

Proceedings of the XIII International Symposium on Biological Control of Weeds

September 11–16, 2011
Waikoloa, Hawaii, USA

Edited by:

Yun Wu¹, Tracy Johnson², Sharlene Sing³, S. Raghu⁴, Greg Wheeler⁵, Paul Pratt⁵, Keith Warner⁶, Ted Center⁵, John Goolsby⁷, and Richard Reardon¹

¹USDA Forest Service, Forest Health Technology Enterprise Team, Morgantown, WV USA

²USDA Forest Service, Pacific Southwest Research Station, Institute of Pacific Islands Forestry, Volcano, HI USA

³USDA Forest Service, Rocky Mountain Research Station, Bozeman, MT USA

⁴Rice Research and Extension Center & Department of Entomology, University of Arkansas, Stuttgart, AR, USA

⁵USDA ARS, Invasive Plant Research Laboratory, Fort Lauderdale, FL USA

⁶Santa Clara University, San Juan Bautista, CA USA

⁷USDA ARS, Kika de la Garza Subtropical Agricultural Research Center, Weslaco, TX USA

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PREFACE

THE SYMPOSIUM

A total of 208 participants from 78 organizations in 19 countries gathered at the Waikoloa Beach Marriott on the Big Island of Hawaii on September 11-16, 2011 for the XIII International Symposium on Biological Control of Weeds. Following a reception on the first evening, Symposium co-chairs Tracy Johnson and Pat Conant formally welcomed the attendees on the morning of September 12, and introduced Bill Steiner, Dean of the College of Agriculture, Forestry and Natural Resource Management, University of Hawaii at Hilo, who provided opening remarks on future directions of invasive species control in Hawaii and the world. The Symposium keynote address, “Finding the weapons of biomass destruction – identifying potential biocontrol agents by applying principles of chemical coevolution,” was delivered by May Berenbaum, Department of Entomology, University of Illinois (Urbana-Champaign).

The Symposium’s scientific program included a total of 85 oral and 135 poster presentations organized around nine themes, plus five evening workshops (Table 1). The program was designed to focus on emerging issues affecting invasive plant biocontrol globally and allow colleagues to update one another on specific projects. Our Hawaii venue also provided a unique opportunity to take stock of a century of biocontrol in these islands and begin to build new collaborations to serve the Pacific region. The organizers focused particularly on connecting Hawaii natural resource managers with international biocontrol specialists and raising awareness of Pacific island weeds as potential targets for research.

Table 1. Scientific Program and organizers

| Sessions | Organizers |
|--|--------------------------------|
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| 2. Emerging Issues in Regulation of Biological Control | Sharlene Sing |
| 3. Non-Traditional Biological Control Agents | John Goolsby |
| 4. Target and Agent Selection | S. Raghu |
| 5. Prospects for Weed Biological Control in Pacific Islands | Tracy Johnson |
| 6. Integrating Biocontrol and Restoration of Ecosystems | Ted Center |
| 7. Ecological and Evolutionary Processes | Jianqing Ding |
| 8. Social and Economic Assessments of Biological Control | Keith Warner & Martin Hill |
| 9. Post-Release Evaluation and Management | Paul Pratt |
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| 1. Is Classical Biocontrol an “Old Science” Paradigm Losing its Way? | Andy Sheppard |
| 2. The International Convention on Protecting Endemic Biodiversity | Dick Shaw & Hugh Gourlay |
| 3. Wild Gingers (<i>Hedychium</i> spp.) | Djami Djeddour |
| 4. Best Management Practices for Communication of Weed Biocontrol | Keith Warner & Darcy Oishi |
| 5. Biological Control of Fireweed: Past, Present and Future Directions | Andy Sheppard & Mohsen Ramadan |

Mid-Symposium tours featured natural history and weed biocontrol of the north and south of the Big Island. The North tour ascended the saddle between Mauna Kea and Mauna Loa volcanoes for a hike up the kipuka Pu'u Huluhulu, a biologically diverse, koa-tree forested cinder cone isolated from the surrounding ecosystem by lava flows in 1843 and 1935. Stops were made at two additional kipuka along the Saddle Road to highlight biocontrol efforts against fireweed and gorse and to view native forest plants and birds before descending into Hilo. North tour participants were dropped off at Hawaii Tropical Botanical Garden where they walked to the shoreline for lunch overlooking spectacular Onomea Bay. A hike to view Akaka Falls was the afternoon highlight of the North tour.

