

# 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?
<b>Seed production</b>	Biological control agents—seed beetles established and large proportions 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.
<b>Dispersal</b>	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 transported in soil attached to vehicles.	As a general rule, upstream infestations should be treated first.  Little is known about the importance of this process in Australia.  The importance of this means of dispersal is unknown.
<b>Germination</b>	Seed-bank age structure—seeds remain viable for many years; processes of breaking dormancy cannot be managed (but see comments under Fire, overleaf). Biological control agents—seed beetles established and large proportions 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.
<b>Plant growth and survival</b>	Climate—species is suited to 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 Preventing new weeds from establishing (cont.)		
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<b>Plant growth and survival (cont.)</b>	<p>Grazing/trampling by cattle—this may kill some small plants; can be managed.</p> <p>Biocontrol agents—a leaf-feeding bug is established but it has little impact on parkinsonia; cannot be managed beyond the point of establishment.</p> <p>Competition—healthy herbaceous stratum may reduce establishment success; this factor can be managed.</p> <p>Fire—will kill small plants but many large individuals survive; this factor can be managed.</p> <p>Herbicide application—several herbicides are registered for this species and are effective.</p> <p>Mechanical treatment—suitable treatments are available.</p>	<p>Insufficient information available.</p> <p>The importance of this factor has not been established but strong grass competition probably retards invasion by parkinsonia.</p> <p>Insufficient is know to provide guidelines for the use of fire.</p> <p>Guidelines for the use of these herbicides are available.</p> <p>May encourage germination; cannot be used in water courses.</p>

**Table 2 Key processes for management**

<i>Management Options</i>		
Based on current scientific understanding, what management 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 interact with other management objectives? Will trade-offs be needed?
Monitor areas downstream from major seed sources. This will help detect incipient infestations and allow intervention early in the invasion process.	The plant is easy to detect, especially when flowering.	No. Monitoring will require familiarity with the species and its preferred habitats. It can be carried out in conjunction with other management activities.
Continue biological control program.	New agents can be identified, introduced, released and established; we can be less confident about established agents reducing weed abundance and spread.	Biological control is generally compatible with other management objectives and with other weed control options. It is important to ensure that, while new agents are establishing, they have access to adequate populations of their host weed.
Avoid transporting plant parts on farm machinery or other motor vehicles.	This is probably a minor dispersal mechanism but could be a means whereby new catchments become infested.	There will be some cost (time, effort) in imposing vehicle hygiene protocols.
Maintain a healthy herbaceous layer.	Reliable strategies are available for doing this within the Burdekin Rangelands.	Maintaining healthy perennial grass pastures as a means of weed management is consistent with sound land management.
Use appropriate mechanical and chemical control techniques.	Reliable chemical and mechanical control techniques are available for parkinsonia.	Chemical and mechanical control techniques are expensive. Herbicide techniques (eg basal bark spraying, cut stump applications) must be applied to individual plants. So do most mechanical techniques, especially in riparian areas. The efficiency of these methods will rely on targeting outlying infestations, small infestations, those that are likely to be serious seed sources (eg those in upper catchment), and infestations in key areas of a property or conservation reserve etc.

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