



INTERNATIONAL PARTHENIUM NEWS

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Produced by:

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What is parthenium weed up to in Tanzania?

By Krissie Clark & Wayne Lotter

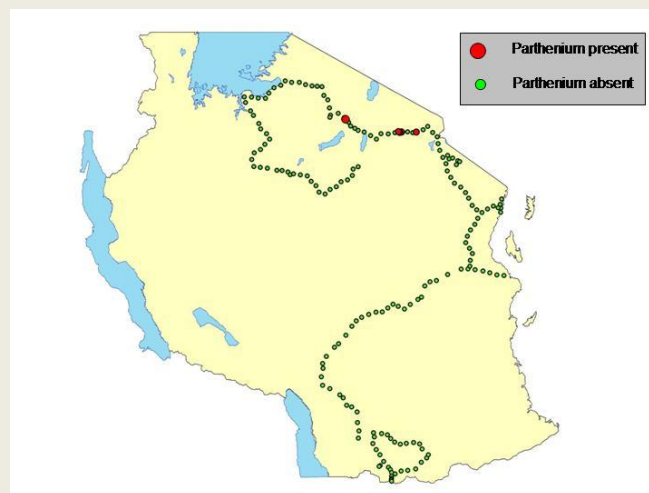
As you are all well aware, *Parthenium hysterophorus* is considered to be one of the world's most serious invasive alien plants, because of its potential for spread, and its economic and environmental impacts. It has already become invasive in South Africa and Ethiopia, and appears to be rapidly spreading in Uganda and Kenya. It is thus only a matter of time before it impacts on Tanzania. As part of an international collaborative project, the PAMS Foundation, a not-for profit conservation NGO, was commissioned to undertake a survey in Tanzania to help improve our understanding of parthenium weed's distribution in this country. This was part of the IPM CRSP Invasive Species Program on Parthenium weed. Tanzania is a big country, although not anywhere nearly as vast as Australia or the USA, and hence the survey was divided into two phases. Phase one surveyed the eastern and central areas of the country and took place in 2010. Phase two is scheduled for 2011 and will cover the north-western sections of Tanzania and the eastern coastline. The surveys were conducted by vehicle along the available national and regional road network, by simply scanning both sides of the road for the weed. This was simple enough to accomplish when we were not stuck in the mud, waiting for a flooded river to subside or waiting for lion to finish their inspection of our vehicle. Particular emphasis was placed on surveying areas which were estimated by the CLIMEX model to be the most suitable for the parthenium weed growth.

Figure 1: Parthenium weed growing in Arusha town, Tanzania.



To date, the surveys picked up parthenium weed in two main localities in northern Tanzania. This was at Kilimanjaro International Airport and also at Arusha airport and in and around Arusha town. Unfortunately, Parthenium weed has also been recorded in the Ngorongoro Conservation Area, one of Tanzania's World Heritage Sites. Seedlings were spotted just outside the headquarters of the protected area.

Figure 2: Parthenium weed presence in Tanzania.



They seem to have come from seeds that had been transported in the mud on shoes, as the seedlings were growing in the foot grid area outside the main

entrance door. The preliminary results of our survey seem to indicate that parthenium weed may still be at the early stages of invasion within Tanzania, having entered at two ports (Arusha airport & Kilimanjaro International airport) and slowly starting to spread from there.

Figure 3: A lioness inspecting the survey vehicle



The good news is that the PAMS Foundation has raised funds to start on initial control operation. However, acquiring the necessary permission from the government of Tanzania to undertake the control operation, and finding the most suitable government department to collaborate with in this regard is proving challenging. Nonetheless, we hope that together with Ngorongoro Conservation Area Authority, Tanzania National Parks, Tanzania Wildlife Research Institute and the Tropical Pest Research Institute we can overcome these challenges and start the control operation during the early part of 2011... so do watch this space for more news!

For more details contact Krissie Clark – krissie@pamsfoundation.org

Figure 4: Krissie conducting the survey in Tanzania



The 1st IOBC Workshop on the Biological Control and Management of *Parthenium hysterophorus*

Parthenium hysterophorus L. (Asteraceae) impacts on crop and animal production, biodiversity conservation, and human and animal health in Africa, Asia and Australia. A Working Group for the Biological Control and Management of Parthenium weed was therefore formed in 2009, under the auspices of the International Organisation for Biological Control (IOBC). The general aim of this working group is to promote the use of sustainable, economically feasible, and socially acceptable control methods, including biological control, of *P. hysterophorus* in its introduced range.

The 1st IOBC Parthenium weed workshop was held from 3rd to 5th November 2010 in Nairobi, Kenya. It incorporated a meeting of the partners of the USAID-funded Integrated Pest Management Collaborative Research Support Program (IPM CRSP) Project on Parthenium (entitled 'Abating the weed (*Parthenium hysterophorus* L.) damage in eastern Africa using integrated, cultural and biological control measures'). The workshop was also held in conjunction with the 8th IOBC International Workshop on Biological Control and Management of *Chromolaena odorata* and Other Eupatorieae which ran from 1st to 3rd November 2010. The meetings of these two groups were held jointly to highlight the spread of these weeds, particularly in Africa, and to draw attention to the need for the implementation of control measures.

