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Farmnote

Scimitar ℗ and Cavalier ℗ annual burr medics

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Figure 1. Scimitar ℗ burr medic sown across a salinity transect at Yealering, Western Australia in 2003.

Two new softer-seeded burr medics for phase, cropping and some saltland pasture systems in Western Australia

Spineless burr medic (*M. polymorpha* L. var *brevispina*) is a highly productive annual pasture legume suitable for loam and clay loam soils in the wheatbelt. This species can tolerate mildly acid soils, giving it a distinct advantage over the traditional barrel and strand medics historically used in Western Australia.

Recent research indicates they also tolerate low to mild levels of salinity and transient (but not prolonged) waterlogging.

The new cultivar Scimitar ℗, is a softer-seeded alternative to Santiago, and will complement the early maturing cultivar, Serena. Cavalier ℗, is a replacement for Circle Valley, for which there is little or no seed production.

Origins and development

Scimitar ℗, and Cavalier ℗, are crossbred medics produced by the South Australian Research and Development Institute (SARDI) from existing germplasm in the South Australian Genetic Resource Centre (tested under the codes Z497 and Z1186, respectively). They were both field tested over three years by collaborating organisations under the National Annual Pasture Legume Improvement Program (including Western Australia), and registered and accepted for Plant Breeders Rights as new cultivars in 2002.

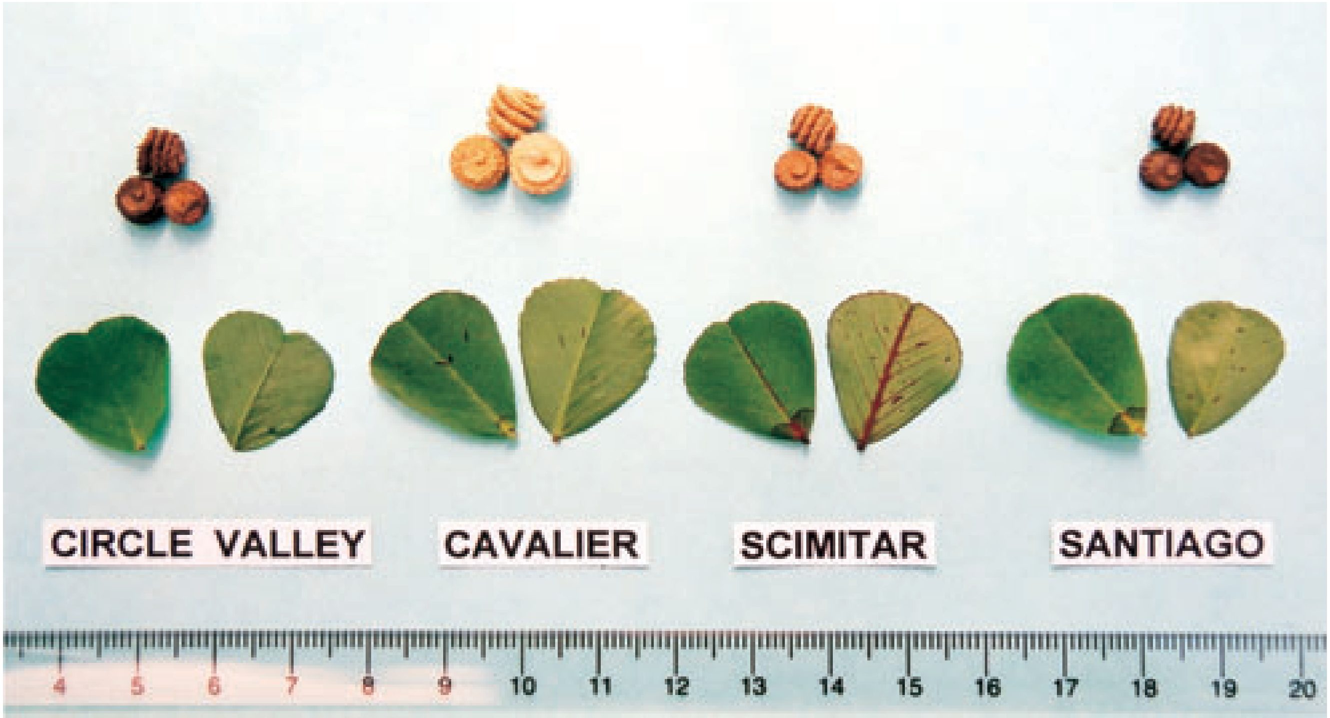


Figure 2. Leaf and pod characteristics of Scimitarⓓ and Cavalierⓓ.

