

## COMPETITION AND THE ESTABLISHMENT OF ALEMAN GRASS

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Ponded pastures are artificially constructed wetlands retaining overland flow from summer rains to enhance the availability of high protein fodder over the seasonally dry winter. The exotic cultivar Amity aleman grass (*Echinochloa polystachya*) is planted in ponds up to 60 cm deep. Aleman has been listed as an environmental weed threat due to its potential for vigorous clonal establishment, initiating new plant modules (ramets) from stolons. This project compared the primary and secondary establishment of Aleman in the presence and absence of pasture species tolerant of waterlogging.

### MATERIALS AND METHODS

Two 10x10 m quadrats were located in the presence and absence of resident pasture (*Cynodon dactylon* and *Paspalum paspaloides*) in a recently constructed pond on a coastal riverine flood plain (150°39'N, 23°02'W Daly Creek Yeppoon Central Qld). Aleman cuttings (4 internodes with 2 leaves) were planted in the centre of each 1 m<sup>2</sup> quadrat. 10 plants were measured for cumulative internode length of the primary tiller and number of secondary tillers after 4 months. 10 plants were measured after 9 months for dry weight of primary plants, and number and average dry weight of ramets per parent (primary) plant. Results were compared using analyses of variance.

### RESULTS AND DISCUSSION

Root competition did not influence aleman grass productivity until the secondary establishment stage (Table 1). Ramet formation was greater in number ( $P = 0.003$ ) and in average dry weight ( $P = 0.004$ ) in the absence of competition. Ramets altered the source-sink relationship, with the average ramet dry weight greater than the parent and a 60% reduction in the survival of primary tillers in the pasture (20% reduction in the bare soil).

Table 1. Comparison of Aleman grass productivity at the primary and secondary growth stages planted in bare soil and in resident pasture (standard deviation in brackets).

	Primary establishment 2/4/95		Secondary establishment 25/9/95		
pasture status	n° secondary tillers	primary tiller length (cm)	n° ramets per parent	dry weight parent (g)	ave. dry wt. ramet (g)
bare soil	2.6 (1.7)	29.9 (18.5)	1.8 (1.1)	16.2 (10.2)	32.9 (27.6)
pasture	2.7 (1.2)	23.9 (18.0)	6.0 (3.7)	30.7 (13.3)	71.1 (23.6)

The strategy of preferential allocation of resources to ramets increases the chance of secondary establishment in aleman. Ramet formation is also dependent on environmental conditions conducive to stolon:soil contact. However in the presence of root competition, the continued survival of ramets is at the expense of the parent plant. Accordingly although the location of plants may alter, within pre-existing competition the total density of aleman plants may not necessarily increase. Weediness will therefore be determined by the intensity of competition. In contrast, graziers wishing to maximise the vigour of aleman grass pasture will need to eliminate waterlogging-tolerant competition prior to planting.