

Register of Australian Herbage Plant Cultivars

B. Legumes

8. Lucerne

a. *Medicago sativa* L. (lucerne)

cv. Nova

Reg. No. B-8a-8

Registered November 1979

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Origin (1, 2, 3, 6, 7)

Developed by Mr G.G. Drummond, Ms M.E. Lattimore and Mr D.B. Waterhouse, N.S.W. Department of Agriculture, Yanco, in association with Mrs V.E. Henry, (*née* Rogers) CSIRO, Deniliquin, from the Cultivar Falkiner (1, 2) by one generation of selection for resistance to the spotted alfalfa aphid (*Therioaphis trifolii* (Monell) *f. maculata*), SAA. It was developed as rapidly as possible following the introduction of this major lucerne pest into Australia. Because Falkiner was derived by selection within Lahontan, a synthetic cultivar based on five clones of Turkestan origin (3), the SAA resistance of Nova is of the Turkestan type.

Seedlings of Falkiner were exposed to SAA attack at the unifoliate leaf stage in the glasshouse at Yanco and 67 plants showing no symptoms of damage were selected. They were transplanted into a heavy clay soil at Deniliquin and subjected to very wet conditions for 3 months. Forty-eight plants were selected for freedom from root disease and trueness to Falkiner type. Following a severe natural attack by SAA on seedling Falkiner in the field at Tamworth in 1977, a further 46 outstanding plants were selected. Polycrossed seed (Falkiner Composite A) was produced from all 94 plants in the glasshouse with the aid of bees in 1978, the seed from each plant being harvested separately.

Plants highly resistant to SAA were identified both by subjecting their polycross progenies to SAA attack at the unifoliate leaf stage and by caging SAA nymphs onto a leaf of each plant and monitoring the reactions of the plants and aphids. The caged leaf test is a recognised means of identifying plants highly resistant to aphids (6, 7) and correlates well with the polycross progeny test (7). Of these 94 plants, 40 were found to be highly resistant. Falkiner Composite B is an equal blend of the 1978 polycrossed seed of these plants. These were combined with a further 62 highly resistant plants selected firstly by exposure to SAA attack at the unifoliate leaf stage in the glasshouse and then by means of the caged leaf test. Following further selection for vigour, type, colour and seed setting ability, breeders' seed of Nova was produced from 84 plants interpollinated in isolation by bees at Deniliquin. This represents a selection intensity within Falkiner of about 0.3%. Submitted by Yanco Agricultural Research Centre, N.S.W. Department of Agriculture, and recommended for registration by the N.S.W. Herbage Plant Liaison Committee. Breeders' seed will be maintained by Yanco Agricultural Research Centre, Yanco, N.S.W. Registered November 1979.

Table 6. Comparative resistance of Falkiner Composite B and other Cultivars to SAA at the seedling stage.

	Percentage of plants ^A			
	Resistance			
	High	Moderate	Low	
Seedling reaction				
	Not Damaged	Some damage	Severely damaged	Total Survivors
Falkiner Comp B	11.8 b	50.0 b	26.7 a	90.5 a
Falkiner Comp A	4.8 d	42.7 b	26.5 b	74.9 b
Falkiner	1.2 e	8.0 e	13.9 bc	25.5 e
CUF 101 (Foundation)	18.9 a	32.4 c	16.2 b	68.7 c
W1 318	9.1 c	28.1 d	13.2 c	50.4 d

^A Backtransformed values.

^B Means followed the same letter(s) are not significantly different ($P < 0.01$) by Duncan's new multiple range test. Analysis on transformed data.

Morphological description

Nova is morphologically identical with Falkiner.

Agronomic characters (4, 5, 7)

Since large numbers of plants were selected over one generation only and some selection pressure was maintained for *Phytophthora* root rot resistance, it is unlikely that the agronomic characteristics of Nova will differ significantly from those of Falkiner (4). Nova should therefore be productive and persistent in poorly aerated heavy soils. All pest resistance tests have been carried out on Falkiner Composite B as an indicator of Nova. Seedlings infested with SAA at the unifoliate leaf stage (5) showed a mean increase from 25% survival for Falkiner to 90% survival for Falkiner Composite B as shown in the table.

Since some of the male parents of Falkiner Composite B were less resistant to SAA than the final Nova parents clones, Nova cannot be less resistant than Falkiner Composite B. The effect of including the less resistant clones in a population can be seen in the reduced resistance of Falkiner Composite A.

Field experience in New South Wales and Victoria from 1977-79 has indicated that only varieties with less than 50% total survival have records of occasional field damage under heavy aphid attack.

The percentage of seedlings surviving a heavy attack at the unifoliate leaf stage is well correlated with field resistance (7). Nova is expected, like Falkiner, to be susceptible to the blue-green aphid, resistant to *Phytophthora* root rot, moderately resistant to bacterial wilt and tolerant to *Colletotrichum* crown rot and to stem nematode.

References

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