The Parthenium weed working group aims to organize workshops every few years to facilitate international cooperation on the biological control and management of parthenium weed. The recent workshop brought together international researchers to review current research activities on parthenium weed, increase collaboration amongst researchers at a regional and global scale, and to optimise resources for the management of this weed. Additionally, this workshop aimed to raise awareness of parthenium weed for countries that are at risk, or that are in the early stages of invasion by this plant, and highlight the importance of management. The combined IOBC workshops were organised by the Agricultural Research Council (South Africa), CABI (Africa), IUCN, GISP, Integrated Pest Management Collaborative Research Support Program (U.S.A.), Queensland Biosecurity - Department of Employment, Economic Development and Innovation, and the University of Queensland (Australia).

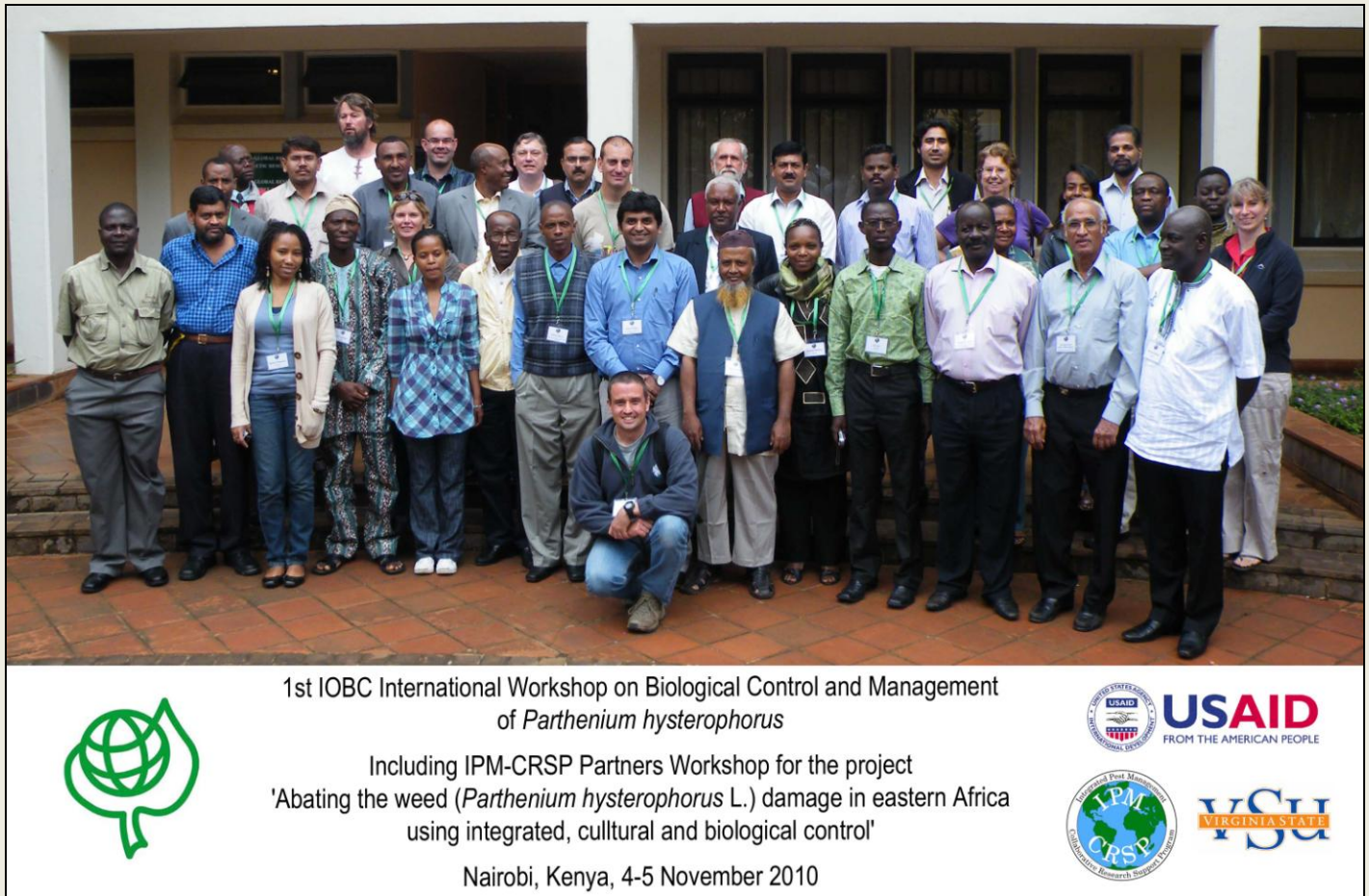


Figure 5: The participants from the 1st IOBC international workshop on biological control and management of parthenium weed. Nairobi, Kenya 3 to 5 November 2010.

