Register of Australian Herbage Plant Cultivars

B. Legumes
1. Clover
(d) *Trifolium subterraneum* L. var. *subterraneum* (Katz. et Morley) Zohary and Heller (subterranean clover) cv. Leura

Reg. No. B-1d-30

Registered 21 October 1991

Originator: National Subterranean Clover Improvement Programme

c/- Western Australian Department of Agriculture, Baron-Hay Court, South Perth, W.A. 6151, Australia.

Registrar: R. N. Oram

CSIRO Division of Plant Industry, G.P.O. Box 1600, Canberra, A.C.T. 2601, Australia.

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Origin

Leura was collected in Sardinia by C. M. Francis and D. J. Gillespie in June 1977, 9 km north of Luras (40.98ºN., 9.15ºE.). It was given the collector's code of CD 60 Brachy Sub E (Gorringe and Pullen 1983). The collection site consisted of a grey, gritty sand of pH 5.7, located at an altitude of 550 m and with mean annual rainfall of 1100 mm. The site had been subjected to light grazing at the time of collection.

Leura was selected in 1982 by W. J. Collins and J. S. Gladstones, as 1 of 97 late-midseason to late maturing breeding lines for distribution to collaborators of the National Subterranean Clover Improvement Programme (Gladstones 1983) in Western Australia, Victoria, New South Wales and South Australia, for initial field evaluation. Evaluation of 93 of these lines commenced in Tasmania in 1983. Leura was among the 5 best performing lines up to 1986 in trials in Victoria and Tasmania. It entered final stage field evaluation trials in 1987 at 29 sites in Western Australia, Victoria, New South Wales and Tasmania. Selection and testing was conducted under the name CPI 89822H.

Field evaluation and final selection of Leura were conducted by the following collaborators of the National Subterranean Clover Improvement Programme: K. F. M. Reed and S. G. Clark (Victorian Department of Agriculture), D. A. Nicholas and P. G. H. Nichols (Western Australian Department of Agriculture), B. S. Dear (NSW Agriculture), J. A. Carpenter and P. M. Evans (Tasmanian Department of Primary Industry), and P. E. Beale, M. J. Cochrane, G. J. Mitchell and I. D. Kaehne (South Australian Department of Agriculture). Screening for disease and insect resistance was conducted by D. J. Gillespie, M. J. Barbetti and J. D. Sandow (Western Australian Department of Agriculture). Phytophthora root rot screening was conducted by P. A. Taylor and S. P. Flett (Victorian Department of Agriculture). Virus screening was conducted by G. R. Johnstone (Tasmanian Department of Primary Industry). Isoflavone analyses were provided by W. R. Stern and B. H. Tan (University of Western Australia).

Leura was submitted for registration by the collaborating organizations of the National Subterranean Clover Improvement Programme and recommended for registration by the Victorian and Western Australian Herbage Plant Liaison Committees. The Victorian Department of Agriculture will maintain breeders' seed. Provisional Plant Variety Rights have been granted (Anon. 1991).

Morphological description

The leaflets of Leura are heart-shaped with a moderate indentation. They contain a pale green, broad, triangular crescent extending about two-thirds of the distance to the margin, flanked by narrow white arms which tend to fade after flowering has commenced. This leaf-mark pattern is classified as C_2A_1, using the method of Collins *et al.* (1984). Leaf-mark and leaf shape are similar to those of Dalkeith. In winter, and under some other growth-limiting conditions, some plants exhibit an anthocyanin flush along the midrib between the leaflet base and crescent. Occasional plants also exhibit weak anthocyanin leaf flecking under these conditions. Otherwise, anthocyanin flushing and flecking of leaves is absent. Stipule pigmentation under shaded conditions is weak to intermediate. In undefoliated rows, average floret number per inflorescence is 4.5. Corollas are pink-veined and calyx pigmentation is absent. Stems are green and exhibit intermediate to strong hairiness, the hairs being erect. Hairiness on leaflet upper surfaces is also strong, with hairs erect. Petiole and peduncle hairiness is weak, with petiole hairs being erect and peduncle hairs semi-appressed.

Seedlings of Leura are prostrate, moderately small and fine. Growth habit is prostrate in the early stages, but becomes semi-erect post-flowering. Coarseness and leaf density of individual plants are both intermediate. Burr burial of Leura is strong. Burr size is intermediate, while burr distribution is mainly distal. Seed colour is black. Approximately 135 000 seeds per kg.

