

European Weed Research Society

3RD CIRCULAR

8TH WORKSHOP OF THE EWRS WORKING GROUP: **PHYSICAL AND CULTURAL WEED CONTROL**

**Zaragoza, Spain
9-11 March 2009**

Dear Colleague,

In this third circular you will find:

- Finalised Scientific Programme
- Detailed information on payment, venue, accommodation, and travel
- Instructions on preparation of papers for the Proceedings
- Provisional list of participants
- Information on presentation facilities
- Registration form

Overview – This programme includes:

- Four plenary sessions with 20 oral presentations
- One keynote session on "Physical and preventive weed control in uncultivated areas" (4 presentations)
- Two poster sessions with 37 posters
- Three round table discussion
- One excursion including dinner
- Dinners and social activities

We look forward to meet you in Zaragoza, Spain.

*Bo Melander
Alicia Cirujeda
Carlos Zaragoza*

Workshop programme - Overview

Sunday 8 March

- 17.00 Afternoon and Evening: Registration
- 20.00 Welcome drink

Monday 9 March

- 09.00 Registration
- 09.30 Opening address
- 09.50 Session 1 – Preventive and cultural methods (3 presentations)
- 11.00 Coffee
- 11.20 Session 2 - Preventive and cultural methods (continuing) (6 presentations)
- 13.30 Lunch
- 14.30 Session 3 - Poster session incl. coffee (19 posters)
- 16.30 Session 4 – Keynote theme: Physical and preventive weed control in uncultivated areas (4 presentations)
- 18.30 End of first day's scientific programme
- 20.00 Guided tour of Zaragoza (to be determined). Afterwards, dinner or tapas in the city centre

Tuesday 10 March

- 09.00 Session 5 - Mechanical weed control (7 presentations)
- 11.20 Discussion
- 11.30 Session 6 - Round-table discussions incl. coffee (3 round-tables)
- 13.30 Lunch
- 14.30 Excursion to conventional and organic farms
- 20.00 Dinner at a local place

Wednesday 11 March

- 09.30 Session 7 - Report from round table discussion
- 10.15 Session 8 - Poster session (16 posters)
- 12.00 Session 9 -Thermal weed control (4 presentations)
- 13.20 Discussion
- 13.45 Lunch and end of workshop

Full Programme – EWRS Workshop, Zaragoza, 2009

Sunday 8 March

- 17.00 Registration
- 20.00 Welcome drink – we will inform you in due time where it will be held

Monday 9 March

- 09.00 Registration
- 09.30 Opening address
Bo Melander, coordinator and scientific organiser
Alicia Cirujeda & Carlos Zaragoza, local organising committee

Session 1 – Preventive and cultural methods

Chair: *Husrev Mennan (TUR)*

- 09.50 Integrated winter/summer cover crops into weed management program in organically grown vegetables, *Husrev Mennan (TUR)*
- 10.10 Initial trials of a crimper-roller for killing cover crops for organic and non-herbicide, no-till cropping, *Charles Merfield (IRL)*
- 10.30 Effects of cereal rye mulch and soybean density on weed suppression, *Matthew Ryan (USA)*
- 10.50 General discussion
- 11.00 Coffee

Session 2 – Preventive and cultural methods (continued)

Chair: *Anne Légère (CAN)*

- 11.20 Combining enhanced competition and cultivation for improved weed control in organic cereals, *Lauren Kolb (USA)*
- 11.40 The relative importance of cultural weed control methods: A survey of results from western Canada, *Steve Shirtliffe (CAN)*
- 12.00 Mechanical barriers for yellow nutsedge (*Cyperus esculentus*) control in strawberry, *Oleg Daugovich (USA)*
- 12.20 An integrated physical approach to control purple nutsedge (*Cyperus rotundus*), *Joseph Hershenhorn (ISR)*

- 12.40 Effect of innovative crop and weed management systems on organic cauliflower in Central Italy, *Stefano Carlesi (ITA)*
- 13.00 Non-chemical weed control with mulches and disks for nursery container production, *Mario Lanthier (CAN)*
- 13.20 Discussion
- 13.30 Lunch

Session 3 – Poster session incl. coffee (19 posters)

- 14.30 Introduction to posters by session chairs
Posters 1 – 9 introduced by *Baruch Rubin (ISR)*
Posters 10 – 19 introduced by *Anne Légère (CAN)*
- 15.00 Poster presentations

