INVASIVE PLANT SCIENCE AND MANAGEMENT





Invasive Plant Science and Management

Published quarterly by the Weed Science Society of America

Antonio DiTommaso, Editor

The Weed Science Society of America (WSSA) publishes original research and scholarship in the form of peer-reviewed articles in three international journals. *Weed Science* is focused on understanding "why" phenomena occur in agricultural crops. As such, it focuses on fundamental research directly related to all aspects of weed science in agricultural systems. *Weed Technology* focuses on understanding "how" weeds are managed. As such, it is focused on more applied aspects concerning the management of weeds in agricultural systems. *Invasive Plant Science and Management* is a broad-based journal that focuses not only on fundamental and applied research on invasive plant biology, ecology, management, and restoration of invaded non-crop areas, but also on the many other aspects relevant to invasive species, including educational activities, policy issues, and case study reports.

Associate Editors (Assignment Year)

Edith B. Allen, Botany & Plant Sciences Department, University of California, Riverside, CA 92521 (2008)
Jacob N. Barney, School of Plant and Environmental Sciences, Virginia Tech, Blacksburg, VA 24061 (2012)
John Cardina, Department of Horticulture & Crop Science, Ohio State University, Wooster, OH 44691 (2008)
Stephen F. Enloe, Center for Aquatic and Invasive Plants, University of Florida, Gainesville, FL 32653 (2010)
Songlin Fei, Department of Forestry and Natural Resources, Purdue University, West Lafayette, IN 47907 (2015)
Guillaume Fried, Plant Health Laboratory, Anses, 34988 Montferrier-sur-Lez, France (2017)
Catherine S. Jarnevich, US Geological Survey, Fort Collins, CO 80526 (2015)
Marie Jasieniuk, University of California, Davis CA 95616 (2017)
Darren J. Kriticos, CSIRO, Canberra, ACT 2601, Australia (2010)
James K. Leary, Center for Aquatic and Invasive Plants, University of Florida, Gainesville, FL, 32653 (2014)
Kelly G. Lyons, Department of Biology, Trinity University, San Antonio, TX 78212 (2008)
Rob J. Richardson, Department of Crop Science, North Carolina State University, Raleigh, NC 27695 (2014)
Steve S. Seefeldt, NWREC, Washington State University, Mount Vernon, WA 98273 (2014)
Ryan M. Wersal, Minnesota State University, Mankato, Mankato, MN 56001 (2014)

Tracy Candelaria, Managing Editor

Officers of the Weed Science Society of America

http://wssa.net/society/bod/

Invasive Plant Science and Management (ISSN 1939-7291) is an official publication of the Weed Science Society of America, 12011 Tejon Street, Suite 700, Westminster, CO 80234 (720-977-7940). It is published quarterly, one volume per year, four issues per year beginning in March.

Membership includes receipt of *Weed Science, Weed Technology, Invasive Plant Science and Management*, and the online *WSSA Newsletter*. Dues should be sent to WSSA, 12011 Tejon Street, Suite 700, Westminster, CO 80234 no later than December 1 of each year. Membership in the society is on a calendaryear basis only.

New subscriptions and renewals begin with the first issue of the current volume. Please visit the *Invasive Plant Science and Management* subscription page at https://www.cambridge.org/core/journals/invasive-plant-science-and-management/subscribe; Email: subscriptions_newyork@cambridge.org in USA, journals@cambridge.org outside USA.

Invasive Plant Science and Management publishes four times a year in March, June, September, and December. Annual institutional electronic subscription rates: US \$398.00; UK £277.00.

Please use Editorial Manager to access manuscript submissions (http://www.editorialmanager.com/ipsm). Authors are asked to pay \$65 per page as a portion of the cost of publication, plus an additional processing charge of \$55 per manuscript if none of the authors are WSSA members. 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 *Invasive Plant Science and Management* 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.

Invasive Plant Science and Management published by the Weed Science Society of America.

Copyright 2020 by the Weed Science Society of America. Printed in USA.

All rights reserved. Reproduction in part or whole prohibited.

Cover Photo: Ground woodpecker (*Geocolaptes olivaceus*) sitting on fire thorn *Pyracantha angustifolia* near the town of Clarens, Free State Province, South Africa. Photo: Grant Martin.



INVASIVE PLANT SCIENCE AND MANAGEMENT

Table of Contents

Editorial	
-----------	--

Biology of Invasive Plants: a new series within <i>Invasive Plant Science and Management</i> Darren J. Kriticos, David R. Clements and Antonio DiTommaso	115
Biology of Invasive Plants	
1. <i>Pyracantha angustifolia</i> (Franch.) C.K. Schneid. Lenin Dzibakwe Chari, Grant Douglas Martin, Sandy-Lynn Steenhuisen, Lehlohonolo Donald Adams and Vincent Ralph Clark	120
Review	
Plant silicon as a factor in medusahead (<i>Taeniatherum caput-medusae</i>) invasion Casey N. Spackman, Thomas A. Monaco, Clinton A. Stonecipher and Juan J. Villalba	143
Case Study	
Landscape factors driving the spread of the invasive grass, <i>Hymenachne amplexicaulis</i> , among wetlands in a Florida subtropical grazing land. Elizabeth H. Bouchard, Grégory Sonnier, Steffan Pierre, Amartya Saha, Vivienne Sclater and Elizabeth H. Boughton	155
Research Articles	
Evaluating landscape characteristics of predicted hotspots for plant invasions Adrián Lázaro-Lobo, Kristine O. Evans and Gary N. Ervin	163
Evaluating the efficacy of removal treatments on wavyleaf basketgrass (<i>Oplismenus undulatifolius</i>). Anna K. M. Bowen, Vanessa B. Beauchamp and Martin H. H. Stevens	176
Role of nitrogen and herbicides in integrated management of mugwort (<i>Artemisia vulgaris</i>) in cool-season forage grasses. Jatinder S. Aulakh	189
Evaluating winter annual grass control and native species establishment following applications of indaziflam on rangeland. Shannon L. Clark, Derek J. Sebastian, Scott J. Nissen	100
and James R. Sebastian	199
Note	
Fosamine ammonium impacts on the targeted invasive shrub <i>Rhamnus cathartica</i> and non-target herbs. Michael J. Schuster, Paul Bockenstedt, Peter D. Wragg	

210

and Peter B. Reich