

## Register of Australian Herbage Plant Cultivars

### B. Legumes

#### 1. Clover

#### *Trifolium michelianum* Savi (balansa clover) cv. Bolta

Reg. No. B-1j-2

Registered 19 June 1998

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*Australian Journal of Experimental Agriculture*, 1998, 38, 531–2.

#### Origin

Bolta was collected as seed from the wild at Canakkale, Turkey, by J. Harlan, USDA, in 1948. It was originally identified as PI 170829 and later allocated accession number WA 464MIC (Snowball 1991) at the Australian Trifolium Genetic Resource Centre in Perth.

Bolta was identified as a high performing line through field selection procedures, primarily conducted in south-east South Australia from 1990 to 1995 and was initially evaluated against 65 *Trifolium michelianum* accessions at Kybybolite Research Centre. It was subsequently field tested with other elite lines in grazed, replicated swards in the Kybybolite, Kalangadoo and Coonawarra districts of South Australia.

Bolta was approved for registration by the South Australian Pasture Plant Assessment Committee in June 1997 under the code name KRC-1. Breeders seed of Bolta will be maintained by the South Australian Research and Development Institute. Seed will be certified in states accredited to operate OECD Seed Certification Schemes. Bolta has been submitted for protection under Plant Breeders Rights legislation (Craig 1997).

#### Morphological description

Bolta is an annual, herbaceous, aerial-seeding legume. Habit prostrate as a single plant, becoming semi-erect in dense swards. Stems hollow, light green in colour, glabrous, to 354 mm long and 5.4 mm thick at flowering. Leaves alternate, trifoliate, green, glabrous, 28 mm long and 16 mm wide on last fully opened leaf of the longest lateral stem at flowering. Leaflets obovate-rhomboidal, apices obtuse, truncate or retuse; margins serrate. Leaf markers variable, with a predominance of plain leaves or with a white marker; anthocyanin pigmentation very low. Petioles glabrous. Stipules lanceolate, green–red in colour.

Inflorescence umbellate, 25 mm in diameter. Peduncles glabrous. Pedicels bracteate, green–red in colour. Number of florets variable, typically 40–55 per inflorescence. Corolla white–pink, standard terminating in a pink tip, becoming light brown in the mature head. Pink florets typically in the outer whorl of the corolla. Corolla tube about 12 mm long. Calyx green, 5 mm long, lobes uneven in length, 2–3 times longer than the tube. Seed colour variable, ranging from green, yellow, light brown, dark brown to black; seed mass  $1.17 \times 10^{-3}$  g (Paradana  $9.8 \times 10^{-4}$  g); about 97% hard-seeded at maturity.

Bolta resembles the earlier-maturing cultivar, Paradana (Anon. 1990), but differs from Paradana in flowering time and leaf markers. Bolta flowers an average of 10 days later than Paradana in South Australia and the 2 cultivars are distinguishable on this characteristic when grown side by side. Paradana is readily recognised by its wide array of leaf markers, with a high frequency of pink and silver markers. In contrast, Bolta displays very little pink or silver colouration, with mostly plain leaves or leaves with a white crescent.

#### Agronomic characters

Bolta has been developed for temperate Australia as a forage plant for livestock. It is suitable for hay production or as a component of permanent pastures. The mean number of days to flowering is 124 (sown June 1996). Bolta has been developed for areas receiving a minimum of 600 mm rainfall per year, with a high winter incidence, although it has also performed well in 550 mm areas on soils with a high moisture holding capacity. It is a later-maturing alternative to Paradana, producing higher levels of herbage production (average 39%) during October and November. Bolta also has a slightly higher (3%) nutritive value (protein and digestibility) than Paradana in November, reflecting its later maturity and delayed senescence. The seeds of Bolta are larger than those produced by Paradana, resulting in the establishment of larger, more vigorous seedlings.

Mid season herbage production of Bolta is slightly lower (5%) than that of Paradana. However, Bolta has produced more late-season growth than Paradana in both South Australian and interstate trials. Stands of Bolta have demonstrated strong recovery from grazing. At times of high grazing pressure (down to 200 kg/ha dry matter), Bolta recovered to produce satisfactory seed yields. Regeneration of Bolta and Paradana is significantly enhanced when residual dry matter is removed from the swards over summer. Bolta has persisted well under grazing for at least 5 years. It is hardseeded and has the ability to regenerate well from year-to-year. Bolta produces high seed yields, similar to those of Paradana, of the order of 1000 kg/ha in suitable environments.

Bolta contains low levels of formononetin (mean 0.09% dry matter) and coumestrols (1 µg/g dry matter), while genistein and biochanin A have not been recorded in Bolta. Isoflavone levels in Bolta are within acceptable levels so as to ensure no risk of infertility in sheep.

Bolta is susceptible to both redlegged earth mite, *Halotydeus destructor* Tucker, and lucerne flea, *Sminthurus viridis* L. Glasshouse screening studies conducted in Western Australia rated Bolta's susceptibility to redlegged earth mite as similar to that of Paradana. Redlegged earth mite should be controlled in the establishment year to ensure good establishment and therefore maximise seed set later in the year. Bolta is tolerant of clover scorch, *Kabatiella caulivora* [Kirchn. (Karak)], and has not been infected by either stem or leaf rust. No other significant disease symptoms have been observed on Bolta.

Bolta nodulates effectively with a wide range of commercial inoculants, although it is recommended that Bolta and Paradana are inoculated with commercial Group B inoculant. This recommendation may change in the near future.

Bolta is adapted to a wide range of soil types, performing well on soils with either a light or heavy texture, although it is unlikely to perform well on deep sandy soils where fertility levels are low. Bolta is known to tolerate a pH (H<sub>2</sub>O) range of 5.0–7.1, although studies conducted with Paradana (Evans *et al.*

1990) showed that it is likely to perform better at the higher pH levels. It is well adapted to waterlogging and grows well on moderately saline soils, demonstrating a tolerance level similar to Paradana.

#### Acknowledgments

Funding for the development of Bolta has been provided by the South Australian Research and Development Institute and the International Wool Secretariat. The technical assistance of all personnel involved in the development of the cultivar is greatly appreciated.

#### References

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