

Register of Australian Herbage Plant Cultivars

B. Legumes

8. Lucerne

(a) *Medicago sativa* L. (lucerne) cv. Genesis

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Origin

Genesis was derived from 2 breeding populations, Hely 8 and Hely 11, supplied by F. W. Hely, CSIRO Division of Plant Industry, Canberra, to G. G. Drummond, P. G. H. Nichols, D. B. Waterhouse and I. A. Cole at Yanco Agricultural Institute. These populations originated from crosses among selected clones of Hunter River, UC110 and UC112 from the University of California, and lowland Turkish lines. Both Hely 8 and Hely 11 were sown in an irrigated trial at Yanco during 1979 and in an irrigated and dryland trial near Tamworth during 1980. A second trial was sown at Yanco in 1982 using open-pollinated seed from the original 1979-sown trial. Selections from the Tamworth trials were crossed in the greenhouse during 1983 and the resulting populations screened intensively within and among half-sib families for resistance to colletotrichum crown rot (*Colletotrichum trifolii* Bain *et* Essary) and spotted alfalfa aphid [*Therioaphis trifolii* (Monell) f. *maculata*]. Genesis is the result of crossing these selections for pest resistance with field-adapted plants dug from open-pollinated progenies in the 1982-sown trial at Yanco. Genesis is a synthetic cultivar based on 185 plants in the final generation. Naming follows the system developed for lucernes bred by NSW Agriculture in which the cultivar name is associated with a celestial object. NSW Agriculture will maintain breeder's seed.

Morphological description

Genesis is a winter-active lucerne with a similar growth pattern to Aurora and Trifecta. Stem length after more than 4 weeks regrowth was greater than those of WL Southern Special but less than that of Aquarius and CUF-101 during summer, autumn and winter. Genesis plants after 12 months at Leeton,

New South Wales, were densely branched with spreading crowns. These crowns were significantly larger than those of Trifecta and CUF-101, and were similar in size to those of WL Southern Special, Aurora and Aquarius. Flowers are predominantly purple to mauve (97%), with a low proportion of dark purple (2%) or lilac (1%).

Agronomic characters

Genesis is a high-yielding, persistent, winter-active lucerne for haymaking and/or grazing in dryland and irrigated environments. It is resistant to the major pests and diseases of lucerne in Australia. Phytophthora root rot (*Phytophthora megasperma* Drechs. f. sp. *medicaginis* Kuan *et* Erwin) is a primary cause of stand decline in irrigated and high rainfall environments (Rogers *et al.* 1978). Genesis was similar to the resistant cultivars, Aurora and Trifecta, in the percentage survival of seedlings (52–54%) exposed to phytophthora root rot in the greenhouse. In this test, Genesis was more resistant than CUF-101 (20%), WL Southern Special (28%), Pioneer brand 581 (32%) and Hunter River (22%), but less resistant than the highly-resistant cultivar, Aquarius (75%). Genesis was resistant to colletotrichum crown rot (37% seedlings survived), as was Trifecta (40%); these survived better than Aquarius (11%) and most other cultivars tested in the greenhouse (4–27%). Genesis was also resistant to spotted alfalfa aphid in the greenhouse with a similar percentage of survivors (38%) as CUF-101 (41%), Aquarius (28%), Pioneer brand 581 (37%) and WL Southern Special (53%). However, in this test, fewer seedlings of Genesis survived spotted aphid than those of Aurora (77%) and Trifecta (56%). Genesis was also highly resistant to damage from blue-green aphid (*Acyrtosiphon kondoi* Shinji) and in this respect was similar to Aurora and Aquarius (68–83%) but more resistant than Trifecta (57%) and Hunter River (30%).

Multiple pest resistance of Genesis contributed to its consistent ranking among the most productive cultivars in dryland and irrigated trials throughout New South Wales and Queensland. Genesis produced 13% more than the mean yield of all entries in a dryland trial at Yanco. It exceeded the site mean yield by 9% under dryland conditions at Tamworth and out-yielded Aurora by 14% and Hunter River by 16%. Total yield of Genesis under irrigation was 12% greater than Aurora at Gatton, Queensland, and an average of 11% greater at Leeton. It averaged 14% greater yields than the broadly-adapted cultivars, Hunter River and Trifecta, under irrigation at Singleton, New South Wales. Genesis was superior to all other comparable cultivars in consistently producing high yields across the 8 testing sites.

Genesis generally maintained significantly higher plant frequencies across trials than comparable cultivars. It exceeded

site mean persistence in dryland trials at Yanco and Tamworth by an average 20% and persisted as well as the adapted cultivar, Hunter River, with low incidences of diseases. Genesis also maintained a 38% higher density than the site mean on average across 6 irrigated trials. It maintained a 32% higher stand density than Aurora and Trifecta at Leeton, and was 10% more persistent than Aurora and 41% more persistent than Trifecta and WL Southern Special at Singleton.

Genesis will provide an alternative to other winter-active lucernes such as Aurora and Trifecta. It is resistant to pests and disease and is more consistent than comparable cultivars in producing higher yields over longer durations in dryland and irrigated sites. Therefore, Genesis is a general purpose, winter-active cultivar for sustainable production in all major lucerne areas of Australia.

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References

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