The South tour began with a stop at Amy Greenwell Ethnobotanical Garden before proceeding to Punaluu Black Sand Beach and an opportunity to view resident sea turtles. South tour participants then rode to Hawaii Volcanoes National Park where they lunched and hiked along the Kilauea caldera rim to Thurston Lava Tube. South tour buses returned to Waikoloa via Hilo and the Saddle Road, allowing participants to also experience the sights of windward rainforests and Pu'u Huluhulu. Both tour groups met for the last stop of the day on the outskirts of Waikoloa to view an example of successful biological control for species conservation: statewide die-off of the archetypal native Hawaiian dry forest tree wiliwili, *Erythrina sandwicensis*, caused by the 2005 invasion of African eulophid gall wasp *Quadrastichus erythrinae*, has been halted by the introduction in 2008 of the parasitic wasp *Eurytoma erythrinae*.

Symposium presentations ended on the afternoon of September 16, and awards were made for best student talks (winner Ikju Park and runner-up Haley Catton) and posters (winner Wyatt Williams and runner-up Andrea Stephens). The XIII International Symposium on Biological Control of Weeds closed with an evening lu'au featuring traditional and modern island cuisine and Polynesian music and dances performed as the sun set over Anaeho'omalū Bay.

Acknowledgements

The organizers wish to express their sincere gratitude to our Symposium sponsors: USDA Forest Service (including the Pacific Southwest Research Station, Institute of Pacific Islands Forestry; and International Programs); Hawaii Department of Agriculture; Hawaii County Department of Research and Development; Hawaiian Electric Company and Hawaii Electric Light Company; US Fish & Wildlife Service, Pacific Islands Office; USGS Pacific Island Ecosystems Research Center; Landcare Research; Hawaii Forest and Trail; Destination Hilo; Big Island Invasive Species Committee; Maui Invasive Species Committee; and University of Hawaii at Hilo Conference Center. Thanks also to exhibitor CABI.

The organizers are grateful also to the many individuals who contributed to the success of the Symposium.

Program Committee

Tracy Johnson (Chair), Ted Center, Jianqing Ding, John Goolsby, Paul Pratt, S. Raghu, Sharlene Sing, Keith Warner, and Greg Wheeler; and reviewers of abstracts, Pat Conant, Hugh Gourlay, Rich Hansen, Richard Hill, Judy Hough-Goldstein, Ruth Hufbauer, and Link Smith.

Organizing Committee

Tracy Johnson and Pat Conant (Co-Chairs), Franny Kinslow, Hugh Gourlay, George Markin, and the staff of the University of Hawaii at Hilo Conference Center: Judith Fox-Goldstein, Mary Ann Tsuchiyama, Jules Ung, Sharay Uemua, Connie Larsen, Alberta Mehau-Matsu, Robin Black, Kristy Uemura and Kelci Meguro.

Local Arrangements

Renato Bautista, Pat Bily, Adrian Boone, Beverly Brand, Sean Callahan, Vickie Caraway, Stacey Chun, Dave Faucette, Betsy Gagne, Jim Gale, Dean Gallagher, Janis Garcia, Jacqueline de la Garza, Fritzi Grevstad, Rob Hauff, Stephen Hight, Richard Hill, Clyde Hirayama, Roger Imoto, Mann Ko, Paul Krushelnycky, Jackie Kozak Thiel, Linda Larish, Christy Martin, Bob Masuda, Shin Matayoshi, Kupono McDaniel, Walter Nagamine, Darcy Oishi, Jimmy Parker, Bobby Parsons, Lyman Perry, Mohsen Ramadan, Neil Reimer, Brent Sheehan, Mariza Silva and the Hawaii Conservation Alliance, Dean Takabayashi, Ken Teramoto, Marcos Vallejo, Peter Van Dyke, Juliana Yalamar, and Aileen Yeh, as well as Gale Kihoi and all the staff at the Waikoloa Beach Marriott.

Judges for Student Awards

Fritzi Grevstad, Ronny Groenteman, Ruth Hufbauer, John Ireson, Alec McClay and Brian Rector.

Proceedings Committee

Yun Wu, Tracy Johnson, George Markin, Richard Reardon, and Sharlene Sing.

THE NEXT SYMPOSIUM

Delegates voted to return to South Africa for the XIV International Symposium on Biological Control of Weeds. Martin Hill, Fiona Impson and colleagues will convene us next in Kruger National Park in March 2014 to coincide with celebrations in 2013 of the centenary of weed biological control in South Africa.

THE PROCEEDINGS

There are a total of 224 presentations (Table 2) including 36 papers, 183 abstracts, and five workshop summaries in these *Proceedings*, grouped into ten chapters in accordance with the nine sessions and the five workshops at the Symposium (Table 1).

Thanks to Mic Julien, René Sforza and Chuck Benedict for providing advice on submission guidelines; and Tracy Johnson, George Markin, Sharlene Sing, and Richard Reardon for reviewing/revising the guidelines.

Thanks to all the session organizers (Table 1) for their assistance in manuscript collection.

