

CEPF SMALL GRANT FINAL PROJECT COMPLETION REPORT

I. BASIC DATA

Organization Legal Name: Landcare Research New Zealand Ltd.

Project Title (as stated in the grant agreement): Prospects for Biological Control of *Merremia peltata*

Implementation Partners for This Project: The Pacific Invasives Initiative (PII)

Project Dates (as stated in the grant agreement): March 1 2006 – June 30 2006

Date of Report (month/year): July 2006

II. OPENING REMARKS

This report is a feasibility study, therefore some of the questions below do not apply. A detailed (34 page) report has already been supplied to the CEPF.

III. NARRATIVE QUESTIONS

1. What were the initial objectives of this project?

The smothering vine *Merremia peltata* was recently considered one of 24 serious weed targets for which it has been identified that biological control should be explored for Pacific island countries and territories. The objectives of this study were to:

- provide information to allow decision-makers to decide if a biological control programme against *M. peltata* is feasible and should proceed, and to understand what it would involve, specifically including:
 - Host-specificity testing, including reviewing weed taxonomies to determine the closest related native or commercially valued plants in Micronesia and Polynesia, to assist develop test-plant lists that take into account the taxonomic relatedness of native and economically important flora;
 - Social issues – how to identify potential conflicts that may require resolution (for example, is the weed valued by some sectors of the community) and gaps in our knowledge, where additional research may be required, before a biological programme can proceed.
 - Quarantine issues, for example, standards and where such testing could be done.
 - How to assess the likelihood of success of a biological control programme in the CEPF region of Micronesia and Polynesia and outline the sequence of steps and costs associated with such a programme, opportunities for collaboration and capacity building to enhance the ability of indigenous people to manage invasive plants within the region.

- To serve as a template for assessing the prospects for biocontrol of other Pacific weeds. Selection of candidate biological control agents, including investigating the geographic origins, distribution and status of the weed to determine where surveys for candidate biological control agents should be conducted, and who might be best placed to undertake this work, a review any information already known about potential candidates, and how to select the most promising ones;

2. Did the objectives of your project change during implementation? If so, please explain why and how.

The objectives of this project did not change.

3. Briefly describe the methods used in achieving the objectives of this project.

Information for this report was obtained by searching published literature, computer databases and Internet sites; cross-referencing; and by contacting botanists familiar with the Pacific region.

4. Was your project successful in achieving the expected objectives? If no, explain why not. If yes, please explain how the project was successful and the key factors that contributed to its success.

Yes: information was provided to allow decision-makers to decide if a biological control programme against *M. peltata* is feasible and should proceed, and to understand what it would involve:

- **Host-specificity testing:** Extensive information was gleaned regarding the distribution of *Merremia peltata* throughout the Pacific region. Contradictory reports regarding its status presented a very complex situation where *M. peltata* is considered native to some islands, but an invasive alien in others. If *Merremia peltata* is native to the Pacific region, then use of classical biological control may not be appropriate. We recommend that before a biological programme is initiated, evidence to clarify the status of *M. peltata* in the Pacific region is required. This may be gained through two approaches: first, by comparing numbers of specialist herbivores and plant pathogens associated with *M. peltata* in the Malaysian-Indonesian region (the presumed area of origin of *M. peltata*) with those in Polynesia and Micronesia; and second, by using molecular methods to determine, if possible, when and how *M. peltata* colonised the Pacific.

Although there is limited published information about insects that attack *M. peltata*; the presence of several fungal pathogens, insects with no other recorded hosts, and the very wide geographic range of *M. peltata* indicate host-specific biological control agents may exist. Furthermore, if a classical biological programme is inappropriate, development of a mycoherbicide to control *M. peltata* is another option. A potential candidate for developing a mycoherbicide for *M. peltata* is *Glomerella cingulata* (anamorph = *Colletotrichum gloeosporioides*), as this fungus

has already been recorded from *M. peltata* in the Pacific. Host-specialised strains of this fungus are already being used for weed control worldwide.

We outlined the rationale for selecting a test-plant list for host-range testing of biological control agents, based on the phylogenetic relationships of test plants to the target weed. The taxonomic position of *M. peltata* was determined from the scientific literature. The most closely related genera of plant species that are present in the Pacific region which should be used to assess the risk of non-target attack when conducting host-range tests are *Hewittia* and *Operculina*. However, the presence of native *Merremia* species on some Pacific islands means any candidate biological control agent should have to be highly specific (probably monospecific to *M. peltata*).

