



Research Way, Clayton VICTORIA 3168
T (03) 9545 2665 • ABN 41 687 119 230

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Our Ref: Email letter to CSIRO Chief Executive dated 6 December 2016

Rob Hansen
Research Director
Agriculture and Environment Committee
Parliament House
BRISBANE QLD 4000

Via: aec@parliament.qld.gov.au

Dear Rob Hansen

Inquiry into the impacts of invasive plants (weeds) and their control in Queensland

CSIRO welcomes the opportunity to provide input to this inquiry by the Queensland Parliament's Agriculture and Environment Committee into the impacts of invasive plants (weeds) and their control in Queensland. We note the following 5 specific points which frame the enquiry.

1. the responsibilities of local governments in relation to the control of prohibited, restricted and invasive plants imposed under s.48 of the Biosecurity Act 2014 are reasonable, and local governments are meeting those obligations
2. programs for the control of weeds on Crown land administered by the Department of Natural Resources and Mines are effective
3. Biosecurity Queensland's weeds programs, including biological controls and new technologies, are adequately funded and effective at controlling weeds
4. environmental programs administered by the Department of Environment and Heritage Protection impact favourably on weed control programs administered by the Department of Agriculture and Fisheries and local governments, and
5. Federal, state and local government weeds programs are coordinated to maximise their achievements and to have a whole of government approach.

Our comments do not address the first point, but relate to the other four.

CSIRO has a long history in weeds RD&E and currently conducts considerable research into invasive plants and their management with specific focus on the deployment of biological control for challenging weeds impacting the extensive grazing industries, the wider environment and waterways in particular.

CSIRO has operated in Queensland for 40+ years working in close collaboration with the Queensland government RD&E efforts, currently delivered through the Biosecurity Queensland weeds group. CSIRO's tropical Weeds Management Team is co-located with BQ Weeds at the Ecosciences Precinct, Dutton Park, where we share major infrastructure, laboratory and office space. CSIRO and Queensland have a strong working relationship that provides a coordinated effort and significant outcomes, albeit in the context of highly constrained funding over the last decade.

Our comments/recommendations below are informed by this expertise, experience and history.

Evidence-based decision making

Knowledge of real or potential impacts from invasive organisms is critical for effective prioritisation of effort and assessment of management options. This is particularly so for invasive weeds where complex life histories and potentially long lived individuals add new challenges. In the case of the three weeds highlighted for this inquiry we do not believe there is sufficient quantitative information on triple bottom line impacts to effectively guide investments. This information is vital to guide decisions on the value or otherwise of different management approaches.

Recommendation: Collect relevant information (quantitative, wherever possible) on triple bottom line impacts of weeds that are the targets of management

Amalgamation of geospatial data on weeds and management in open-access platforms

Agencies within each state and territory, including Queensland, have geospatial databases on the distribution of weeds, and in some cases for management activities. Most of these data are collectively inaccessible (e.g. those collected by local government and NRM bodies). There is a need to link these data sets for better data access and analysis. The Atlas of Living Australia (ALA <http://www.ala.org.au/>), the national biological data geospatial portal, could now easily and cheaply achieve this and allow more powerful analyses of species distribution, and impacts. The ALA is a federally supported piece of national infrastructure built under NCRIS and EIS support. The ALA does not host data, which stays in the ownership of the relevant state agency, but allows public access to pool multiple data sources in real time and provides open source powerful analytical tools to analyse the data for drivers and patterns using all the nationally available environmental data layers. The ALA is already being used by the Federal Department of the Environment (*Caring for Our Country*) and local communities for monitoring and evaluation of actions (some on weeds), based on the MERI system, via online or smart-phone data inputs that are greatly enhancing citizen science in NRM. In this way, evaluation of actions and investments and even assessments of the benefits from actions for farming systems or the environment can be assessed. The ALA already has two portals dedicated to weeds:

- A weed biological control portal <http://root.ala.org.au/bdrs-core/wbiocont/home.htm> being used nationally and at state level to record distribution of weed biocontrol agents.
- A weed spotters portal for South East Queensland <http://www.ala.org.au/blogs-news/dial-w-for-weeds/>

ALA software is already available for providing open access to weed data and for assisting weed management outcomes in NSW. Specific portals can be easily created as required, and there could be considerable value in having a QLD-specific weeds portal on ALA that makes the relevant state-level data available to aid more coordinated RD&E. Where weeds data may have sensitivities, such data could be appropriately censored and annotated to indicate this.

Recommendation: Make relevant weeds and weed management data available through open access platforms to enable weed management RD&E investments and coordination

Critical importance of an integrated approach for weeds RD&E

In our view the management (including biocontrol) of these weeds (and others) needs to be placed within an appropriate ***integrated management framework***, with clear and realistic management goals and expectations stated up front (with stakeholder buy-in), to provide cost-effective prioritisation of interventions and enable appropriate future evaluation against these goals.

