

LOAN BAN EXPIRES 10 NOV 1999

Weed Science

Journal of the Weed Science Society of America



10-MAY-1999 BSDS BOSTON SPA
WEED SCIENCE LS23 7BQ

WEED SCIENCE

~~ETOC~~



9284.450000

VOL 47 PART 1

1/1

Volume 47 Number 1
JANUARY-FEBRUARY 1999

ISSN 0043-1745

WEED SCIENCE

Published six times a year by the Weed Science Society of America

Robert L. Zimdahl, *Editor*

Associate Editors

Robert Blackshaw, Agriculture & Agri-Food Canada, P.O. Box 3000 Main, Lethbridge, AB, Canada T1J 4B1
Michael E. Foley, Botany & Plant Pathology, Purdue University, 1155 Lilly Hall of Life Science, West Lafayette, IN 47907-1155
Frank Forcella, USDA/ARS, North Central Soil Conservation Res. Laboratory, Morris, MN 56267
B. Clifford Gerwick, Agric. Products Dept., DowElanco, 9330 Zionsville Rd., Indianapolis, IN 46268
Jeffrey L. Gunsolus, University of Minnesota, 411 Borlaug Hall, 1991 Buford Circle, St. Paul, MN 55108
J. Christopher Hall, University of Guelph, Bovey Bldg., Room 2225, Guelph, ON, Canada N1G 2W1
David A. Mortensen, Agronomy Department, University of Nebraska, 309 Keim Hall, Lincoln, NE 68583
John T. O'Donovan, Pest Management Program, Alberta Environmental Centre, Bag 4000, Vegreville, AB, Canada T9C 1T4
Emilie Regnier, Horticulture/Crop Science, Ohio State University, Kottman Hall, 2021 Coffey Road, Columbus, OH 43210
Dale L. Shaner, American Cyanamid Co., P.O. Box 400, Princeton, NJ 08540
Clarence J. Swanton, Crop Science Dept., University of Guelph, Guelph, ON, Canada N1G 2W1
John Teasdale, USDA-ARS, Bldg. 001, Room 323, Beltsville, MD 20705
William Vencill, Crop and Soil Sciences, University of Georgia, 3111 Miller Plant Science Bldg., Athens, GA 30602
William W. Witt, Agronomy Department, University of Kentucky, N-106C Ag. Science Ctr., North Lexington, KY 40546
Debra E. Palmquist, *Consulting Statistical Editor*
Sheila M. Rake, *Managing Editor*

Officers of the Weed Science Society of America

F. Dan Hess, *President*

James M. Chandler, *President-Elect*

Lawrence R. Oliver, *Vice President*

Calvin G. Messersmith, *Past President*

Jill Schroeder, *Secretary*

Joan Dusky, *Treasurer*

Anne Légère, *Director of Publications*

Horace D. Skipper, *Chair, Constitution and Operating Procedures*

Weed Science (ISSN 0043-1745) is an official publication of the Weed Science Society of America, 810 East 10th Street, Lawrence, KS 66044-8897 (785-843-1235). It contains refereed papers describing the results of research that elucidates the nature of phenomena relating to all aspects of weeds and their control. It is published bimonthly, one volume per year, six issues per year beginning in January.

Membership is \$85 per year, student affiliate membership \$30, which includes receipt of *Weed Science*, *Weed Technology*, and *WSSA Newsletter*. Dues should be sent to WSSA, 810 East 10th Street, Lawrence, KS 66044-8897 not later than December 1 of each year. Membership in the society is on a calendar-year basis only.

Subscriptions (institutions, libraries, etc.) to *Weed Science* are \$95 per year, one volume per year of six issues beginning in January. Subscriptions to both *Weed Science* and *Weed Technology* (ISSN 0890-037X) (four issues per volume) are available for \$160 per year. New subscriptions and renewals begin with the first issue of the current volume and should be sent to WSSA, 810 East 10th Street, Lawrence, KS 66044-8897.

Change of address affecting the mailing list for members, students, and subscribers, inquiries about copies lost in the mail, requests for back issues, and all matters pertaining to the receipt of the Journal, membership and subscription information should be sent to WSSA, 810 East 10th Street, Lawrence, KS 66044-8897. Claims for copies lost in the mail must be received within 30 days (90 days foreign) of the date of issue to insure replacement at no charge.

One copy of the manuscript must be sent to the Editor, Robert L. Zimdahl, Weed Research Laboratory, Colorado State University, Fort Collins, CO 80523. Two copies of the manuscript must be sent to the Managing Editor, Sheila M. Rake, Allen Press, Inc., 810 East 10th Street, Lawrence, KS 66044-8897. Directions for contributors are published in the October–December issue of *Weed Science*. Authors are asked to pay \$50 per page as a portion of the cost of publication. The Editor can make exceptions in advance when justified.

The Weed Science Society of America fully subscribes to the belief that progress in science depends upon the sharing of ideas, information, and materials among qualified investigators. Authors of papers published in *Weed Science* are therefore encouraged, whenever practicable and when state and federal laws permit, to share genotypically unique, propagative materials they might possess with other workers in the area who request such materials for the purpose of scientific research.

Weed Science published by the Weed Science Society of America.

Periodical postage paid at Lawrence, KS and at additional mailing offices.

Copyright 1999 by the Weed Science Society of America. Printed in USA.

All rights reserved. Reproduction in part or whole prohibited.

POSTMASTER: Send address changes to WSSA, 810 East 10th Street, Lawrence, KS 66044-8897.