Session 4 - Keynote theme: Physical and preventive weed control in uncultivated areas

Chair: *Bo Melander, DNK*

- 16.30 Weed occurrence on pavements in five European towns, (20 min. presentation + 5 min. discussion), *Bo Melander (DNK)*
- 16.55 Results and experiences with physical weed control on hard surfaces (30 min. presentation + 5 min. discussion), *David Hansson (SWE)*
- 17.30 Experiences with physical weed control on hard surfaces in central Italy (20 min. presentation + 5 min. discussion), *Andrea Peruzzi (ITA)*
- 17.55 The invasion of weeds in the archaeological sites and innovated methods for their Control (30 min. presentation + 5 min. discussion), *Garifalia Economou (GRC)*
- 18.30 End of first day's scientific programme
- 20.00 Guided tour of Zaragoza (to be determined). Afterwards, dinner or tapas in the city centre

Tuesday 10 March

Session 5 – Mechanical weed control

Chair: *Ilse A. Rasmussen (DNK)*

- 09.00 Morphological differences between carrot and weeds: its usefulness in selective mowing as a weed control technique, *Diane Lyse Benoit (CAN)*
- 09.20 The use of flex-tine harrow, torsion weeder and finger weeder in Mediterranean crops, *Alicia Cirujeda (ESP)*
- 09.40 Sensor based selective weed harrowing in cereals, *Victor Rueda Ayala (GER)*
- 10.00 Physical weed control in protected leaf-beet in Central Italy, *Michele Raffaelli (ITA)*
- 10.20 Performance of a min-till rotary hoe in field pea (*Pisum sativum*), *Eric Johnson (CAN)*
- 10.40 Weed patchiness: implications for physical and cultural control, *Cesar Fernandez-Quintanilla (ESP)*
- 11.00 New innovations for intra-row weed control, *Pieter Bleeker (NLD)*
- 11.20 Discussion

Session 6 – Round-table discussions incl. coffee

- 11.30 3 round tables
- 1) Unifying parameters in mechanical weed control research and in practise, lead by *Jesper Rasmussen (DNK)*
 - 2) Unifying parameters in thermal weed control research and in practise, lead by *Daniel Cloutier (CAN) & Johan Ascard (SWE)*
 - 3) Relevant and non-relevant parameters when studying cover crop and mulching effects, lead by *Eric Gallandt (USA)*
- 13.30 Lunch

Excursion

- 14.30 Departure
- Afternoon: Field visits to an organic vegetable producer, to an organic wheat and bread producer of an ancient wheat variety and to an olive farm in the surroundings of Zaragoza
- Evening: Dinner at a local place

Wednesday 11 March

Session 7 – Report from round table discussions

- 9.30 Unifying parameters in mechanical weed control research and in practise, lead by *Jesper Rasmussen (DNK)*
- 9.45 Unifying parameters in thermal weed control research and in practise, lead by *Daniel Cloutier (CAN) & Johan Ascard (SWE)*
- 10.00 Relevant and non-relevant parameters when studying cover crop and mulching effects, lead by *Eric Gallandt (USA)*

Session 8 – Poster session (17 posters)

- 10.15 Introduction to posters by session chairs
Posters 20 – 28 introduced by *Ilse A. Rasmussen (DNK)*
Posters 29 – 37 introduced by *Andrea Peruzzi (ITA)*
- 10.30 Poster presentations

Session 9 – Thermal weed control

Chair: *Andrea Peruzzi (ITA)*

- 12.00 Thermal weed control - a review of current techniques, *Johan Ascard (SWE)*
- 12.20 Crop tolerance to flaming, *Stevan Knezevic (USA)*
- 12.40 Solarization as a tool for non-chemical weed management, *Baruch Rubin (ISR)*
- 13.00 Weed control with steam and solarization for field grown flower and strawberry, *Steve Fennimore (USA)*
- 13.20 Discussion
- 13.30 Concluding remarks and working group affairs, *Bo Melander (DNK)*, *Alicia Cirujeda (ESP)* and *Carlos Zaragoza (ESP)*
- 13.45 Lunch and end of workshop

