Transition to Management Plan for Branched Broomrape

Primary Industries Standing Committee

27 March 2012

Prepared by the National Steering Committee for Branched Broomrape

This transition to management plan aims to contain branched broomrape while industries, businesses or individuals prepare and adopt risk management measures with a view to long term management of the weed.

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1 Context

Broomrapes are non-photosynthesising plants that grow parasitically on the roots of broad-leafed hosts. The branched broomrapes are a group of species that include several major pests of agricultural crops in Europe and the Middle East.

Branched broomrape (*Orobanche ramosa)* was discovered in 1992 near Bowhill in the Murray Mallee of South Australia. The small area of known infested land was fumigated with methyl bromide and monitored.

Following the discovery of additional infestations, the Standing Committee on Agriculture and Resource Management (SCARM) agreed to fund a national management and delimitation program at meeting 14 in August 1999. The national eradication program was established by Ministers at the Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) meeting 19 in March 2001 (Resolution No 3B).

The Primary Industries Ministerial Council continued to support the program and, at its 14th meeting in November 2008, agreed national funding of $7.583 million for a further three years until June 2012.

In addition to approved national funding, South Australia has contributed approximately $2m pa over 10 years.

It is important to note that as weeds are not covered by existing biosecurity agreements between governments and industries, particularly the Emergency Plant Pest Response Deed (EPPRD), there was no endorsed process or requirement for industry to contribute to the eradication program for branched broomrape.

An independent review of the national Branched Broomrape Eradication Program was released in May 2011. The Technical Review Panel comprised Mr John Burley (Director, Invasive Plants and Animals, Biosecurity Victoria) Chair, Mr Greg Fraser (Chief Executive Officer, Plant Health Australia) and Dr Dane Panetta (Principal Scientist, Biosecurity Queensland). The reviewers made eight recommendations:

Recommendation 1: That management of the branched broomrape incursion has a more realistic and achievable objective, based on consideration of technical feasibility, the relative benefits, costs and beneficiaries of further coordinated action and on the willingness of major beneficiaries to contribute to ongoing action.

Recommendation 2: That Containment plus Pursuit of Product and Property Branched Broomrape Free Status be pursued as the new objective for the branched broomrape in the current quarantine area and throughout all susceptible lands in Australia.

Recommendation 3: That by 1 July 2012 a national management plan for branched broomrape be developed and agreed to by all stakeholders. This would enable a smooth transition from the funding currently provided through the national Branched Broomrape Eradication Plan to the new Containment plus Product and Property Free option.

The National Management Plan for Branched Broomrape should include:

i. development of market access conditions; protocols for determining property- and product-free status;
ii. mechanisms for prevention of spread by machinery;
iii. a timetable for implementation of such mechanisms;
iv. protocols for determining area free status across uninfested parts of Australia to assure market access;
v. appropriate funding and resourcing mechanisms for implementation.
vi. surveillance mechanisms for branched broomrape in all potentially affected jurisdictions, which could require government funding.

Recommendation 4: That mechanisms to implement both the containment program and any changed funding arrangements required need to be a focus of the currently available funding until June 2012.

Recommendation 5: Assuming the foregoing occurs, that progress by 1 July 2015 be measured by:

i. Evidence of compliance with: a) requirements to clean machinery prior to movement from properties containing BBR and b) orders to control in critical infestations, e.g. satellites and those on the periphery of the containment line;
ii. Evidence of containment plus levels of adoption of property- and product-free status for producers whose marketing is potentially affected by the risk of contamination by branched broomrape;
iii. The success of the containment approach in limiting BBR infestations to properties within the currently infested area (i.e., as known in 2011);
iv. Improvements to the infestation status of land within the currently infested area;
v. The level of commitment to funding the program by actual and potentially impacted industry sectors.

Recommendation 6: That any ongoing program aimed at containment and assuring market access be funded principally by the affected parties benefiting from this action.

Recommendation 7: That the South Australian Government ensure that compliance and positive incentives are maintained to minimise the risks posed by non-agricultural stakeholders.

Recommendation 8: That the following steps be followed as part of the transition process:

i. Maintain the QA under existing SA legislation
ii. Transition from an eradication to a containment program, with the aim of moving to a national management approach involving all potentially affected stakeholders
iii. Conduct a thorough beneficiary analysis
iv. Consult with specific industry /commodity representative bodies

v. Engage Plant Health Committee's sub-committee on Domestic Quarantine and Market Access Working Group, to identify what data is needed to facilitate domestic market access for goods produced within the QA
vi. Develop a plan to facilitate domestic market access
vii. Confirm with AQIS export certification requirements for branched broomrape.

Some of the other key findings of the review included:

- The program has been conducted in a professional and diligent manner. This has mitigated the spread and impact of this weed both within SA and nationally.
- Eradication was not considered to be technically feasible within the constraints of current or potential future investment in the program.
- The beneficiaries of the program are widely distributed across industries but significant public benefits that support continued government investment in the absence of an industry partnership cannot be identified.
- There should be a transition to another form of management with "Containment plus Pursuit of Product and Property Branched Broomrape Free Status" as the preferred arrangement for future Branched Broomrape management.
- Containment should be a long term commitment by government and all stakeholders, with government funding subject to transition and adaptation over time.

There had been four previous independent reviews of the program (2003, 2004, 2005 and 2008) that consistently recommended that eradication was technically feasible and an appropriate response to Branched Broomrape.

The current review was endorsed by the National Management Group (NMG) for Weeds in August 2011. The NMG for Weeds was responsible for oversighting this nationally funded eradication program. As a result, the focus for the national program will be to ensure a smooth transition from an eradication focus to ongoing management.

The National Biosecurity Committee has developed draft guidelines for National Transition to Management Arrangements[1]. The Scope recommends the following for a pest that is no longer feasible or beneficial to eradicate:

(a) The objective of transition to management programs is to enable affected industries, businesses or individuals to prepare and adopt risk management / impact mitigation measures with a view to long term management of an established nationally significant pest/disease that is not eradicable. This may be when a pest/disease is first detected, or

[1] National Biosecurity Committee, Draft National Transition to Management Arrangements (Version: 15 December 2011).

during the course of an eradication program, and it is determined that eradication is no longer feasible or cost beneficial.

(b) For the purpose of a national transition to management program, 'transition to management' is defined as being of short-term (1-3 years) duration, with the aim of developing and implementing alternative strategies or preparations for on-going management of the pest/disease as established.

(c) Restricting the pest/disease to a defined geographical area(s) or suppressing its population / spread potential for an appropriate period within the program should be done, if feasible, where this activity secures the space within which ongoing management measures can be developed and implemented.

The development of this transition to ongoing management plan was overseen by a National Steering Committee, chaired by Biosecurity SA with members from Commonwealth and State Government agencies and Plant Health Australia. The Committee prepared the plan for implementation in July 2012 in order to minimise the production and market impacts of branched broomrape in Australia. The National Steering Committee considered options for domestic management of branched broomrape to limit the spread of branched broomrape to new areas.

1.1 Objective

It has been nationally agreed that branched broomrape cannot be eradicated. National cost-sharing agreements only provide for eradication programs. Once a pest is established in Australia, its management becomes an issue for jurisdictions and industries, although some national funding may be available for jurisdictions to establish arrangements for the transition to management.

The objective of this transition program is to contain branched broomrape while industries, businesses or individuals prepare and adopt risk management measures with a view to long term management.

Key elements required to effectively transition to management include:

i. Development of appropriate domestic and international quarantine protocols and certification procedures;
ii. Development/implementation of appropriate state and territory legislation required to mitigate spread;
iii. Identification and consultation with industries and stakeholders potentially impacted by moving from eradication to management;
iv. Agreed surveillance procedures to underpin Branched Broomrape freedom to satisfy market requirements;
v. Development of appropriate risk mitigation procedures that can be used by stakeholders such as decontamination;
vi. Development of an appropriate, ongoing funding model and governance arrangements and;
vii. Implementation of an ongoing, national management program by industry and government stakeholders.

