Darwin Initiative for the Survival of Species

Annual Report

http://www.darwin.gov.uk

Project Reference Number : 162/12/026

Towards sustainable management of alien invasive weeds in southern China

Project Leader and Author: Dr. Carol A. Ellison, 7th June 2007

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1. Darwin Project Information

Project Ref. Number	162/12/026
Project Title	Towards sustainable management of alien invasive weeds in southern China
Country(ies)	UK, China
UK Contractor	CABI (formerly CABI Bioscience, an institute of CAB International), Silwood Park, Ascot, Berks. SL5 7TA
Partner Organisation(s)	Institute of Biological Control (IBC), Chinese Academy of Agricultural Sciences (CAAS), Beijing, China. (IBC is now part of the Institute of Environment and Sustainable Development in Agriculture, but will still be referred to as IBC in this Annual Report) Guangdong Entomological Institute (GEI), Guangzhou, China
Darwin Grant Value	£177,508
Start/End dates	October 2003 / September 2006 (no cost extension until 30 September 2007)
Reporting period and report number	1st April 2006 – 31st May 2007 Report 4.
Project website (updated 2005)	http://www.cabi.org/projectdetail.asp?Heading=Projects&projid=63 '*Mikania micrantha* in Southern China. Towards sustainable management of invasive alien weeds'
Author(s), date	Dr. Carol A. Ellison, 7th June 2007

2. Project Background

- Invasive alien species (IAS) represent the greatest threat to the preservation of global biodiversity after habitat destruction. In the fight to safeguard the world's biodiversity against IAS, it is essential not only to assess their impact, but also to develop and employ control strategies that are not damaging to the environment. The use of co-evolved natural enemies, a strategy referred to as classical biological control (CBC), has proven to be an efficacious, cost-effective, sustainable and safe option for the management of alien weeds. The aim of this method of natural weed suppression is to select agents (arthropod and pathogen) from the centre of origin of the target weed, and after intensive assessment and screening for specificity, release them in the invasive range.

- As a leading international organisation in the field of biological control, CABI has received a number of independent requests from local scientists in China, concerning the sustainable control of invasive alien weeds (IAW). CABI has a history of collaborative development projects with China, and has an office in Beijing. Although China has expertise in the biological control field, CBC of IAW has yet to be fully exploited, and the use of pathogens is a totally new technology to China.

  Amongst those weed species that have been identified as having the highest environmental impact in China, is the pernicious, neotropical, composite *Mikania micrantha* (mile-a-minute weed or Mikania). This vine is a serious problem in Guangdong Province, particularly within the highly biodiverse National Conservation Areas. This project aims to implement a pilot project for the CBC of Mikania, by exploiting a similar programme that has been undertaken in India.

3. Project Purpose and Outputs

- The purpose of this project is to develop the capability of exploiting pathogens for the sustainable management of IAW in China. The project will specifically develop and apply the research already undertaken under a Department for International Development (DFID)-funded Natural Resources International-administered project for the classical biological control of Mikania in India, using the highly host specific, neotropical rust fungus *Puccinia spegazzinii*. Training activities and hands-on experience received during the project will empower Chinese scientists with the skills necessary to develop new collaborative proposals. The objective is to develop these proposals during the course of the programme, with support from CABI personnel, targeting other invasive weeds that are seriously affecting the biodiversity in natural environments in China.

  Annex 1 is a report of the progress and achievements against the Logical Framework for Financial Year 2006/2007.

- The progress of the fieldwork in China was interrupted in 2006, while permission to use the selected rust isolate, from Argentina, is finally secured from the Argentine authorities. A no-cost extension was agreed by the Darwin Initiative (DI) Secretariat, thus, no changes have currently been made to the design of the project, only to the timings of activities, detailed below.

