the field may be eligible. These keywords will be used for indexing purposes.

### Abbreviations

Define abbreviations that are not standard in this field in a footnote to be placed on the first page of the article. Such abbreviations that are unavoidable in the abstract must be defined at their first mention there, as well as in the footnote. Ensure consistency of abbreviations throughout the article.

### Acknowledgements

Collate acknowledgements in a separate section at the end of the article before the references and do not, therefore, include them on the title page, as a footnote to the title or otherwise. List here those individuals who provided help during the research (e.g., providing language help, writing assistance or proof reading the article, etc.).

### Formatting of funding sources

List funding sources in this standard way to facilitate compliance to funder's requirements:

Funding: This work was supported by the National Institutes of Health [grant numbers xxxx, yyyy]; the Bill & Melinda Gates Foundation, Seattle, WA [grant number zzzz]; and the United States Institutes of Peace [grant number aaaa].

It is not necessary to include detailed descriptions on the program or type of grants and awards. When funding is from a block grant or other resources available to a university, college, or other research institution, submit the name of the institute or organization that provided the funding.

If no funding has been provided for the research, please include the following sentence:

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

#### *Nomenclature and units*

1. Authors and Editor(s) are, by general agreement, obliged to accept the rules governing biological nomenclature, as laid down in the *International Code of Botanical Nomenclature*, the *International Code of Nomenclature of Bacteria*, and the *International Code of Zoological Nomenclature*.

2. All biotica (crops, plants, insects, birds, mammals, etc.) should be identified by their scientific names when the English term is first used, with the exception of common domestic animals.

3. All biocides and other organic compounds must be identified by their Geneva names when first used in the text. Active ingredients of all formulations should be likewise identified.

4. For chemical nomenclature, the conventions of the *International Union of Pure and Applied Chemistry* and the official recommendations of the *IUPAC-IUB Combined Commission on Biochemical Nomenclature* should be followed.

#### *Formulae*

1. All formulae should be presented consistently and clearly with regard to the meaning of each symbol and its correct location. Formulae must be typed throughout.

2. All unusual symbols must be collected in a separate list in the appendix, giving a clear explanation of each symbol.

3. Please try to keep the notation as simple as possible, and avoid ambiguities. Do not use special typefaces if there is no urgent need to do so.

4. Different formulae should be clearly separated in the manuscript, at least by punctuation marks, if not by words. Avoid breaking formulae if breaking is not strictly necessary (i.e., if the equation is less than one typed line). Never let a sentence consist of formulae alone (i.e., without any connection with the preceding text).

5. Do not use complicated juxtapositions of symbols. Also, try to avoid complicated subscripts and superscripts; third-order indices especially present difficulties as to their size and position, and fourth-order indices are taboo.

6. The manuscript must show a clear distinction between similar symbols, (e.g., between zero (0) and the letter O, between one (1) and the letter l, and between multiplication ( $\times$ ) and the letter x).

7. Important formulae (e.g. definitions) must be displayed. All formulae which are to be referred to later on must be displayed and numbered consecutively throughout the paper; the number should appear on the right-hand side of the page.

8. In chemical formulae the valence of ions must be given as, for example,  $\text{Ca}^{2+}$  and  $\text{CO}_3^{2-}$  rather than as  $\text{Ca}^{++}$  and  $\text{CO}_3^{--}$ .

9. Isotope numbers should precede the symbols (e.g.,  $^{18}\text{O}$ ).

#### *Footnotes*

Footnotes should be used sparingly. Number them consecutively throughout the article. Many word processors build footnotes into the text, and this feature may be used. Should this not be the case, indicate the position of footnotes in the text and present the footnotes themselves separately at the end of the article.

## Artwork

### Electronic artwork

#### General points

- Make sure you use uniform lettering and sizing of your original artwork.
- Preferred fonts: Arial (or Helvetica), Times New Roman (or Times), Symbol, Courier.
- Number the illustrations according to their sequence in the text.
- Use a logical naming convention for your artwork files.
- Indicate per figure if it is a single, 1.5 or 2-column fitting image.
- For Word submissions only, you may still provide figures and their captions, and tables within a single file at the revision stage.
- Please note that individual figure files larger than 10 MB must be provided in separate source files. A detailed [guide on electronic artwork](#) is available.

**You are urged to visit this site; some excerpts from the detailed information are given here.**

#### Formats

Regardless of the application used, when your electronic artwork is finalized, please 'save as' or convert the images to one of the following formats (note the resolution requirements for line drawings, halftones, and line/halftone combinations given below):

EPS (or PDF): Vector drawings. Embed the font or save the text as 'graphics'.

TIFF (or JPG): Color or grayscale photographs (halftones): always use a minimum of 300 dpi.