The National Steering Committee assessed scenarios to limit the spread of the weed from the current quarantine area to minimise production impacts and ensure that market access and trade of agricultural products are not disrupted or overly restricted. Issues considered by the Committee include:

a. The transition phase of the program should mitigate the spread outside the current infested area while producers and industries develop and implement measures for ongoing management of risks.
b. As eradication is no longer the objective, the future approach should allow for higher tolerance of the risks of spreading broomrape than existed during the eradication phase of the program.
c. Pathways for spread of branched broomrape have been reassessed based on a better understanding of risks gained through the eradication program. Measures to limit spread should focus on highest risks. The provisions in the current Code of Practice for Branched Broomrape will be reviewed to allow low risk commodities to trade freely. This is consistent with the regulatory approach for other established nationally significant pests that are not eradicable.
d. Natural spread of branched broomrape is slow in the absence of human activity. Movement of host-rich hay and machinery may need to be regulated, but the risks of spreading broomrape with cereals, canola, washed potatoes, onions and livestock are comparatively low.
e. Initial concerns about the threat to international markets for major commodities, including cereals and hay, have not eventuated. The only markets that have requested certification for broomrape freedom relate to small seed exports. Producers will need to satisfy any specific requirements for market certification that might be imposed. Biosecurity SA will work with industries on protocols as required.
f. Experience gained through the program has demonstrated that branched broomrape can be managed effectively in most crops. There have been no observed production losses within the quarantine area, although its potential impact on susceptible vegetable crops such as carrots remains a concern. There have been no environmental impacts on native species.

Under current arrangements, branched broomrape is managed within South Australia as a pest under plant health legislation *(Plant Health Act 2009*), although it is also a declared weed under the *Natural Resources Management Act 2004* (SA).

1.1.1 Transition phase

It is proposed that the transition to management plan will operate for two (2) years to allow industries and individuals to develop and implement their own farm biosecurity plans. During the transition phase, Biosecurity SA proposes to maintain restrictions on the movement of high risk products and machinery, but lower risk products will be able to move freely. These arrangements ensure that

branched broomrape will remain under official control as defined by the International Plant Protection Convention.

As part of the new program, restrictions will apply only to high risk commodities on the currently known infested properties. These properties will remain in quarantine under a Ministerial notice issued under the South Australian *Plant Health Act 2009* and will be required to comply with the requirements of a regulated but modified "*Code – Control of Branched Broomrape*" focused on managing high risk products and machinery. Other properties that are currently under quarantine, but are not infested or where broomrape has not been detected through surveys over the last 12 years[2] will be released from quarantine.

Limited surveillance of infested properties will be conducted to support affected landholders with accreditation of products to support market confidence while the program transitions out of eradication. Annual surveys across the region conducted as part of the eradication program to detect new infestations and maintain the integrity of the quarantine area will cease. Instead, it is proposed to conduct a limited survey in three (3) years to redefine the distribution of branched broomrape at the end of the transition program. This will indicate whether branched broomrape is likely to spread widely or can be satisfactorily confined to the Mallee.

The National Steering Committee reviewed the risks of broomrape spread for each of the commodities produced in the affected region. Currently only Queensland imposes restrictions, which apply to the movement of potatoes. As the potatoes are washed and bagged, the requirement for this restriction is being reviewed with Queensland. There are no restrictions on the movement of machinery or products across state borders. Now that the eradication program will cease, other domestic jurisdictions will need to determine whether they need to regulate the movement of high risk products coming from areas where broomrape is known to occur. However, it should be noted that excessive domestic regulation is likely to influence international markets with adverse consequences for all Australian commodities.

1.1.2 Management phase

The transition phase will end in June 2014. By this time, all properties will be released from quarantine and branched broomrape will cease to be regulated as a declared pest under the *Plant Health Act 2009* (SA). It will continue to be regulated as a declared weed in South Australia under the *Natural Resources Management Act 2004* (SA).

The spread of branched broomrape in Australia will be mitigated through existing programs focused on farm biosecurity planning and industry codes of practice with decisions based on each industry's assessment of risk. This ensures that

[2]Process for release from quarantine endorsed by the Australian Weeds Committee at AWC 8 Item 12.3 "Branched Broomrape Eradication Program – proposed mechanism for release of paddocks from quarantine"

appropriate levels of resources are allocated and targeted to protect at risk industries.

Product certification arrangements will be based on market requirements. Primary producers will be responsible for meeting any market requirements for produce. Biosecurity SA will seek to implement Interstate Certification Assurance arrangements as required to facilitate domestic trade by accredited producers with Plant Health Assurance Certificates.

Property freedom certification will be an option for consideration by industries to meet any future market requirements or opportunities.

1.2 Description of pest/disease

Broomrapes are non-photosynthesising obligate parasitic plants that derive their nutrient requirements by attaching to the roots of broad-leafed herbaceous hosts. Unlike other weedy species of pest plant, broomrapes cause direct effects on host plants through parasitism rather than by competition for resources; non-hosts are unaffected.

While most species of *Orobanche* have no economic impact, several including: *O. ramosa* and *O. aegyptiaca* (main hosts include tomato, tobacco, hemp, eggplant and lentil); *O. cumana* and *O. cernua* (sunflower, tobacco and tomato)*, O. crenata* (faba bean, pea and lentil)*, O. foetida* (faba bean, alfalfa and trefoil) and *O. minor* (alfalfa, clover and trefoil) are significant pests on commercial crops (Parker, 2009; Parker and Riches, 1993).

At the time of its discovery in 1992, the species of branched broomrape in SA was identified as *Orobanche ramosa.* This species has a mainly Mediterranean distribution extending through central Europe, and has been introduced into South Africa, Central America and the USA. It has a wide host range and is an economically significant pest on host crops in the families Solanaceae, Brassicaceae and Fabaceae (Parker and Riches, 1993). Broomrapes affect both productivity and quality through their parasitism of the host plant. Furthermore, a number of countries include broomrapes on their quarantine lists as prohibited species for imported products. On this basis, an aggressive approach to eradicate the new infestation was agreed by Ministers as the appropriate response.

Two other species of broomrape also occur in Australia: *O. cernua* var. *australiana* which is a native species and *O. minor* which is common in pastures; however, neither of these species are considered to be significant pests. A further record from the SA herbarium of *O. ramosa* subsp. *mutelii* was based on a plant collected at Glenelg in 1911 (Barker, 1986; Black, 1912). Recent taxonomic and host range studies on branched broomrapes support reclassification across the genus; *O. ramosa* subsp. *mutelii* has been reclassified as *Phelipanche mutelii*. This species is a native of Spain where it is not considered as a pest (Prider, 2011).

At this stage, the South Australian Herbarium will continue to name the Australian strain of branched broomrape under a broad classification as *O. ramosa* without infraspecific identification (Barker, pers. comm.). The Australian strain of branched broomrape has a wide host range based on greenhouse testing of 97

broad-leafed crop, native and weed species. Of these, 45 were definite hosts, 11 likely, 4 possible, while 37 were non-hosts. Significant hosts include canola, chickpea, faba bean, carrot, cabbage, tomato, eggplant and some legume pasture species. However, potatoes (with the possible exception of the cultivar 'Shine') and cucurbits were not hosts, which is consistent with the host range reported for *P. mutelii.*

The potential for international markets to restrict the import of non-host commodities, such as cereals or hay, due to concerns about possible risks of contamination with broomrape that has grown on broad-leafed weeds within the crop has been a major concern for producers.

1.3 Chronology of events to date

1911 – Branched broomrape (*Orobanche ramosa* subsp. *mutelii*) recorded at Glenelg in South Australia[3]. There have been no further records of branched broomrape from Glenelg.

1992 – Branched broomrape, identified as *Orobanche ramosa,* was found on farmland near Bowhill in the mallee region of South Australia. Surveys showed that the infestation was restricted to a few properties. The infestation was fumigated and monitored.

August 1999 – Following the discovery of additional infestations, the Standing Committee on Agriculture and Resource Management (SCARM) agreed to fund a national management and delimitation program at meeting 14.

March 2001 – The eradication program was established by Ministers at the Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) meeting 19 (Resolution No 3B).

2001 -2005 – Industry funded research on managing branched broomrape, jointly funded by the Grains Research and Development Corporation and Horticulture Australia Ltd.

2002 - 2012 – The South Australian Government commits to invest in a 10 year program seeking to eradicate branched broomrape. South Australia has contributed an additional $2m pa over 10 years. In 2011/12, SA will contribute $1.955 m in the final year of the program.

