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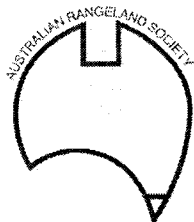
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## ARISTIDA INFESTATIONS OF MITCHELL GRASSLANDS: SELECTING CONTROL OPTIONS

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### THE PROBLEM

Increasing infestations of *Aristida leptopoda* (whitespear) and *A. latifolia* (feathertop) have decreased productivity from Mitchell grassland (*Astrebla* spp.) grazing enterprises. The seed of these perennial grasses causes significant contamination in fleeces, which costs in the order of \$4.7 to 5.5 million per annum (1989/90 prices) for the Mitchell grasslands of Queensland (1). *Aristida* spp. are relatively unpalatable, particularly to sheep, and as a result the more palatable grasses are preferentially grazed. Increased grazing pressure on the desirable and palatable grasses reduces their growth and further enhances the opportunity for increases in the *Aristida* populations.

### THE NEED

Maintaining a dominance of Mitchell grass can minimise an *Aristida* invasion. But to reduce established *Aristida* infestations, the best chance of success are control options that reduce the mature *Aristida* population and/or reduces the seed load. The desirable perennial grasses must be retained otherwise any advantage of *Aristida* control will be lost.

Control options need to exploit vulnerable features in the growth of whitespear and feathertop. These features include:

1. susceptibility to defoliation, whereby tiller mortality is increased and seed production is reduced (2);
2. viability of soil seed reserves is low after two years (1);
3. during wet summer conditions (30-35°C), the growth of *Aristida* spp. is less than that of Mitchell grass (3).

### CONTROL OPTIONS

#### Grazing with cattle

Cattle are less selective than sheep in their grazing of Mitchell grass pastures and cattle include whitespear and feathertop in their diet (1). As long as moderate grazing pressures are applied, the presence of cattle either alone or in conjunction with sheep can contain whitespear and feathertop to a small proportion of the pasture.

Sheep alone will not control infestations of whitespear or feathertop. Grazing by cattle at high grazing pressures (1 to 3 beasts/ha) for two to three months results in defoliation with a reduction in plant height and seedhead numbers. If repeated over two to three years, a reduction in whitespear and feathertop density may occur. Cattle need to be introduced at the start of the whitespear and feathertop growing season, as at this stage available green leaf and nutritional quality of these plants are at a maximum.

#### Baling

Following the accumulation of surplus pasture, some graziers bale the pasture. Consequently whitespear or feathertop is included in the hay and as a result of this defoliation their proportions in the pasture have declined following a number of balings. The greater resilience of Mitchell grass to defoliation has ensured that it persists following baling.

### Herbicide application

Whitespear and feathertop are suitable targets for a wick-wiper herbicide application. As these plants are generally avoided by stock, they are taller than the remaining desirable species. Wick-wiper applications of glyphosate (30% concentration) can kill half the whitespear population and reduce the growth of the remaining whitespear plants. Mitchell grass plants, untouched by this type of herbicide application, have a competitive advantage during subsequent summer growing periods and have an opportunity to become dominant in the previously whitespear infested pasture.

### Fire

Prior to European settlement, fires in the Mitchell grasslands were more frequent than in recent times. Fire stimulates Mitchell grass (4), whilst the recovery of whitespear and feathertop is considered to be less vigorous and depends on rainfall and grazing conditions. Fire reduced *Aristida* spp. numbers in sub-coastal Queensland (5), but in western Queensland management with fire is commonly viewed as risky.

### Forage and grain cropping

Cultivation kills mature whitespear and feathertop tussocks. If a cropping phase is greater than two years, regeneration of *Aristida* spp. will be minimised as little viable seed remains. However, the recovery to a desirable perennial grassland following cropping can only occur if the soil seed reserves of the desirable species remains and is not unduly affected by cultivation.

### Resowing with desirable grasses

Increasing the size of the soil seed reserve, by resowing with Mitchell grass and blue grass (*Dichanthium serecium*) can aid in increasing the recruitment of desirable grasses in whitespear and feathertop dominant pastures. Mitchell grass seed is now readily available, small scale collections of blue grass have been made and there is also interest in harvesting other useful native grasses.

### REFERENCES

1. Filet, P.G. (1990). The ecology and control of whitespear grass (*Aristida leptopoda*) and feathertop (*A. latifolia*) in Mitchell grass in south west Queensland. Final Report, AWC.
2. Brandon, N.J. (1987). Effects of repeated defoliation on the growth and inflorescence production of *Aristida latifolia*, *A. leptopoda* and *Aristida squarrosa*. 4th Year Project, Ag. Dept., U. of Qld.
3. Christie, E.K. (1979). Eco-physiological studies of the semiarid grasses *Aristida leptopoda* and *Astrebla lappacea*. Aust. Ecol. 4: 223-228.
4. Scanlan, J.C. (1983). Changes in tiller and tussock characteristics of *Astrebla lappacea* after burning. Aust. Rangel. J. 5: 13-19.
5. Paton, C.J. and Rickett, K.G. (1989). Burning then spelling reduces wiregrass (*Aristida* spp.) in black spear grass pastures. Trop. Grassl. 23: 211-218.