Studies of the costs and benefits or effectiveness of both invasive species RD&E and management are now well developed (e.g. Liu et al.2011) and continue to be important to facilitate sensible decisions about RD&E by funding organisations, policies developed by government agencies and management strategies

used by landholders. Weeds RD&E aims to develop and implement cost-effective management tools or systems that reduce, but not necessarily eliminate all weed-related impacts. It is also important to focus RD&E on the long-term solutions for widespread weeds, but noting that for some weed problems there will be no permanent solution.

Eradication is a highly politicised term in Australia and, while this is also an important prevention tool for new incursions, is rarely achieved; usually only where weeds are localised to a few 10's of hectares (Panetta, 2007, 2009).

The need for an integrated management approach as opposed to reliance on one particular tactic is particularly clear for the weeds highlighted here. Biosecurity Queensland has been pursuing biocontrol solutions for prickly acacias for many years, but with variable returns. Now we see a different, herbicide-based, approach adopted for this weed by land managers. Significant amounts of generic systemic herbicides (e.g. Graslan/Tebuthiuron) being applied in granular form across vast areas to try and bring prickly acacia under control, with some even promoting the possibility of eradicating this weed using this tactic. While this may reflect the desperation being felt by landholders in terms of combatting the impacts of this weed, the long-term sustainability of using such a tactic, for a weed that has a 10+ year seed survivability in the seedbank, needs careful consideration especially along watercourses. The non-target and persistent impacts of this tactic may need careful evaluation within a risk-cost-benefit framework that also appropriately takes into account the social, environment and economic dimensions.

An integrated, and possibly habitat-specific, management approach is needed for prickly acacia. The same is also true for giant rat's tail grass where fire and herbicide-based approaches have had variable success and where biological control may well contribute to an integrated management outcome.

Recommendation: Place RD&E within an appropriate integrated management framework, with clear and realistic management goals and expectations stated up front (with stakeholder buy-in), to provide cost-effective prioritisation of interventions and enable appropriate future evaluation of efficacy of management

Adequacy of capability into the future for weeds RD&E

The resources invested in weed RD&E in Queensland have declined in recent years, as elsewhere in Australia. The inevitable and unfortunate consequences of reduced and more fragmented funding for weeds RD&E are the ongoing critical decline in expertise and capacity in this area. At both a national and State level, the capabilities required to undertake multiple weed management programs based on biological control has until recently been under critical threat due to lack of resources. We are aware that Biosecurity Queensland has had to reduce overall effort in weed management research during this period.

Despite these challenges, there have been many ongoing successes against weeds in QLD (e.g. successful biological control projects against opuntoids, salvinia, alligator weed, water hyacinth, parthenium etc.). Some weed problems are manageable on a reasonable budget with good returns on investment, but this cannot be taken for granted with declining capability.

Recommendation: Ensure appropriate level of medium- to long-term funding is present to secure capability in order to effectively focus on weed management RD&E

Coordination of Federal, state and local government weeds programs

Australia has had over 28,000 exotic plants deliberately introduced for various agricultural and ornamental uses. Not all of these plants cause significant impacts, but many can take substantial time before the real cost is known. In addition exotic plant introductions have occurred through accidental or natural spread of

propagules to Australia. Collectively exotic weeds conservatively result in impacts in excess of \$6 billion/year.

In the case of biosecurity breaches, Australia's full biosecurity continuum involves border surveillance by the Federal government and post border responsibilities for surveillance and response by State, and local governments and industries. The reality is however, that post border detections of exotic plants that have established at very low densities is unlikely until they have become well established because priorities are always focussed on more pressing threats.

The national Weeds of National Significance (WONS) Program has been effective in arriving at a nationally agreed list of high priority weeds for active surveillance, eradication or management and in helping to prioritise research investments to areas of highest return. WONS historically also provided valuable coordination of efforts through support for coordinator positions, but this funding lapsed few years ago. Without coordination across research and management activities at all levels the pace of progress will, and has, suffered.

Recommendation: Finding a mechanism to achieve coordination through funding of specific coordinator roles will be important in achieving progress for these weeds.

In the specific context of new and emerging weeds at a State level, Australian science has explored various systems to identify which plants, currently at low density or not even present in the State, are likely to have wide distribution under current and future climates (Randall 2000, Anon 2006, Scott et al. 2009, Virtue 2010, Morin et al. 2013, van Klinken et al. 2013). This requires a comprehensive data set on the distribution and invasive characteristics of exotic plant taxa, both at the state and national level. Adoption of such systems would provide an evidence-based approach to listing and even prioritizing the importance of future weeds as the basis of some kind of "alert list" for the State. Consistent, objective and standardized criteria for predicting impact across sectors, however, do not yet exist.

Recommendation: Science can be used more effectively to develop an evidence-based weed listing for new and emerging weeds based on likely future distributions. Further research may allow this to also be based on predicted future impacts.

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We trust these comments will be useful in the Committee's deliberations. CSIRO is happy to provide further detail in interview if required.

Yours sincerely,

Dr. Anita Hill
Executive Director - Future Industries

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Contact: Dr Gary Fitt on telephone: [REDACTED]