2003, 2004, 2005 and 2008 – Independent reviews of the program consistently recommended that eradication was technically feasible and an appropriate response to Branched Broomrape.

November 2008 The Primary Industries Ministerial Council continued to support the program and, at its 14th meeting, agreed national funding of $7.583 million for a further three years until June 2012.

[3] State Herbarium of South Australia. Details are: "S. Dixon (Herb. J.M. Black)" s.n., Prior to or in 1911, South Australia, Southern Lofty region. "Sandhills nr. Glenelg. Observed by him during the last year or two. Grows near *O. australiana*. Sent to Kew, Oct. 1911 "Annotations by Black in his detailed dissection notes include: "corolla lilac (light)" Sheet number AD 97306334.

March 2011 – An independent review of the branched broomrape review program concludes that eradication is no longer technically feasible within the financial constraints facing the program.

August 2011 – The National Management Group for Weeds endorses the review recommendations and establishes a National Steering Committee to oversee the development of a plan for the transition to management of branched broomrape. It is also agreed that the existing national funding of $2.6 million and State initiatives of $1.95 million will continue until 30 June 2012 to support elements of the current program and provide for transition to management.

July to December 2011 – The eradication program completed operations and surveys of the quarantine area (209,685 Ha) in 2011. The surveys discovered 28 new infested paddocks (total infested 852) and 5 new infested patchers on roadsides (total infested 72) within the quarantine area. Most landholders have continued to manage broomrape effectively on their properties with it reoccurring on only 11.5% of infested land in 2011; however, this was above the target for eradication which required a recurrence rate of less than 8%.

September 2011 to February 2012 – Development of a transition to management plan by a National Steering Committee. This has included extensive stakeholder consultation.

2 Governance

2.1 Affected Parties

Branched broomrape has potential to affect a complex range of stakeholders. The reviewers concluded that beneficiaries of the program are widely distributed across industries but significant public benefits that support continued government investment in the absence of an industry partnership cannot be identified. Some of the potential stakeholders include:

- Government as regulators and funders of programs to control spread of branched broomrape.
- Primary producers and other owners of land infested with branched broomrape through regulatory controls on movement of products to limit spread
- Primary producers of susceptible vegetable crops, such as carrots, lettuces, tomatoes etc
- Primary producers of crops for markets that require specific certification of freedom from broomrapes. To date the only markets that have required this certification are for small seed exported to South American countries for sowing.
- Commodity marketers based on quarantine status of broomrapes in some international markets should they impose restrictions due to concerns about contamination.
- Natural resource management boards, catchment boards and local governments with regulatory responsibility for managing declared weeds and regional development.

- Infrastructure managers and contractors who operate and move machinery from infested land.

The eradication program was largely funded by Governments with both national and state components. Affected landholders contributed to the program in-kind by managing the weed on their own land. Grains and horticultural industries contributed funding for research to develop strategies to manage the branched broomrape in crops. While the review found that there were private and industry benefits from the eradication program; they could not identify significant public benefits to the wider community. In this context it is important to note that as weeds are not covered by existing biosecurity agreements between governments and industries, particularly the Emergency Plant Pest Response Deed (EPPRD), there was no endorsed process or requirement for industry to contribute to the eradication program for branched broomrape.

2.2 Domestic regulation of branched broomrape

Branched broomrape is considered a threat to production of susceptible broad-leafed agricultural crops. Experience gained through the program suggests it has few environmental impacts on native plant species. Broomrapes pose no human or animal health risks related to consumption of contaminated produce.

Branched broomrape is declared or proclaimed under legislation in most jurisdictions, with the exception of the Northern Territory and the Australian Capital Territory, specifically to prevent its spread to new regions. However, there is little consistency in the controls or the application of state plant quarantine legislation; as follows:

2.2.1 South Australia

Branched broomrape is managed within South Australia as a declared pest under the *Plant Health Act 2009* (SA) using Ministerial powers to establish a quarantine area. All landholders within the quarantine area are required to comply with the "*Code – Control of Branched Broomrape*"[4], which is adopted through the *Plant Health Regulations 2009*. The Code establishes crop specific protocols to prevent the spread of broomrape. During the eradication phase of the program, the protocols applied to all crops, including those that pose only a relatively low risk of spread.

Branched broomrape is also a declared weed under the *Natural Resources Management Act 2004.* The State's management objectives for broomrapes are detailed in the Government's declared plant policy[5]. The NRM Act is administered by regional NRM Boards in accordance with regional priorities. Branched

[4] Code – Control of Branched Broomrape, Number 7, October 2010, Issued by the Minister for Agriculture, Food and Fisheries
http://www.pir.sa.gov.au/biosecuritysa/branched_broomrape/procedures_and_protocols/code_-_control_of_branched_broomrape

[5] Government of South Australia, Declared Plant Policy – Broomrapes (*Orobanche* spp.)
http://www.pir.sa.gov.au/__media/pdf/pirsa_internet/biosecurity/nrm_biosecurity/pest_weed_policies/declared_plants_2/broomrape_policy.pdf

broomrape is restricted to the region administered by the SA Murray Darling Basin Natural Resources Management Board (SA MDB NRMB). The Board's current regional plan[6] prioritises branched broomrape as a target for eradication within the region in support of the national objective. This plan will require a review, due to the national decision to move away from the objective of eradication.

2.2.2 Victoria

Orobanche ramosa is declared as a schedule 1 state prohibited weed under the *Catchment and Land Protection Act 1994*[7]. Under the CaLP Act all land owners have legal obligations regarding the management of declared noxious weeds and pest animals on their land. The Act includes a general restriction on bringing branched broomrape into Victoria.

Branched broomrape (*Orobanche ramosa*) is also declared as an exotic disease under the *Plant Health and Plant Products Act 1995*[8]; however, the Victorian Department of Primary Industries, Plant Quarantine Manual (v22) made under this Act does not include any reference to branched broomrape for the movement of products to Victoria.

2.2.3 New South Wales

Orobanche species, with the exception of the native *O. cernua* var. *australiana* and *O. minor,* are declared under the *Noxious Weeds Act 1993*[9], which requires that the plant must be eradicated from the land and the land must be kept free of the plant. Broomrape is not a declared pest or disease under plant health legislation (*Plant Diseases Act 1924).*

2.2.4 Queensland

Branched Broomrape (*Orobanche ramosa*) is regulated as a pest under the *Plant Protection Act 1989* with specific requirements applied through the *Plant Protection Amendment Regulation (No. 4) 2008*[10]. This Regulation restricts the importation into Queensland of products from within 50 km of a known infestation; importation is allowed only with conditions and if the inspector is satisfied that it will not pose a risk of spreading broomrape. To maintain this arrangement once the program transitions from eradication to management

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[6] South Australian Murray-Darling Basin, Natural Resources Management Board Regional NRM Plan Volume 3: Regulatory and Policy Framework http://www.samdbnrm.sa.gov.au/Portals/9/Publications%20and%20Resources/Reports,Plans%20&%20Policies/volume%203%20regularitory%20policy%20and%20frame%20work.pdf

[7] Victoria Government Gazette, No 399, Friday 1 October 2010, p22 http://www.gazette.vic.gov.au/gazette/Gazettes2010/GG2010S399.pdf

[8] Victoria Government Gazette, No S137 Tuesday 26 September (Special Gazette) http://www.gazette.vic.gov.au/gazette/Gazettes2000/GG2000S137.pdf

[9] Government Gazette of the State of New South Wales, Week No. 34/2011 Friday 26 August 2011 p5264 http://www.nsw.gov.au/sites/default/files/Government_Gazette_26_August.pdf

[10] *Plant Protection Amendment Regulation (No. 4) 2008*. Subordinate Legislation 2008 No 134, http://www.legislation.qld.gov.au/LEGISLTN/SLS/2008/08SL134.pdf

would be unworkable as knowledge of where broomrape may be will be unavailable.

2.2.5 Western Australia

Broomrapes including branched broomrape (*Orobanche ramosa; Orobanche spp.* except *O. minor*) are declared weeds under the *Agriculture and Related Resources Protection Act 1976*[11], which prohibits movement of plants and contaminated products and machinery, and aims to eradicate any infestations that may establish in the state.

Branched broomrape is not declared as a disease under plant health legislation (*Plant Diseases Act 1914*).