POSTERS

Section 1. Chair: *Baruch Rubin (ISR) (rubin@agri.huji.ac.il)*

- 1 Comparison of three tillage intensities on grass weed occurrence in cereal rotation, *Jukka Salonen (FIN)*
- 2 Using ecological processes to manage cropping systems for weed suppression and other services in the U.S. corn belt, *Matt Liebman, Paula R. Westerman, Andrew H. Heggenstaller, and Brent J. Danielson (USA)*
- 3 Weed suppression by canola and mustard cultivars, *Hugh J. Beckie, Eric N. Johnson, Robert E. Blackshaw, and Yantai Gan (CAN)*
- 4 Control of weeds in flooding rice through non-chemical methods, *Taberner A., Consola S. Llenes JM, Roque A. (ESP)*
- 5 Evaluation of different mulches for weed control in processing tomato, *A. Cirujeda, J. Aibar, A. Anzalone, M. Gutierrez, S. Fernández-Cavada, A. Pardo, M^a L. Suso, A. Royo, L. Martín-Closas, J- Costa, A. M. Pelacho, M.M. Moreno, A. Moreno, R. Meco, I. Lahoz, J.I. Macua, C. Zaragoza (ESP)*
- 6 Possibilities to use mustard (*Sinapis alba*) meal for weed control, *Fredrik Fogelberg (SWE)*
- 7 Weed population dynamics in fields with different management, *Pilikserē Dace (LVA)*
- 8 Effect of *Cirsium arvense* and *Elymus repens* on yield of winter wheat, spring barley and faba bean in an organic crop rotation experiment, *Ilse A. Rasmussen (DNK)*
- 9 Effect of soil tillage systems on the control of perennial weeds in a fluvisol, *T. Rusu, P. Gus, I. Bogdan, P. I. Moraru, A.I. Pop, I. Pacurar, H. Cacovean and D. Clapa (ROU)*

Section 2. Chair: *Anne Légère (CAN) (legerea@agr.gc.ca)*

- 10 Reduced rate of herbicide in corn by using different planting methods, *Eskandar Zand, Mohammad Ali Baghestani Mohammad Sarhaddi & Ali Eskandari (IRN)*
- 11 Influence of plant densities of two barley (*Hordeum vulgare* L.) varieties on wild oat (*Avena fatua* L.), *Adel Dabbagh Mohammadi Nassab, Ismaeel Mohammadi Bilankohi, Aziz Javanshir, Elnaz Ebrahimi Mollabashi (IRN)*
- 12 Flag leaf area and chlorophyll content of wild oat (*Avena fatua* L.) influence by different plant densities of two barley (*Hordeum vulgare* L.) varieties, *Ismaeel*

Mohammadi Bilankohi, Elnaz Ebrahimi Mollabashi, Adel Dabbagh Mohammadi Nassab, Aziz Javanshir, Bahram Mirshekari (IRN)

- 13 Managing weed seed rain to enhance physical weed control efforts, *Eric Gallandt (USA)*
- 14 Dissecting IWM: the contribution of cultural control to the success of IWM in Prairie cropping systems, *AG Thomas, J Leeson, FA Holm, B Gradin, CS Stevenson (CAN)*
- 15 In pursuit of effective mechanical/physical weed management in organic lo-till, *W. Curran, R. Bates, S. Mirsky, R. Gallagher, D. Mortensen, and M. Ryan (USA)*
- 16 Non-chemical weed control on open-field fresh market tomato in the Serchio Valley (Central Italy), *Fontanelli M., Raffaelli M., Ginanni M., Lulli L., Frascioni C., Sorelli F., Peruzzi A. (ITA)*
- 17 Comparison of several recommended cultural practices for weed management and their effects on yield of coconut in tropical coconut plantations, *S.H.S.Senarathne and M.J.I.Costa (LKA)*
- 18 Innovative operative machines for physical weed control on organic cauliflower in Central Italy, *Fontanelli M., Frascioni C., Lulli L., Sorelli F., Carlesi S., Bigongiali F., Antichi D. & Peruzzi A. (ITA)*
- 19 Management issues related to the use of the herbicide glyphosate and the transformations operated by urban vegetation in Genoa (Northern Italy). First note, *Alessandra Di Turi (ITA)*