4. Progress

- *Previous achievements: October 2003-March 2006*
  The project was initiated in October 2003. The Inception Workshop was held in November in China, and the prospective rust release site Neilingding Island, Guangdong Province, off the coast of Southern China, had been established by GEI. At the workshop, the project work plan was discussed, the methodology for the assessment of the weed within the permanent sample plots agreed, and the release site for the rust visited by all collaborators. Two Chinese scientists (Han Shichou and Fu Weidong) came to CABI for training in February 2004 and the isolate of the rust to be imported into China was selected. An Import Licence was obtained by IBC, from the China Import and Export Inspection Bureaux (IEIB) and the rust shipped to China in July 2004. Additional host specificity testing was completed by February 2005 in quarantine, and the results submitted to the IEIB. The report included data on the response of sunflower to the rust (chlorotic spotting), and consequently IEIB requested that a further selection of sunflower varieties needed to be tested before they would consider issuing a rust release permit. The sunflower varieties were challenged with the rust and none became infected.

  The rust release site was selected on Neilingding Island, off the coast of Guangdong, and permanent sample plots established and the *Mikania micrantha* density recorded. A licence was agreed by the IEIB for an experimental release of the rust to be undertaken on the Island, in September 2005. However, for political reasons (discussed in the Darwin six-month report, October 2005 and the 2005/6 Annual Report) the site had to be destroyed. A new 'trial' rust release site was established on Jui-zhou Island, about 20 km

from the original release site on Neilingding Island. The rust was released at three permanent sample sites in October 2005, but failed to establish, due to the late season environmental conditions being non-conducive for infection. Continued efforts have been made to gain permission to use the rust in China, from the Misiones Provincial Government in Argentina (where the rust was collected), but this has not yet been secured. It was decided that no more releases would be made on the Island because of the risk of the rust reaching the mainland, before Argentina had agreed to the rust being used in China. A number of publications and proposals for continued funding were completed.

- *Progress during current reporting period*
  The focus of the current reporting period has necessarily been on publications and development of proposals, since the lack of permission from Argentina has meant that the release programme has is still on hold. The final project meeting was held in Guangdong, and donor organisations visited in Beijing. From these meetings a concept proposal was submitted to Australian Centre for International Agricultural Research (ACIAR). The UK project leader attended a workshop on Mikania management in Taiwan, where the DI project was promoted. Following this, a consultancy taken to advise on the import and release of the rust into Taiwan.

  The IBC have successfully obtained permission from the IEIB to undertake full releases of the rust i.e. on mainland China. Efforts have continued on developing a relationship with the relevant personnel within the Misiones Government and indeed they ensured us that we would have an answer by the end of May 2007. Disappointingly this did not transpire, but still we are assured that the decision is imminent, and will be in time to do releases on the mainland this rainy season.

  Slippage: Due the lack of permission from Argentina to use the rust this part of the project is still on hold.

The achievements of the project this year can be considered under the following categories:

Obtaining official Permissions from Argentina and China

Strenuous efforts have been made during this reporting period to secure the necessary permission from Argentina to use its biodiversity to protect biodiversity in China. It has recently come to light though the British Embassy in Buenos Aires, that Misiones Provincial Government is utilizing a recently instated policy framework for dealing with biodiversity issues, to assess the request for China to use the rust. This Darwin Initiative project has thus provided the opportunity for the Misiones Government to implement this policy, and the fact this is a test case, explains the excessive delays in Misiones reaching a decision.

IBC successfully secured a permit to release the rust on mainland China, from the IEIB. This process has involved intensive awareness raising within these authorities, which has established the framework for future pathogen introductions into China for weed control.

