New herbage plant cultivar

B. Legumes
17. Jointvetch
Aeschynomene villosa Poir. (villose jointvetch) cvv. Reid and Kretschmer

Reg. No. B-17c-1, B-17c-2. Registered on November 10, 2000.
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Released by Head Licensee, Southedge Seeds Pty Ltd, Mareeba, Queensland, Australia.
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Origin

Aeschynomene villosa occurs from southern Arizona, through Mexico, central America and the Caribbean to north-western South America. It grows at elevations up to 2250 m, usually in dry areas, pine and oak forests, pastures and sometimes in wet places (Judd 1955). The Australian collection of *A. villosa* comprises 58 accessions (Bishop *et al.* 1988) of which 11 are perennial. Two of these were selected for direct release following classification, description and evaluation. CPI 91209 (cv. Reid) was collected by R. Reid at 22°26′N, 99°29′W in Mexico, 11.6 km east of Ciudad del Maiz, San Luis Potosi, at 1250 m above sea level (ASL), in an area receiving 650 mm average annual rainfall (AAR) (Anon 1983). CPI 93621 (cv. Kretschmer) was collected by R. Reid and A.E. Kretschmer at 19°24′N, 96°36′W in Mexico near Corral Falso, Veracruz, at 1420m ASL on a loamy clay/clay loam soil in an area receiving 1100mm AAR (A.E. Kretschmer and R. Reid, personal communication). CPI 91209 and CPI 93621 were endorsed for release as cultivars Reid and Kretschmer, respectively, by the Queensland Herbage Plant Liaison Committee in September 1995. Breeders' seed will be maintained at DPI Walkamin Research Station and the Australian Tropical Forages Genetic Resource Centre, St Lucia, Queensland 4067.

Morphological description

Aeschynomene villosa is described by Rudd (1955) as follows:

"Stem to about 1 m long, prostrate to weakly erect, hispid; stipules (5–) 10–15 mm long, 1–1.5 mm wide, subglabrous, ciliate, usually somewhat hispid at the point of attachment; leaves about 2–7 cm long, 20–50 foliolate; leaflets 3–15 mm long, 1–3 mm wide; inflorescences 3–10 flowered, the peduncles and pedicels hispid like the stem, the bracts cordate, acuminate, 1.5–6 mm long, 1–2 mm wide, ciliate, the bracteoles ovate-lanceolate, acute to acuminate, 1–4 mm long, 0.5–1 mm wide, ciliate; flowers 3–9 mm long; calyx 2–4 mm long, hispid; standard commonly 5–7 mm long, the claw 1–2 mm long, the blade suborbiculate, 4–5 mm in diameter, emarginate, entire; wings about as long as the standard, the blade 1–2 mm wide; keel about 4–5 mm long, the claws 1–1.5 mm long, the blades 3–4 mm long, 1–2 mm wide, sometimes ciliate along the free margin; stamens 4–5 mm long; fruit 3–7 (commonly 4–6) seeded, the articulations distinct or sometimes lacking, the articles 2.5–3 (–4) mm in diameter, villous-hispid, the tuberculate bases of the hairs often dark, in contrast to the otherwise straw-coloured or light brown fruits, the venation inconspicuous, the margins often breaking away from the body of the articles; seeds 2–2.5 mm long, 1.5–2 mm wide, blackish."

Reid and Kretschmer are both perennials conforming to this general species description, but differ slightly from each other within the ranges mentioned. Reid is more prostrate and has darker seeds than Kretschmer. Dense stands of the former have reached 30cm tall compared with 60 cm for the latter in trials at Gympie. Plant diameters at Mackay reached 150 cm and 230 cm, respectively. There are 420 000 and 480 000 seeds/kg in the respective lines. Gametic chromosome number is n = 10 (Bielig 1997).

Agronomic characters

Both accessions fall into Group 7, one of two groups of perennial *A. villosa* in a morphological/agronomic classification described by Bishop *et al.*(1988), many plants living for more than three years under ideal conditions. Reid and Kretschmer are maintained as separate cultivars for seed production, equal portions being mixed and marketed commercially as "Villomix", by Southedge Seeds Pty Ltd, Mareeba, Queensland, to take advantage of the variation in plant maturity and growth habit between cultivars.