Section 3. Chair: *Ilse A. Rasmussen (DNK) (ilsea.rasmussen@agrsci.dk)*

- 20 Using the spring-tine harrow in a navy bean crop (*Phaseolus vulgaris* var. *Tabella Bresa*) for human intake, *Taberner A., Llenes JM, Roque A. (ESP)*
- 21 Using the spring- tine harrow in a crop of *Amaranthus* sp. for grain production, *Taberner A., Zamora N., Llenes JM, Roque A. (ESP)*
- 22 Current weed management and the problem of the highly adaptive, cosmopolitean weeds, *L. Radics and M. Glemnitz (HUN)*
- 23 Evaluation of Finger and Torsion Weeders for Cultivating Cool Season Vegetables in Salinas, CA, USA, *R.F. Smith, M. Silva Ruiz (USA)*
- 24 Physical weed control on cabbage in the Serchio Valley (Central Italy), *Fontanelli M., Raffaelli M., Ginanni M., Lulli L., Frascioni C., Sorelli F., Peruzzi A. (ITA)*
- 25 Innovative operative machines for physical weed control on processing tomato in the Serchio Valley (Central Italy), *Fontanelli M., Raffaelli M., Ginanni M., Lulli L., Frascioni C., Sorelli F., Peruzzi A. (ITA)*

- 26 False seedbeds in organic grown winter wheat, *Arnd Verschwele (DEU)*
- 27 Autonomous navigation in weed-infested maize fields. *Abadia D., Ballano S., Uson F., Paniagua J., Seco T., Cirujeda A., Zaragoza C. (ESP)*
- 28 Vision based crop plant identification for weeding operations. *Abadia D., Gonzalez S., del-Hoyo R., Paniagua J., Seco T., Cirujeda A., Zaragoza C. (ESP)*

Section 4. Chair: *Andrea Peruzzi (ITA) (aperuzzi@agr.unipi.it)*

- 29 Using cultural methods for controlling weeds in corn and reducing herbicide rate, *Mohammad Ali Baghestani Maybodi, Eskandar Zand, and Arash Roozbehani (IRN)*
- 30 Identifying weed distribution using soil properties, *Hamid Salehian and Saeid Soltani (IRN)*
- 31 Is yardwaste mulch a weed-free substrate?, *Oleg Daugovish, James Downer, Ben Faber (USA)*
- 32 Weed tolerance to flaming, *Stevan Z. Knezevic Santiago Ulloa (USA)*
- 33 Corn types differ in their response to broadcast flaming, *Stevan Z. Knezevic, Claudio Martin da Costa, Santiago Ulloa and Avishek Datta (USA)*
- 34 Winter wheat (*Triticum aestivum* L.) tolerance to broadcast flaming, *Stevan Z. Knezevic, Jaymo Ferrari Neto, Santiago Ulloa and Avishek Datta (USA)*
- 35 Dose-response of weeds to flaming, *Leblanc, M.L., Cloutier, D.C., Sivesind, E., Stewart, K.A. (CAN)*
- 36 Effects of soil steaming on weed seed viability, *Francesco Vidotto; Marilisa Letey; Davide Ricauda-Aimonino (ITA)*
- 37 Liquefied Petroleum Gas (Propane + Butane) as a new physical method to control weed, turfgrass and pest in olive (*Olea europaea*) trees. *JM. Durán, R. Moratiel, N. Retamal, E. Pombo, I. Santiago (ESP)*

IMPORTANT

Poster presenters must send a maximum of two PowerPoint slides to the relevant session chair BEFORE March 1st 2009 (their emails are besides their names in the programme). Their posters will only be introduced if they have sent it in time.

The slide MUST contain:

- **Poster number according to the number in the programme**
- **The title**

- **Name(s) of authors incl. country codes. If more than two authors use: *et al.***
- **Objective of the work**
- **Main results and conclusions**

Detailed information

REGISTRATION

Please note that the final deadline for us to receive your payment is January 15, 2009.

Please fill-in the online form to confirm your payment. The link to the form is in the Physical and Cultural Weed Control web site at: www.ewrs.org/pwc. **Send the form only after having paid your registration fee.**

The registration fee will cover the costs for the welcome drink on Sunday, the meeting's booklet with abstracts and folders, facilities, excursion on Tuesday, coffee-breaks and lunches (Monday to Wednesday), and dinner on Tuesday, following the excursion.

