## Weeds of the Burdekin Rangelands: Managing parkinsonia

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Table 1 Preventing new weeds from establishing					
Summary of key processes: what do we know?					
What are the key bio- physical processes and at what scale do they operate?	What factors regulate them, in order of importance? Are they 'manageable'?	Do we have enough data to set benchmarks? Do these vary with landtypes and/or seasons?			
Seed production	Biological control agents—seed beetles established and large prop- ortions of seeds destroyed at some sites. Rainfall and temperature—probably influence seed production and timing but processes cannot be managed.	Now the agents have established there is nothing that can be done to increase their effectiveness.			
Dispersal	Water—seeds wash downstream and across floodplains; dispersal cannot be managed. Animals—may ingest and pass the seeds; can only be managed where livestock are the agents. Motor vehicles—seeds could be tran- sported in soil attached to vehicles.	As a general rule, upstream in- festations should be treated first. Little is known about the import- ance of this process in Australia. The importance of this means of dispersal is unknown.			
Germination	Seed-bank age structure—seeds remain viable for many years; pro- cesses of breaking dormancy cannot be managed (but see comments under Fire, overleaf). Biological control agents—seed beetles established and large prop- ortions of seeds destroyed at some sites. Soil moisture and temperature— probably influence seed production and timing but processes cannot be managed. Disturbance of the soil—promotes germination; generally manageable.	Little is known of this process. Now the agents have established there is nothing that can be done to increase their effectiveness. At least some kinds of mechanical treatment of established plants could promote germination of parkinsonia.			
Plant growth and survival	Climate—species is suited to a a broad area of sub-humid and semi- arid Australia, but more restricted to run-on areas in lower rainfall zones; there may be some mortality due to drought; many seedlings probably die during their first dry season.	Very few data on the ecology of parkinsonia in Australia.			

	Table 1	Table 1 Preventing new weeds from establishing (cont.)			
		Summary of key processes: what do we know?			
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	Plant growth and survival (cont.)	Grazing/trampling by cattle—this may kill some small plants; can be managed. Biocontrol agents —a leaf-feeding bug is established but it has little impact on parkinsonia; cannot be managed beyond the point of establishment. Competition—healthy herbaceous stratum may reduce establishment success; this factor can be managed. Fire —will kill small plants but many large individuals survive; this factor can be managed. Herbicide application—several herbi- cides are registered for this species and are effective. Mechanical treatment—suitable treat- ments are available.	Insufficient information The importance of this not been established I grass competition proba invasion by parkinsonia Insufficient is know t guidelines for the use of Guidelines for the use herbicides are available May encourage germina not be used in water co		

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Insufficient information available.

The importance of this factor has not been established but strong

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Guidelines for the use of these

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guidelines for the use of fire.

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Based on current scientific understanding, what manage- ment options are available to achieve the objective? How can we monitor their effectiveness?         What confidence do we currently have in these options?         Do the options conflict or intera with other management of ectives? Will trade-offs to needed?           Monitor areas downstream from major seed sources. This will help detect incipient in- festations and allow inter- vention early in the invasion process.         The plant is easy to detect, especially when flowering.         No. Monitoring will require fam iarity with the species and is preferred habitats. It can to carried out in conjunction other management activities.           Continue biological control program.         New agents can be identified, introduced, released and es- tablished; we can be less confident about established agents reducing weed abund- ance and spread.         Biological control is general compatible with other manage ment objectives and with oth weed control options. It is in portant to ensure that, while ne agents are establishing, the have access to adequate po- ulations of their host weed.           Avoid transporting plant parts on farm machinery or other motor vehicles.         This is probably a minor dis- gera means whereby new catchments become infested.         Maintaining healthy perenni grass pastures as a means weed management is consiste with sound land management.           Use appropriate mechanical and chemical control techniques.         Reliable chemical and mech- anical control techniques are available for parkinsonia.         Chemical and mechanical control iestations, those that are likely be serious seed sources (of those in upper catchment), an infestations in key areas of property or conservation reser- etc. <th colspan="5">Table 2 Key processes for management</th>	Table 2 Key processes for management					
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