Meeting and Workshop

Seventh International Workshop on Biological Control and Management of Chromolaena odorata and Mikania micrantha (12-15th September, held at National Pingtung University of Science and Technology (NPUST), Pingtung, Taiwan

The UK DI project leader attended the workshop and gave a presentation; 'Sustainable control of *Mikania micrantha* – implementing a classical biological control strategy using the rust fungus *Puccinia spegazzinii*'. A paper will be published in the proceedings, and will be available online: www.ehs.cdu.edu.au/chromolaena/siamhome.html

These International workshops have been held under the auspices of the IOBC (International Organization for Biological Control of Noxious Animals and Plants) since 1988, at 3–4 yearly intervals. The workshop was attended by about 20 international participants, from Australia, Guam (USA), India, Indonesia, Papua New Guinea, Saipan (Commonwealth of Northern Mariana Islands), Secretariat of the Pacific Community – SPC (Fiji), South Africa, Timor-Leste (East Timor) and the UK, and by about 30 local participants. Collaborators from GEI applied to attend, but did not get government approval; movement between mainland China and Taiwan, for nationals, is still very restricted.

Final project meeting at GEI September, 2006
Project activities during the 1 year (no cost) extension were discussed; focussing on rust release strategies. A visit was also made to the rust release site on Jiu-Zhou Island off the coast of Zhu-Hai, Guangdong. Han Shichou from GEI, our main project collaborator informed us that he has managed to secure some funding for continuing the Mikania-rust work from the Guangdong State Forestry Department.

Progress of follow-on projects and development of proposals

The World Vegetable Centre (AVRDC), National Taiwan University (NTU), Bureau of Animal and Plant Health Inspection and Quarantine (BAPHIQ) (September 2006)
CABI has been requested to provide the Mikania rust to Taiwan by Prof. Tzean from the NTU. Following on from the workshop in Pingtung, a visit was made to AVRDC to assess their transgenic containment facility, for its suitability to quarantine the Mikanian rust (since it has HEPA filtration, suitable to prevent the escape of fungal spores). Following this a courtesy visit was made to BAPHIQ to discuss the issues involved with importing the Mikania rust into quarantine in Taiwan. Finally, a visit was made to the NTU in order to discuss the Mikania biological control project, and try and provide some training to the mycologists who will be doing the rust work at AVRDC. Unfortunately, no funding was secured for CABI to provide technical support only travel costs were covered to make this single visit. The rust was sent to Taiwan at CABI's expense in November 2006.

Sustainable management strategy and control technology for the invasive alien weed, Ageratina adenophora (Eupatorium adenophorum) *in China. (Lead by CAAS)*
This Ministry of Science and Technology (MoST), China funded project, has now commenced, with an assessment of the impact of the weed in Yunnan Province. Surveys are planned for Mexico to collect natural enemies of Ageratina, pending funding being secured for CABI staff cover (only travel costs are cover by the MoST funding). A paper was presented at the 12th International Symposium on the Biological Control of Weeds (ISBCW) (April, 2007, La Grande Motte, France) on this work, and will be published in the proceedings.

Managing Wetlands for Sustainable Livelihoods at Koshi Tappu, Nepal.
(Lead by Wildfowl & Wetlands Trust)
This DI funded project has commenced. CABI inputs concern invasive species management; Mikania is the top invasive species present.

Chinese Government funding to continue work initiated under this DI funding
IBC and GEI collaborators successfully obtained funding from MoST and Guangdong Regional Government respectively. Unfortunately, MoST funding does not cover costs for international collaborators.

Visit to donors (Canadian International Development Agency [CIDA], Australian Centre for International Agricultural research [ACIAR], China offices, Beijing) to discuss funding priorities and concept proposal to ACIAR (September 2006)
Funding priorities and opportunities in invasive alien species management were discussed. It was recommended that CABI prepare a concept proposal for consideration by ACIAR. This was undertaken, and the outcome is still pending.

Assessment and Monitoring

Data on the infestation and impact of Mikania on Neilingding Island has been published in Chinese, with an English abstract. CABI China Office undertook a full translation of the paper and this is given in Annex 2. This is forms part of Output 2 of this DI project, and although this Island is no longer the place where the rust will be tested and monitored, the paper is still considered to provide useful data for a general assessment of the ecological impact of the weed in China.