Fee for EWRS-members and students paid before 15 December 2008:	150 Euro
Fee for non EWRS-members paid before 15 December 2008:	205 Euro
Fee for EWRS-members and students paid after 15 December 2008:	180 Euro
Fee for non EWRS-members paid after 15 December 2008:	235 Euro

Credit card payments cannot be accepted. Please pay the registration fee to the following bank account:

Account Name: Meeting WG PCWC Zaragoza 2009

Account Number: 2086-0047-34-3300109336

Bank: Caja Inmaculada

IBAN: ES58-2086-0047-3433-0010-9336

BIC/SWIFT: CECAESMM086

Address of the bank: Avda. de Cesáreo Alierta, nº 19 -21, 50008 Zaragoza, Aragón, Spain

Telephone number of the bank: 976.59.69.60; Fax: 976.59.68.94

IMPORTANT

Please add "EWRS Workshop 2009 Zaragoza" for payment identification. Bank transaction fees have to be paid by the participants.

VENUE

The Workshop meetings will take place on the Campus of Aula Dei, located 17 km from the centre of Zaragoza. Zaragoza, a 2000-year-old city with 700.000 inhabitants, is architecturally very interesting, especially from its Arabic period. The city is located next to the Ebro river, which defines the landscape of the 'Ebro valley', an important agricultural

region. This is an area of large contrasts between the irrigated valley and the arid surroundings with little vegetation. Zaragoza is located between Madrid and Barcelona, approximately 300 km from each. It is serviced directly by a few airlines and there are fast and frequent trains from both Madrid and Barcelona. Zaragoza's central location offers an excellent opportunity for you to spend some extra days visiting the two major cities of Spain, Barcelona and Madrid, with all their interesting attractions.

Several institutions are located on the Aula Dei Campus: The Centro de Investigación y Tecnología Agroalimentaria (CITA) (a regional Research Centre in Food and Agriculture), a delegation of the Consejo Superior de Investigaciones Científicas (CSIC) (the main Research Institution of Spain), the Plant Protection Service and different laboratories of the Agriculture Department of Aragón and the Instituto Agronómico Mediterráneo de Zaragoza (IAMZ), the latter is providing the facilities for our meeting.

ACCOMMODATION AND TRANSPORT TO THE CAMPUS

Participants in the workshop will have lunch at the Campus restaurant. Accommodations will be in Zaragoza, and a list of recommended hotels in the city centre is provided below. The central location of the hotels will encourage meeting after the official programme. We hope that informal discussions will continue while enjoying some 'tapas' in many of the bars of the old city.

We recommend staying at one of the hotels in the city centre as we will provide transport to the Campus. The listed hotels are very close to each other. There will be a limited number of stops to pick up the participants, probably at the Coso or Avda. César Augusto road and at the Echegaray y Caballero road. We will decide the definitive stops depending on the location of the chosen hotels. Therefore, **PLEASE SEND US THE NAME OF YOUR HOTEL AS SOON AS YOU HAVE BOOKED IT** (mleonn@aragon.es) so that we can select the final stops. We will inform you of the definitive route in due time.

Here is a list of recommended hotels in the city centre listed from lower to higher category with updated prices. Vía Romana and Tibur are next to each other. When contacting the hotels, please indicate that you are a participant in the Working Group Meeting to obtain lower prices:

- Zaragoza hostel Calle Predicadores 70; Tlf.: (+34) 976.48.15.68 http://www.alberguezaragoza.com 16.60-21.60€ without breakfast	- Hotel Husa Vía Romana *** Calle Don Jaime 154-156; Tlf.: (+34) 976. 39.82.15 http://www.hotelhusaviaromana.com 60-80€ single room
- Hotel Río Arga ** Calle Contamina 20; Tlf.: (+34) 976. 39.90.65 http://www.hotelrioarga.es 43€ single room, 60€ double room	- Hotel Tibur*** Plaza de la Seo 2 y 3 Tlf.: (+34)976.20.20.00 http://www.hoteltibur.com 80€ double room
- Hostal Santiago *** Calle Santiago 3; Tlf.: (+34) 976. 39.45.50 http://www.hostalplaza-santiago.com 45€ double room	- Hotel Oriente **** Calle Coso 11; Tlf.: (+34) 976. 20.32.82 http://www.hotel-oriente.com 60-75€ + 10€ breakfast

	- Hotel Ramiro I **** Calle Coso 123 Tlf.: (+34) 976. 29.82.00 http://www.pretur.com/hotel_ramiro_i.php 100€ single room, breakfast included 120€ double room, breakfast included
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DEADLINES

15th December 2008

- Deadline for payment of the workshop fee

15th January 2009

- Deadline for submission of final abstracts (**mandatory**) and optional full papers for the Proceedings. Submissions will only be done online through the web site (see instructions at www.ewrs.org/pwc). Please note that you must resubmit your abstract and follow the instructions below. The link for uploading will be available starting December 8.