The IOBC, IPM CRSP and AusAID supported the attendance of several delegates at the IOBC parthenium weed workshop and their financial contributions are gratefully acknowledged. GISP and IUCN also each sponsored an evening function during the combined workshops at the ICRAF and IUCN venues, respectively. The IOBC chromolaena and parthenium weed workshops were attended by 45 participants representing 16 countries (Australia, USA, Jamaica, Ethiopia, Kenya, Uganda, Ghana, Nigeria, Tanzania, South Africa, Mauritius, India, Pakistan, Bangladesh, Thailand, and Papua New Guinea). A total of 20 orals and three posters were presented during the IOBC parthenium weed workshop, and presentations and discussions covered topics such as the biology, ecology, distribution, impacts, utilisation, biological, chemical and mechanical control, competitive plant species and integrated management of this weed. New collaborative links were forged

among researchers and land managers, and previous associations were strengthened; this will ultimately result in improved management of this plant.

During an interlinking day between the chromolaena and parthenium workshops, delegates visited Nairobi National Park on the outskirts of the city, to view invasive plants, including parthenium weed, and local wildlife. Parthenium weed has recently been detected in several Kenyan national parks that conserve biodiversity, and various management options are under consideration. At an annual meeting of IPM CRSP parthenium project partners held during the workshop, project progress and future research plans were discussed. This meeting was led by the project coordinator Dr Wondi Mersie from Virginia State University and the IPM CRSP director Dr Rangaswamy Muniappan, and attended by IPM CRSP parthenium project partners from the USA, Australia, Ethiopia,

Kenya, Uganda, Tanzania, and South Africa. In formal recognition of their past, current and future contribution to biological control, honorary IOBC membership was awarded to both Dr Rachel McFadyen and Dr Rangaswamy Muniappan at a function held at the IUCN in Nairobi on 3rd November, during the combined IOBC workshops. Dr Muniappan and Dr McFadyen have contributed extensively to the development of the IOBC Working Groups on *Chromolaena odorata* and *Parthenium hysterophorus*, and the biological control of these invasive plants.

At a meeting of the IOBC Parthenium Weed Working Group held during the workshop, Dr Kunjithapatham Dhileepan from Biosecurity Queensland, Australia was elected as the new convener of this Working Group (the outgoing convenors are Dr R. Muniappan and Dr W. Mersie). The IOBC parthenium weed workshop was concluded with the development of a set of technical recommendations (detailed below). Proceedings of the workshop presentations are being compiled for distribution.

Recommendations arising from the 1st IOBC International Workshop on Biological Control and Management of *Parthenium hysterophorus*

1. While *Zygogramma bicolorata* is recognized as an effective biocontrol agent of *Parthenium hysterophorus*, there are several other agents available in Australia which should be considered for introduction in countries where *P. hysterophorus* is a problem.
2. Combined workshops of IOBC Working Groups on Parthenium and *Chromolaena* should be considered for future meetings.
3. The International Parthenium Weed Newsletter produced by the University of Queensland be expanded to include the IOBC Parthenium Working Group and IPMCRSP Parthenium Project.
4. IOBC Working Group is urged to contact the organizers of the International Conference on Parthenium, to organize joint workshops in the future to prevent duplication and promote coordination.
5. IOBC Working Group, IPM-CRSP Parthenium Project and International Parthenium Weed Network (IPaWN) to consider development of a parthenium weed website.
6. Countries where parthenium has recently invaded are encouraged to survey and record the spread and to implement control and possible eradication programs. Countries where parthenium has firmly established are encouraged to continue surveying and to take up biological control and other management options as early as possible to prevent further spread and economic loss.
7. Countries in West Africa, Indochina and Pacific should monitor possible introduction of parthenium weed from countries where it is present and take up immediate eradication measures when found.
8. Some agencies supported by developmental funds which are inadvertently introducing invasive weeds should take appropriate remedial measures to prevent further spread.
9. Governments of countries where parthenium weed has established in recent years are encouraged to declare it a noxious weed.
10. Countries are encouraged to cooperate and create regional networking to implement integrated weed management including biological control.

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Editorial Note: Thanks go to Lorraine for organizing and running of an excellent international workshop on parthenium weed.

Noxious weed threatens the biggest wildlife migration on the planet

24 November 2010 | News - News story

(Storey taken from IUCN website:
<http://www.iucn.org/what/tpas/biodiversity/?6511/Noxious-weed-threatens-the-biggest-wildlife-migration-on-the-planet>)

The Serengeti - Masai Mara ecosystem in Africa, which hosts the largest wildlife migration known to man, is under attack from a noxious weed from Central America, commonly known as feverfew (*Parthenium hysterophorus*). If left unchecked it could threaten the continued migration of millions of animals across the plains every year, including 1.5 million wildebeest, 500,000 Thomson's gazelle and 200,000 zebra.

The Serengeti - Mara ecosystem hosts approximately 70 large mammal species and some 500 different bird species in highly diverse habitats ranging from riverine forests, swamps, grasslands and woodlands. Researchers from CABI Africa and IUCN, based in Nairobi, Kenya, found the weed, parthenium, during a recent survey, growing along parts of the Mara River

and along some dirt tracks in the Masai-Mara National Reserve.

“Although this weed may look benign to most people it probably poses one of the most serious threats to the ecosystem, which is already under threat from illegal hunting, land conversion, fencing, disease and uncontrolled fires,” says **Arne Witt, Invasive Species Coordinator, CABI Africa**. “Research suggests that conditions in the Serengeti are highly suitable for this weed so we should all be very concerned.”