Timetable for reporting period October 2006 to September 2007

Time period	Output (output addressed in Logical Framework)	Activities	Personnel Responsible
July 2007	Biocontrol agent imported and released in china (3)	Rust released at selected sites on mainland China.	IBC Fu Weidong/ Zhang Guoliang GEI Han Shichou/ Li Liying
August 2007	Public awareness campaign implemented (5)	China, Guangdong: Targeted information produced (leaflets, posters, and videos); media contacted (local and national T.V. and newspapers); popular articles produced UK: Press release made	GEI CABI
Sep 2007	Results publicised and new project proposals developed (6)	Final Project report prepared Publications currently under preparation published	IBC Fu Weidong/ Zhang Guoliang GEI Han Shichou/ Li Liying CABI

5. Actions taken in response to previous reviews (if applicable)

The 05/06 Annual Report Reviewer raised a number of issues:

- *Elucidation of issues involved with terminating releases on Neilingding Island*

  It was not possible to obtain any more information on this. It must be remembered that the use of pathogens for IAW control is a new technology in Asia, and consequently the authorities are very cautious ('pathophobia' is the term CABI staff use). Most likely an uninformed individual decided to stop the releases. This is ironic, since it is an invasive alien species that is destroying the biodiversity, but they will not allow a host specific alien species to be used to save the biodiversity.

- *Protocol for selection of release sites*

  In terms of lesson learnt, clearly initial releases of an agent should not be undertaken in a National Nature Reserve and avoidance of military areas is fundamental. This experience also highlights the need to raise awareness in the authorities responsible for such decisions. Understanding will lead to change. The public information campaign that will be conducted, once Argentina has given permission to use the rust, will help in this process. Indeed, in India, there has been outstanding success from the awareness campaign undertaken under the sister DfID-funded project on Mikania.

- *Value to future projects*

  This project has been a valuable learning process, for all collaborators. Despite the fact the classical biological control using fungal pathogens is a proven technology in a number of countries around the world, with major success stories; it is still a relatively new technology, and the first introduction into a country will always be difficult. Once the process is in place within the relevant government departments, and a precedence set, new projects will not encounter the same delays or prejudices. This Darwin Initiative is fundamental to the success of the MoST project, since the *process* has been established, and now it only needs to be followed in future projects.

- *Implications from none establishment of the rust on Juizhou Island*

  In India, the critical issue at present is developing an optimum rust release strategy. In Kerala and Assam releases have lead to the spread of the rust in the field, but it apparently has died out during the dry season. From observation in the glasshouse and native range of the rust, over-season survival is dependent on the rust infecting plants in particular niches (e.g. along permanent steams), or as cankers on dormant but living stems. From this, CABI scientists believe that the rust must reach a sufficient density in the favoured over-seasoning situation, to elicit an epidemic early in the next growing season. Juizhou Island is very small and dry, with no above ground persistent water sources; thus, Mikania may mainly over-season as seeds, rather than plants (defoliated vines). Consequently, the rust may not over-season successfully on this island, and infection of mainland or large island Mikania populations will be needed before the rust can perpetuate permanently. This does not mean that small island populations are going to be protected from the rust, since spores will potentially blow in each season, from high density populations of infection.

- *No cost extension*

  A one year no cost extension was agreed with the Darwin Initiative Secretariat. It is still hoped that by September 2007, successful completion of all the major project activities will be achieved. However, even at this stage the project has achieved a significant legacy in China and Argentina:

  China
  - training of scientists in biocontrol technology using fungal pathogens
  - development of government policy on importation of fungal biocontrol agents
  - awareness raising within government, scientific establishment and donors
  - securing follow-on projects

  Argentina
  - providing an opportunity for the Misiones Government to implement the province's recent policy on biodiversity protection and exploitation.

