

Register of Australian Herbage Plant Cultivars

B. Legumes

8. Lucerne

a. *Medicago sativa* L. (lucerne)

cv. Sirotasman

Reg. No. B-8a-10

Registered April 1980

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Origin (1, 3, 5, 6, 7, 9, 11)

This cultivar was bred by R.W. Downes and P.A. Salisbury of the Division of Plant Industry, CSIRO, Canberra, in a program to incorporate resistance to both the spotted alfalfa aphid (SAA), *Therioaphos trifolii* (Monell) *f. maculata*, and the blue green aphid (BGA), *Acyrtosiphora kondoi* Shinjii, into a lucerne suitable for humid, cool-temperate conditions.

Sirotasman combines material from two main sources. Eight clones of Du Puits were obtained from the Tasmanian Department of Agriculture. Plants were also selected from 13 populations provided as seed by M.W. Dunbier, Crop Research Division, DSIR, Lincoln, New Zealand. The 13 populations (SAI, WAI, SCAI, WCAI, CAI bulk, CAI, 1A, 1B, 1C, 2A, 2B, 2C and DA1) had mainly been selected from BGA resistance in New Zealand and resulted either from direct selection within Saranac and Washoe, cultivars well adapted to N.Z., and from other breeding lines resistant to bacterial wilt (*Corynebacterium insidiosum* (McCull) Jens), or from crosses between these three sources and the U.S. lines CUF 101, UC 110 or UC 112 (5).

The source germplasms from Tasmania and New Zealand were chosen because of their adaptation, to humid, cool-temperature regions, with Du Puits and Saranac, in particular, based mainly on Flemish germplasm which is generally resistant to foliar disease (1). The U.S. lines provided a source of aphid resistance (7).

Initial crosses between the Du Puits clones, 70 New Zealand clones and 40 highly aphid-resistant clones from U.S. cultivar CUF 101 and breeding lines UC 110 and UC 112, the latter three populations used only as male parents, resulted in the selection of 250 plants, while direct selection from the New Zealand lines provided another 240 plants with some resistance to both aphids. Resistant plants were selected from seedling test similar to that described by Nielson *et. al.* (9), except that both SAA and BGA were applied simultaneously (3). The progeny of selected plants were then subjected to up to three generations of recurrent selection (6) to intensify aphid resistance.

In each generation, plants were selected from the polycross progenies with the highest general combining ability for aphid resistance (11). A selection intensity of 1% in the seedling tests ensured that rapid progress was made, but a broad genetic base was maintained by the selection of 500 plants per generation. Sixty-six elite genotypes were finally selected as the parents of Sirotasman.

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

Sirotasman plants are similar to Du Puits in habit, being somewhat more erect than Hunter River. Seed of Sirotasman is slightly larger than Du Puits seed, and the seedlings are more vigorous.

Agronomic characters (2, 4, 5, 7, 10, 12)

This 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.

Preliminary field evaluation at Canberra (4) suggested that Sirotasman plants maintained fewer aphids than a range of commercial cultivars, and did not appear to suffer any yield depression due to aphid attack. In two seedling tests against the pea aphid alone (*Acyrtosiphon pisum* (Harris)) (4), the proportion of healthy seedlings with little or no aphid damage averaged 53% in Sirotasman, 33% in

CUF 101, 30% in WL 514, 5% in WL 318 and 9% in Hunter River. Sirotasman had 99% survival, CUF 101 and WL 514 97%, WL 318 93% and Hunter River 69%.

Sirotasman should have a measure of bacterial wilt resistance derived from its New Zealand parentage (5). Resistance to bacterial wilt tends to be controlled by dominant genes (12). The level of resistance in Sirotasman to a mixture of Queensland isolates of *Phytophthora megasperma* var. *sojae* Hildebrand in a glasshouse test similar to that described by Bray and Irwin (2) was 2.9 relative to 3.0 in Hunter River (7).

A phytotron study (4) showed Sirotasman to be somewhat more active than Du Puits under short days. However, potential activity is likely to be marked by cold-induced dormancy in winter in the cool-temperate regions for which Sirotasman was bred.

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