Parthenium weed has gained notoriety in Australia, India and Ethiopia where it was accidentally introduced with what many would consider disastrous consequences. The weed, which can grow from seed to maturity in 4-6 weeks and has an ability to produce 10,000–25,000 seeds, is known to be allelopathic, which in layman's language means that it produces chemicals which inhibit the growth of other plants. This means that if it invades natural pasture it can reduce the amount of available forage to such an extent that carrying capacities of grazing animals can be reduced by up to 90%. If allowed to grow without any weeding it can reduce yields of crops, such as sorghum, by up to 97%. It is also toxic, which means that animals will not eat it unless they are starving or stressed, with fatal consequences. This weed also has impacts on human health – many people who come into direct contact with the plant can develop severe skin allergies (dermatitis) and pollen production by the plant can result in respiratory problems.



Parthenium weed has invaded about 2 million ha in Ethiopia including productive grasslands where it has displaced valuable pasture species to the detriment of livestock and wildlife.

Photo: Arne Witt



In Ethiopia, parthenium weed has invaded more than 2 million ha of grazing and cropland to the detriment of biodiversity, agriculture and human health.

Photo: Arne Witt

The implications for wildlife conservation in the Serengeti ecosystem are potentially extremely serious. The movement of thousands of grazing animals means that the grasslands are often highly disturbed, making it easier for parthenium to invade. The displacement of palatable species means that, in time, the available food for wildebeest, zebra, gazelle and the pastoralists livestock will rapidly diminish.

“Unless action is taken immediately to eradicate known infestations in the Masai-Mara National Reserve it is not unrealistic to expect a drastic reduction in wildlife populations in the long term as the parthenium population rapidly expands as an invading species,” says **Geoffrey Howard, IUCN's Global Invasive Species Programme Coordinator**. “It is therefore possible for a little green plant to transform one of the greatest spectacles on earth.”

“However, we can stop the invasion in its tracks and protect this national and global treasure for our children's grand-children if we all work together in support of the Kenyan government and national institutions which have indicated, based on their pronouncements at CABI's 100 year celebrations held at Nairobi National Park, that they are committed to managing invasive species in Kenya,” says **Arne Witt**.

For more information or to set up interviews, please contact:• Nicki Chadwick, IUCN Media Relations Officer, m +41 79 528 3486, e nicki.chadwick@iucn.org

Status of parthenium weed and the *Zygogramma* beetle in Nepal

By Bharat Babu Shrestha

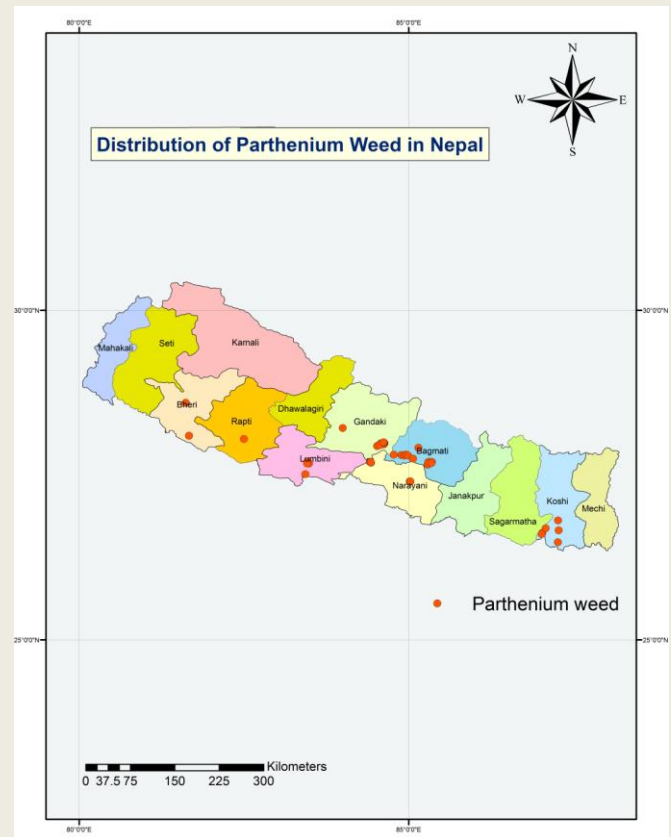
The rapid expansion of parthenium weed has rapidly become a new environmental problem in urban and peri-urban areas of Nepal, particularly in the southern tarai plains and the middle hilly region. Although the plant was first known to the scientific community of Nepal in the 1960s, population increases of this weed did not occur until the 1990s. It is interesting to note that farmers of Hetaunda (a city in Churia region which is about 50 km north from the Nepal-Indian border) noticed this weed in their pasture land (Lamsure danda) in 1990 when there was restoration of the multiparty system in Nepal. Then the local people called this weed “Bahudal Jhar”, literally meaning “Multiparty weed”. From the current distribution pattern of this weed in Nepal, it is evident that parthenium weed entered Nepal from the south. Due to the open border and direct road connection, thousands of the vehicles cross the Nepal-India border every day and at several places. Through any of these road networks, parthenium weed might have entered Nepal early from India, where the weed was first reported in 1814.

