Register of Australian Herbage Plant Cultivars

B. Legumes
1. Clover
Trifolium semipilosum var. *glabrescens* Gillet. (Kenya white clover) cv. Safari

Reg. No. B-1i-1
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Origin

Derived from seed introduced by CSIRO in March 1960 (CPI 27218) from the Kitale Seed Company, Kenya. A seed production plot was established at Samford, South-east Queensland, in 1962 and from this time onwards seed was issued as CPI 27218 in Queensland and elsewhere. The seed production area at Samford was expanded in 1968 and in 1971 at both Samford and Beerwah on areas free of *Trifolium repens* and other accessions of *T. semipilosum*. Submitted for registration by the CSIRO, Division of Tropical Agronomy, Brisbane. Recommended for registration by the Queensland Herbage Plant Liaison Committee. Registered June 1973. Breeders' seed will be maintained by CSIRO, Division of Tropical Agronomy.

Morphological description (2,5,7)

A perennial herb with a strong tap root and pilose stems radiating from a central crown and rooting at the nodes. In grazed pastures individual plants intertwine with neighbours to form a dense mat. Ascending stems arise from the crown and from rooting nodes, especially under lax grazing or cutting. Stolons, *c.* 2 mm in diameter, with radiating secondary stolons at intervals along their length. Short tap roots (to 20 cm) develop at the nodes along the stolons.

Leaves, trifoliate with leaflets cuneate-obovate up to 2.4 cm long and 2.0 cm wide with a length to width ratio of 1.25 and mainly emarginate. Leaflets mainly glabrous above, pilose at the margins, on the midrib, and on the lower half of the two lateral leaflets. The central leaflet may also be pilose on the midrib, margins, and on one side. The hairs are silky *c*. 1mm long. Leaves have ± 10 main nerves each side at an angle of 40-50^{o} to the midrib. In this cultivar *c*. 30% of the plants have a broad white mark along the midrib of the leaflets, while a small percentage (*c*. 5%) have a red inverted V mark across the leaflets.

Petiole pilose, much longer than the leaflet except in heavily grazed or stunted plants, up to 26 cm long, more often 12-18 cm. Stipules up to 2 cm long joined to the petiole for approximately half their length. Base of stipules whitish, the falcate-triangular tips green and pilose, inflorescence globose, with 4-40 (often c. 20) flowers on long peduncles somewhat longer than the leaves. Peduncles, pilose round in section and hollow. Flowers borne on pilose pedicels 2-5 mm long, with membranous, rather bifid bracts 0.5 mm long. The pedicels reflex after fertilization. Calyx teeth awl shaped, pilose, extending to more than half the length of the corolla. Flowers white, cream or pale pink, standard 8-10 mm long. Stamens c. 5 mm long, ovary stipulate, glabrous with 3-6 ovules. Pod 5-6 mm long and 2-2.5 mm broad, light green changing to brown when ripe. Seeds 2-6 per pod, irregularly discoid becoming more rounded when ripe and some 1.5 mm across. Seed mango shaped, dull yellow, light brown, olive grey or even black in colour and often mottled. 700-1000 seeds/g. The cultivar is cross pollinating and self sterile with 2n = 16 chromosomes (13,14).

Agronomic characters

Suitable for subtropical areas in Queensland and New South Wales which receive an annual rainfall of 1000 mm or more. This cultivar has been shown to be more persistent under drought conditions than *T. repens* cultivars (4,10) and to extend production into the summer period (8). Unlike *T. repens* it is capable of competing for light with associated grasses by means of its ascending stems.

It is highly specific in its *Rhizobium* requirement, but inoculum strain CB 782 is fully effective (14,3). Nodulation failures or partial failures have been encountered in the field and these have contributed to the observed slower rate of establishment compared with white clover (7).

The nitrogen yield of this cultivar was higher under glasshouse conditions than either CPI 21156 or CPI 25347 (14), although it gave lower dry matter yields than CPI 25347 in another experiment (14). In the field, CPI 27218 was higher yielding or equal in yield to CPI 21156, 25347, and 31996 (18). There is also evidence to suggest that cv. Safari is less affected by a virus akin to bean yellow mosaic virus than other introductions (18). However, it is very susceptible to rugose leaf curl virus. Consequently, young stands are often unproductive. Ability to overcome the virus attack results in productive pastures subsequently (6). Safari appears to be resistant to clover rust (*Uromyces trifolii-repentis*) (7) and to clover burn (*Sphaerulum trifolii*) (17).

Compared with white clover, *T. semipilosum*, cv. Safari is less sensitive to variations in cutting management (7). In a preliminary grazing trial at Samford, cv. Safari has given a much higher clover contribution to the sward than white clover. The higher contribution of clover has been associated with higher liveweight gains in grazing steers (9). In chemical composition cv. Safari resembles white clover, except that the sodium content is low (0.05%) (8). The critical value for phosphorus is 0.23% P for dry matter yield, but may be as high as 0.3% P for protein yield (1). In glasshouse studies it is capable of better nodulation and growth at low pH and low calcium supply than New Zealand certified white clover (1).

In vitro dry matter digestibility of herbage cut every 4 or 8 weeks was consistently high - 75% and 71% respectively with little change throughout the year (8).

Preliminary pen trials with ovarectomized ewes fed fresh cv. Safari have given no evidence of oestrogenic activity (11). On this, and field evidence in East Africa, no fertility problems due to oestrogens are expected with this legume.

In a glasshouse experiment in Brisbane, flowering occurred from mid July till mid October (12), but in the field in south-east Queensland peak flowering usually occurs in May and October. Seed yields of up to 400 kg/ha have been achieved. The pods do not shatter readily and the seed needs to be scarified for high germination (7).

In south-east Queensland and New South Wales cv. Safari should do well in areas which now grow *T. repens* successfully. I could be of particular value on the Atherton Tableland where white clover fails to persist (17). Cattle can bloat on *T. semipilosum*, but the risk may be less than on *T. repens*.

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