2.2.6 Tasmania

Orobanche species, other than *O. cernua* var. *australiana* and *O. minor,* are both declared weeds under the *Weed Management Act 1999*[12] and declared pests under the *Plant Quarantine Act 1997*[13]. The importation, sale and distribution of declared species of broomrape, and products that may be contaminated, is prohibited in Tasmania.

2.3 Program management

It is proposed that the management of branched broomrape will continue as a State program run by Biosecurity SA under the *Plant Health Act 2009* during the transition to management phase. This phase of the plan will operate for two years to allow industries and individuals to develop and implement their own farm biosecurity plans. During this period, Biosecurity SA proposes to maintain restrictions on the movement of high risk products and machinery, but lower risk products will be able to move freely. These arrangements ensure that branched broomrape will remain under official control as defined by the International Plant Protection Convention.

2.3.1 Quarantine arrangements

It is proposed during the transition phase that a quarantine area will be maintained by Ministerial notice issued under s8 of the *Plant Health Act 2009* (SA); however, the quarantine will only apply to those properties where broomrape is known to occur. As a result, affected landholders will continue to

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[11] Western Australian Government Gazette, Perth, Tuesday, 23 December 2008, No. 225 p5499 http://www.slp.wa.gov.au/gazette/gazette.nsf/a391d13f7e4e0a8048256bdf00165b3e?CreateDocument

[12] Broomrape - Statutory Weed Management Plan, *Orobanche* species (excluding *O. minor* and *O. cernua* var. *australiana*) (approved 30 August 2003; amendments approved 21 June 2011). http://www.dpipwe.tas.gov.au/inter.nsf/Attachments/LBUN-8EZ2GK/$FILE/Broomrape_WMP_2011.pdf

[13] Tasmanian Government Gazette, No. 21 196, Wednesday 16 November 2011 p1694 http://www.gazette.tas.gov.au/editions/2011/november_2011/21196_-_Gazette_16_November_2011.pdf/

have a prescribed encumbrance on their land titles under the *Land and Business (Sales and Conveyancing) Regulations 2010.*

All other properties within the current quarantine area, where broomrape has either never been detected, or where broomrape has not been detected through surveys over the last 12 years, will be released. As a result of these changes, the current quarantine area for branched broomrape will reduce from 209,689 Ha to approximately 107,000 Ha on 1 July 2012 with the release of approximately 100,000 Ha of un-infested or qualifying land (Annex 1). General signage that identifies the broad quarantine area will be replaced with property based farm biosecurity signs. The new quarantine area will be established as soon as possible after 1 July 2012.

It is proposed that the regulated *Code – Control of Branched Broomrape* will be revised in accordance with the new objective. Restrictions will apply only to properties remaining in quarantine and these will be focused only on products and machinery that pose a high risk of spreading branched broomrape. All landholders and infrastructure managers will be required to comply with regulations relating to ground engaging equipment from infested land. Biosecurity SA will continue to provide a service to decontaminate machinery from infested land. In addition, an accreditation process established by the eradication program for landholders to conduct their own decontamination of machinery will continue.

Biosecurity SA will not require landholders to eradicate branched broomrape on their properties under the provisions of the Plant Health Act. No further resources will be allocated by Biosecurity SA towards eradicating branched broomrape in native vegetation, roadsides, residential properties and other non-productive environments.

Primary producers on quarantined properties where infestations occur within the cropped area of paddocks will be required to manage high and medium risk commodities, and machinery in accordance with the *Code – Control of Branched Broomrape* to minimise the risk of domestic spread of branched broomrape. Primary producers on land where infestations occur outside the cropped area will have an option of fencing off infested areas with a buffer.

Quarantine restrictions on the remaining infested properties will be removed during 2013/14 as the program moves to routine management. The declaration of branched broomrape as a declared pest under the Plant Health Act will be rescinded; however, it will continue to be regulated as a declared plant under the Natural Resources Management Act.

Natural Resources Management (NRM) Boards that administer the NRM Act will be consulted on these changes and will implement measures to control branched broomrape in accordance with the state declared plant policy and regional priorities. The state government policy objectives for broomrapes will be reviewed as a result of the changed focus for the national program. Regional plans for NRM Boards in South Australia will also need to be revised accordingly.

2.3.2 Communication

Biosecurity SA will coordinate a national industry awareness program in partnership with Plant Health Australia. The objective of the awareness program will be to inform industries of the changed quarantine approach and the need to implement property-based biosecurity plans to minimise the risk of introducing branched broomrape into production areas. Biosecurity SA will consult with Plant Health Australia and Animal Health Australia on incorporating branched broomrape into their existing farm biosecurity programs.

Information on managing branched broomrape from the eradication program will be available from the Biosecurity SA website.

2.3.3 Surveillance

It is proposed that the general surveillance program that underpinned the eradication program will cease. Annual surveys across the region to detect new infestations and maintain the integrity of the quarantine area will not be conducted. No further work will be conducted to delimit the distribution of branched broomrape within the region.

Limited surveys will be conducted, focused on quarantined farming properties during the transition phase to assist with accreditation of products to support market confidence and where properties may qualify for release after 12 years of freedom. If branched broomrape is discovered as part of these certification surveys, then producers will be required to take risk mitigation measures appropriate for the commodity and market. For low risk crops, the program will work with landholders to exclude the infested patches within the paddock from the harvest. During the 12 year eradication program, branched broomrape was rarely discovered in cropped paddocks.

A limited general survey focused on the boundary of the current quarantine area is planned after three years to determine the spread of branched broomrape during the transition to management phase.

2.3.4 Product freedom

The focus of the program will be on supporting primary producers in establishing protocols for commodities and certifying product freedom.

Landholders remaining under quarantine will be required to comply with a revised "*Code – Control of Branched Broomrape*" regulated under the *Plant Health Regulations 2009* focused on managing the movement of high and medium risk products and machinery. The revision of the Code will be overseen by the National Steering Committee.

Experience has shown that the risks of branched broomrape contamination can be managed through systems approaches tailored for each commodity that combines crop selection, herbicide use, harvesting methods and post-harvest treatments. It is anticipated that protocols and Interstate Certification Arrangements (ICAs) should satisfy domestic market requirements for most commodities. ICAs should be developed once plant health regulators clarify

jurisdictional requirements. Biosecurity SA will update protocols for primary producers to meet the requirements of domestic and international markets as required. This would allow accredited producers to issue Plant Health Assurance Certificates under a process endorsed by plant health regulators.

Once the program moves into the management phase of the program, movement of all products from the area will be unregulated. Managing the risk of spread will driven by market requirements based on production protocols and product-freedom certification. It will be a producer's responsibility to implement industry codes of practice and certifications to meet market requirements for their products.

2.3.5 Property freedom

Certification of property freedom will not be required during the transition phase of the program. Quarantine arrangements for infested properties will continue under the current arrangement. Properties where branched broomrape has not been found or there has been 12 years without further detection will be released from quarantine.

Guarantees of property freedom may not be maintained once the program progresses to routine management as resources are not available to conduct annual surveys. The benefits of establishing and funding arrangements for property freedom certification will be an issue for industries to determine.

As broomrape cannot be eradicated, Biosecurity SA will not enforce a requirement to treat infestations on non-arable land, including public land, transport corridors and areas of native vegetation. Future management in public land will be an issue for consideration during the review of the state's declared plant policy on broomrape and by regional NRM Boards.

Once quarantine restrictions are removed, maintaining property freedom will be an issue for individual land owners and industry to manage through hygiene and other standard practices under farm biosecurity plans.

2.3.6 Managing domestic trade

Now that the eradication program will cease, domestic jurisdictions will need to determine whether they need to regulate the movement of high risk products coming from properties where broomrape is known to occur.

The National Steering Committee has reviewed the risks of broomrape spread for each of the commodities produced in the affected region. This review should form the basis for decisions on interstate movement of products. Only a few commodities from the region are considered high risk (host-rich hay and small seeds).

Although most states have general regulatory statements for branched broomrape, only Queensland has specific regulations that currently restrict the movement of potatoes from within 50 km of known infestations. Biosecurity SA

will seek to have this restriction reviewed, based on protocols for washed potatoes which is assessed as low risk, to allow trade to recommence.

