

IPPS

The International
Parasitic Plant Society

Proceedings of the 8th INTERNATIONAL PARASITIC WEEDS SYMPOSIUM

In collaboration with the
4th International Weed Science Congress (IWSC)

Durban (South Africa), June 24-25, 2004

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The 8th International Symposium on Parasitic Weeds
International Convention Center, Durban, South Africa
24-25 June 2004

FOREWORD and ACKNOWLEDGEMENTS

The Durban Symposium on Parasitic Weeds, organized by the International Parasitic Plant Society (IPPS) is the 8th in a series of international meetings dedicated to this special group of plants that has a tremendous impact on world agriculture and forestry. We are pleased with the relatively large number of contributions to this Symposium that together gave updated reports on the achievements in many different aspects of parasitic weed research, including basic aspects like host-parasite interaction and biodiversity, and more applied aspects that relate to parasitic weeds management.

We are grateful to the organizers of the 4th International Weed Science Congress (IWSC), and in particular to Baruch Rubin and Charlie Reinhardt who so kindly agreed to have the Parasitic Weeds Symposium as a satellite meeting at the same venue, and helped with linking the Congress sessions on parasitic weeds with our Symposium. This allowed IWSC participants to take part in presentations and discussions during our Symposium, and exposed the parasitic weed researchers to the broader scope of weed science.

Much work was done in the development of the Symposium Program, and the Symposium happened to be a great success thanks to the efforts put by members of the International Scientific Organizing Committee, who reviewed all abstracts and helped in the decisions behind the formation of the final program.

The Executive committee of the IPPS started organizing the Symposium as early as January 2003, but all technical issues could be finalized only shortly before the Symposium. We owe special thanks to the Committee Members Jim Westwood and Jos Verkleij for their continuous involvement in the decisions behind the meeting.

We wish to thank Chris Mulder, Chairman of the local organizing committee of the IWSC, for his support in providing the venue. The International Convention Center (ICC) was an important partner in the success of the meeting. We thank the Congress Secretariat, and in particular Gill Slaughter and Kerry de Lange, for their kind help in all aspects of local arrangements.

Unfortunately Durban did not prove to be a safe place. We extend our best wishes to all Congress participants who were hurt while walking in the city.

And last but not least, we are grateful to all Symposium Participants for their contribution, both in scientific presentations and in fruitful discussions. They were the actual key to the success of the Symposium.

Danny Joel

25 June 2004

Detailed program – Thursday June 24**IWSC Plenary lecture**

8:00 – 9:00	DM Joel	The parasitic weeds problem and its fate in the 21 st century
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Progress in parasitic weed research . Chair: DM Joel, F Kanampiu, P Westernman

9:00 – 9:30	J Ransom	New methodologies for the management of parasitic weeds
9:30 - 10:00	P Westerman	Demography of parasitic weeds and its impact on management
10:30 - 11:00	G Ejeta	Understanding key developmental processes in parasitic weeds
11:00 - 11:15	J Westwood	Manipulating host defences to enhance resistance to <i>Orobanch</i>
11:15 - 11:30	B Rubin	EPSP-synthase presence and activity in broomrape
11:30 – 11:45	K Yoneyama	Determination and quantification of strigolactones
11:45 – 12:00	D Müller-Stöver	Enhancing the efficacy of a fungal biocontrol agent against <i>Orobanch</i> through combination with resistance-inducing chemical
12:00 - 12:15	B Abu-Irmaileh	Manure fermentation reduces <i>Orobanch</i> infestation on tomato
12:15 - 12:30	JH Grenz	Evaluating strategies to control the parasitic weed <i>Orobanch crenata</i> – a simulation study using APSIM

Workshop on Striga management. Chair: J Ransom

16:30 - 16:45	Emechebe	Ways to manage <i>Striga</i> infestations without herbicides
16:45 - 17:00	B Haussmann	Arresting the scourge of <i>Striga</i> by combining marker-assisted backcrossing and farmer-participatory selection
17:00– 17:15	J Rodenburg	Yielding ability, resistance and tolerance as independent selection criteria for breeding against <i>Striga</i>
17:15 – 17:30	Gworgwor	Systems approach for ecological management of <i>Striga</i> in cereal-based cropping systems in northern Nigeria
17:30 – 17:45	Reinhardt	Prospects and limitations for <i>S. asiatica</i> control in sorghum/desmodium intercrop
17:45 – 18:00	VW Lenzemo	Field inoculation with arbuscular mycorrhizal fungi reduces <i>Striga</i> performance on cereal crops and has the potential to increase cereal production
18:00 - 18:15	H Traoré	Pathogenicity of <i>Fusarium</i> spp. isolates and metabolites to <i>Striga hermonthica</i> in Burkina Faso
18:15 - 18:30	A Murdoch	Linking laboratory and field studies of dormancy in <i>S. hermonthica</i> : is delayed planting an option for integrated control?

