

Register of Australian Herbage Plant Cultivars

B. Legumes

9. Annual Medics

e. Medicago polymorpha var. *brevispina* (Benth.) Heyn (burr medic)

cv. Santiago

Reg. No. B-9e-3

Registered April 1988

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Origin

Cv. Santiago was collected by Dr. J.P. Simon near Santiago, Chile, in 1962, and was tested under the University of Western Australia code number N3146. It was initially selected for its high seed yield and spineless pods. Testing has been intensive in Western Australia during the period 1981-86, following initial screening in the early 1970's. Originated by M.A. Ewing, C.K. Revell and C.W. Thorn. Submitted by the Western Australian Department of Agriculture and recommended for registration by the Western Australian Herbage Plant Liaison Committee. The Western Australian Department of Agriculture will maintain breeders' seed. Registered April 1988.

Morphological description

Annual prostrate herb with the central stem weakly erect and with lateral branches of spaced plants up to 1m. Leaves are green with small random purple flecks and an inverted 'V' shaped leaf mark at the base. The mark has a strong purple margin when unshaded and a green centre, often paler than the main leaf and with a purple flush. The mark is most pronounced on young plants and fades on old shaded leaves in spring. Santiago markings are different from those of cv. Circle Valley, which has a smaller basal purple anthocyanin marking on leaflets, and Serena which usually has a plain leaf, or similar markings to Circle Valley on a few leaves. Santiago leaflets have a protruding terminal tooth which is absent from both Serena and Circle Valley. Vegetative plant parts are almost glabrous when mature but have a few simple hairs when immature especially on the adaxial side of the midrib of leaflets. Flowers are 3-5 mm long, bright yellow with brown streaks running up the inside of the standard. One to three flowers per peduncle which is shorter than the subtending petiole. Corolla is almost twice the length of the calyx; wings longer than keel. Young pods are contracted and protrude sideways from the calyx. Mature pods almost cylindrical with a diameter and length of 4-5 mm. Pods have anti-clockwise coils, are spineless and brown/black at maturity. Seeds are ovoid, dark yellow brown with three to seven per pod and 250 000/kg.

About 1% of plants have the following variant characteristics: Variant 1 (c. 0.48%): White flecks on the upper leaf surface; more distinct in cold conditions and fading with the onset of warmer weather.

Variant 2 (c. 0.48%): White flecks as in variant 1, but the basal leaf mark is absent.

Variant 3 (c. 0.04%): Slightly earlier (6 days) and more vigorous plant with no leaf marks or flecks and distinctly larger pods.

Agronomic characters

Santiago flowers 80-85 days after late May sowing at Merredin, Western Australia, and slightly later in cooler southern areas. It is similar in maturity to *M. truncatula* cv. Cyprus, 7-10 days later than *M. polymorpha* cv. Serena and 10-15 days earlier than *M. polymorpha* cv. Circle Valley. If germination occurs in late April or early May, time to flowering is shortened and Santiago flowers before Cyprus (D.J. Gillespie, pers. comm.) When moisture limits growth in spring, Santiago can remain vegetative longer than other *M. polymorpha* cultivars of similar maturity.

Santiago has been extensively field tested in Western Australia during the period 1981-86, an era in which seasonal conditions have fluctuated widely. In 14 large-plot grazed comparisons conducted on a wide range of soils in areas receiving between 300 and 450 mm of annual rainfall Santiago produced 16 and 521 kg more seed than Serena and Circle Valley, respectively. Seed yield superiority has been greatest under heaviest grazing, commonly being two-fold. The high seed yields achieved with Santiago have given rise to high plant densities in regeneration pastures, commonly in the range of 500-1500 plants/m². The superior regeneration capacity of Santiago over Serena and Circle Valley has given rise to higher dry matter production, especially in winter and early spring.

Like Serena and Circle Valley, Santiago is well adapted to a wide range of soils (Ewing 1986). These include the alkaline sandy clay loams, on which *M. truncatula* has performed well, but also lighter textured sandy loams and shallow sands over grey clays. The pH of these latter 2 categories range from pH 6 to 7, 1:5 water extract. Testing since 1985 has been with the acid-tolerant *Rhizobium* strain WSM419 which is superior to earlier commercial inoculum strains (Howieson and Ewing 1986).

Hard seed testing was largely conducted on material recovered from the soil surface in autumn. Result indicate levels of hard seed similar to Cyprus. Seed of Santiago grown in 1984 and collected in May 1985 had 80% residual hard seed, the same level as Cyprus (G.B. Taylor, pers. comm.). Seed grown in 1985 at 3 sites gave an average residual hard seed level of 68%, equal to Serena and 2.5% higher than Cyprus.

Dry leaves, stems and pods contain only trace amounts of coumestrol (B. Tan, pers. comm.). Disease resistance screening for *Phoma medicaginis* (Malbr.) Roum. has revealed no significant difference in the reaction of Santiago compared with Serena, Circle Valley and Cyprus, with all being classed as intermediate, but a significant advantage for Santiago, classed as resistant, over Serena in reaction to *Staganospora meliloti* (Lasch) Patrak. (M.J. Barbetti, pers. comm.). Santiago has some resistance as mature plants to blue-green aphid (*Acyrtosiphon kondoi* Shinji); in the field it rates between susceptible cultivars such as Cyprus and *M. littoralis* cv. Harbinger and tolerant cultivars like *M. truncatula* cvv. Sephi and Paraggio. Field ratings for aphids in Western Australia have often been complicated by the simultaneous presence of cowpea aphid (*Aphis craccivora* Koch) and blue-green aphid. Santiago, Serena and Circle Valley have valuable tolerance to cowpea aphid while all commercial cultivars of *M. truncatula* are susceptible. Santiago is susceptible to lucerne flea (*Sminthurus viridis* L.) and has only slight resistance to red-legged earth mite (*Halotydeus destructor* Tucker). As seedlings in glasshouse screening, the red-legged earth mite resistance of Santiago is superior to Cyprus and Circle Valley and similar to Serena (D.J. Gillespie, pers. comm.) and this ranking has been confirmed in field sown experiments.

Acknowledgements

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References

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2. Howieson, J.G., and Ewing, M.A. (1986). Acid tolerance in the *Rhizobium meliloti*-*Medicago* symbiosis. *Australian Journal of Agricultural Research*, 37, 55-64.