Agronomic characters

Leura is of late-midseason to late maturity, with flowering generally commencing later than Karridale, Mt Barker and Larisa, but earlier than Tallarook. Leura commences flowering 8 days later than Karridale at Perth, Western Australia, 4 days later at Macarthur, Victoria, 11 days later at Epping Forest, Tasmania and 14 days later at Wagga Wagga, New South Wales. Fresh leaves of Leura contain only a trace (<0.05% of dry matter) of formononetin. The levels of genistein and

biochanin A are 0.8 and 0.3% of dry matter, respectively. Leura is relatively soft-seeded. In 3 laboratory tests, Leura had 6.8% hard seed after 4 months in a 60º/15ºC temperature cabinet, compared to Karridale with 8.7% and Mt Barker and Woogenellup with 3.0%. Leura is compatible with commercial strains of *Rhizobium trifolii* (R. Roughley pers. comm.).

Leura has a high level of resistance to root rot caused by *Phytophthora clandestina* Taylor, Pascoe and Greenhalgh. In greenhouse seedling tests, with an increasing damage scale of 0–1.0, Leura had a rating of 0.1, compared to Karridale, Mt Barker, Woogenellup and Larisa with 0.2, 0.7, 1.0 and 0, respectively. Leura has an intermediate level of resistance to clover scorch, *Kabatiella caulivora* (Kirch.) Karak. In 7 field screening trials, Leura has had an average rating of 4.9, compared to Karridale, Mt Barker, Woogenellup and Esperance with 4.6, 5.5, 7.0 and 1.1, respectively (increasing damage scale of 0–10). Under favourable conditions for disease development, stands of Leura may suffer some losses when closed up for hay or seed production, although losses under normal grazing conditions should be slight.

Leura has some resistance to at least 4 leaf diseases. Its resistance to leaf rust (*Uromyces trifolii-repentis* Liro), is superior to that of Mt Barker, Karridale and Woogenellup (Barbetti and Nichols 1991*a*). Its resistance to powdery mildew (*Erysiphe polygonii* DC.), is superior to that of Karridale and similar to that of Woogenellup and Mt Barker (Barbetti and Nichols 1991*b*). Leura has some resistance to leaf spot caused by *Cercospora zebrina* Pass. Field trial ratings from South Perth of disease severity for Leura were significantly less than those for Karridale, Mt Barker and Woogenellup, but significantly greater than those of Larisa and Meteora (Barbetti 1991). Field observations from Holbrook, New South Wales, indicate a low susceptibility to common leafspot [*Pseudopeziza trifolii* (Fr.) Fuckell].

Leura develops less field symptoms than both Mt Barker and Karridale when inoculated with a range of viruses. On the basis of field ratings from Hobart, Tasmania, Leura has resistance to Beet Western Yellows and Alfalfa Mosaic viruses and moderate resistance to Bean Yellow Mosaic, Cucumber Mosaic, Clover Yellow Vein and Subterranean Clover Red Leaf viruses. Tasmanian field data also indicate that Leura has resistance to Subterranean Clover Mottle Virus. However, glasshouse inoculation studies indicate that it can be severely affected by this virus (J. Wroth pers. comm.). Leura is susceptible to Subterranean Clover Stunt Virus (P. Chu pers. comm.).

Leura is susceptible to red-legged earth mite (*Halotydeus destructor* Tucker), particularly at the seedling stage. A phytotron seedling study gave damage ratings of 6.2 for Leura, 5.4 for Karridale, 6.0 for Woogenellup and 4.2 for Mt Barker (increasing damage scale of 0–10). Leura has a similar level of blue-green aphid (*Acyrthosiphon kondoi* Shinji) tolerance to Karridale. In a glasshouse trial, blue-green aphid-infested adult plants of Leura had a mean weight of 40% of uninfested controls, compared to Karridale, Daliak, Junee and Clare with 41, 35, 30, and 61% respectively.

The performance of Leura in the high rainfall regions of Victoria, New South Wales, Tasmania and South Australia has been outstanding. Its performance in early trials in Victoria has been reported by Clark and Hirth (1987). Herbage production of Leura has consistently been at least equal to that of Karridale and superior to that of Mt Barker and Larisa. Leura has also demonstrated a major advantage over other late-midseason cultivars by having the potential to remain green for a longer period into early summer. Seed production of Leura over all sites has generally been superior to that of Mt Barker, but less than that of Karridale. However, seed set has proved to be enough to maintain a dense sward over several years.

Leura will be recommended in the most favourable subterranean clover districts of Victoria, New South Wales, South Australia and Tasmania, where Mt Barker and Karridale have previously been recommended. Its good phytophthora root rot resistance also suggests its suitability to irrigation areas where a late-maturing cultivar is required. Its excellent late spring herbage production lends itself to the production of high quality hay. Its late maturity also gives it the potential to provide good quality feed for grazing animals well into summer.

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