A reconnaissance of the distribution of parthenium weed in Nepal revealed that this weed is expanding along the road network in the country. Physiographically, Nepal can be divided into three horizontal (east-west) zones: tarai plains in the south, the mid hills in the centre, and the high mountains on the north. From the tarai plains, the weed is expanding to the mid hills through the road network and transportation of agriculture products. The weed has been observed up to 1,400 m asl (Kathmandu valley). In peri-urban areas, this weed is mainly found in grasslands and abandoned agriculture lands. It has been found less frequently in cultivated agriculture lands. However, once the agriculture land is abandoned for 1-2 years, parthenium weed becomes a dominant weed. In most of the places, invasion is considered to be at the ‘colonization’ stage and stem density has reached up to 402 stem m⁻².

Currently parthenium weed is a dominant species in the grasslands, fallow lands and roadside vegetation of several major urban areas in Nepal including Kathmandu (the capital city), Hetaunda, Narayangarh, Butwal, Pokhara, Dang, Surkhet, etc. So far a Nationwide survey of the area invaded by this weed is lacking, however, by a joint effort of Bharat Babu Shrestha from Central Department of Botany, Tribhuvan University, Nepal, and Asad Shabbir from Tropical and Sub-Tropical Weed Research Unit,

University of Queensland, Australia, a preliminary map of distribution of parthenium weed in Nepal has been prepared (Figure 6).

Figure 6: A preliminary map showing the distribution of Parthenium weed in Nepal as assessed by survey along roadsides.



(Data provided Bharat B Shrestha & map developed by Asad Shabbir)

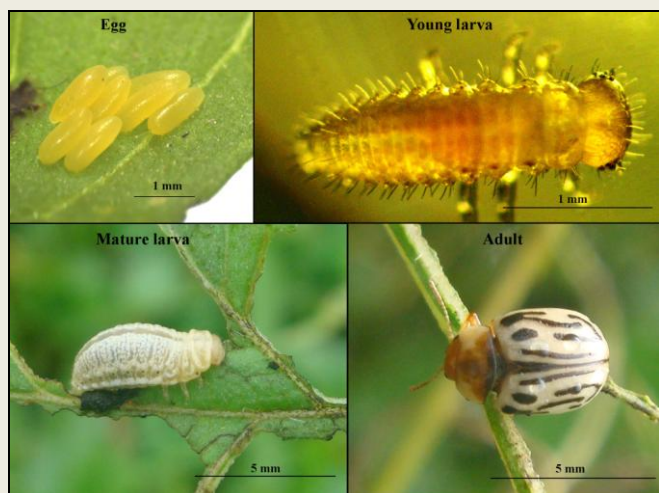
Zygogramma bicolorata in Nepal

There is no official record of deliberate introduction of *Zygogramma bicolorata* Pallister (Coleoptera: Chrysomelidae) into Nepal. However in August 2009, defoliation of parthenium weed by *Z. bicolorata* was observed at Hetaunda (Makawanpur district, central Nepal) (Figure 7). By the end of September 2009, more than 80% of the *Parthenium* infested sites at Hetaunda showed heavy defoliation by the beetle. Similar defoliation, but less extensive in area and level of defoliation, was also observed in Bharatpur (Chitwan district), Gaidakot (Nawalparasi district), Butwal and Bhairahawa (Rupandehi district).

In August 2009, a detailed survey was carried out in the Kathmandu valley (covering three cities Kathmandu, Patan and Bhaktapur) to prepare distribution map of parthenium weed and to observe

possible defoliation by the beetle. Though parthenium weed was the dominant weed in grassland, fallow lands and roadside vegetation throughout the valley, defoliation was not observed and beetle was not found. Surprisingly, a small population of this beetle was encountered in the grassland at Kirtipur (Kathmandu Valley) alongside the Hetaunda-Kathmandu highway (via Kulekhani) in October 2010. However, the defoliation of weed was not appreciable at this site.

Figure 7: Stages in life cycle of *Zygogramma bicolorata* as seen in Nepal



From this highway nearly 200 vehicles from Hetaunda enter Kathmandu valley every day. It appears that the beetle was carried to the Kathmandu Valley from Hetaunda by these vehicles. Presence of high hills (>2000 m asl) and absence of parthenium weed in the areas between Hetaunda and Kathmandu ruled out the natural dispersal of this beetle to Kathmandu. Similarly, in October 2010 a small population of this beetle without appreciable defoliation of parthenium weed, was also observed in Dhading Bensi (Dhading district).

Figure 8: Defoliation of Parthenium weed by *Zygogramma bicolorata* at Hetunda (Nepal)



The above reports indicate that *Z. bicolorata* has become established in Nepal, and has become an interesting phenomenon of 'fortuitous biological control'. Due to the presence of an open border, ecosystem corridors, direct road connection, and free vehicular movement between Nepal and India, it is almost certain that the beetle has entered Nepal from India in the same way as parthenium weed has done. Since defoliation of the weed in Hetaunda (about 50 km north from Nepal-India border) was not seen in 2008, but was seen in 2009, a conservative estimate based on the reports from India and Australia has led to the conclusion that the beetle has entered Nepal recently, between 2004 and 2006.