Thanks to the following people for editing manuscripts, making it possible to publish these *Proceedings* within a limited time and budget: Greg Wheeler (Session 1), Sharlene Sing (Sessions 2 and 7, and four workshop reports), John Goolsby (Session 3), S. Raghu (Session 4), Tracy Johnson and Yun Wu (Session 5), Ted Center (Session 6), Keith Warner (Session 8 and one workshop report), Paul Pratt and Yun Wu (Session 9). Thanks Sharlene Sing for helping on scientific name completions for Session 6. Sharlene Sing and Yun Wu compiled the scientific name index; Tracy Johnson and Eddie Bufl compiled the delegate's address list; and Denise Binion for the layout and design of this publication.

Thanks for efforts on the group photo to: Darcy Oishi for taking the photo; Nancy Chaney for photo touch-up; Sheryl A. Romero for making the silhouette; Denise Binion for the silhouette key; Tracy Johnson, Darcy Oishi, Sharlene Sing and many helpful participants for name matching.

Special thanks to George Markin and Richard Reardon for their enthusiastic support for these *Proceedings*;

Sharlene Sing and Tracy Johnson for their willing help whenever there was need; and the USDA Forest Service, Forest Health Technology Enterprise Team for financial support to publish these *Proceedings*.

Yun Wu, Managing Editor
Morgantown, West Virginia, USA
June, 2012

Table 2. Summary of attendance and proceedings of symposia to date

| Symposium Details | | | Attendance numbers by | | | Number of papers and abstracts in the proceedings |
|-------------------|------|----------------------------|-----------------------|--------------|---------------|---|
| No. | Date | Location | Countries | Participants | Organizations | |
| I | 1969 | Delémont, Switzerland | 11 | 22 | 15 | 21 |
| II | 1971 | Rome, Italy | 9 | 37 | 17 | 23 |
| III | 1973 | Montpellier, France | 11 | 25 | 14 | 16 |
| IV | 1976 | Gainesville, FL, USA | 11 | 84 | 42 | 45 |
| V | 1980 | Brisbane, Australia | 11 | 100 | 52 | 68 |
| VI | 1984 | Vancouver, Canada | 13 | 135 | 59 | 96 |
| VII | 1988 | Rome, Italy | 20 | 128 | 60 | 96 |
| VIII | 1992 | Canterbury, New Zealand | 18 | 181 | 80 | 139 |
| IX | 1996 | Stellenbosch, South Africa | 25 | 202 | 91 | 165 |
| X | 1999 | Bozeman, MT, USA | 27 | 308 | 115 | 226 |
| XI | 2003 | Canberra, Australia | 20 | 175 | 60 | 177 |
| XII | 2007 | La Grande Motte, France | 32 | 250 | 106 | 226 |
| XIII | 2011 | Waikoloa, HI, USA | 19 | 208 | 78 | 224 |

Note: Data for I-VII from Proceedings of the VII International Symposium on Biological Control of Weeds, ed. by E. S. Delfosse (1988). Proceedings of Symposia I-XII can be found at: <http://www.invasive.org/proceedings/>; CDs are also available from USDA Forest Service-FHTET (contact Richard Reardon at rreardon@fs.fed.us or Yun Wu at ywu@fs.fed.us).

SYMPOSIUM WELCOME

E komo mai (Welcome) to the XIII International Symposium on Biological Control of Weeds and the beautiful Kohala coast of the Big Island of Hawaii! Extraordinary cultural and natural diversity in Hawaii, and its long history in weed biocontrol, make these islands an ideal site for reflection and discourse on the past, present and future of our field.

Our goal during this symposium has been to help colleagues reconnect, share experiences and plan future collaborations as we examine emerging issues that affect invasive plant management across the globe. This symposium also provided a unique opportunity to take stock of a century of biological control in the Pacific, where our modern history of weed biocontrol began with Albert Koebele and his 1902 introductions for lantana biological control in Hawaii. Looking into the future, the wonderful biodiversity and people of Pacific islands face overwhelming threats, with invasive plants prominent among them. We hope an enduring outcome of this symposium will be new connections between the international community of weed biocontrol specialists and our islands' natural resource managers and scientists, enabling new collaborations that will serve the Pacific region in years to come.

Aloha!

Tracy Johnson
USDA Forest Service
Pacific Southwest Research Station
Institute of Pacific Islands Forestry
Volcano, HI USA

Patrick Conant
Hawaii Department of Agriculture
Plant Pest Control Branch
Biological Control Section
Hilo, HI USA

Proceedings sections available at:
<http://www.invasive.org/publications/xiiisymposium/>

Proceedings papers available at:
<http://www.invasive.org/proceedings/volumeXIII.html>