

Register of Australian Herbage Plant Cultivars

A. Grasses

22. Rye

Secale montanum Guss. (secale) cv. Black Mountain

Reg. No. A-22a-1

Registered April 1985

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Origin

Introduced by the Plant Introduction Section of CSIRO Division of Plant Industry as *Secale dalmiticum* Vis. (CPI 22755) in 1957 from the Botanic Gardens of Griefswald University. Collected near Kotor, province of Montenegro, Yugoslavia. In the original line the rachis shattered severely and seed yields from mechanical harvesting were so low that commercial development was not possible. L.F. Myers and R.J. Kirchner crossed 120 plants of the original line with *S. cereale* (cv. South Australia), backcrossed twice to the parent line and selected during two polycross generations mainly for solid rachis, but also for fine leaved, multi-tillered plant type, vigour and rust resistance. The first polycross involved 20 plants selected out of 360 second backcross individuals. Eleven half-sib families each of 280 plants made up the second polycross, which is the source of breeders' seed.

Secale was first drawn to our attention by L.G. Wright (10), tested under grazing and cutting by L.F. Myers, J.H.E. Mackay and R.J. Kirchner. R.W. Downes suggested the use of *S. cereale* as a source of solid rachis. All workers are members of CSIRO Plant Industry at Black Mountain, Canberra. The coincidence of Montenegro province, the place of origin and Black Mountain, where the final line was developed, suggested the cultivar name. Mr. L.J. Hamilton of the Victorian Department of Agriculture was responsible for extensive testing. Mr. R.D. Hill, also of the Victorian Department of Agriculture and Mr. D. Richardson of 'Cobunga', Omeo assisted with testing and seed increase. Submitted for registration by CSIRO Division of Plant Industry, which will maintain breeders' seed. Data supporting registration discussed with the Victorian Herbage Plant Liaison Committee. Registered April 1985.

Morphological Description (1,6)

S. montanum Guss. Caespitose, greyish-green perennial. Stems up to 100cm, usually glabrous below the spike. Leaves usually 2 – 8mm wide, flat or involute, glabrous or scabridulous. Spike 4 – 11cm (excluding awns), linear, rachis very fragile, bearded at the nodes and margin. Glumes 8 – 10mm, densely scabrid at the keel, acuminate or shortly awned. Lemma 8 – 13mm; awn 0.2 – 2.5cm (6).

S. montanum cv. Black Mountain. As for *S. montanum* but profusely tillered with lax, slender, flat blades, 3 – 5mm wide and 150 – 250mm long, green. Fine hairs on sheath paler green than the blade, with variable purple colouring, otherwise glabrous. Membranous ligule (1mm +) and fine auricles 0.75mm long, often purple coloured. Leaf is tender and breaks readily when pulled. Culms are longer (150 – 180cm) as are spikes (10 – 15cm excluding awns) and rachis less fragile than *S. montanum* but more fragile than *S. cereale*. Glumes 10 – 12mm, acuminate; lemma 10 – 15mm; awn 30 – 50mm. Self-incompatible and cross pollinating so most characters vary somewhat. Grain free between lemma and palea, hairy at summit; embryo about one quarter the length of the grain (1). In cv. Black Mountain grain is longer and narrower (7 – 8mm × 2mm) and more vitreous than in *S. cereale*. Seed colour varies from white to dark purple (20% have substantial colour). From 280,000 – 400,000 seeds/kg. Coleoptile red to purple, first leaf normal green. In most plants root hairs persist along whole root length. Chromosome number $2n = 14$ (9).

Agronomic characters (2,3,5,7,8,10)

Adapted to areas with cold, dry winters, and substantial summer rainfall, i.e. mountain areas of the south-east Australian Highlands, which support white clover in most seasons (10). Tolerant of high

levels of soil aluminium and manganese (2,3). At most sites with acid sandy, sandy loam or loam surface soils it provides higher yields than other adapted grasses (4,5,7,8). For example, from March to September in the Upper Shoalhaven catchment at Krawarree, N.S.W. it has produced twice as much forage as tall fescue (cv. Demeter) and for the 14 months November to February nearly twice as much as Victorian perennial ryegrass (8). It is more frost resistant than *Phalaris aquatica*. Vegetative growth continues during flowering in November and seed matures in February. In a grazing trial which ran for four years it was outstanding in the severe winter of 1971 when sheep at 20 sheep/ha maintained liveweight on secale plots but lost 8kg each on perennial ryegrass plots. Wool production was 1.3kg/sheep higher ($P < 0.01$) on secale plots. Differences in liveweight persisted until the flock was replaced in 1973 (8). Density of established plants declined after three years of continuous grazing (20 sheep/ha winter; 10 sheep/ha summer). None of the original plants survived at the end of the fourth year but seedlings were plentiful. It is expected that deferment of grazing will allow seedlings to establish adequately to maintain stands. Sowing rate 5–10kg/ha. Establishes readily using aerial seeding, sometimes even in existing annual pasture (4). Machine harvested yields of seed are 100–150kg/ha. In seed increase plots secale can be infected with *Claviceps purpurea* (Fr.) Tul. in years favouring its development. Less than 5% of plants have been infected in the worst case seen and in most years ergot does not occur. The ergots are very large and conspicuous. In 13 cutting and observation trials conducted by the Department of Agriculture in eastern and north-eastern Victoria, secale was superior to other grasses tested in six trials and cocksfoot was superior in 4 of the 13 trials. Secale performs poorly on heavy textured and/or poorly drained soils. It will not survive in drainage lines and yields are low on soils that support toad rush (*Juncus bufonius* L.) (7).

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