Friday June 25**Genetic variation in parasitic weeds.** Chair: J Verkleij and B Roman

8:00 - 8:20	J Westwood	ISSR characterization of <i>Orobanch minor</i> populations in the U.S.
8:20 - 8:40	B Roman	Biodiversity of <i>Orobanch crenata</i> in the Mediterranean region (review)
8:40 - 9:00	B Haussmann	Genetic variability of <i>Striga hermonthica</i> (review)
9:00 - 9:20	M Timko	Genetic variability and host specialization in <i>Striga gesnerioides</i>
9:20 - 9:40	J Verkleij	Analysis of genetic variability in the closely related species <i>S. hermonthica</i> and <i>S. aspera</i> by RAPD and SCAR markers

Physiological and molecular aspects of parasitic plants (I). Chair: K. Yoneyama and J Westwood

10:30 - 10:50	SF Shamoun	Tissue culture of western hemlock dwarf mistletoe (<i>Arceuthobium</i>)
10:50-11:10	WJ Zhou	Callus production of <i>Orobancha</i> and its novel aseptic infection on host roots
11:10 - 11:30	G Glatzel	Active vs passive mineral nutrient uptake in mistletoes– a still unresolved question?
11:30 - 11:50	D Cameron	Using the broad-spectrum hemi-parasitic angiosperm to investigate compatible and incompatible interactions
11:50 – 12:10	M Timko	Mapping and cloning of race-specific resistance genes to <i>Striga gesnerioides</i> and <i>Alectra vogelii</i> in cowpea
12:10 – 12:30	R Dorka	Endogenous rhythms of nutational movement in <i>Viscum album</i> l. correlates with high level of jasmonic acid

Physiological and molecular aspects of parasitic plants (II). Chair: G. Ejeta and M. Timko

14:00 - 14:20	Y Takeuchi	Fluridone promotes conditioning and germination of parasitic weed seeds
14:20 - 14:40	G Gbèhounou	Seed germination of <i>Rhamphicarpa fistulosa</i>
14:40 – 15:00	G Dinelli	Germination ecology, emergence and early host parasitization of <i>Cuscuta campestris</i> Yuncker
15:00 – 15:20	H Eizenberg	Growing degree days - a predictive tool for <i>Orobancha</i> parasitism
15:20 – 15:40	M De Mol	Water relations and development of the European mistletoe <i>Viscum album</i>

Parasitic weeds control. Chair: F. Kanampiu and J. Hershenhorn

16:30 - 16:50	Y Goldwasser	Utilizing herbicide-resistant tomato to manage <i>Orobancha aegyptiaca</i>
16:50 - 17:10	J Hershenhorn	<i>O. aegyptiaca</i> control in tomato
17:10– 17:30	F Kanampiu	<i>Striga</i> control in maize using herbicide seed coating technology
17:30 – 17:50	A Menkir E	Use of inbreeding as a tool to improve resistance to <i>Striga</i>
17:50 – 18:10	AC Franke	On-farm testing of <i>Striga hermonthica</i> control technologies
18:10 – 18:30	A Elzein	Seed treatment technology: an appropriate delivery system for controlling <i>Striga</i> spp. with <i>Fusarium oxysporum</i> Foxy 2
18:30 - 18:50	G Malidza	<i>Orobancha</i> control in imidazolinone-tolerant sunflower hybrids

POSTERS.

