

B. Legumes

22. Lotus

(a) *Lotus pedunculatus* Cav. (greater lotus) cv. *Sharnae*

Reg. No. B-22a-1. Registered on 28 October 1991. *Originator*: G.P.M. Wilson, NSW Agriculture, Agricultural Research & Advisory Station, PMB 2, Grafton, NSW 2460, Australia.

Registrar: R.N. Oram, CSIRO Division of Plant Industry, GPO Box 1600, Canberra, ACT 2601, Australia.

Released by New South Wales Agriculture, Locked Bag 21, Orange, NSW 2800.

Origin

Developed from accession CPI 67677 collected in 1974 by Mr A.D. O'Brien, formerly with NSW Agriculture, in Algarve, southern Portugal, between Caldas de Monchique (latitude 37° 9' N) and Monchique (latitude 37° 11' N). The site is a rugged but protected 30% slope with an easterly aspect and a gravelly soil, derived from granite (pH 6.0), kept wet by spring fed soakages. Average annual rainfall approximately 850 mm (O'Brien 1974).

CPI 67677 was originally combined with two similar accessions, CPI 67676 and CPI 67678 and evaluated as composite line P15303 which performed well in trials at Kempsey and Grafton, north-east New South Wales (Wilson 1980) and near Gympie in south-east Queensland (Cook 1984 and 1985). P15303 had an extended flowering period (June–February) which complicated management for seed production. To overcome the problem seed produced from the original accession CPI 67677 was sown under isolation in 1984. Very early flowering plants were eliminated from the population to produce cv. *Sharnae* which has a more restricted flowering period.

Submitted by NSW Agriculture, and recommended for registration by the New South Wales Herbage Plant Liaison Committee. NSW Agriculture will maintain breeders' seed.

Morphological description

Stoloniferous, rhizomatous perennial, upright (in dense stands) or decumbent. Stems hollow, glabrous, up to 1 m long. Leaflets 5, the lower

pair almost sessile at the base of the rachis; the upper 3 sub-sessile (or the middle leaflet having a petiolule 1–2 mm long) at the apex. Leaflets 1–3 cm long, the lower pair ovate-elliptic with the mid-vein to one side, the upper leaflets obovate with an acute, obtuse or apiculate apex; margins entire; the leaflets on flowering stems are more elongate with some narrowly-elliptic; underside of main veins and margins with soft, white, tubercle-based hairs, occasional hairs on upper side of leaflets. Flowers 5–12, in umbels subtended by leaf-like bracts, at the ends of axillary peduncles twice to four times as long as the leaves, often a few hairs on the peduncle tip. Individual flowers 1–1.8 cm long; pedicels 1–2 mm long, glabrous; calyx 5–8 mm long, with 5 spreading, hairy teeth about half as long as the tube; corolla bright yellow with red veining at the base of the standard, the keel a paler yellow. Pods cylindrical, brown, 2 mm wide and up to 4 cm long, widely spreading. Seeds globular, pale, < 1 mm in diameter, 25–40 per pod (D.J.B. Wheeler pers. comm.).

Sharnae is morphologically similar to cv. *Grasslands Maku*. However, *Sharnae* is a less hairy plant. At flowering the buds of *Grasslands Maku* are densely hairy, the matted hairs almost obscuring the calyx teeth. There are fewer hairs on the calyx of *Sharnae* and the outlines of the spreading teeth are clearly visible. The peduncle tip of *Sharnae* is also much less hairy than that of cv. *Grasslands Maku* and the leaves are less hairy (D.J.B. Wheeler, pers. comm.). *Sharnae* produced fewer crown stems (4.4 per plant) than *Grasslands Maku* (5.05 per plant) in a glasshouse study of 200 one month old plants. Similarly, in a study of 17 month old plants grown on low fertility podzolic soil at Grafton, *Sharnae* produced slightly fewer rhizomes (1.03 per plant) compared to *Grasslands Maku* (1.40 per plant). Seeds of *Sharnae* are much smaller (0.70–0.95 mm; 1 640 000 to 1 995 000/kg) than those of *Grasslands Maku* (0.85–1.20 mm; average 1 250 000/kg) and there are over 20 per pod compared with an average of 12 per pod for *Grasslands Maku* (G.P.M. Wilson, unpublished data). *Sharnae* is a diploid with $2n = 12$ (W.M. Kelman pers.

comm.), whereas Grasslands Maku is a tetraploid (Armstrong 1974).

Sharnae is more robust and bulkier but forms a less dense sward than Grasslands Maku.

Agronomic characters

On the North Coast of New South Wales, Sharnae commences flowering in mid September, reaches a first peak by mid October and waves of flowering continue until late summer. By contrast, Grasslands Maku rarely flowers before early to mid December. Mature seed has been collected from predominantly raingrown Sharnae during each month from mid November to mid April (G.P.M. Wilson, unpublished data). In subtropical regions of New South Wales and Queensland, ability to mature seed before the summer-autumn wet season could enhance survival through seedling recruitment following flooding of the coastal lowlands. Grasslands Maku is usually killed or its population seriously diminished by summer-autumn inundation.

In trials on two soil types at Grafton, Sharnae has given higher forage yields during late spring and early summer than Grasslands Maku; and in continuously grazed trials on two sites with contrasting moisture regimes at Fineflower, in the Upper Clarence valley, Sharnae persisted better, spread further and produced more dry matter than Grasslands Maku on the driest site. Conversely, Grasslands Maku had markedly superior persistence, spread and yield on the moist site (G.P.M. Wilson, unpublished data).

The concentration of condensed tannins in Sharnae varies between sites (Canberra, Armidale) and seasons but in each situation is approximately double that of Grasslands Maku (M.J. Hill, pers. comm., and W.M. Kelman, pers. comm.).

Limited observations suggest that Sharnae has resistance to root knot nematode, whereas Grasslands Maku is susceptible. This may be an important consideration affecting the choice of lotus cultivars for use as permanent groundcover in subtropical orchards and plantation crops and

for pastures on acid sandy soils (G.P.M. Wilson, unpublished data).

There has been no specific evaluation of the seed production potential of Sharnae, but an irrigated plot harvested at Grafton in early February 1985 yielded 314 kg per hectare of seed. The hard seed content of untreated samples tested for germination has varied from 38 to 45%.

At Gympie, Sharnae has been screened for tolerance to a wide range of post-emergence herbicides including some unregistered chemicals. It tolerated the full range of selective grass herbicides available, when applied at recommended rates, but failed to tolerate any of the standard range of broadleaf herbicides (Lock and Harvey 1990).

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