Weed Science

VOLUME 47

JANUARY–FEBRUARY 1999

NUMBER 1

EDITORIAL

- My view. **Robert L. Zimdahl** 1

PHYSIOLOGY, CHEMISTRY, AND BIOCHEMISTRY

- Influence of nitrogen on germination and early development of broomrape (*Orobanche* spp.). **James H. Westwood and Chester L. Foy** 2
- Absorption, translocation, and metabolism of primisulfuron and nicosulfuron in broadleaf signalgrass (*Brachiaria platyphylla*) and corn. **Kent Gallaher, Thomas C. Mueller, Robert M. Hayes, Otto Schwartz, and Michael Barrett** 8
- Chlorophyll fluorescence evaluation of agrochemical interactions with propanil on propanil-resistant barnyardgrass (*Echinochloa crus-galli*). **Jason K. Norsworthy, Ronald E. Talbert, and Robert E. Hoagland** 13
- A kochia (*Kochia scoparia*) biotype resistant to triazine and ALS-inhibiting herbicides. **Matthew J. Foes, Lixin Liu, Gerald Vigue, Edward W. Stoller, Loyd M. Wax, and Patrick J. Tranel** 20
- A biochemical study of BAS 517 using excised corn and soybean root systems. **Hwei-Yling Li and Chester L. Foy** 28
- Absorption and translocation of MON 37500 in wheat and other grass species. **Brian L. S. Olson, Kassim Al-Khatib, Phillip Stahlman, Scott Parrish, and Sharon Moran** 37

WEED BIOLOGY AND ECOLOGY

- Growth of field horsetail (*Equisetum arvense*) under low light and low nitrogen conditions. **Torsten N. Andersson and Bengt Lundegårdh** 41
- Field horsetail (*Equisetum arvense*)—effects of potassium under different light and nitrogen conditions. **Torsten N. Andersson and Bengt Lundegårdh** 47
- Competition between wheat and canarygrass biotypes and their response to herbicides. **Catherine G. Afentouli and Ilias G. Eleftherohorinos** 55
- The implications of variable or constant expansion rates in invasive weed infestations. **H. Arlen Smith, Wayne S. Johnson, J. Scott Shonkwiler, and Sherm R. Swanson** 62
- Weed seedbank response to crop rotation and tillage in semiarid agroecosystems. **J. Dorado, J. P. Del Monte, and C. López-Fando** 67
- Characterizing traits that enhance the competitiveness of winter wheat (*Triticum aestivum*) against jointed goatgrass (*Aegilops cylindrica*). **Alex G. Ogg, Jr. and Steven S. Seefeldt** 74
- Influence of velvetleaf (*Abutilon theophrasti*) and common sunflower (*Helianthus annuus*) density variation on weed management outcomes. **J. Anita Dieleman, David A. Mortensen, and Alex R. Martin** 81
- Soybean response to weed interference and defoliation. **Charles F. Grymes, James L. Griffin, David J. Boethel, B. Rogers Leonard, David L. Jordan, and John S. Russin** 90
- Seasonal abundance and spatial pattern of *Setaria faberi*, *Chenopodium album*, and *Abutilon theophrasti* in reduced-tillage soybeans. **Dawit Mulugeta and Chris M. Boerboom** 95

WEED MANAGEMENT

- Competition and control of weeds in soybean. **Rajender Singh Chhokar and Rajender Singh Balyan** 107
- Relative influence of crop rotation, tillage, and weed management on weed associations in spring barley cropping systems. **Anne Légère and Nathalie Samson** 112
- Influence of bromoxynil on annual grass control by graminicides. **A. Stanley Culpepper, Alan C. York, and Cavell Brownie** 123

Accessing Your WSSA Business Office

Memberships, subscriptions, address changes, missing journal issues, single journal issue and back issue orders, reprints, color plates and page charge payments, ordering special publications: WSSA Business Office, 810 East 10th St., P.O. Box 1897, Lawrence, KS 66044-8897 [phone: 1-800-627-0629 (U.S. and Canada), 785-843-1235; fax: 785-843-1274; e-mail: wssa@allenpress.com]. Executive Secretary: Joyce Lancaster (jlancaster@allenpress.com); Executive Assistant: Linda Hardwick (lhardwick@allenpress.com).

Directions for Submission to *Weed Science*

Send two copies of the manuscript and all illustrations to Sheila M. Rake, Managing Editor, Allen Press, 810 East 10th St., P.O. Box 1897, Lawrence, KS 66044-8897 and one copy to R. L. Zimdahl, Editor, *Weed Science*, Weed Research Laboratory, Colorado State University, Fort Collins, CO 80523. In the accompanying cover letter to R. L. Zimdahl provide: 1) the corresponding author's name and telephone number, b) three stick-on labels showing the name and address of the corresponding author, c) the category that best describes the paper's content: Weed Management; Physiology, Chemistry, and Biochemistry; Weed Biology and Ecology; Soil, Air, and Water; or Special Topic, and d) a brief list of names, addresses, phone numbers, fax numbers, and e-mail addresses of suggested reviewers.

Directions for Submission to *Weed Technology*

Send three copies of the manuscript and all illustrations to Sheila M. Rake, Managing Editor, Allen Press, Inc., 810 East 10th St., P.O. Box 1897, Lawrence, KS 66044-8897 and one copy to Chester L. Foy, Editor, *Weed Technology*, Dept. of Plant Pathology, Physiology, and Weed Science, Virginia Polytechnic Institute and State Univ., 502 Price Hall, Blacksburg, VA 24061-0331. Please include the names, addresses, phone numbers, fax numbers, and e-mail addresses of suggested reviewers.

Cover drawing from: USDA/ARS Handbook No. 366. 1970. Selected Weeds of the United States, p. 291.