ORGANISING COMMITTEE

Organising committee:

- ***Scientific organisers***

Bo Melander (Aarhus University, Faculty of Agricultural Sciences, Department of Integrated Pest Management, Research Centre Flakkebjerg, Denmark)

Alicia Cirujeda & Carlos Zaragoza (Centro de Investigación y Tecnología Agroalimentaria (CITA), Zaragoza, Spain)

Daniel Cloutier (Institut de malherbologie, Beaconsfield, Canada)

- ***Local organisers***

Alicia Cirujeda & Carlos Zaragoza (Centro de Investigación y Tecnología Agroalimentaria (CITA), Zaragoza, Spain)

Joaquín Aibar (Escuela Politécnica Superior de Huesca, University of Zaragoza, Spain)

Sonsoles Fernández-Cavada (Centro de Protección Vegetal, Diputación General de Aragón, Zaragoza, Spain)

- ***Chairman of the working group***

Bo Melander (Aarhus University, Faculty of Agricultural Sciences, Department of Integrated Pest Management, Research Centre Flakkebjerg, Denmark)

Appendix 1

Instructions for the preparation of abstracts and papers for the proceedings

Abstracts are mandatory for all authors.

The final formatting and changes in font size for paragraphs and various headings will be done by the editor.

General instructions:

Word processor:	If at all possible, please submit your text in a PC compatible format, using either WordPerfect for Windows (version 6 or up) or Microsoft Word for Windows (.doc not .docx). Otherwise, save your text as a RTF file (rich text format).
Paper format:	A4 (210 x 297 mm)
Page margins:	20 mm on every side except for the top where the margin is 30 mm
Line spacing:	Single space
Font:	Times New Roman
Font size:	12 pt. everywhere in the text, including headings, title, etc. Text in the tables can be smaller to make it fit but no less than 8 pt. Superscript and subscript can be used anywhere.
Text justification:	Left justified everywhere, for all the text, title, authors, etc
Page numbering:	NONE
Headers, footers:	NONE
Latin names:	Use italics for Latin names. Do not underline. Use common names for crops and Latin names for weeds. Common names for weeds may be indicated in parenthesis after the first mention of the Latin binomial.
Paragraphs:	No indentation
Between paragraphs:	Insert a blank line between paragraphs
Headings:	Four levels of heading can be used. All in Times Roman at 12 pt. <ul style="list-style-type: none">- The first level is bold, preceded and followed by a blank line- The second level is in italics, preceded by a blank line- The third level is underlined, preceded by a blank line- The fourth level is underlined and in italics, preceded by a blank line
Measurement units:	Standard international units should be used
Space preceding and following various headings:	One blank line
Insert only one single blank space after a full stop in a sentence.	
File name:	Please note that you must use file names that are informative when submitting your abstract or full paper. When submitting your text, please use you name and use underscore (_) between words. Example: Bo_Melander.doc. If you submit more than 1 file, use numbers. Example: Bo_Melander_1.doc, etc.

Abstracts:

Mandatory for all authors is the submission of a one-page abstract for each oral or poster presentation. These abstracts will appear in the hard-copy booklet that will be distributed at the

workshop and also in the proceedings of the workshop. Your text must conform to the general instructions above and to the following instructions:

Headings: No more than two levels
Tables and figures: Should be avoided in the abstracts
References: Maximum of three references should appear in the abstracts.

See the example at the end of this Appendix.

Full papers (optional):

There is an example at the end of this Appendix.

Authors who want to publish full papers are requested to upload their contributions **no later than 15 January 2009**. These papers will appear in the proceedings which will be made available on the web. **Papers received after 15 January 2009 will not appear in the Proceedings.**

The language for the texts will be English. The texts will not be refereed and therefore the author(s) must assume full responsibility for any errors or omissions. The maximum number of pages allowed for a manuscript is 15 pages (including tables, figures and pictures). The submitted paper must be formatted exactly as it is intended to appear, with the tables and figures included in the text. Left align everything, title, headings, etc.