Description

Both Scimitarⓓ and Cavalierⓓ have yellow flowers which occur in bunches of three to four florets per stalk.

Scimitar ⓓ has a leaflet shape similar to Santiago, but appears darker green and is characterised by purplish-red colouring on the mid-rib and lateral vein on both the front and back of the leaf (more pronounced on the back). The front of the leaf has a distinctive proximal blotch on the lower section where the leaf joins the leaf stalk (darker red than for Santiago, and fully coloured). Scimitar ⓓ flowers approximately one week later than Santiago (84 days at Cunderdin, Western Australia) but this can vary with environment. It produces grey-brown pods, similar to Santiago, but generally lighter in colour. It has no spines and coils in an anticlockwise direction. Individual seeds are yellow-brown, kidney-shaped and weigh approximately 4 mg.

Cavalier ⓓ has a leaflet shape and colour similar to Santiago, with some mild brown-purple flecking. It has a brown-purple proximal blotch on the leaf, similar to Santiago, but this is generally paler and not fully coloured. Cavalier ⓓ flowers at the same time as Circle Valley (around 90 days at Cunderdin, Western Australia). It produces significantly larger pods than Scimitar ⓓ and Santiago, and these are a light straw colour. Cavalier ⓓ generally has slightly larger seeds, which are yellow-brown, kidney shaped and weigh approximately 4.5 mg.

Soil adaptation and use

Both Scimitarⓓ and Cavalierⓓ are adapted to the sandy clay loams and red clay loams of the wheatbelt with pH ($CaCl_2$) 4.8 to 8.0. They are also suited to the grey clays of the south-east wheatbelt and the valley floors in these regions away from severe waterlogging. They tolerate transient waterlogging but not extended periods of flooding.

Scimitar ⓓ is an early to mid-season maturing cultivar and is suited to areas with 325 mm to 450 mm growing season rainfall.

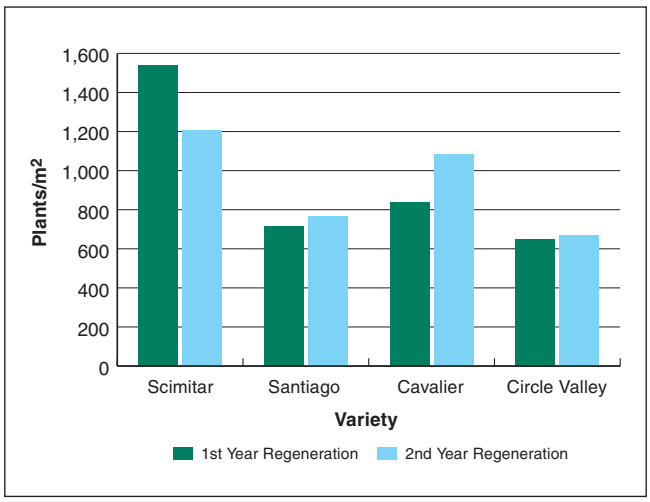
Cavalierⓓ is a mid-season maturing cultivar and is suited to areas with 375 mm to 550 mm growing season rainfall.

Use in phase pasture and cropping systems

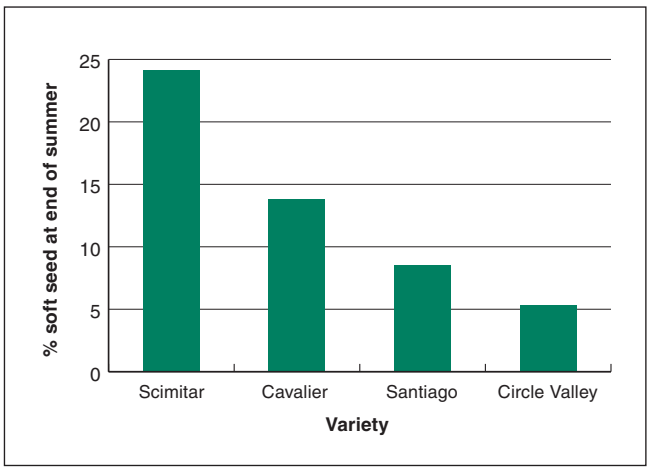
Scimitar ⓓ and Cavalier ⓓ were selected as cultivars with high herbage and seed production. Hardseeds of Scimitar ⓓ and Cavalier ⓓ soften more readily than those of Santiago and Circle Valley, which allows them to regenerate better in long-term pasture phases (Tables 1 and 2). However, their hardseed reserves are still adequate for persistence through reasonably intensive cropping rotations (one crop every two to three years). Santiago is preferred for year-in year-out rotations.