Both cultivars appear to be well adapted to environments receiving 1000 mm AAR and above. However, in subtropical areas receiving a winter rainfall component and where spring–early summer rainfall is more reliable, they can persist in areas down to 900 mm AAR. At a range of sites in coastal Queensland, both accessions have persisted better than Glenn and Lee American jointvetch under variable rainfall conditions. Both display moderate cold tolerance.

They have been grown successfully on soils ranging in texture from sandy loams to heavy cracking clays. Both have performed well in Queensland in dairy pasture evaluation sites at Rockhampton and Gympie and on the Atherton Tableland and in NSW at Kyogle. The commercial "Villomix" has persisted on heavy clay soil downs country in a 700 mm rainfall zone of central Queensland. Both lines tolerate waterlogging but not to the same extent as does *A. americana*. They combine well with companion grasses including competitive species such as *Brachiaria humidicola* (Bishop *et al*. 1997).

Kretschmer grew well and spread in a coastal lowland situation near Gympie, in comparison with a limited set of *A. americana* and *A. villosa* lines. Despite frequent dry conditions, heavy grazing and little fertiliser, this line persisted in a dense mat of *Axonopus affinis* on a red duplex soil (B.G. Cook, unpublished data). In evaluation sites near Mackay and Gympie both lines have persisted better and yielded more than Glenn and Lee American jointvetch (Bishop *et al.* 1997). At Mackay, dry matter yield of Reid, receiving 10 kg/ha applied P, was >2000 kg/ha, in Year 1, >600 kg/ha in Year 2, and >500 kg/ha in Year 3. Dry matter yield at nil applied P was around 150 kg/ha (H.G. Bishop, unpublished data). Leaf and stem material are readily eaten by cattle, but no specific liveweight gain data for *A. villosa* are yet available. Experience at a range of sites indicates that villose jointvetch nodulates effectively with native rhizobia, but it is recommended that jointvetch inoculum (CB2312) be used when sowing new sites.

Kretschmer was ranked second highest of seven legumes for nitrogen content in the leaf from plant tips (3.71%) compared with Lee American jointvetch (highest at 4.04%) and Seca stylo (lowest at 2.87%). Using acid detergent fibre (ADF) as an indicator of digestibility, Kretschmer had second highest digestibility (ADF 20.70%) compared with Lee (highest at 17.30%) and Seca (4th at 24.30%) (Jones *et al.* 2000).

At Mackay, flowering of Reid and Kretschmer commenced on April 5 and 14, respectively (Bishop *et al*. 1988), compared with March 15 and April 10 at Gympie (B.G. Cook, unpublished data). The difference in flowering time in Reid between the two centres is more likely the result of juvenility at Mackay, rather than the daylength difference between the two sites. This is supported by flowering data from seed crops at Walkamin Research Station, north Queensland, where first flowers were recorded on March 27 and April 10, respectively.

A. villosa exhibits two types of seedpod dehiscence, one where the arcuate suture separates at maturity, dropping the seed, and the other similar to that of *A. americana,* where the pod breaks into segments, the seed being retained within the segment. The latter is more easily commercially harvested. Reid and Kretschmer exhibit the first type, but a combination of direct and suction harvesting can produce seed yields approaching 1t/ha (Bishop *et al*. 1997). Commercial yields of this order have been achieved using this procedure (John Rains, personal communication).

Preliminary herbicide trials indicate *A. villosa* is relatively tolerant of 2, 4-D but not as tolerant as Glenn and Lee American jointvetch. Reid and Kretschmer seedlings were killed by acifluorfen (Blazer® at 2 L/ha), fluoroxypyr (Starane® at 750 ml/ha) and metsulfuron (Ally® or Brushoff® at 7.5g/ha) (D.S. Loch, personal communication).

A. villosa is affected by powdery mildew in the autumn when growth slows, although this is less of a problem in well-grazed stands. Reid and Kretschmer are less affected than is Glenn American jointvetch. In seed crops, the *Sclerotinia-Botrytis* pathogen complex sometimes

causes death of stems necessitating spraying with fungicides (J.M. Hopkinson, personal communication).

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