TIFF (or JPG): Bitmapped line drawings: use a minimum of 1000 dpi.

TIFF (or JPG): Combinations bitmapped line/half-tone (color or grayscale): a minimum of 500 dpi is required.

#### Please do not:

- Supply files that are optimized for screen use (e.g., GIF, BMP, PICT, WPG); the resolution is too low.
- Supply files that are too low in resolution.
- Submit graphics that are disproportionately large for the content.

#### Color artwork

Please make sure that artwork files are in an acceptable format (TIFF (or JPEG), EPS (or PDF), or MS Office files) and with the correct resolution. If, together with your accepted article, you submit usable color figures then Elsevier will ensure, at no additional charge, that these figures will appear in color online (e.g., ScienceDirect and other sites) regardless of whether or not these illustrations are reproduced in color in the printed version. **For color reproduction in print, you will receive information regarding the costs from Elsevier after receipt of your accepted article.** Please indicate your preference for color: in print or online only. [Further information on the preparation of electronic artwork.](#)

#### Figure captions

Ensure that each illustration has a caption. A caption should comprise a brief title (**not** on the figure itself) and a description of the illustration. Keep text in the illustrations themselves to a minimum but explain all symbols and abbreviations used.

#### Tables

1. Authors should take notice of the limitations set by the size and lay-out of the journal. Large tables should be avoided. Reversing columns and rows will often reduce the dimensions of a table.
2. If many data are to be presented, an attempt should be made to divide them over two or more tables.
3. Tables should be numbered according to their sequence in the text. The text should include references to all tables.
4. Each table should be typewritten on a separate page of the manuscript. Tables should never be included in the text.
5. Each table should have a brief and self-explanatory title.
6. Column headings should be brief, but sufficiently explanatory. Standard abbreviations of units of measurement should be added between parentheses.
7. Vertical lines should not be used to separate columns. Leave some extra space between the columns instead.

8. Any explanation essential to the understanding of the table should be given as a footnote at the bottom of the table.

#### References

**References** 1. All publications cited in the text should be presented in a list of references following the text of the manuscript. The manuscript should be carefully checked to ensure that the spelling of author's names and dates are exactly the same in the text as in the reference list.

2. In the text refer to the author's name (without initial) and year of publication, followed - if necessary - by a short reference to appropriate pages. Examples: "Since Peterson (1993) has shown that ...." "This is in agreement with results obtained later (Peterson and Kramer, 1993, pp. 12-16)".

3. If reference is made in the text to a publication written by more than two authors the name of the first author should be used followed by "*et al.*" This indication, however, should never be used in the list of references. In this list names of first author and co-authors should be mentioned.

4. References cited together in the text should be arranged chronologically. The list of references should be arranged alphabetically on authors' names, and chronologically per author. If an author's name in the list is also mentioned with co-authors the following order should be used: publications of the single author, arranged according to publication dates - publications of the same author with one co-author - publications of the author with more than one co-author. Publications by the same author(s) in the same year should be listed as 1994a, 1994b, etc.

5. Use the following system for arranging your references:

##### 5.1 For periodicals

Yang, Q., 1993. Classification of apple surface features using machine vision and neural networks. *Comput. Electron. Agric.* 9, 1-12.

##### 5.2 For entire (special) issue of journal

Glaser, R., Bond, L. (Eds). 1981. Testing: Concepts and Research (special issue). *American Psychologist* 36 (10).

##### 5.3 For books

Peart, R.M., Brooks, R.C. (Eds.), 1992. Analysis of Agricultural Energy Systems. *Energy in World Agriculture*, 5. Elsevier, Amsterdam.

5.4 For multi-author books Price, D.R., Chen, T.H., Peart, R.M. 1992. Acknowledge-based decision system for control of waste heat for a greenhouse-aquaculture complex. In: Peart, R.M., Brooks, R.C. (Eds.), *Analysis of Agricultural Energy Systems. Energy in World Agriculture*, 5. Elsevier, Amsterdam, pp. 33-46.

5.5 For unpublished reports, departmental notes, etc. Deshazer, J.A., Moran, P., Onyango, C.M., Schofield, C.P., 1988. Imaging systems to improve stockmanship in pig production. Div. Note 1549, AFRC Institute of Engineering Research, Silsoe, UK.

6. Do not abbreviate the titles of periodicals mentioned in the list of references; alternatively use the *International List of Periodical Title Word Abbreviations*.

7. In the case of publications in any language other than English, the original title is to be retained. However, the titles of publications in non-Latin alphabets should be transliterated, and a notation such as "(in Russian)" or "(in Greek with English abstract)" should be added.

8. Work accepted for publication but not yet published should be referred to as "in press".

9. References concerning unpublished data and "personal communications" should not be cited in the reference list but may be mentioned in the text.

