

Weed Science

Journal of the Weed Science Society of America

6-OCT-1997 BSDS

BOSTON SPA
LS23 7BQ

WEED SCIENCE

*ETOC



9284.450000

VOL 45 PART 5

PB

1/1



BRITISH LIBRARY
DOCUMENT SUPPLY CENTRE
14 OCT 1997
CONFERENCE
INDEXED

LOAN BAN EXPIRES

- 6 APR 1998

Volume 45 Number 5
SEPTEMBER-OCTOBER 1997

ISSN 0043-1745

WEED SCIENCE

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

Robert L. Zimdahl, *Editor*

Associate Editors

James D. Burton, Horticulture Dept., N. Carolina State University, Box 7609, Raleigh, ND 27695-7609
Michael E. Foley, Botany & Plant Pathology, Purdue University, 1155 Lilly Hall of Life Science, West Lafayette, IN 47907-1155
B. Clifford Gerwick, Agric. Products Dept., DowElanco, 9330 Zionsville Rd., Indianapolis, IN 46268
J. Christopher Hall, University of Guelph, Bovey Bldg., Room 2225, Guelph, ON, Canada N1G 2W1
Jeffrey L. Gunsolus, University of Minnesota, 411 Borlaug Hall, 1991 Buford Circle, St. Paul, MN 55108
Robert G. Hartzler, Agronomy Dept., Iowa State University, 2104 Agronomy Hall, Ames, IA 50011
Nicholas Jordan, Dept. Agron/Plant Genetics, Univ. of Minnesota, 1991 Buford Circle, St. Paul, MN 55108
Robert J. Kremer, USDA-ARS, 144 Mumford Hall, University of Missouri, Columbia, MO 65211
Martin A. Locke, Southern Weed Science Lab, USDA ARS, P.O. Box 350, Stoneville, MS 38776
John T. O'Donovan, Pest Management Program, Alberta Environmental Centre, Bag 4000, Vegreville, AB, Canada T9C 1T4
David T. Patterson, USDA ARS, University of Florida, 2199 S. Rock Rd., Ft. Pierce, FL 34945-3138
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
Thomas Tworowski, Appalachian Fruit Res. Station, USDA ARS, 45 Wiltshire Road, Kearneysville, WV 25430
Susan E. Weaver, Agriculture Canada, Research Station, Harrow, ON, Canada NOR 1G0
Robert G. Wilson, Panhandle Station, University of Nebraska, 4502 Avenue I, Scottsbluff, NE 69361
Debra E. Palmquist, *Consulting Statistical Editor*
Sheila M. Rake, *Managing Editor*

Reviewers

Yuguang Bai	Stephen E. Hart	Todd L. Mervosh	Krishna N. Reddy	Mark J. VanGessel
Daniel A. Ball	David H. Johnson	David W. Monks	Emilie E. M. Regnier	Jerome B. Weber
Todd A. Baughman	Gregg A. Johnson	David A. Mortensen	Jill Schroeder	Glenn R. Wehtje
Roger L. Becker	Marie A. Jasieniuk	Thomas C. Mueller	Steven S. Seefeldt	Leslie A. Weston
Chris M. Boerboom	Carol A. Mallory-Smith	Chandrashekhar I. Nimbale	Reid J. Smeda	John W. Wilcut
John Cardina	Diane R. Manthey	Roy K. Nishimoto	François J. Tardif	
William E. Dyer	Bruce D. Maxwell	Gregory L. Orr	John R. Teasdale	
Frank Forcella	Wondie Mersie	Micheal D. K. Owen	Mahesh K. Upadhyaya	

Officers of the Weed Science Society of America

Calvin G. Messersmith, <i>President</i>	Jodie S. Holt, <i>Secretary</i>
F. Dan Hess, <i>President-Elect</i>	Joan Dusky, <i>Treasurer</i>
James M. Chandler, <i>Vice President</i>	Anne Légère, <i>Director of Publications</i>
Stephen O. Duke, <i>Past President</i>	Horace D. Skipper, <i>Chair, Constitution and Operating Procedures</i>

Weed Science (ISSN 0043-1745) is an official publication of the Weed Science Society of America, 810 East 10th Street, Lawrence, KS 66044-8897 (AC/217-352-4212). 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 \$75 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.) are \$125 per year, one volume per year of six issues beginning in January, and includes a subscription to *Weed Technology* (four issues per volume). Subscription to *Weed Science* includes a subscription to *Weed Technology* (ISSN 0890-037X) (four issues per volume). 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 1997 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 45