Both IBC and GEI have successfully obtained Chinese government funding to continue the work on the *Mikania* rust, beyond the finish of the Darwin Initiative project. Thus, even if Argentina continues to delay responding to the request for permission, that prevents mainland releases before September 2007, work will continue.

- *Implementation time table*

  See 4. above

Partnerships

- *Within Darwin Project:* As in previous years there has been good communication over the year between China and CABI. Personnel from CABI's Beijing Office have had increased involvement with project activities and communication, which has significantly helped the smooth running of the project.

Good relations between the China IEIB and IBC have resulted in permission being obtained to release the rust on mainland China.

CABI has commenced the MoST funded project on Ageratina with project collaborators at CAAS.

A good relationship has been established between CABI, DI Secretariat and the British Embassy in Argentina. This has helped immeasurably with the negotiations with Misiones Government.

- *Outside Darwin Project (update from Annual Report 2005/06)*: *Mikania* is an Asia-wide invasive weed problem, and CABI is established as the leader in the CBC of this weed. Consequently, though the Darwin Initiative and the sister project in India (funded by DfID) there has been much interest in taking this technology to other affected countries. Below is an update of the Asia-wide initiatives:

  Nepal: The Darwin Initiative has funded the project: Managing Wetlands for Sustainable Livelihoods at Koshi Tappu, Nepal. This project is lead by Seb Buckton, Wildfowl & Wetlands Trust, Slimbridge, UK, with CABI inputs concerning invasive species management in the reserve (Mikania is the top invasive species present), and has now started.

  Taiwan: Taiwan National University has secured internal funding from the Forest Bureau to introduce the Mikania rust pathogen into Taiwan. CABI undertook a consultancy to Taiwan in September 2006, piggy-backing on the DI final project meeting and donor visit by CABI to mainland China. The rust has now been imported into quarantine in Taiwan.

  South Pacific Islands: A programme has been funded by ACIAR for the classical biological control of Mikania in Fiji and Papua New Guinea (though the Secretariat of the Pacific Community). CABI is a partner institute and is supplying a rust isolate. This project has used the same training schedule developed for the Chinese collaborators for training Fijian project personnel (December 2006). Lessons learned and techniques developed during the release programme in China are also being used.

6. Impact and Sustainability

- The Pingtung, Taiwan workshop provided an excellent venue to promote the DI project, to an international and national audience.
- There is evidence for an increasing awareness within the Chinese National and Provincial government of the value of biological control of invasive alien weeds. Both IBC and GEI were successful in obtaining Chinese funding to continue the work undertaken under the DI project on Mikania.
- The successful funding of the Ageratina project by the Chinese MoST, Forestry Bureau funding in Taiwan and more widely the ACIAR funding for Fiji and PNG, are all testament to this increased interest both within China and regionally.

7. Outputs, Outcomes and Dissemination

- The rust has been successfully shipped to China, established in quarantine and additional host specificity tested completed. A release permit was obtained for a trial release of the rust in a contained environment on an island, however, the rust did not establish due to the time of release (at the cusp of the rainy/dry seasons). It has been recommended that the trial release programme should not continue (due to the risk of the rust reaching the mainland) until permission from Argentina had been secured. Consequently, the rust release part of the project and the publicity campaign are still effectively on hold. Hence, a no cost project extension has been agreed by the Darwin Initiative Secretariat, until September 2007.

- Increased efforts have gone into project development activities and dissemination outputs. A paper was presented at the International Workshop on held at the NPUST, in Taiwan. A proceeding is in press. International donors have been canvassed in Beijing and a concept proposal presented to ACIAR.