- **Social issues.** We identified potential conflicts that may require resolution and gaps in our knowledge, where additional research may be required, before a biological programme can proceed. For example, *M. peltata* is considered native to some Pacific islands. If *Merremia peltata* is native to the Pacific region, then use of classical biological control may not be appropriate. We recommend that before a biological programme is initiated, evidence to clarify the status of *M. peltata* in the Pacific region is required.
- **Quarantine issues.** There are very limited facilities for testing pathogens in the Pacific region, so pathogen work may have to be performed in the country of origin of the pathogenic organism. A number of adequate facilities for insect work exist in the Pacific region, so an absence of quarantine facilities should not be a hindrance to biological control of *Merremia peltata* in the Pacific, though there may be a shortage of trained personnel who are capable of running a biological control programme.
- **Assessing the likelihood of success, outlining the sequence of steps and costs, opportunities for collaboration and capacity building.** We outlined the sequence of steps and costs involved in a biocontrol programme against *Merremia peltata* and produced a list of recommendations. Prospects of success would have to be assessed at the completion of each step as there is insufficient information at this time to give a definitive answer. Opportunities for collaboration were identified, for example, during initial surveys, extensive collaboration between Pacific nations and science providers will be essential for a biological control programme against *Merremia* to proceed. Dialogue between Pacific nations and science providers will be essential to decide how such a programme should proceed.

5. Describe what was achieved in terms of:

a) **capacity development;**

Capacity development is not within the scope of this project.

b) **developing partnerships;**

We have developed new relationships with the PII and several botanists with international reputations regarding the flora of the Pacific Islands.

c) **raising awareness of invasive species and generating community support for their management;**

This report will be circulated to stakeholders throughout the Pacific region, thereby raising awareness of the issues surrounding the potential use of biological control methods against *Merremia peltata*.

d) **involving the local community and other stakeholders:**

Involving local communities was beyond the scope of this project.

e) **providing benefits to the local community and other stakeholders.**

This report provides information which may or may not be used to further *Merremia* control throughout the Pacific region.

6. **What was the impact of the project at the local level?**

None at this stage.

7. **What was the impact of the project (if any) at the national level?**

None at this stage.

8. **Did your team experience any disappointments or failures during implementation? If so, please explain and comment on how the team addressed these disappointments and/or failures.**

The project is a feasibility study and the recommendations have not yet been implemented.

9. **Describe the key positive and negative lessons learned from this project that would be useful to share with other organizations interested in implementing a similar project.**

There were many botanists who were highly enthusiastic and willing to share their experience. Nevertheless, information can be slow to obtain and one potentially important botanist was away and unable to be contacted for the duration of this study. The Pacific is a very diverse area and we had to make generalizations in this report which might not apply uniformly. Some information does not exist.

10. **How has the project been promoted? (Please enclose/attach press clippings, brochures, publications, videos, websites, photos, etc). Please describe the products developed during the project and how and to whom these were disseminated.**

This project has yet to be widely promoted, although Alan Saunders (PII) recently drew attention to it at the NETS 2006 conference held in Paihia. Pending permission from the PII and CEPF, the report will be distributed widely and made available in the Landcare Research web page.

11. **Describe any follow-up activities you wish to implement and how you intend to do so (eg other invasive species management actions you wish to pursue, or how you plan to scale up the project to a broader area).**

Once the report has been circulated there will be dialogue between key organizations to decide if and how to implement the report's recommendations.

12. **Please provide any additional information you think may assist CEPF in understanding any other aspects of your completed project.**

IV. ADDITIONAL FUNDING

Provide details of any additional donors who supported this project and any funding secured for the project as a result of the CEPF grant or success of the project.

Donor	Type of Funding*	Amount	Notes

***Additional funding should be reported using the following categories:**

- A** *Project co-financing (Other donors contribute to the direct costs of this CEPF project)*
- B** *Complementary funding (Other donors contribute to partner organizations that are working on a project linked with this CEPF project)*
- C** *Grantee and Partner leveraging (Other donors contribute to your organization or a partner organization as a direct result of successes with this CEPF project.)*
- D** *Regional/Portfolio leveraging (Other donors make large investments in a region because of CEPF investment or successes related to this project.)*

Provide details of whether this project will continue in the future and if so, how any additional funding already secured or fundraising plans will help ensure its sustainability.

At this stage we cannot provide details. Whether we continue with attempts to implement a biological control programme against *Merremia peltata* is contingent upon the outcome of dialogue with key affected organizations in the Pacific region.

V. ADDITIONAL COMMENTS AND RECOMMENDATIONS

VI. INFORMATION SHARING

CEPF aims to increase sharing of experiences, lessons learned and results among our grant recipients and the wider conservation and donor communities. One way we do this is by making the text of final project completion reports available on our Web site, www.cepf.net, and by marketing these reports in our newsletter and other communications. Please indicate whether you would agree to publicly sharing your final project report with others in this way.

Yes

No

If yes, please also complete the following:

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