Host range expansion of *Z. bicolorata* has not been observed in Nepal. However, larva and adults of this beetle do feed on the leaves of another invasive species *Xanthium strumarium* and this was observed in Butwal.

Is parthenium weed present in Uruguay?

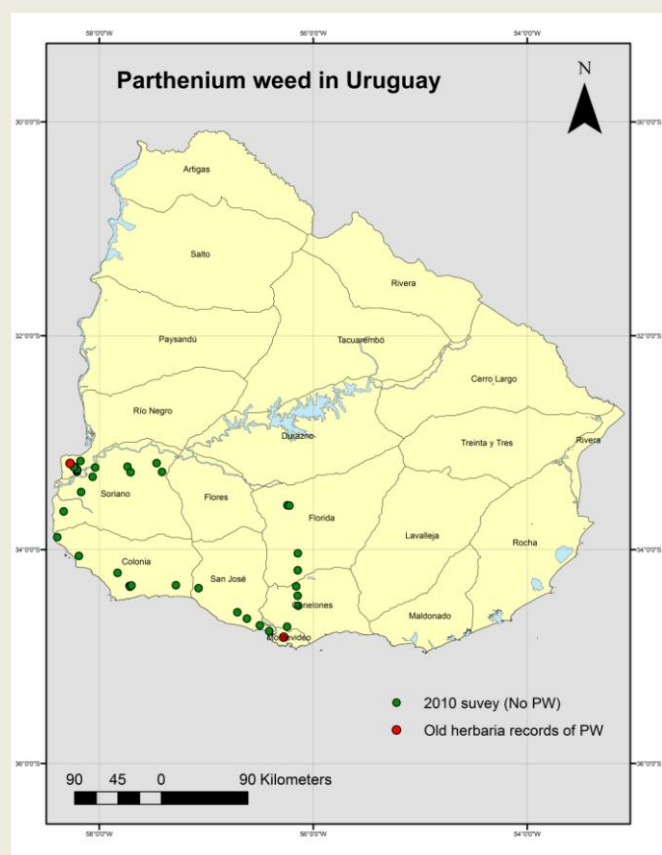
By Amalia Belgeri

Earlier this year, as part of the IPaWN series discussions, we asked the question where in the world is parthenium weed found? To date, literature claims parthenium weed as a native species to the area surrounding the Gulf of Mexico and in central South America (Navie *et al.* 1996). Dale (1981) also reported parthenium weed to occur naturally throughout the tropical and subtropical Americas from the southern United States of America (USA) through to southern Brazil and northern Argentina. As I come from Uruguay and just starting on my PhD program on parthenium weed, I wondered if it was present in Uruguay. I was aware that it has never been mentioned as problematic weed in my country (and should it be if it is a native in Uruguay?).

Recent news about its status, as a declared weed species in Bahia Blanca (South Argentina Renzi, 2009 pers. comm.), Brazil and Colombia, where its been found to be resistant to ALS herbicides and glyphosate respectively, increased the uncertainty about its status in Uruguay and indeed the possible threat that this species could have upon Uruguay. Therefore, while having the chance to visit my country in 2010 an initial search for herbaria records of parthenium weed was undertaken. Five herbarium specimens, dated from the early 60s, were found in the Faculty of Agronomy's

herbarium (Figure 10). Based on the locations recorded for these five specimens, during October 2010 two farmers' properties around Fray Bentos and Rio Negro areas (Figure 11) were surveyed using a randomly assigned quadrats approach. A total of three native pastures and two improved pastures were surveyed. Additionally, paddocks ready to be planted (fallow) were also surveyed. Furthermore, one native pasture and paddocks prepared to be planted (fallow) in Soriano and Colonia districts were also surveyed (Figure 11).

Figure 9: Areas where parthenium weed herbarium specimens have been collected (red circles) and GPS waypoints (green circles) showing absence of parthenium weed along roadsides and pastures in Western Uruguay in spring 2010.



(Data provided by Amalia Belgeri & Map developed by Asad Shabbir)

GPS coordinates from each paddock, road side locations and other disturbed areas studied were also taken in order to map the presence/absence of parthenium weed. Parthenium weed was not found during this vegetation survey. Therefore, it is believed that the weed was introduced from neighbored countries in the 60s, but this introduction was sporadic and has not established widely.

Figure 10: Examples of two of the five herbarium specimens of Parthenium weed found in the herbarium of the Faculty of Agronomy in Uruguay.

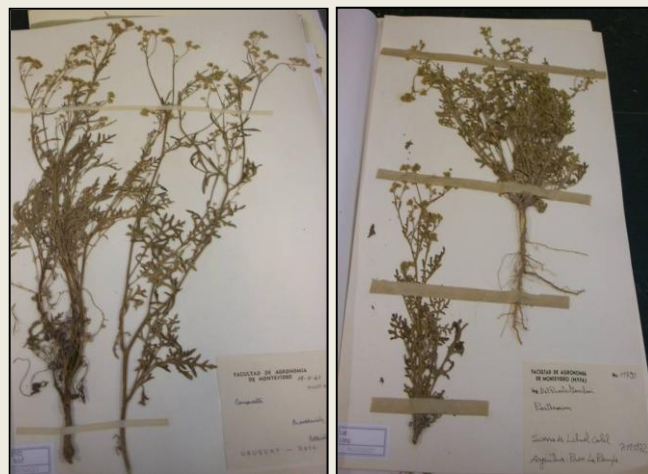


Figure 11: Looking for Parthenium weed in a native pastures (left) and roadsides (right) in Western Uruguay.



