

## *Secale montanum* breeding in CSIRO Plant Industry

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The objectives have been to breed productive, palatable, nutritious, easily-established, grass cultivars that can persist as permanent stands of short-lived perennial plants, in which dead plants are replaced by seedlings. The grass is designed to be grown in association with annual and perennial pasture legumes, and grazed rotationally by sheep and cattle on light textured and duplex soils in southern Australian regions with 500–750 mm of annual rainfall received predominantly in autumn winter and spring.

The only registered cultivar (Black Mountain) was bred by Mr LF Myers by crossing a wild population of *S. montanum* from Montenegro, Yugoslavia (Commonwealth Plant Introduction 22755) with *S. secale* cv. South Australian, and back-crossing twice to the perennial species. This population was selected over two generations for non-shattering spikes, abundant foliage production and rust resistance (Myers *et al.* 1985; Myers and Kirchner 1990). The cultivar has been sown in several regions in the highlands of Victoria and New South Wales, often with tall fescue and cocksfoot, and has become naturalised in some areas.

Extensive somaclonal variation was induced in CPI 22755 and cv. Black Mountain by Dr DM Halsall, who produced callus cultures from immature embryos under sterile conditions and then regenerated seedlings. Mr LF Myers selected perennial plants with high seed viability and non-brittle rachis over two generations in a glasshouse: some of these had very high seed yields (Myers and Kirchner 1990). I then selected individuals from these populations in the field near Canberra over six generations for high floret fertility, high tiller number, high herbage yield, shorter awns and an intermediate level of seed retention (Oram 1996). Families 10 and 42 were retained, and seeds of the former were sown in a 0.5 ha block on CSIRO's Ginninderra Experiment Station near Canberra in 1993. This block produced 380 kg seed/ha in that year, and subsequently was crash-grazed five times until mid 1995. The number of sheep grazing days provided by the stand was equivalent to a set stocking rate of 5 sheep/ha/annum, even though 1994 was a dry year. Seed of these two families is still on hand in cold storage, but it has low viability (RA Culvenor, pers. comm. 2010). Family 10 as given promising results in grazing trials in Western Australia and South Australia (Oram 1996), but it has not yet been released commercially. However, there is renewed interest in that possibility.

### References

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