Use in saltland pastures

Scimitarⓓ and Cavalierⓓ have also shown promise in mildly saline areas of Western Australia, where waterlogging is not prolonged. In saline transect demonstrations, they have grown into salt scalds as far as balansa clover. These cultivars may have applications as understorey plants in saltbush alleys or on mildly saline barley grass flats. The extent to which they can contribute to the rehabilitation of saline land requires further investigation.



Graph 1. Regeneration (plants per square metre) at Cunderdin, Western Australia in 1998 and 1999.



Graph 2. Percentage of soft seeds at the end of the first summer, Plant Breeders Rights (PBR) comparative trial Urrbrae Adelaide (SARDI) 1999.

Pest and disease resistance

Scimitar ® and Cavalier ® have low levels of resistance to blue-green aphid, and are susceptible to spotted alfalfa aphid and cowpea aphid. They have moderate resistance to the root lesion nematode *Pratylencus neglectus*, which is not significantly different to other medics. Scimitar ® has a low level of tolerance to redlegged earth mite (RLEM), similar to Circle Valley and slightly less than that of Santiago. Cavalier ® is susceptible to RLEM. Scimitar ® and Cavalier ® contain low levels of coumestrol (up to 35 ppm) which is within the acceptable range for annual medics.

Establishment

Good weed control prior to sowing is essential, particularly for broadleaf weeds. Establishment into a paddock that has been cropped or has low weed densities is desirable. Delay sowing until after the break, and apply two knockdown sprays if time permits. Sow shallow (< 1 cm) with recommended fertiliser rates for the paddock (phosphate, potash and trace elements).

Apply a preventative bare earth spray for RLEM after sowing in susceptible areas. An inspection of seedlings after sowing for RLEM and lucerne flea is recommended for all areas, and spray if these are present. Selective herbicides for grass control can be applied six to eight weeks after establishment.

Companion species: Can be sown in mixtures with other burr and barrel medics, sub clover and other *Trifolium* species, according to paddock soil type and pH. The use of mixtures can act as a buffer against different seasonal conditions, soil types and management decisions. However, they can limit the herbicide options for broadleaf weed control.

Sowing rate: 7-10 kg alone, 2-4 kg/ha in mixtures with other legumes.

Inoculant: All new sowings must be inoculated with Group AM (as used for burr, barrel, murex, snail and gamma medics).

Management

Moderate grazing six to eight weeks after germination will help reduce weeds and encourage development of a prostrate dense sward. Grazing animals should be removed during flowering in the establishment year to optimise seed set. Excessive grazing should be avoided over summer. Pods are easily eaten by sheep, resulting in seed loss and poor regeneration. A dry shallow cultivation at the end of the first summer to bury pods can enhance germination in the second year.

Production and marketing

Cavalier ® and Scimitar ® are protected under the Plant Breeders Rights Act 1994. Under the Act there is no restriction on producing seed of Cavalier ® and Scimitar ® for personal use (farmer's privilege) or from sale of produce, such as hay or silage. However, sale of Cavalier ® and Scimitar ® seed can only be carried out by agreement with the licensees (Cavalier ® – "Seed Distributors Pty Ltd", Scimitar ® – "Seed Technology & Marketing Pty Ltd" i.e. Seedmark). Sale includes exchange by way of a barter arrangement.

Unauthorised propagation of seed for commercial purposes or sale of these cultivars is an infringement under section 53 of the Plant Breeders Rights Act 1994 and is subject to prosecution.

Acknowledgements

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Further information

For more information, phone Dr Angelo Loi (08 9368 3907), Dr Clinton Revell (08 9368 3596) or Mr Brad Nutt (08 9368 3870) Department of Agriculture Western Australia.

Other reading

Journal of Agriculture No 4. 1986 'Serena and Circle Valley Medic Establishment', pp107-112.

Farmnote No. 19/2002 'Inoculation and lime pelleting pasture legumes'

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