WJ Song	Changes in <i>Orobancha</i> germination in response to conditioning temperature and GR treatments
A Okazawa	Characterization of photoreceptors from <i>Orobancha minor</i> Sm.
WM Al-Khateeb	Influence of salinity on the interaction between tomato and <i>Orobancha cernua</i>
K Yoneyama	Effects of nutrients on the production of germination stimulants
M Haidar	Blue light induced changes in inositol 1,4,5-trisphosphate in dodder (<i>Cuscuta campestris</i>) seedlings
JR Qasem	Host range of <i>Orobancha ramosa</i> among some cultivated and wild grown plant species
D Gidoni	Is host range potential related to genetic diversity in <i>Orobancha</i> ?
JR Qasem	<i>Osyris alba</i> occurrence in Jordan: new hosts and importance
D Plakhine	Variation in the response of resistant sunflower to <i>Orobancha</i>
O Ou'draogo	Identification of resistance mechanisms of some sorghum varieties towards <i>Striga hermonthica</i>
C Mallory-Smith	Integrated management of <i>Orobancha minor</i> in <i>Trifolium pratense</i>
T Nadler-Hassar	Natural tolerance of <i>Cuscuta</i> spp. to herbicides inhibiting amino acid biosynthesis
A Kamara	Cereal-legume rotation to control <i>Striga</i> and improve on-farm yield of maize in Northern Guinea
W Lanini	Management of <i>Cuscuta</i> in tomato with resistant varieties and herbicides
N Gworgwor	The effect of Arbuscular Mycorrhiza (AM) fungi on the control/management of <i>Striga hermonthica</i>
H Buschmann	Induced Resistance: An effective Method for the Control of Parasitic Weeds?

Parasitic weeds control

OROBANCHE AEGYPTIACA CONTROL IN TOMATO

T Lande, G Achdari, H Eizenberg, and J Hershenhorn

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Orobanche aegyptiaca is the most troublesome weed on processing tomato in Israel. Recently, *O. aegyptiaca* parasitism in tomato was also reported in other Mediterranean countries such as Turkey, Greece and Italy. Experiments conducted in pots under greenhouse conditions indicated that three foliar applications of MON 37500 (sulfosulfuron 75%) at 50 or 100 g/ha control effectively and selectively *O. aegyptiaca* parasitizing tomato. It was also determined that foliar applications must be followed by upper irrigation in order to activate the herbicide. In the present study we tested the efficacy of MON37500 to control *O. aegyptiaca* on tomatoes in the field. Additionally, the efficacy of activating the herbicide by sprinkler or moving pivot irrigation methods was compared. Experiments were conducted in 5 locations with various levels of *O. aegyptiaca* natural-infested fields. Three sequential treatments of 80 g/ha sulfosulfuron 14 and 28 days after tomato seedlings establishment, resulted in excellent control of the parasite. *O. aegyptiaca* shoots decreased from 21 shoots/m², in the non-treated control to 0.8/m² in the treated plots. Tomato yield decreased accordingly, from 94 tons/ha in the treated plots to 56 tons/ha in the non-treated control. The same control efficacy was achieved when the herbicide was activated with sprinkler irrigation or by moving pivot.

CONTROL OF OROBANCHE CERNUA IN IMIDAZOLINONE-TOLERANT SUNFLOWER HYBRIDS

G Malidza, S Jovic & D Skoric

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Sunflower breeding for tolerance to imidazolinone-based herbicides began in 1997, and many sunflower seed companies and institutes are actively developing so-called Clearfield* sunflower hybrids tolerant to imidazolinone-based herbicides. Clearfield* production system for sunflower holds a lot of promise, including possibility of selective *Orobanche cernua* control.

Field trials were conducted during 2001-2003 in northern Serbia to determine efficacy of imidazolinone-based herbicides on *Orobanche cernua* in Clearfield* sunflower hybrids. Used in the study were experimental hybrids from Nidera, Mycogen and commercial hybrid Rimi 2 from Institute of Field and Vegetable Crops. The following herbicides were studied: imazamox (20-48 g a.i. ha⁻¹) and imazamox + imazapyr (33-39.6 + 15-18 g a.i. ha⁻¹). Field studies focused on effects of herbicides and application timing (from one to eight pairs of sunflower leaves) on crop tolerance and *O. cernua* control.

The efficacy of the herbicides in *O. cernua* control reached 100% at the time of sunflower flowering. At harvesting, the efficacy either remained the same or dropped a few percent depending on herbicide rates and time of application. Application of herbicides at the later stage of sunflower growth proved more effective. The yields obtained in the untreated check were significantly lower than those obtained in the treatments with herbicides. The phytotoxicity of the herbicides was transient and acceptable.

Our results are indicative of the significant advancement and possibility *O. cernua* i control by growing imidazolinone-tolerant sunflower hybrids and application of imazamox and imazamox + imazapyr.

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<http://www.ppws.vt.edu/IPPS/>