During the transition phase, movement of high risk commodities, including host-rich hay and small seeds, produced on properties where branched broomrape occurs within the cropped area would be restricted. Movement of these products out of the quarantine area will be subject to conditions and require approval from an inspector (Annex 2).

Protocols and certification arrangements will be developed to enable domestic trade in medium risk commodities, including cereal hay and straw, unwashed potatoes and root vegetables, which would be based on a combination of pre- and post-harvest management practices through the "*Code – Control of Branched Broomrape*".

Under the proposed arrangement, low risk commodities, including cereals, canola and most horticultural products would be unregulated and able to move freely during transition.

During the transition phase, Biosecurity SA will maintain quarantine restrictions to restrict trade in high risk commodities from infested properties. It is recognised that the quarantine boundary regulated in SA may not align with interstate requirements; however, it is not appropriate to broaden the State regulated quarantine area to accommodate this. It should be noted that excessive domestic regulation is likely to influence international markets with potentially adverse consequences for all Australian commodities.

Quarantine restrictions will be removed from all properties during 2013/14 as the program transitions to management. Risks will be managed through product certification. Biosecurity SA will assist by accrediting producers and certifying crops as required under standard cost-recovery arrangements. Primary producers will be responsible for meeting the market specifications for their products.

2.3.7 International trade

While many countries prohibit the importation of *Orobanche* species, it has not been raised as a certification requirement by international trading partners for the main commodity exports, including cereals and hay. This may reflect the proposed end uses for these products in these markets as there is little risk that products for human or animal consumption will result in new infestations. The only situations where freedom from broomrape has been required related to small seed exports for South American countries where the end use was for sowing.

The Department of Agriculture, Fisheries and Forestry (DAFF) will inform the International Plant Protection Convention of changes in the management of branched broomrape in Australia. The proposed arrangement complies with the definition of the pest remaining under official control during the transition phase. It is not expected that this change in status will affect international markets.

Biosecurity SA and DAFF will work with international marketers on protocols to address international market requirements for products. It will be the primary producer's responsibility to meet the market requirements for any product.

Even so, there is a risk that some commodity marketers will simply seek to avoid any market issues by not sourcing products from within the known quarantine area. Biosecurity SA and DAFF will continue to provide information so that marketers are aware of production protocols, risk assessments and certification arrangements.

2.3.8 Review of the transition program

It is proposed that the regulated approach will continue for 2 years after which a survey of the boundary of the known quarantine area will be conducted and the transition program will be reviewed.

It is anticipated that by this time, the quarantine notices on known properties should be removed as, without general surveillance, the known distribution of branched broomrape will not necessarily reflect the actual distribution of branched broomrape in Australia.

If no market issues arise during the 2 year transition that require significant changes to the way broomrape is managed, any ongoing management will become a normal commitment for South Australia.

3 Risk Assessment

The purpose of the transition to management program is to manage the risks of further spread of branched broomrape while industries, markets and regulators adapt to the new arrangement recognising that branched broomrape cannot be eradicated and that there will be some spread over time. It should be noted that there have been no observed production impacts or market assurance problems from branched broomrape during the 12 year eradication program.

3.1 Pathways for spread of branched broomrape

As branched broomrape can affect a wide range of broad-leafed plants, the risk assessment includes an assessment of the spread pathways in products and on machinery; the potential for direct production impacts on crops; market restrictions arising from contamination in non-host crops; and the potential for impacts on native vegetation.

The national eradication program assessed and reviewed the risk pathways for spread of branched broomrape (Correll, 2006). The main risks arise through the movement of contaminated commodities and machinery from infested areas. However, the risks differ for each product. In non-hosts (eg. wheat, barley or oats), normal crop management practices including control of broad leafed weed hosts, differences between the height of broomrape plants and the cutting height of the grain crop, and the threshing and cleaning processes ensure that the risks of contamination are low. In potatoes, there is a risk from contaminated soil adhering to tubers that can be eliminated through washing. Risks are higher in

cereal hay as broomrape plants are more likely to be harvested; however, this risk can be significantly reduced by managing broad-leafed weeds.

Strategies to mange these risks were incorporated into the current *Code – Control of Branched Broomrape* with the objective of maintaining high levels of control over the movement of products and machinery to support the eradication goal.

As eradication cannot be achieved, the requirement for high levels of regulatory control over all products is reduced. As a consequence controls on low risk pathways and commodities will be removed from the revised code. It is not reasonable or appropriate to maintain these controls under a normal management regime.

Protocols will be developed for other products to meet domestic and international trade requirements. Only high risk products, including host rich hay and small seeds, will be restricted from quarantined properties.

3.2 National interest

The national eradication program for branched broomrape was established by the Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) meeting 19 (Resolution No 3B) in 2001. The program has been continued by Primary Industries Ministerial Council (PIMC) as an *ad hoc* program outside the existing deeds with industries. The industry deeds do not provide for the eradication of weeds.

The National Environmental Biosecurity Response Agreement (NEBRA) identifies national significance criteria to support continued government investment in eradication programs. In the absence of industry agreements on weeds, the NEBRA provides guidance on national significance under the following criteria.

3.2.1 Environment

This national significance criterion covers the projected impacts of a pest or disease outbreak on the environment if the pest or disease was to realise its full potential range in Australia.

The host range of branched broomrape is wide and includes some native species, including native daisies and Sturt's desert pea. However, there is no evidence that broomrape poses a significant risk to those species. There have been no observed impacts on the survival of these species at sites where broomrape is present.

3.2.2 People, including social amenity and human infrastructure

This national significance criterion is concerned with the impacts of pests and diseases on people, including: the inconvenience to people and society caused by the pest or disease; the impacts on human infrastructure.

Branched broomrape does not pose any risks to people, social amenity or human infrastructure.

3.2.3 Business activity

This national significance criterion is concerned with the economic impacts of pests or diseases on business costs or profitability. A pest or disease will meet this national significance criterion if an outbreak is likely to result in: substantial increases in business costs; or a substantial loss of production or business opportunities for an extended period; and the pest or disease is not able to be managed under a pre-existing cost-sharing arrangement.

3.2.3.1 Production impacts

Host range studies conducted by the national eradication program have confirmed that the Australian strain of branched broomrape can host on at least 60 broad-leafed plant species. However, yield losses have never been observed during the eradication program. The most common host encountered during the program is cretan weed (*Hedypnois rhagadioloides*) which is common in sandy areas within the current quarantine area. These sandy areas also appear to favour branched broomrape.

An assessment of the potential economic impacts of branched broomrape on production found that eradication or containment provided similar net benefits of approximately $340m over 30 years (Ferris, 2010a). The assessment assumed that branched broomrape spread was uninhibited reaching 100% of host crops within 60 years; no production controls were applied to crops which reach their maximum loss 15 years after infestations establish; and, susceptible crops suffered a maximum of 35% yield loss.

Control options are available for production of some susceptible crops. Group B herbicides provide an effective control measure where host varieties are sufficiently tolerant to a registered herbicide. Growers with canola rotations can manage branched broomrape effectively by selecting Clearfield® canola.

An awareness program will be required to advise producers of susceptible vegetable crops about measures to prevent the introduction of branched broomrape through their farm biosecurity plans.

Branched broomrape does not host on grasses, including cereals and hay, or tree crops. While broomrape does not pose a production risk for these crops, there was concern that its seed might contaminate produce at trace levels. In non-hosts, control is readily achievable through weed control and is consistent with best practice production methods.

There are no direct impacts on livestock production.

3.2.3.2 Market impacts

Branched broomrape contamination of non-hosts arises through the growth of branched broomrape on broad-leafed weeds. Broomrape contamination can occur at very low levels. The only risks in commodities relate to the spread of broomrape; there are no health or quality implications from contamination. Consistent with many pests and diseases, there are no tests to guarantee freedom of products.

There have been few domestic markets impacts during the eradication program. The program redirected commodities produced on land where broomrape was discovered during surveys to suitable markets for processing. Under the proposed arrangement, interstate certification arrangements will be sought to meet domestic restrictions that may be imposed in future. As noted above, domestic regulation may have broader implications for international markets.

While there have been few direct domestic issues with trade, growers within the quarantine area have reported that their livestock and other commodities have been discriminated against in stock sales and possibly other markets. This highlights the need for a stronger awareness program to ensure that products are not unnecessarily discriminated against.