SEPTEMBER–OCTOBER 1997

NUMBER 5

EDITORIAL

- My view. **Arnold P. Appleby** 599

SYMPOSIUM

- The Search for Novel Herbicide Target Sites: Explorations Off the Beaten Pathway. **Jim Burton** 600
- The discovery and structural requirements of inhibitors of *p*-hydroxyphenylpyruvate dioxygenase. **David L. Lee, Michael P. Prisbylla, Thomas H. Cromartie, Derek P. Dagarin, Stott W. Howard, W. McLean Provan, Martin K. Ellis, Torquil Fraser, and Linda C. Mutter** 601
- Inhibitors of imidazoleglycerolphosphate dehydratase as herbicides. **Daisaku Ohta, Ichiro Mori, and Eric Ward** 610
- Revisiting auxin transport inhibition as a mode of action for herbicides. **Mani V. Subramanian, Sandra A. Brunn, Paul Bernasconi, Bhavesh C. Patel, and Jeff D. Reagan** 621
- Evaluating anthranilate synthase as a herbicide target. **Daniel L. Siehl, Mani V. Subramanian, Eric W. Walters, Johathan H. Blanding, Thierry Niderman, and Christian Weinmann** 628

PHYSIOLOGY, CHEMISTRY, AND BIOCHEMISTRY

- Soybean (*Glycine max*) cultivar differences in response to sulfentrazone. **Franck E. Dayan, John D. Weete, Stephen O. Duke, and H. Gary Hancock** 634
- Physiological mechanisms for differential responses of three weed species to prosulfuron. **Guoying Ma, Harold D. Coble, Frederick T. Corbin, and James D. Burton** 642
- Basis for thifensulfuron-insecticide synergism in soybeans (*Glycine max*) and corn (*Zea mays*). **William H. Ahrens and William R. Panaram** 648
- Pyridazocidin, a new microbial phytotoxin with activity in the Mehler reaction. **B. Clifford Gerwick, Stephen S. Fields, Paul R. Graupner, James A. Gray, Eleanor L. Chapin, John A. Cleveland, and Dale R. Heim** 654
- Absorption and translocation of glyphosate in tolerant and susceptible biotypes of field bindweed (*Convolvulus arvensis*). **James H. Westwood, Carla N. Yerkes, Francis P. DeGennaro, and Stephen C. Weller** 658

WEED BIOLOGY AND ECOLOGY

- Influence of nitrate and ammonium nutrition on the growth of giant foxtail (*Setaria faberi*). **Maria L. Salas, Michael V. Hickman, Don M. Huber, and Marvin N. Schreiber** 664
- Effects of shading on the growth of nutsedges (*Cyperus* spp.). **Bielinski M. Santos, Jose P. Morales-Payan, William M. Stall, Thomas A. Bewick, and Donn G. Shilling** 670
- Genetic diversity of broom snakeweed (*Gutierrezia sarothrae*) and threadleaf snakeweed (*G. microcephala*) populations. **Tracy M. Sterling and Yanglin Hou** 674
- Influence of tuber size and shoot removal on purple nutsedge (*Cyperus rotundus*) regrowth. **Bielinski M. Santos, Jose P. Morales-Payan, William M. Stall, and Thomas A. Bewick** 681
- Simulation of pigweed (*Amaranthus* spp.) seedling emergence in different tillage systems. **Joseph O. E. Oryokot, L. Anthony Hunt, Stephen Murphy, and Clarence J. Swanton** 684
- Growth analysis of sulfonylurea-resistant and -susceptible kochia (*Kochia scoparia*). **Pedro J. Christoffoleti, Philip Westra, and Frank Moore III** 691
- Germination ecophysiology of bur beggarticks (*Bidens tripartita*) as affected by light and oxygen. **Stefano Benvenuti and Mario Macchia** 696
- Scentless chamomile (*Matricaria perforata*) growth, development, and seed production. **Robert E. Blackshaw and K. Neil Harker** 701

WEED MANAGEMENT

- Weed and seedbank management with integrated methods as influenced by tillage. **Dawit Mulugeta and David E. Stoltenberg** 706

Sensitivity of coca (<i>Erythroxylum coca</i> var. <i>coca</i>) to ethylene and fungal proteins. Bryan A. Bailey, James C. Jennings, and James D. Anderson	716
SOIL, AIR, AND WATER	
Imazaquin leaching in Karnak soil in Kentucky. Marina N. Sorokina and Grant W. Thomas	722
Soil type and tillage effects on sorption of cyanazine and degradation products. Krishna N. Reddy, Martin A. Locke, and Robert M. Zablotowicz	727
Sulfentrazone adsorption and mobility as affected by soil and pH. Timothy L. Grey, Robert H. Walker, Glenn R. Wehtje, and H. Gary Hancock	733
SPECIAL TOPICS	
Effect of glyphosate-treated henbit (<i>Lamium amplexicaule</i>) and downy brome (<i>Bromus tectorum</i>) on <i>Fusarium solani</i> f. sp. <i>lisi</i> and <i>Pythium ultimum</i> . Michael K. Kawate, Susan G. Colwell, Alex G. Ogg, Jr., and John M. Kraft	739

Accessing Your New 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), 913-843-1235; fax: 913-843-1274; e-mail: wssa@allenpress.com]. Executive Secretary: John Breithaupt (jbreith@allenpress.com); Business Manager: Gina Black (gblack@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.