

Weeds of the Burdekin Rangelands: Managing giant rat's tail grass

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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 land types and/or seasons?
Seed production	<p>Soil moisture—plants seed whenever soil moisture is adequate; the process cannot be managed.</p> <p>Grazing—it is reported that grazing by horses will reduce seed production in light infestations.</p>	<p>There are insufficient data to provide guidelines.</p>
Dispersal	<p>Water—seeds of these species can be spread downstream; the process cannot be managed.</p> <p>Livestock—seeds are transported when they stick to the coats of livestock; these processes are manageable at scales above the level of the paddock.</p> <p>Other animals—any animals that move through seeding grass may transport seeds; these factors cannot be managed.</p> <p>Transport in hay—hay may be contaminated by seeds of giant rat's tail; this is manageable.</p> <p>Motor vehicles—seeds are transported in soil and plant material stuck to motor vehicles; this problem can be managed by keeping vehicles clean.</p>	<p>The importance of this process will vary with seasonal conditions. It is probably especially important in flood times.</p> <p>There is sufficient information to form protocols and establish practices for controlling cattle-aided dispersal of this species.</p> <p>Practices for minimising this risk are available.</p> <p>Protocols for minimising transport of seed on motor vehicles and farm machinery are available.</p>
Germination	<p>Seed-bank age structure—this will influence the proportion of the seed-bank that will germinate following rain; it cannot be managed.</p> <p>Soil moisture</p>	<p>Seeds are long-lived.</p> <p>While the climatic determinant of germination and establishment cannot be managed, they can be predicted. Management should involve identifying specific occasions when large-scale establishment is likely to occur</p>





Table 1 Preventing new weeds from establishing (cont.)		
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Plant growth and survival	<p>Competition—gaps in perennial pastures provide opportunities for giant rat's tail plants to establish; the herbage layer can be managed to reduce this risk.</p> <p>Application of herbicides—several herbicides are registered for use against giant rat's tail grass.</p> <p>Integrated treatments—a combination of fire, chemical and mechanical treatments, sowing improved pastures, and grazing are recommended.</p>	Maintaining healthy perennial grass pastures as a means of weed management is consistent with sound land management.

Table 2 Key processes for management		
Management Options		
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?
Thoroughly clean vehicles and machinery before they leave infested areas.	This will reduce, but not eliminate the risk of spread.	No conflicts involved. There will be a time cost in practising vehicle hygiene.
Where cattle have been grazing in rat's tail-infested paddocks mustering should be done when herbage is not wet so that seeds are less likely to stick to their coats.	This will reduce, but not eliminate the risk of spread.	No conflicts involved but some restrictions on animal husbandry.
Spot spray rat's tail with glyphosate where it occurs at low densities; do not spray neighbouring plants of desirable species.	This strategy is recommended.	No conflicts involved but there is an economic cost to spraying.
Treat dense infestations using a combination of fire, boom spray, cultivation, sowing of improved pastures, spot spraying, wick wiper application of herbicide; treat infestations from outside toward inside.	This strategy is recommended.	This is an expensive series of treatments. The earlier in an invasion that action is taken, the better.

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