Table 5. Project Outputs (According to Standard Output Measures)

Code No.	Description	Year 1 Total	Year 2 Total	Year 3 Total	Year 4 Total	TOTAL
4C	Postgraduate training in biological control at workshop in Guangdong			30		
4D	Training duration			0.4 2 days		
6A	Training of 2 Chinese scientists (Ms. Fu Weidong from IBC and Prof. Han Shichou from GEI) in handling rust at CABI, UK	2				
6B	Training period in UK, 4 weeks	4				
8	Inception Workshop Beijing, China, for 5 days, two UK staff attended. Workshop attended by 12 people.	2				
8	Unscheduled project meeting Beijing, China, 1 day, both UK project staff attended. Meeting attended by 8 people.		0.2 (1 day)			
8	Attending Workshop in Guangdong and meeting in Beijing			1		
8	Attending final project meeting in Guangdong and donor discussions in Beijing				1	
11A	Peer reviewed papers			2		
13A	Facilities established for holding of fungal rust culture for reference		1			
14A	Inception Workshop Beijing.	1				
14A	Unscheduled project meeting Beijing		1		1	
14A	Biological control workshop Guangdong			1		
14A	Final Project meeting in Guangdong				1	
14B	Workshop in Nepal where findings from Darwin project were presented. Attended by both UK project staff		1			
14B	CAAS/CABI Invasive Alien Species Meeting, Beijing. Darwin project activities were presented. Attended by all key Darwin project staff (UK and China)		1			
14B	Roundtable for Nature Conservation in the Pacific and the Invasive Species Working Group (ISWG) meetings held in Alatau, PNG in July 2005. Darwin Project activities were presented. Attended by CABI Darwin project leader.			1		
14B	Seventh International Workshop on Biological Control and Management of *Chromolaena odorata* and *Mikania micrantha*, held at National Pingtung				1	

	University of Science and Technology (NPUST), Pingtung, Taiwan, 12-15th September. CABI Darwin project leader to gave a presentation on *Mikania* biological control project.				
22	Permanent sample plots established on Neilingding Island, Guangdong Province, Southern China.	10			
22	Permanent sample plots established on Jiuzhou Island, Zhuhai, Guangdong Province, Southern China.			3	
?	Establish web-page on Darwin project on CABI website		1		
23	Resources raised from CABI PF to support project development activities on invasive alien weed management in China				£10k

8. Project Expenditure

The project expenditure has been agreed between DEFRA and CABI and finalised. In accordance with the contract, the final 10% (£3,138.70) will be paid upon completion of the final report to the Departments satisfaction.

9. Monitoring, Evaluation and Lessons

- The monitoring and evaluation has been built-in to the progression of the project. Regular e-mail communication between collaborators, facilitated by the CABI China office has continued throughout the reporting period.
- The problems that have been encountered, concerning use of biodiversity from one country by another, have been a key lesson learnt from this project, and has been previously discussed (October 2005 HYR, Annual report 2005/6). It is vital to have prior informed consent from the country of origin of an agent before a classical biological control project is initiated in a target country.

The main outputs from this year (06/07) of the project, given in the table below.

Project Outputs	Method of Evaluation	Current Status
English translation of Chinese published paper about Mikania at the original release site (Nelingding Island) completed by CABI personnel.	Copy of translation available to interested parties.	Completed, (see Annex 2)
Policy makers awareness campaign (IEIB) in Beijing	Permission to release the rust on mainland China achieved	Releases waiting for permission from Argentina
Donor discussion held in Beijing	Concept proposal prepared and submitted to ACIAR	Under evaluation by ACIAR
DI-UK project leader attended and presented paper at Chromoleana / Mikania Workshop in Taiwan in September 2006.	Paper published	Paper in press
Final project meeting held at GEI	Plan of work for 2006/7 drawn-up	Execution of work-plan pending (waiting for

		permission from Argentina)
Progress of projects developed under this project: 1) Wetlands and Wildlife Trust (in collaboration with CABI) Darwin Initiative for Nepal 2) CAAS/CABI MoST and CABI Partnership Facility funded project on Ageratina 3) CABI/NTU project to import and release rust, NTU funded by Taiwan Forestry Bureaux.	1) Project reports submitted to DI 2) Internal CABI reports produced, and paper presented (and to be published) at the ISBCW (April 2007) 3) Rust imported into Taiwan	On-going CABI-WWT CABI–CAAS and CABI-NTU collaborations Applications for funding for CABI is underdevelopment to allow collaborations to continue

10. OPTIONAL: Outstanding achievements of your project during the reporting period (300-400 words maximum)

None to date.