#### Reference links

Increased discoverability of research and high quality peer review are ensured by online links to the sources cited. In order to allow us to create links to abstracting and indexing services, such as Scopus, CrossRef and PubMed, please ensure that data provided in the references are correct. Please note that incorrect surnames, journal/book titles, publication year and pagination may prevent link creation. When copying references, please be careful as they may already contain errors. Use of the DOI is highly encouraged.

A DOI is guaranteed never to change, so you can use it as a permanent link to any electronic article. An example of a citation using DOI for an article not yet in an issue is: VanDecar J.C., Russo R.M., James D.E., Ambeh W.B., Franke M. (2003). Aseismic continuation of the Lesser Antilles slab beneath northeastern Venezuela. *Journal of Geophysical Research*, <https://doi.org/10.1029/2001JB000884>. Please note the format of such citations should be in the same style as all other references in the paper.

### *Data references*

This journal encourages you to cite underlying or relevant datasets in your manuscript by citing them in your text and including a data reference in your Reference List. Data references should include the following elements: author name(s), dataset title, data repository, version (where available), year, and global persistent identifier. Add [dataset] immediately before the reference so we can properly identify it as a data reference. The [dataset] identifier will not appear in your published article.

[dataset] Oguro, M., Imahiro, S., Saito, S., Nakashizuka, T., 2015. Mortality data for Japanese oak wilt disease and surrounding forest compositions. Mendeley Data, v1. <http://dx.doi.org/10.17632/xwj98nb39r.1>.

### *Reference management software*

Most Elsevier journals have their reference template available in many of the most popular reference management software products. These include all products that support [Citation Style Language styles](#), such as [Mendeley](#). Using citation plug-ins from these products, authors only need to select the appropriate journal template when preparing their article, after which citations and bibliographies will be automatically formatted in the journal's style. If no template is yet available for this journal, please follow the format of the sample references and citations as shown in this Guide. If you use reference management software, please ensure that you remove all field codes before submitting the electronic manuscript. [More information on how to remove field codes from different reference management software](#).

Users of Mendeley Desktop can easily install the reference style for this journal by clicking the following link:

<http://open.mendeley.com/use-citation-style/computers-and-electronics-in-agriculture>

When preparing your manuscript, you will then be able to select this style using the Mendeley plug-ins for Microsoft Word or LibreOffice.

### *Journal abbreviations source*

Journal names should be abbreviated according to the [List of Title Word Abbreviations](#).

### **Video**

Elsevier accepts video material and animation sequences to support and enhance your scientific research. Authors who have video or animation files that they wish to submit with their article are strongly encouraged to include links to these within the body of the article. This can be done in the same way as a figure or table by referring to the video or animation content and noting in the body text where it should be placed. All submitted files should be properly labeled so that they directly relate to the video file's content. . In order to ensure that your video or animation material is directly usable, please provide the file in one of our recommended file formats with a preferred maximum size of 150 MB per file, 1 GB in total. Video and animation files supplied will be published online in the electronic version of your article in Elsevier Web products, including [ScienceDirect](#). Please supply 'stills' with your files: you can choose any frame from the video or animation or make a separate image. These will be used instead of standard icons and will personalize the link to your video data. For more detailed instructions please visit our [video instruction pages](#). Note: since video and animation cannot be embedded in the print version of the journal, please provide text for both the electronic and the print version for the portions of the article that refer to this content.

### **Data visualization**

Include interactive data visualizations in your publication and let your readers interact and engage more closely with your research. Follow the instructions [here](#) to find out about available data visualization options and how to include them with your article.

### **Supplementary material**

Supplementary material such as applications, images and sound clips, can be published with your article to enhance it. Submitted supplementary items are published exactly as they are received (Excel or PowerPoint files will appear as such online). Please submit your material together with the article and supply a concise, descriptive caption for each supplementary file. If you wish to make changes to supplementary material during any stage of the process, please make sure to provide an updated file. Do not annotate any corrections on a previous version. Please switch off the 'Track Changes' option in Microsoft Office files as these will appear in the published version.

## Research data

This journal encourages and enables you to share data that supports your research publication where appropriate, and enables you to interlink the data with your published articles. Research data refers to the results of observations or experimentation that validate research findings. To facilitate reproducibility and data reuse, this journal also encourages you to share your software, code, models, algorithms, protocols, methods and other useful materials related to the project.

Below are a number of ways in which you can associate data with your article or make a statement about the availability of your data when submitting your manuscript. If you are sharing data in one of these ways, you are encouraged to cite the data in your manuscript and reference list. Please refer to the "References" section for more information about data citation. For more information on depositing, sharing and using research data and other relevant research materials, visit the [research data](#) page.