Title:

Bold. Capitalise only the first word and proper names in the title. Include only the scientific names of weeds and of uncommon crops in the title, but only the common names of well-known crops.

Author(s):

Skip one line after the Title. The author(s) list and affiliation/location are left aligned and in bold-face. Use first name initials prior to family name (e.g. D.W.M. Pullen¹ and P.A. Cowell²). Use the same numbers in superscript after family name to identify authors with same mailing address. On the line below the author's name(s), when there is more than one author, put the number in superscript, followed by the author's name of institution, city, country and email.

Body of the text:

Skip one line after the last author's address. Main headings are left justified on one line in bold-face. In Materials and methods, include location of manufacturers or suppliers with brand names. Discussion must incorporate conclusions. Skip one line before each heading and skip a line after each heading.

Normally, main headings are:

Abstract, Introduction, Material and Methods, Results, Discussion (or Results and discussion), Acknowledgements, References but other headings could be used if relevant.

Standard international units (SIU) must be used. For SI usage see Standard Practice for Use of the International System of Units E380-91a, available from American Society for Testing and Materials, 1916 Race St., Philadelphia, PA 19103. Use mass rather than weight; use negative exponents for units in the denominator (e.g., kg m⁻²) and use L for litre (mL for millilitre).

Use "Figure" only at start of sentence; otherwise "Fig." or "Figs."

References: For reference citations, follow the *Weed Research* style

Tables and figures:

- Number tables and figures in Arabic followed by a full stop. Capitalise the first word of the title; all others should be in lowercase unless a proper noun; place a full stop at the end of the table title.
- Insert a blank line before and after a table or a figure.
- The text in the tables should be no less than 8 pt. in size.
- Tables should be made using the Table option of your word processor rather than using spaces or tabs.
- Capitalise the first word of each entry in each column; do not use vertical lines; indicate footnotes by lowercase superscript letters.
- Tables, figures and pictures should not exceed page margins (170 mm).

For any queries about instructions, please contact Daniel Cloutier (pwc2009@ewrs.org)

Example of an abstract

(text truncated, used for illustration purposes only, one extra name was added after Pullen):

Comparison of alternative interrow weeder steering systems

D.W.M. Pullen¹, A.N. Addedname¹ and P.A. Cowell²

¹Cranfield University at Silsoe, Silsoe, Bedford MK45 4DT, UK Email: d.pullen@cranfield.ac.uk

²Consultant, formerly with Cranfield University at Silsoe

The success of interrow weeding depends on being able to quickly and accurately guide the weeder along the rows. This can only be done by automatically guiding the weeder. Any automatic weeder steering system requires a sensor/s to provide an error or guidance signal and a mechanism to move the hoes to the correct lateral position at the correct time

Results of the study show the modelling technique was accurate. The amplitude of the predicted weeder path was within 2% and the phase angle within 2 degrees of the actual value. The study also suggests fitting steered wheels, whose position moved proportionally with the error signal was overall the most suitable method of steering the weeder. For this steering system the model shows the critical parameters affecting overall performance were the steering gain and hoe position. The tractor type (ICR position), the sensing position, the steered wheel position and steered wheel axle position did not significantly influence performance. However, positioning the steered wheels behind the headstock but in front of the weeding blades would be better practically.

References

Pullen DWM and Cowell PA (2000). Prediction and experimental verification of a rear-mounted inter-row weeder. *J. agric. Engng Res* 77, (2) 137-153.

Jahns G (1976). Automatic guidance of farm vehicles - a monograph. Agricultural Engineering Departmental Series No 1. Agricultural Experiment Station, Auburn University.

Example of a full paper (text truncated, used for illustration purposes only):

Analysis and definition of the close-to-crop area in relation to robotic weeding

M. Nørremark and H.W. Griepentrog

The Royal Veterinary and Agricultural University, Department of Agricultural Sciences / AgroTechnology, Copenhagen, Denmark

Abstract

The objective of this paper is to analyse and define the field conditions close to the crop plants of sugar beet (*Beta vulgaris* L.). The aim is to use this study for the choice and.....

Introduction

So far, no commercial mechanical or physical method has been developed for highly selective control of weeds within the crop row. Concerning efficiency, the available.....

