



## Pasture improvement for sustainability

*Nowendoc Landcare Group, Nowendoc.*

Beef cattle producers in the Upper Manning catchment are experiencing declining productivity and profit due to loss of desirable pasture species, decline in soil fertility, and an increase in timber regrowth and noxious weeds – *it was no longer sustainable to run cattle under these circumstances.*

Landholders in the Nowendoc Landcare Group set up a pasture establishment and grazing project to demonstrate techniques to reverse the pasture decline. With some slopes exceeding 18° it was necessary to demonstrate that pasture improvement did not trigger any soil erosion. The site was located midway between Tamworth and Taree on the Cooplacurripa River, elevation 575 m, rainfall 925 mm, soil type-red earth (basalt origin). Detailed costing allowed the trials to be related to an actual beef production enterprise.

### Methods

Three seedbed preparation techniques, aerial spray and sow, aerial spray and direct drill, and broadcasting onto an undisturbed/unsprayed site, were compared with conventional cultivation. Cattle performance on three sown pasture mixes: (I) **temperate** - perennial rye, cocksfoot, tall fescue, prairie grass, phalaris, white clover and sub clover; (II) **clovers** - white clover and subterranean clover and (III) **subtropical** - setaria, kikuyu, cocksfoot, white clover and Maku lotus were compared with the native/naturalised pasture as the control treatment. Plot size was 3.4 ha. and treatments were not replicated.

The plots were grazed by cattle from 21 June 1995 to 2 November 1995 and 22 October 1996 to 14 March 1997. The stocking rate on treatments were determined by the Landcare group, matching feed supply to feed demand.

### Results

For temperate pasture, grass cover was similar for all sowing methods but for clover, the cultivated seedbed was superior to the spray/broadcast method which in turn was superior to the spray/direct drill method.

Clovers oversown into untreated native/naturalised grassland failed due to the severe drought in 1994; both white and subterranean clover failed to produce seed for regeneration in later years. White clover - broadcast with the subtropical pasture mix had no grass competition and survived severe drought conditions to produce a clover dominant, bloat prone pasture, after an early summer break. The nitrogen produced, gave a necessary boost to the sown grasses, kikuyu and setaria.

Observations in late February 2000 suggest that kikuyu dominated pastures: promoted the greatest competition to a range of weeds, including St. Johns Wort, carpet grass, and fireweed; provided excellent erosion control and had the highest level of persistence of any pasture species.

February 2000 observations indicated carpet grass replacing some temperate grasses (cocksfoot, tall fescue and perennial ryegrass) in all temperate pasture plots. An



estimated 10% replacement had occurred in high fertility situations to > 50% replacement in low fertility situations.

Although not sown as a replicated trial, treatments, T1, T4 and T5 were of the same pasture mix and treatment T3 was similar in composition to the control treatment, due to failure of clover to establish in 1994.

### Conclusions

Pasture improvement appeared to be associated with increased weight gain per hectare & weight gain per beast, potentially producing a product suited to several beef markets. Native/naturalised pastures only allow weaner or bullock production, both of which are susceptible to low returns during market downturn.

**Table 1. Results per ha from 5 alternative pasture development systems compared with unfertilised pastures; unreplicated\* demonstration at Nowendoc, NSW**

	Cost of Improvements \$	Annual Cost <sup>1</sup> \$	LWG <sup>2</sup> kg	Gross Returns \$	Net Profit \$
T2. Control-unfertilised Naturalised pasture	0	60	139	153	93
T3. Naturalised pasture over-sown with fertiliser & white & sub clover	115	117	176	194	77
T1. Aerial spray & drill temperate mix	313	146	226	249	103
T4. Aerial spray & broadcast temperate seed mix	276	143	246	271	128
T5. Cultivated seed bed & broadcast temperate seed harrowed in	231	138	250	275	137
T6. Aerial spray, harrow & broadcast subtropical seed mix	311	146	279	307	161

\* Being unreplicated, the limitations of experimental design preclude unequivocal conclusions

<sup>1</sup> "Annual costs" include pasture depreciation, annual pasture costs and animal health and marketing costs. Returns are based on \$1.10/Kg liveweight gain

<sup>2</sup> The 2 grazing periods approximate the annual grazing potential of the pastures. Total liveweight gain is the sum of the two grazing periods

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