

# Register of Australian Herbage Plant Cultivars

## B. Legumes

### 8. Lucerne

#### a. *Medicago sativa* L. (lucerne)

##### cv. Siriver

Reg. No. B-8a-9

Registered April 1980

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##### Origin (1, 3, 6, 10)

Bred by R.W. Downes, P.A. Salisbury, F.W. Hely and J.H.E. Mackay of the Division of Plant Industry, CSIRO, Canberra, in a program to incorporate resistance to both the spotted alfalfa aphid (SAA), *Therioaphis trifolii* (Monell) *f. maculata*, and the blue green aphid (BGA), *Acyrtosiphon kondoi* Shinji, into a population based on Hunter River.

Parental Hunter River plants were from two sources. Fifty-four plants were from the joint breeding program of R.A. Bray (Division of Tropical Crops and Pastures, CSIRO) and J.A.G. Irwin (Queensland Department of Primary Industries). These had been selected for three generations for resistance to root rot caused by *Phytophthora megasperma* var. *sojae* Hildebrand (1). Twenty-two plants came from Endura (a narrow leafed selection of Hunter River) and Landmark (50% Hunter River, 25% Turkestan and 25% lowland Turkish germplasm), which are two germplasms developed by the Division of Plant Industry, CSIRO, that had been selected for field resistance to root rot, grazing, drought and severe SAA attack.

Since none of these plants carried acceptable levels of resistance to both SAA and BGA, 265 highly aphid-resistance clones were selected from the U.S.A. cultivars and breeding lines, CUF 101 (6), UC 110 and UC 112. These were used as male, non-recurrent parents in a backcross program to transfer their aphid resistance to Hunter River.

Selections were made on the basis of glasshouse seedling tests described by Nielson *et al.* (9) but modified in that both SAA and BGA were applied simultaneously (3). Plants were selected only if healthy and free of symptoms 2 weeks after attack by large numbers of both aphids.

Initially F<sub>1</sub> hybrids, then later backcross progenies were tested and selections made. A selection intensity of 1% was applied but a broad genetic base was maintained by the selection of a least 500 plants per generation.

A further generation of selection was used to intensify the aphid resistance among the 500 first backcross individuals. Using the polycross progeny test for general combining ability for aphid resistance (10), 26 elite clones were selected. These were intercrossed to produce breeders' seed. Submitted for registration by the Division of Plant Industry, CSIRO, which will maintain breeders' seed. Recommended for registration by the South Australian Herbage Plant Liaison Committee. Registered, April 1980.

##### Morphological description

Siriver derives c. 75% of its genes from Hunter River, and was selected to have broad crowns and basal branching. As with Hunter River, the flowers of Siriver are purple and blue. Siriver has slightly larger seeds than Hunter River.

##### Agronomic characters (1, 2, 4, 5, 7, 8)

The cultivar was developed as rapidly as possible after the introduction of SAA and BGA into Australia. It was not tested extensively in the field before registration, but its pedigree indicated that it would be broadly similar to Hunter River for grazing and hay production.

Preliminary field evaluation at Tamworth (7) and Canberra (4) suggested that Siriver plants maintained fewer aphids than a range of commercial cultivars and did not appear to suffer any yield depression owing to aphids.

Phytotron studies showed Siriver to be more winter active than Hunter River (4). Siriver seedlings are more vigorous than those of Hunter River.

Polycross progeny of all 26 elite clones contained between 20 and 45% of seedlings which remained symptomless and healthy following joint attack by SAA and BGA. CUF 101 contained 7% of such seedlings. Total surviving seedlings in the polycross progenies ranged between 80 and 100% and in CUF 101 survival was about 40%.

In a seedling test against SAA alone, progeny of two of the elite clones chosen at random has 91 and 96% survival, CUF 101 66%, Condura 73 Brand 57%, Nova 73%, Hunter River 0% and 12 other U.S. cultivars 18-77%. The proportion of healthy, symptomless seedlings in these two progenies was 38 and 50%, in CUF 101 14% and in the remaining 15 cultivars 0-6%. Preliminary results of a seedling test (2) with BGA alone indicated that Siriver has 95% survival compared with 87% in CUF 101 and 66% in Hunter River. The proportion of healthy seedlings with only slight damage was 77% in Siriver, 53% in CUF 101 and 1% in Hunter River. Two tests done by the Division of Plant Industry, CSIRO, gave similar results.

In two seedling tests against the pea aphid (*Acyrtosiphon pisum* (Harris)) alone (4), the proportion of healthy seedlings with little or no aphid damage averaged 45% in Siriver, 33% in CUF 101, 30% in WL 514, 5% in WL 318 and 0% in Hunter River, Siriver had 99% survival, CUF 101 and WL 514 97%, WL 318 93% and Hunter River 69%.

Most parents of Siriver carried resistance to *Phytophthora megasperma*. The reaction Siriver seedlings to a mixture of Queensland isolates of *Phytophthora* was rated at 2.4, superior to Hunter River at 3.0 (5). Siriver should therefore be more persistent than Hunter River on those poorly drained and irrigated soils in which *Phytophthora* root rot is the major limiting factor.

## References

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