

Genetic fingerprinting of natural kikuyu populations in Australia

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Kikuyu (*Pennisetum clandestinum*) is an important grass for the dairy and beef industries of the subtropics of Australia, South Africa and New Zealand (Mears 1970). Even though Parker (1941) recognised clonal variation in Australian material in the 1930s, Mears concluded that it would now be difficult to distinguish between the different ecotypes introduced into Australia from Africa. Screening of natural populations selected

from diverse regions within Australia for the genetic relatedness was part of a study to evaluate their innate variation.

Leaf tissue was collected from plants grown in an experiment, which evaluated the yield and quality of spaced plants of 11 ecotypes and 6 cultivars on a red ferrosol at Wollongbar. DNA was extracted from leaf samples of the different genotypes. Genetic fingerprints of each of the kikuyu cultivars and ecotypes were determined using a modified DAF analysis (Caetano-Anolles *et al.* 1991). Duplicate DNA samples were amplified using 4 different oligonucleotide primers and fragment sizes determined by denaturing polyacrylamide gel electrophoresis. DAF profiles were analysed by PHYLIP (Felsenstein 2005) to determine the genetic relatedness of each of the individuals.

From this study it appears that kikuyu in Australia falls into at least 2 distinct types. In one group, the cultivars Whittet, Crofts and Noonan are

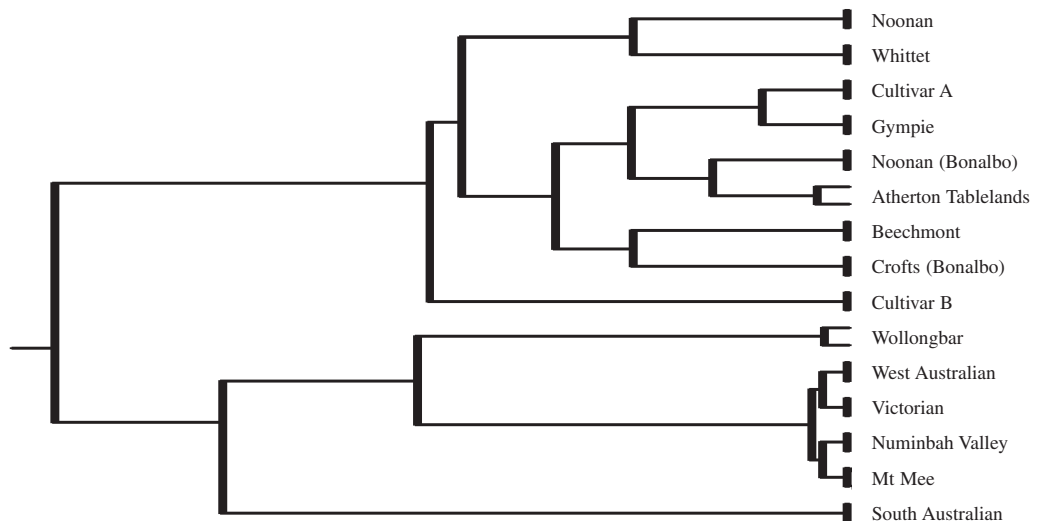


Figure 1. Genetic relationships between ecotypes and cultivars, determined by DAF profiling using 4 different oligonucleotide decamer primers.

closely related. The mutagenically-produced lines (Cultivars A and B) were in the same group as Whittet, suggesting that genetic mutations have not drastically changed their genetic makeup. The other group were generally sourced from farms, which had grown kikuyu for generations. The ecotypes from Beechmont, Gympie and Atherton Tablelands do not fit in this group and may be different from the other regional ecotypes. However, it is more

likely that these areas may have been contaminated by Whittet some time in their history.

References

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