An assessment of the risks to international markets identified: pasture seeds, hay and chaff, and other forage products as relatively high risk (Ferris, 2010b). The risk assessment was based on assumptions on the market reactions as a consequence of finding contamination in products for a scenario where branched broomrape was distributed across its biogeographical range in Australia.

Although a number of countries prohibit the importation of broomrapes, no countries have raised concerns about low levels of possible contamination in grain or hay exports. As these commodities are used for human or stock feed, it appears that the possibility for trace levels of broomrape is not a major concern and should not pose a significant risk to these markets.

Small seeds, produced for international seed markets are more likely to require certification about branched broomrape. There is no small seed production from within the current quarantine area. For other producers, crop management protocols and certification processes should be adequate to address these market concerns.

3.2.3.3 Regulatory impacts

Growers within the current quarantine area have made significant personal commitments toward the eradication program that must be recognised. These commitments in time and effort to support the eradication are a consequence of regulation and have a significant impact on business.

Growers' properties under quarantine are identified on the SA land title register, with potential impacts on sale and value of land.

3.3 Transition to management plan

3.3.1 Outcome

Now that it has been recognised that eradication cannot be achieved, the program will transition out of eradication with its high levels of regulation, surveillance and support to a plan focused on managing branched broomrape as an established pest.

During the transition phase, a lighter regulatory approach focused only on managing the major risks is appropriate with the resources available. Quarantine areas will be established by Ministerial notice based on properties where

broomrape is known to occur. Properties within the current quarantine area that have never had broomrape or that have met the agreed criteria of twelve consecutive years of freedom will have their current restrictions removed.

The *Code – Control of Branched Broomrape* will be amended to focus on high risk commodities, soil and machinery only. Regulation will focus on managing the risks associated with movement of high-risk products and machinery. Restrictions on residential and non-productive properties will apply only to ground engaging equipment and soil movement. No further effort will be expended on eradicating branched broomrape in native vegetation, roadsides or other non-productive areas.

It is anticipated that the transition phase will last for two years, after which all properties will be released from quarantine, as responsibility for managing broomrape reverts to primary producers and industries through their farm biosecurity arrangements.

3.3.2 Actions needed to achieve outcome

Components of the program during transition will include:

3.3.2.1 Regulation and support

Biosecurity SA will maintain a limited regulatory support program for quarantined properties. The regulatory program will include decontamination services for ground engaging and other high risk machinery moving out of quarantined properties.

Biosecurity SA will continue to conduct limited surveys on infested properties as required to support product certification arrangements, and to support landholders who continue to seek property-freedom and release from quarantine under the protocol based on 12 years of freedom from branched broomrape.

3.3.2.2 Knowledge and data management

The knowledge base developed by the program will be documented and recorded. This information will be available for extension to landholders on the management of branched broomrape. Details on the administration of the program will be documented to inform future eradication programs.

Data collected on infested properties will continue to be recorded in the existing database during the transition to management phase. Information on the distribution of branched broomrape will be provided to the SA MDB NRM Board to support weed compliance work under the Natural Resources Management Act at the end of the transition program.

3.3.2.3 Communication program

A national communication program will advise industries and primary producers on commodities at risk and management of branched broomrape. The program will also seek to address any misapprehensions about the threat from branched broomrape.

The program will support farm biosecurity planning to manage risks. The program will be coordinated by Biosecurity SA with a national focus. Information on management of branched broomrape will be disseminated to industries.

3.3.2.4 Farm biosecurity planning

Branched broomrape will be included in a national program supporting farm biosecurity planning through Plant Health Australia and Animal Health Australia to assist industry and primary producers to manage their own risks.

3.3.2.5 Product certification and Interstate Certification Arrangements

Once domestic and international market requirements are clarified, if any, there will be a need to establish and negotiate protocols to allow trade to continue. Biosecurity SA will work with the Department of Agriculture, Fisheries and Forestry (DAFF) and the other jurisdictions on Interstate Certification Arrangements and protocols for certification of products for international markets.

3.3.2.6 Research and Development

Research capacity for branched broomrape will be maintained at a lower level to support the establishment of protocols for product certification, to develop control strategies in different crops and to study the biology and survival of branched broomrape seed.

3.3.2.7 Boundary survey

A survey focused on the boundary of the current quarantine area is proposed in 3 years to determine the extent of further spread. This survey will determine the success of the transition program and frame its future direction. It is anticipated that the program will use this information to inform the plan for the ongoing management of branched broomrape.

3.3.3 International obligations

Australia ratified the International Plant Protection Convention in 1952. The IPPC aims to protect cultivated and wild plants by preventing the introduction and spread of pests. It is administered by the Food and Agriculture Organisation (FAO) of the United Nations.

DAFF will be responsible for liaising with the IPPC on changes to the management of branched broomrape. During the transition phase, the proposed approach complies with the requirements for it to remain under regulatory control.

3.4 Benefit:cost analysis (BCA)

A BCA of the options for managing branched broomrape was prepared for the previous review of the program (Ferris, 2010a).

The analysis used a 30 year time period from 1999/00 to 2028/29 and compared eradication and containment of branched broomrape against an uncontrolled scenario. The analysis assumed that without control, branched broomrape would spread to all suitable environments within 60 years, and that maximum yield

losses in crops would reach 35% after 15 years once established in a crop. Potential international market access losses and environmental implications were excluded from the analysis.

Under these scenarios, the BCA found that the benefits and costs of continuing the eradication program were comparable with a containment program that aimed to contain broomrape within the current quarantine area over the 30 year time period. The analysis assumed that the cost of delivering the two programs over 30 years would be comparable at $85.7m for eradication assuming cost reduces over time and $91.4m for containment assuming a fixed cost base. Based on these assumptions, the BCA analysis estimated that the net benefit of eradication in 2010 values was $342m compared with $344m for containment.

4 Risk Management

Branched broomrape poses two types of risk for agriculture; as a direct threat to production of susceptible crops and as an indirect threat to some markets through contamination of products.

4.1 Mitigating production risks

Spread of branched broomrape poses a threat to a range of susceptible broad-leafed horticultural and agricultural annual crops. Parasitism on host plants will cause reduced yields and affect the quality of produce. A range of regulatory, farm biosecurity and in crop measures can effectively manage production risks.

4.1.1 Regulation

During the transition phase, high risk commodities from infested properties will continue to be regulated under the Plant Health Act through a regulated *Code – Control of Branched Broomrape* to minimise spread of branched broomrape to other regions.

During the transition phase, industries and interstate regulators will implement measures to manage domestic risks. Interstate Certification Arrangements will be negotiated and protocols developed as necessary to facilitate trade in affected commodities.

The regulatory measures will be removed after 2 years when the program transitions to management.

4.1.2 Farm biosecurity

Individual producers of susceptible crops can minimise their own risks through simple biosecurity measures to avoid bringing high risk products, such as host rich hay, onto their properties.

4.1.3 In-crop measures

Methods to manage branched broomrape in crops have been developed through the national program. Measures need to be tailored for specific crops but include: host weed control, crop selection, fumigation and Group B herbicides and

crop hygiene. These measures are compatible with normal best practice production measures.

4.2 Managing marketing risks

While a number of countries list branched broomrape as a prohibited pest, no significant international market issues have emerged to date. This is unlikely to change during the transition phase as branched broomrape will continue to be under official control as agreed through the International Plant Protection Convention.

Branched broomrape seed has never been detected but might occur at undetectable, trace levels in some commodities. It poses no health or quality risks.

A market analysis was conducted each commodity that assessed the size of markets and the likely reaction for discovering broomrape (Ferris, 2010b). The assessment affirms that markets would be expected to be most concerned where the product was likely to contribute directly to establishing new populations of the pest in the importing country. Consistent with this view, the only markets where importers have required certification to date were for small seeds for sowing in some South American countries. Production protocols should be sufficient to address these certification requirements for affected industries.

As most of the commodities exported from the region are for manufacturing, feed or food uses, it is unlikely that branched broomrape will have any impacts on these markets. However, there is a risk that this situation may change, particularly if there is excessive domestic regulation which would raise international concerns.

There is also a risk that marketers may avoid purchasing some commodities from affected properties regardless of market concerns. Biosecurity SA is working to ensure that there is no unnecessary prejudice against affected producers.