Annex 1 Report of progress and achievements against Logical Framework for Financial Year: 2006/2007

Project summary	Measurable Indicators	Progress and Achievements April 2006-Mar 2007	Actions required/planned for next period
Goal*:* To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but poor in resources to achieve • The conservation of biological diversity, • The sustainable use of its components, and • The fair and equitable sharing of the benefits arising out of the utilisation of genetic resources			
Purpose To develop the capability of exploiting pathogens for the sustainable management of invasive alien weeds in China	SHORT TERM: *Puccinia spegazzinii* (rust) established in the field in China LONG TERM: Mikania weed controlled & conservation areas protected. Conservation authorities adopt classical biological control using fungi as an alternative strategy for the management of alien invasive weeds.	SHORT TERM: Permission to release rust on mainland China achieved, following trial releases on islands.	Rust to be released and established in Guangdong Province mainland, and spread monitored.
Outputs			
1. Chinese scientists & weed control practitioners trained in weed biocontrol with pathogens	1. Scientists visit UK & receive training; workshop held		
2. Permanent sample plots established & weed impact assessed in China	2. Plots established & methodology agreed with collaborators	Permanent weed sample plots on Jiuzhou Island continue to be monitored. English translation of data on the ecological-	

Project summary	Measurable Indicators	Progress and Achievements April 2006-Mar 2007	Actions required/planned for next period
		economic loss caused by Mikania on Neilingding Island, has been completed (see Annex 2).	
3. Biocontrol agent imported & released in China	3. Permit for import & release applied	Full release permit obtained from IEIB and Guangdong Authorities	Obtain permission from Misiones Province, Argentina to use rust isolate in China.
4. Rust impact studies initiated	4. Methodology agreed with collaborators	Support was provided by UK collaborators (by e-mail & during final project meeting) on the development of release & monitoring techniques for the rust in the field.	CABI to continue with providing support.
5. Public awareness campaign implemented	5. Targeted information produced (leaflets, posters, videos); media contacted		The public awareness campaign will be initiated once permission has been obtained from Argentina to release the rust on mainland China.
6. Results publicised & new project proposal developed	6. Articles/proposals developed	MoST-China project commenced. Field data collected, survey in Mexico planned, paper presented at ISBCW. DI project for Nepal (Lead by Wildfowl & Wetlands Trust) commenced. DI-UK project leader attended and presented paper at Chromoleana / Mikania Workshop in Taiwan in September 2006. Paper written and in press. IBC collaborators successfully obtained Chinese Government funding to continue Mikania-rust work.	Continue with the development of new project proposals. A national press release will be made in the UK once the rust has been released and has established on mainland China. Provide Chinese government policy makers with copies of book *Invasive Alien Plants in Asia: Problems and Solutions.* Edited by ST Murphy, CA Ellison and R Murphy (in

Project summary	Measurable Indicators	Progress and Achievements April 2006-Mar 2007	Actions required/planned for next period
		GEI collaborators successfully obtained funding from Guangdong Regional Government to continue Mikania-rust work. Visits made to donors in Beijing to increase awareness in IAS problems in China and to investigate funding opportunities in IAW management. Proposal prepared for ACIAR.	press).

Note: Please do NOT expand rows to include activities since their completion and outcomes should be reported under the column on progress and achievements at output and purpose levels.

Annex 2 Full English translation

Analysis of ecological-economic loss caused by weed *Mikania micrantha* on Neilingding Island, Shenzhen, China.

ZHONG Xiao-qing[1,2], Huang Zhuo[1,2], Si Huan[1,2], Zan Qi-jie[3]