Considering that Uruguay imports seed of several pasture species from Australia and the presence of parthenium weed in neighboring countries the potential for accidental introduction of parthenium in Uruguay a possibility.

Testing the seed bank viability of parthenium weed in PNG

By Anastasia Kawi and Warea Orapa

Parthenium hysterophorus L. (Asteraceae) a serious agricultural and rangeland weed was recorded in one Province, Lae, Morobe Province, Papua New Guinea (PNG) in 2001. In this district, the weed was found in two locations in Lae City, one in a vehicle bond yard and the other in Buambub Plantation, 10 km from Lae City. The infestation in the Industrial area in Lae City was mainly along the drainage ditches and onto road sides and property perimeters. The infestation at Buambub Plantation was under cocoa trees and most probably accidentally introduced to this area by people

from Lae City. With financial support from Secretariat of the South Pacific Commission (SPC) Plant Protection Services, an eradication programme was initiated and implemented by National Agricultural Quarantine & Inspection Services (NAQIA) and National Agricultural Research Institute (NARI) in Morobe Province, PNG. The parthenium weed eradication programme for 5 years with the regular use of paraquat and an glyphosate at the affected sites. Other weeds were up rooted placed in air tight bags and burnt to avoid dispersal of seed. NAQIA and SPC have yet to declare parthenium weed as having been eradicated in PNG as seed banks may still give rise to further infestations.

Figure 12: Collecting soil samples at the area where parthenium weed was present near the vehicle bond yard in Lae Industrial area, PNG.



A recent quarantine survey in November 2009 indicated that no parthenium weed was sighted at the two infested sites and elsewhere in Lae City. A follow up visit was made by a NARI weed scientist and a NAQIA officer to these sites on the 1st December 2010 and to collect soil samples from the infested sites to test for the presence of viable seed in the seed bank. Quadrat samples were collected from two sites within the Industrial centre in Lae City and one at Buambub

Plantation. Soil samples were collected to 15 cm depth and with local knowledge at the exact position where parthenium weed stands were growing in earlier times (Figure 12). Soil samples are now being analysed at NARI Islands Regional Centre Kerevat, East New Britain Province, to determine if viable seeds are still present. Observations indicated that no parthenium weed was present in both locations. The drainage areas in Lae city has been toiled and planted with food crops, while the other been slashed and maintained.

At Buambub plantation the area previously under cocoa has now been graded and is being used as a sports field. No regrowths of parthenium weed was sighted in all locations at this site.

Further update of the status of parthenium weed in Pakistan

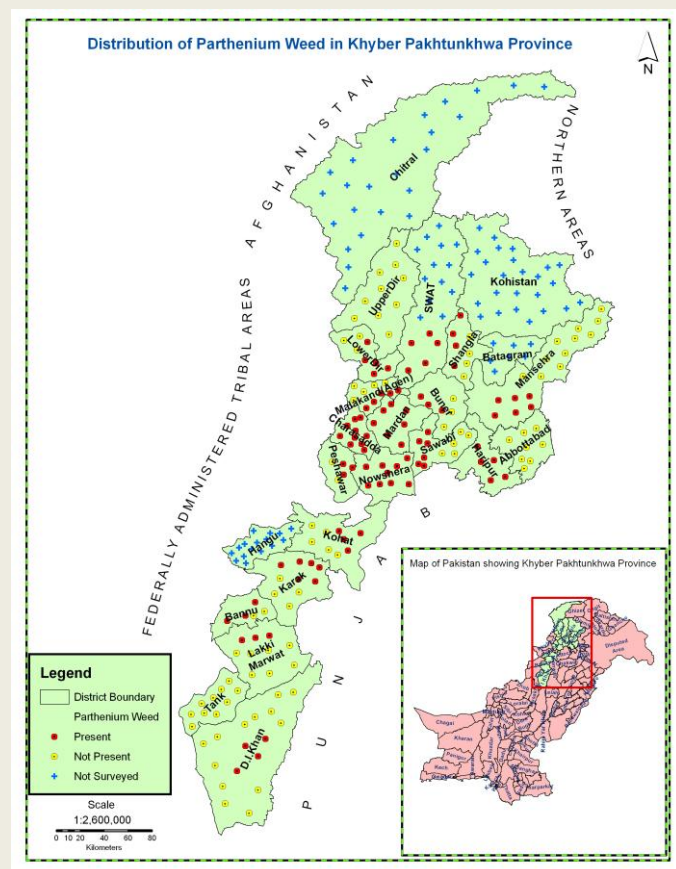
(Report from the International Linkages Project coordinated by Prof. Gul Hassan, Khyber Pakhtunkhwa Agricultural University, Peshawar, Pakistan)

A joint project sponsored by the Higher Education Commission, Islamabad, on the Biology, Physiology, Ecology and Management of parthenium weed is underway and jointly run by the Khyber Pakhtunkhwa Agricultural University, Peshawar and University of the Punjab, Lahore, Pakistan and the University of Queensland, Australia. The phytosociology of parthenium weed has been investigated in Khyber Pakhtunkhwa and Punjab provinces. Parthenium weed has rapidly spread in the both provinces and warrants mitigatory measures to arrest its further spread and minimize its existing infestation in the already infested areas (Figure 13).