Components of the proposed program to ensure that broomrape is contained during the transition to management phase include the following components (Annex 3).

Activity	2012/13		2013/14		Ongoing	
	Govt	Other affected party	Govt	Other affected party	Govt	Other affected party
Quarantine	✓		✓			
Surveillance	✓					
Regulation & Compliance	✓		✓			
Product certification	✓	✓	✓	✓		✓
Property certification						✓
R&D	✓		✓			
Awareness	✓	✓	✓	✓		✓
Technical support	✓		✓			
Farm Biosecurity Planning	✓	✓	✓	✓		✓

4.3 Communication and engagement

A national communication program in partnership with Plant Health Australia will aim to inform industries of the changes and support the development of farm biosecurity plans, appropriate to the production system on the property. This can be facilitated through the Grains Biosecurity Officers who operate in each jurisdiction funded by industry.

Biosecurity SA will also provide technical advice on management of branched broomrape in crops for affected producers based on knowledge and experience from the eradication program.

4.4 Resource requirements

Components of a program to meet the objectives of containing branched broomrape while permanent management arrangements are developed are based on five project areas detailed in Annex 3. The total cost of the proposed two year program is $1.674 m under a national cost sharing arrangement.

At the end of the two year program, quarantine restrictions in individual properties will be removed and management will be the responsibility of primary producers, who will be required to meet the requirements set by markets.

5 Program Review

5.1 Program review triggers

The National Biosecurity Committee's draft Transition to Management Arrangements identifies key triggers for reviewing programs. These have been reviewed in context of the proposed branched broomrape program.

Branched broomrape containment / suppression not effective	Review application of program resources – recommend shift from suppression and redirect to increased stakeholder awareness & preparedness
Branched broomrape is detected well beyond containment boundary	Assess options for managing outlier infestation. Increase focus on developing ongoing management measures and prepare stakeholders for rapid adoption.
R&D activity contributes substantial new knowledge on pest/disease or pest/disease-host relationship	Review feasibility of program objectives Review resource and priority balance between activities such as suppression, development of management measures and awareness & preparedness.
Program reaches halfway point of agreed program duration or 50% of total program budget expended	Scale back / cease suppression activity within containment area. Undertake suppression outside containment area only for critical new detections which have the potential to compromise program objectives. Redirect resources to increased awareness & preparedness, especially building stakeholder capacity to assume ongoing responsibilities.
Infestation exceeds a pre-determined proportion of the potential host area	Cease all suppression activity. Conclude ongoing management measures under development. Transition all available information to stakeholders for implementation, and wind up program.
Milestone or deliverable not achieved by any affected party	Review feasibility of completing planned activities and achieving agreed outcomes. Determine if program integrity has been compromised to the extent that program should cease.
Agreed commitment of any affected party not forthcoming	Move towards cessation of program.
Industry or other parties agree to contribute funds to further the program	Review long term commitment to the objective from the review of long-term suppression with product certification and property freedom status.

5.2 Review outcomes

The most recent review in 2011 has recommended that the program should transition away from eradication. The National Management Group for Weeds endorsed the review recommendations at a teleconference on 11 August 2011.

Decision threshold analysis

	Decision threshold
	Proposal/plan submitted
	National Interest
	Feasible to implement
	Cost beneficial
	Affected parties/beneficiaries identified and prepared to contribute
	Delivery of plan exceeds normal business

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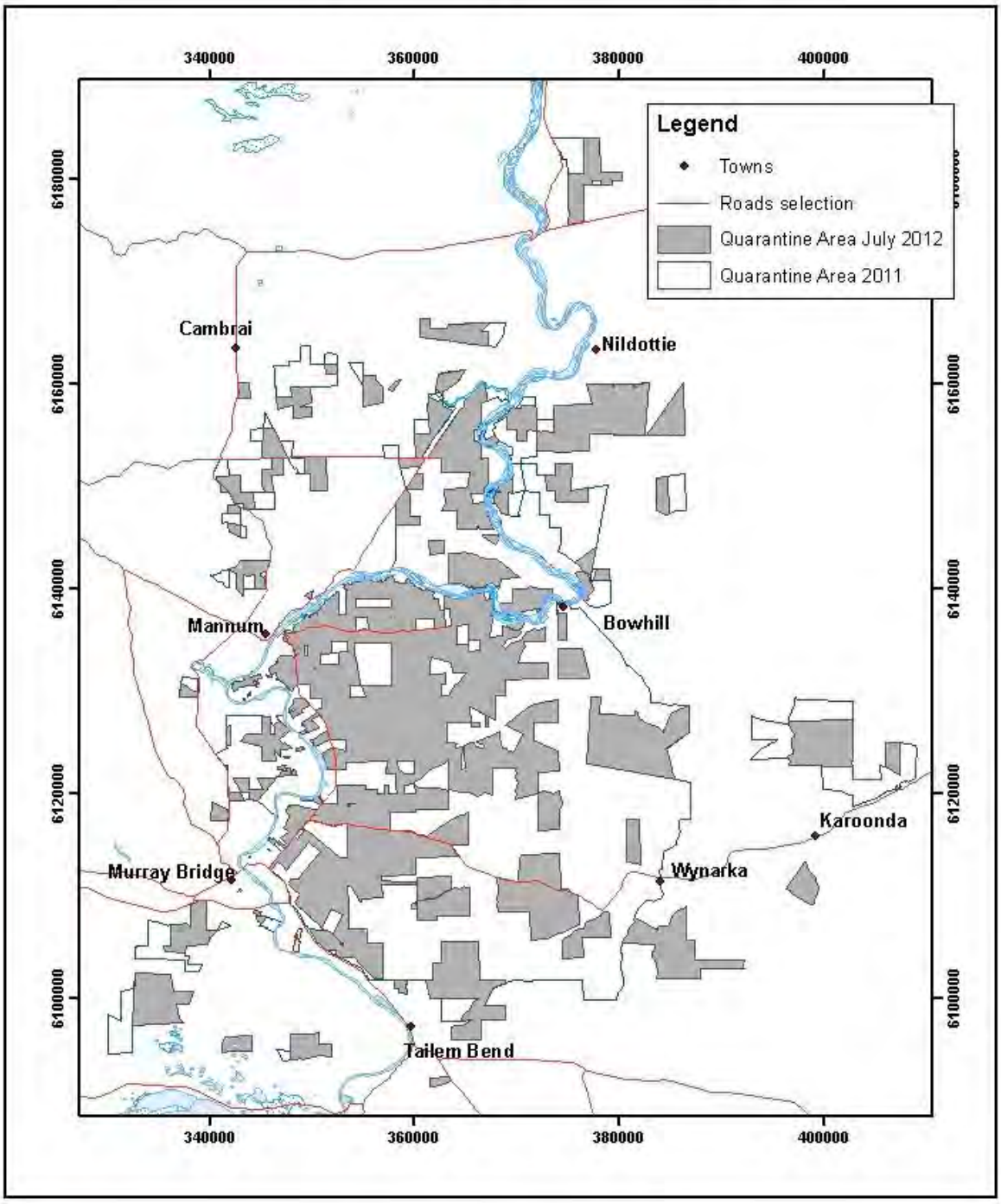
Branched Broomrape Quarantine Area 2012



Risk Material	Risk	Source	Risk Mitigation Measures	Regulatory Response	Residual Risk	Regional impact
Commodities			Production protocols	Regulated through a Code of practice – only for high risk products; low risk products free to move without restriction		Small; most major products free to move
Cereals	Very low	Non-host Seed contamination during harvest	Broad-leafed weed management Normal harvesting practices Manage cutter bar height	Nil – No current market requirements	Very low	Nil
Canola	Low	Host for broomrape Windrowing	Manage broad-leafed weeds Grow On Duty / Clearfield varieties Normal harvesting / grain threshing Processing of product for oil and meal	Nil for grain – No current market requirements Regulate seed production within the quarantine area	Very low	Small yield penalty
Pulses	Low	Host for broomrape Cutting height	Threshing process Broad-leafed weed management Processing for feedlots	Nil for grain – No current market requirements for pulse grain Pulse hay/straw regulated as host-rich hay	Low	Low
Small seeds	High	Broomrape seed as a contaminant	Seed certification requirements Seed cleaning processes No small seeds produced in the region	Regulate small seeds production within quarantine area	Low	Nil