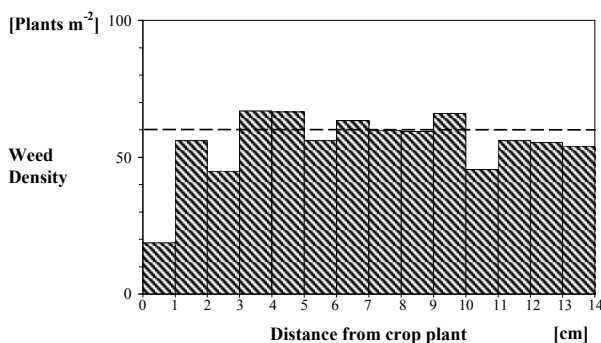


Figure 1. Relationship between weed counts and distance from centre of sugar beet plant at the cotyledon stage. The average weed density of whole plot is indicated by a dotted line.

Table 1. Frequency of weed species on Danish sugar beet fields. Data from a vegetation study during 1987 to 1989 on 47 locations in Denmark (Andreasen, 1990). The weed species, which have a negative impact on yield is indicated by 'Yes'. 'No' means the weed species do not have an negative impact on yield (modified after Melander, 1993)

Latin name	Frequency ^a [%]	Yield reduction impact
<i>Chenopodium album</i>	37.4	Yes
<i>Stellaria media</i>	33.6	Yes
<i>Veronica spp.</i>	23.8	No

^a Percentage of locations with presence of each weeds species.

References

- Andreasen C (1990) The occurrence of weed species in Danish arable fields. PhD thesis, The Royal Veterinary and Agricultural University, Copenhagen, Denmark
 Ascard J and Mattson B (1994) Inter-row cultivation in weed-free carrots: the effect on yield of hoeing and brush weeding. *Biological Agriculture and Horticulture* **10**, 161-173.

Appendix 2

Provisional List of Participants

Surname, Name	Country
Abadía, David	Spain
Andujar, Dionisio	Spain
Antichi, Daniele	Italy
Ascard, Johan	Sweden
Benoit, Diane Lyse	Canada
Bigongiali, Federica	Italy
Bleeker, Pieter	Netherlands
Carlesi, Stefano	Italy
Cirujeda, Alicia	Spain
Cloutier, Daniel	Canada
Curran, William	USA
Daugovish, Oleg	USA
De Cauwer, Benny	Belgium
Di Turi, Alessandra	Italy
Dorado, José	Spain
Duran, José María	Spain
Economou, Garifalia	Greece
Fagot, Maureen	Belgium
Fennimore, Steve	USA
Fernandez-Quintanilla, Cesar	Spain
Fogelberg, Fredrik	Sweden
Fontanelli, Marco	Italy
Franklin Egan, J.	USA
Frasconi, Christian	Italy
Gallandt, Eric	USA
Glemnitz, Michael	Germany
Hansson, David	Sweden
Hershenthorn, Joseph	Israel
Johnson, Eric	Canada
Knezevic, Stevan	USA
Kolb, Lauren	USA
Lanthier, Mario	Canada
Leblanc, Maryse	Canada
Légère, Anne	Canada
Liebman, Matt	USA
Lulli, Leonardo	Italy
Melander, Bo	Denmark
Mennan, Husrev	Turkey
Merfield, Charles	Ireland
Mollabashi, Elnaz Ebrahimi	Iran (Islamic Republic Of)
Nassab, Adel Dabbagh Mohammadi	Iran (Islamic Republic Of)
Peruzzi, Andrea	Italy
Piliksere, Dace	Latvia
Radics, Laszlo	Hungary

Raffaelli, Michele	Italy
Rasmussen, Ilse	Denmark
Rasmussen, Jesper	Denmark
Rubin, Baruch	Israel
Rueda Ayala, Victor	Germany
Salonen, Jukka	Finland
Senarathne, S.H.S.	Sri Lanka
Shirtliffe, Steve	Canada
Smith, Richard	CA, USA
Smith, Richard	PA, USA
Sorelli, Francesca	Italy
Stewart, Katrine	Canada
Taberner Palou, Andreu	Spain
Teodor, Rusu	Romania
van der Weide, Rommie	Netherlands
Verschwele, Arnd	Germany
Vidotto, Francesco	Italy
Zand, Eskandar	Iran (Islamic Republic Of)