Regarding the management of parthenium weed it has been figured out that glyphosate in the Round up and Mera 76 formulations is effective for the non-selective control of parthenium weed. Moreover, it has also been discovered that table salt is also effective in controlling the weed. Thus, the use of common salt could be a practicable intervention for the parthenium weed management in home gardens and lawns.

Five distinct biotypes were identified from various locations based on their morphology and later confirmed using a RAPD analysis. Biotypes one and three were shown to be genetically close (75 % similarity) while biotypes four and five were very close (90 %), despite the two having significant differences in morphology. The results indicate that multiple introductions with genetic differences might have occurred into Pakistan, which could have aided the rapid colonization of parthenium weed across Pakistan.

Figure 13: Distribution of parthenium weed in Khyber Pukhtunkhwa Province, Pakistan.



It has been determined that parthenium weed in certain parts of Pakistan can act as a perennial plant rather than as an annual herb as generally reported from the other parts of the world (Figure. 14). The picture was taken during mid February (early spring) showing regrowing growth from the previous season's growth.

Figure 14: Parthenium weed regrowing from the previous year's plant in Khyber Pukhtunkhwa Province.



Stop press News: The third International Parthenium Weed Conference (IPWC) Delhi, India December 8-10th 2010

The 3rd IPWC was held from 8th to 10th December 2010 in Delhi, India. We hope to have full report available the next newsletter. Unofficially the conference was attended by about 120 participants representing 5 countries (India, Nepal, USA, Israel and Australia). A total of 103 orals and posters have scheduled to be presented during the two and half days of the conference, and presentation and discussions covered the topics such as biology, ecology, allelopathy, utilization, biological, chemical, and mechanical control, competitive plant species and effects on human health. New collaborative links were proposed between Australia and South Asia. As yet official recommendations arising from the conference have not been released however on many occasions the need to better network with other working on parthenium weed is required and membership of the IPAWN was encouraged.

Upcoming Conferences on Weed Science and Invasive Species

11th Queensland Weed Symposium

Venue: Mackay, Queensland

Dates: 31 July – 3 August 2011

Weed Management – *Back to basics*

Website: <http://www.wsq.org.au/11%20QWS.htm>

13th International Symposium on Biological Control of Weeds

Venue: Waikoloa Beach Marriott Resort, Hawaii

Dates: 11-16 September 2011

Website: http://uhhconferencecenter.com/xiii_isbcw.html

23rd Asian Pacific Weed Science Conference

Date: 25-23rd September 2011

Venue: Sebel Cairns, Australia

Website: www.apwss2011.com

The 3rd Symposium on Environmental Weeds & Invasive Plants (Intractable Weeds and Plant Invaders)

Dates: 2-7 October 2011

Venue: Ascona, Switzerland

Website: <http://invasive.weeds.ascona.ewrs.org/default.asp>

Recent publications on parthenium Weed

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Call for collaboration in Parthenium Weed seed collection

Two PhD students from University of Queensland (Australia), Ruey Toh and Zahid Hanif, wish to call for collaboration in parthenium weed seed collection for invasiveness, pathogenicity and for molecular studies. We have been in touch with a few countries, while are still seeking collaboration in countries as followed: Argentina, Belize, Bolivia, Brazil, Chile, Costa Rica, Cuba, Ethiopia, Honduras, Israel, Mexico, Nicaragua, Paraguay, Peru, South Africa, Sri Lanka, Uganda, Uruguay, USA, Vietnam, and West Indies.

We hope seed collection from fifteen populations will be possible from each country populations are considered to be distinct if the at least 50 m apart. A single sample of seed might be 1 gram of cypselas if at all possible. Dry, mature seed free from dust, live insects, and other animals are required. Each seed sample should be sealed in double, clean, new see-through plastic zipper bags, and labeled with the botanical name, country name, sample site code, collection date, site name, collector name(s), GPS coordinate, and any other notes if applicable (eg. *Parthenium hysterophorus* L., Australia, Sample site #1, 27/07/2010, Toogoolawah, Ruey Toh, GPS - 27.08,152.37, Note: dense population on rangeland). In order to assist the quarantine process in Australia, all sample bags must be securely sealed into an unbreakable new container (eg. plastic box with a tight fitting lid), and attached with labels 'Parthenium hysterophorus L.' and 'QUARANTINE MATERIALS' and with the information including our Permit Number (IP10008620) and a signed Exporter's Declaration. The delivery address is: Ms Ruey Toh, School of Land, Crop and Food Sciences, University of Queensland, St Lucia QLD 4072 Australia.

For any detail, further information, or inquiry, please kindly contact Ruey Toh by email ruey.toh@uqconnect.edu.au. Your cooperation in this regard will highly be appreciated!