### *Data linking*

If you have made your research data available in a data repository, you can link your article directly to the dataset. Elsevier collaborates with a number of repositories to link articles on ScienceDirect with relevant repositories, giving readers access to underlying data that gives them a better understanding of the research described.

There are different ways to link your datasets to your article. When available, you can directly link your dataset to your article by providing the relevant information in the submission system. For more information, visit the [database linking page](#).

For [supported data repositories](#) a repository banner will automatically appear next to your published article on ScienceDirect.

In addition, you can link to relevant data or entities through identifiers within the text of your manuscript, using the following format: Database: xxxx (e.g., TAIR: AT1G01020; CCDC: 734053; PDB: 1XFN).

### *Mendeley Data*

This journal supports Mendeley Data, enabling you to deposit any research data (including raw and processed data, video, code, software, algorithms, protocols, and methods) associated with your manuscript in a free-to-use, open access repository. During the submission process, after uploading your manuscript, you will have the opportunity to upload your relevant datasets directly to *Mendeley Data*. The datasets will be listed and directly accessible to readers next to your published article online.

For more information, visit the [Mendeley Data for journals page](#).

### *Data in Brief*

You have the option of converting any or all parts of your supplementary or additional raw data into one or multiple data articles, a new kind of article that houses and describes your data. Data articles ensure that your data is actively reviewed, curated, formatted, indexed, given a DOI and publicly available to all upon publication. You are encouraged to submit your article for *Data in Brief* as an additional item directly alongside the revised version of your manuscript. If your research article is accepted, your data article will automatically be transferred over to *Data in Brief* where it will be editorially reviewed and published in the open access data journal, *Data in Brief*. Please note an open access fee of 600 USD is payable for publication in *Data in Brief*. Full details can be found on the [Data in Brief website](#). Please use [this template](#) to write your Data in Brief.

### *MethodsX*

You have the option of converting relevant protocols and methods into one or multiple MethodsX articles, a new kind of article that describes the details of customized research methods. Many researchers spend a significant amount of time on developing methods to fit their specific needs or setting, but often without getting credit for this part of their work. MethodsX, an open access journal, now publishes this information in order to make it searchable, peer reviewed, citable and reproducible. Authors are encouraged to submit their MethodsX article as an additional item directly alongside the revised version of their manuscript. If your research article is accepted, your methods article will automatically be transferred over to MethodsX where it will be editorially reviewed. Please note an open access fee is payable for publication in MethodsX. Full details can be found on the [MethodsX website](#). Please use [this template](#) to prepare your MethodsX article.

### *Data statement*

To foster transparency, we encourage you to state the availability of your data in your submission. This may be a requirement of your funding body or institution. If your data is unavailable to access or unsuitable to post, you will have the opportunity to indicate why during the submission process, for example by stating that the research data is confidential. The statement will appear with your published article on ScienceDirect. For more information, visit the [Data Statement page](#).

## **AFTER ACCEPTANCE**

### **Online proof correction**

Corresponding authors will receive an e-mail with a link to our online proofing system, allowing annotation and correction of proofs online. The environment is similar to MS Word: in addition to editing text, you can also comment on figures/tables and answer questions from the Copy Editor. Web-based proofing provides a faster and less error-prone process by allowing you to directly type your corrections, eliminating the potential introduction of errors.

If preferred, you can still choose to annotate and upload your edits on the PDF version. All instructions for proofing will be given in the e-mail we send to authors, including alternative methods to the online version and PDF.

We will do everything possible to get your article published quickly and accurately. Please use this proof only for checking the typesetting, editing, completeness and correctness of the text, tables and figures. Significant changes to the article as accepted for publication will only be considered at this stage with permission from the Editor. It is important to ensure that all corrections are sent back to us in one communication. Please check carefully before replying, as inclusion of any subsequent corrections cannot be guaranteed. Proofreading is solely your responsibility.

### **Offprints**

The corresponding author will, at no cost, receive a customized [Share Link](#) providing 50 days free access to the final published version of the article on [ScienceDirect](#). The Share Link can be used for sharing the article via any communication channel, including email and social media. For an extra charge, paper offprints can be ordered via the offprint order form which is sent once the article is accepted for publication. Both corresponding and co-authors may order offprints at any time via Elsevier's [Author Services](#). Corresponding authors who have published their article gold open access do not receive a Share Link as their final published version of the article is available open access on ScienceDirect and can be shared through the article DOI link.

## **AUTHOR INQUIRIES**

Visit the [Elsevier Support Center](#) to find the answers you need. Here you will find everything from Frequently Asked Questions to ways to get in touch.

You can also [check the status of your submitted article](#) or find out [when your accepted article will be published](#).

© Copyright 2018 Elsevier | <https://www.elsevier.com>