Risk Material	Risk	Source	Risk Mitigation Measures	Regulatory Response	Residual Risk	Regional impact
Potatoes and root vegetables	Medium	Non-host Soil on tubers	Washing / Brushing Industry protocols (common issues with PCN)	Regulated under the Code of Practice Markets to determine the standards	Very low	Low
Onions, Leeks and bulbs	Low	Non-host Soil	Curing and processing	Nil – No current market requirements	Very low	Nil
Leaf vegetables	Low	Soil	Washing/processing	Nil – No current market requirements	Very low	Nil
Almonds	Medium	Non-hosts Soil in husks harvested off the ground	Processing removes husk from product Industry protocol on management of processing offal	Regulated – Code of Practice requires almond husks and offal to be returned to quarantine area	Very low	Low
Livestock	Low	Soil and plant material on and in the gut of animals	Manage animals Industry standards	Nil	Low	Nil
Wool	Very low	Soil and plant material in wool	Processing of wool	Nil	Very low	Nil

Risk Material	Risk	Source	Risk Mitigation Measures	Regulatory Response	Residual Risk	Regional impact
Cereal hay/ straw	Medium	Whole broomrape plants and seed in hay bale	Manage broad-leafed weeds in hay crop Surveys / certification of crop Promote standard weed management strategies for hay with purchasers	Regulate under the Code of Practice Certification of cereal hay	Low	Cost of certifying crop
Host rich hay (meadow / cereal legume mixtures / pea straw)	High	Whole broomrape plants and seed in hay	Restrictions on movement and sale out of management zone Promote standard weed management strategies for hay with purchasers	Regulate; restriction on movement and sale from the quarantine area Sale permitted within the quarantine area	Low	Restriction on sale
Machinery			Machinery clean-down Communication and awareness strategy	Regulate requirement for machinery clean down when leaving the quarantine area Unrestricted movement within the area		Impact on contractors moving across the boundary
Hay baling machinery	High	Hay in machine Chaff / dust	Machinery protocols Decontamination	Decontaminate machinery moving out of quarantine area	Low	Cost of machinery clean down
Harvesters	Low	Chaff / dust in machines	Machinery protocols Decontamination	Decontaminate machinery moving out of quarantine area	Low	Cost of machinery clean down

Risk Material	Risk	Source	Risk Mitigation Measures	Regulatory Response	Residual Risk	Regional impact
Soil engaging machinery	High	Soil adhering to machinery	Machinery protocols Decontamination / clean down	Decontaminate machinery moving out of quarantine area	Low	Cost of machinery clean down
Public lands	High	Soil adhering to machinery	Machinery protocols Decontamination / clean down	Decontaminate machinery moving out of quarantine area	Low	Cost of machinery clean down
Transport corridors / Roadsides	High	Machinery working on infested road verges	Machinery protocols Decontamination / clean down	Decontaminate machinery moving out of quarantine area	Low	Cost of machinery clean down
Infrastructure / land development	Medium	Machinery working on infested land	Machinery protocols Decontamination/clean down	Decontaminate machinery moving out of quarantine area	Low	Cost of machinery clean down
Land development	Medium	Topsoil and fill	Restrict movement from infested land Certification of site	Regulate movement of soil from infested land Accreditation / certification	Low	Cost of certification
Quarrying / Gypsum / Calcrete	Medium	Topsoil	Machinery protocols / Industry standards Remove topsoil before extracting material	Accreditation / certification	Low	Cost of certification

TRANSITION TO MANAGEMENT FOR BRANCHED BROOMRAPE OPERATIONAL PLAN 1 JULY 2012 - 30 JUNE 2014

Introduction

This plan provides for the transition to management of branched broomrape through five project areas:

1. Management, Policy & Administrative Support
2. Communication & Technical Support
3. Quarantine & Compliance
4. Market Assurance
5. Research

Milestones

The following targets are relevant to the delivery of the transition program. Targets include those drawn from Recommendation 5 of the Review (Burley et al., 2011)

July 2012	• Affected landholders know the transition arrangements • A revised Code of Practice is in place
December 2012	• Market assurance surveys for 2012 production year are complete.
February 2013	• Best practise manuals are available for all producers. • National marketing arrangements, e.g. Interstate Certification Arrangements, are in place.
July 2014	• Evidence of compliance with: a) requirements to clean machinery prior to movement from properties containing BBR and b) orders to control in critical infestations, e.g. satellites and those on the periphery of the containment line; • Evidence of containment plus levels of adoption of property- and product-free status for producers whose marketing is potentially affected by the risk of contamination by branched broomrape; • The success of the containment approach in limiting BBR infestations to properties within the currently infested area (i.e., as known in 2011); • Improvements to the infestation status of land within the currently infested area; • The level of commitment to funding the program by actual and potentially impacted industry sectors.

Program Assessment

It is proposed that the National Steering Committee continue to provide oversight for the program, assess progress and report to the National Management Group for Weeds.

Program Management, Policy & Administrative Support

Objectives

i. Manage and coordinate the transition to management program for branched broomrape
ii. Administer arrangements for the quarantine area under the *Plant Health Act 2009* (SA)
iii. Liaise with industries and governments on legislation, policies, market issues and industry protocols
iv. Update the Code – Control of Branched Broomrape
v. Communicate program directions with affected landholders.

Outcomes

a) Domestic and international market protocols and certification procedures are finalised.
b) National arrangements to mitigate spread implemented.
c) Industries and stakeholders are aware and implement appropriate measures to manage risks.
d) State Government and natural resource management boards amend weed policies and regional plans to manage branched broomrape under the *Natural Resources Management Act 2004* (SA).
e) Risk mitigation procedures are documented that can be used by stakeholders.
f) Ongoing management arrangements (e.g. farm biosecurity plans are implemented by farmers and industries).

Communications & Technical Support

Objectives

i. Industries, government and landholders are aware of proposed changes to the management of branched broomrape.
ii. Affected landholders and NRM Boards are provided with the tools to manage branched broomrape through the transition.
iii. Communication of technical information on how to manage broomrape is widely distributed.

Outcomes

a) The understanding of the transition program among governments and industry organisations, landowners and the public is increased.
b) Market confidence is maintained through awareness of the program objectives
c) Improved adoption in the farming community of appropriate technologies to move towards product assurance.

Compliance & Market Assurance

Objectives

i. The revised Code of Practice for Branched Broomrape will be implemented. Movement of host-rich hay and machinery will continue to be regulated in the first year of transition. There will be revised provisions finalised for cereals, canola, washed potatoes, onions and livestock.
ii. Compliance arrangements will be in place enabling landowners to undertake their own decontamination, but decontamination of machinery leaving the new quarantine area by program officers will continue for the first year of transition.
iii. Maintain database records to support compliance operations. There is also a legal requirement for South Australia to maintain the database for a further seven years.

Outcomes

a) Market confidence is maintained by ensuring there is a smooth transition to a management approach.
b) Advisory, inspection and permit services ensure compliance with the protocols to manage high risk commodities and machinery moving off infested properties.
c) Data base records on branched broomrape are maintained to support compliance.

Market Assurance – Surveys

Objectives

i. All infested produce paddocks in the 2012 quarantine area are surveyed prior to harvest.
ii. While it is anticipated there will be no international market concern as branched broomrape will remain under official control, reaction is yet to be tested.

Outcomes

a) A limited survey in the spring of 2012 provides assurance to primary producers and marketers to ensure continued access to national and international markets during transition.
b) Enable the progressive and orderly introduction of marketing arrangements

Research

Objectives

i. Finalise and report on effective control methods to support management protocols to meet market requirements, especially for non cereal crop situations.
ii. Refine model on the potential distribution of branched broomrape in Australia.
iii. Finalise studies on survival of branched broomrape seed in soil to understand seed bank dynamics in farming systems.

Outcomes

a) Policies and ICAs are supported with scientific information about the potential of branched broomrape to spread and affect production.
b) Quality assurance systems are revised to support marketing certification.
c) Risks of spread and contamination attached to branched broomrape free status are managed.
d) Methods are available to eradicate branched broomrape where required.

References

BURLEY, J. R. W., PANETTA, F. D. & FRASER, G. 2011. Review of the Branched Broomrape Eradication Program, South Australia. May 2011.