



Key features

- First barrel medic with tolerance to SU herbicide residues*
- Early maturing (~ 70-90 days to flowering), similar to Caliph and Angel
- Caliph hybrid with improved regeneration
- Less hard seeded than Caliph (~ 85% cf 95%), similar to Jester
- Good aphid resistance (BGA & SAA)
- Boron tolerant.

Description/breeding

Sultan-SU is an early flowering, aphid resistant barrel medic (*Medicago truncatula*) which is tolerant of sulfonylurea (SU) herbicide residues. It is the only barrel medic on the market with all of these key attributes. Sultan-SU was derived from a cross made between Angel strand medic (world's first SU tolerant medic) and Caliph barrel medic and subsequently back-crossed to Caliph four times. It was selected on the basis of SU herbicide tolerance and superior regeneration (ie reduced hardseed levels compared to Caliph).

Adaptation/use

As a typical barrel medic it is well suited to mildly acidic to alkaline ($\text{pH}_{\text{ca}} > 5.5$) soils with textures ranging from loams to clays. However this could be further extended to include soils which have a lower pH and are low in exchangeable aluminium. These include parts of western NSW where the traditional subclovers are failing to persist due to increased cropping intensity and a succession of below-average rainfall years.

Sultan-SU with its early maturity, good seed yields and similar hardseed levels to Jester, can regenerate well in the first year after sowing and/or after 2-3 years of cropping. Once healthy seed reserves have been established in the soil, Sultan-SU should have superior persistence to the subclovers currently used in these areas.

Sultan-SU's tolerance to SU will also enable farmers in low-medium rainfall areas to successfully grow barrel medic pastures in the presence of SU herbicide residues resulting from applications to prior crops.

Pest resistance

Sultan-SU has good resistance to both bluegreen aphid (BGA, *Acyrtosiphon kondoi*) and spotted alfalfa aphid (SAA, *Therioaphis trifolii*) although aphicides may still need to be applied during severe infestations to avoid loss of plants and/or yield.

It is susceptible to cowpea aphid (CPA, *Aphis craccivora*) and like most other annual medics, Sultan-SU is susceptible to redlegged earth mite (RLEM) and lucerne flea (LF). The presence of root lesion nematode (*Pratylenchus neglectus*) may cause loss of yield but annual medics in general are rated as moderately resistant (MR) and have been shown to result in a reduction in *Pratylenchus* numbers.

Disease resistance/tolerance

Similar to other barrel medics, Sultan-SU can be affected by spring black stem (*Phoma medicaginis*), especially in regenerating, under-grazed, lush stands. Powdery mildew (*Erysiphe trifolii*) is another foliar disease which appears to be gaining in significance.

Other diseases capable of affecting annual medic seedlings include the soil pathogens *Pythium* spp. and *rhizoctonia*.

Variety management/agronomy

Establishment: establishes well if sown dry (from mid-April onwards) into cereal stubbles free of broadleaf weeds and with good weed control the previous year. Alternatively, sow into a fine, moist and weed-free seedbed soon after the break of the season.

Seeding rate & sowing: sow at 4-10kg/ha, depending on the situation. Higher seeding rates will improve competition against weeds and allow for earlier grazing in the first year. Sow at the lower rates if using in mixtures of varieties with different maturity, adaptation and hardseededness (mixtures can help to overcome seasonal, soil and rotational variability, eg Sultan-SU could be sown with Angel, to accommodate variable soil types/textures within the paddock). Aim for a sowing depth of 1-2cm and ensure good seed-soil contact by the use of press wheels or covering devices such as harrows or prickle chains.

Inoculation: inoculate seed with group AM rhizobium unless the paddock has had a healthy stand of medic in the past two years. Inoculation is vital if the soil is under pH(H₂O) 7.0. Good nodulation is essential to maximise nitrogen fixation for the benefit of the following crop.

Nutrition: good phosphorus (P) and zinc (Zn) nutrition is critical for maximum medic growth and thus nitrogen fixation. Other nutrients to watch out for are copper (CU) and sulphur (S).

Weed control: maximise seed set in the establishment year of Sultan-SU by reducing weed competition as much as possible. Early removal of grasses with grass selective herbicides results in improved pasture growth and reduced carry-over of cereal root diseases (eg Take-all and CCN). Less selective means of weed control such as spray-grazing, winter-cleaning and spray-topping can be more safely used to control weeds after the initial year, when medic density and soil seed reserves have built-up.

Pest control: closely monitor for redlegged earth mite and lucerne flea damage, both at the seedling and flowering stage, especially in the year of establishment. Spray as necessary.

Grazing – establishment: defer grazing after sowing until plants are well established and then only graze lightly until flowering. Remove stock until the stand has finished flowering and producing pods to maximise seed set. Carefully monitor summer grazing, especially in the first year, as over-grazing of pods will reduce future pasture regeneration.

Grazing – regeneration: initially defer grazing at the break of the season to maximise plant establishment. Then apply grazing pressure to control upright grasses and encourage prostrate growth until ground cover is complete. Increase grazing pressure if necessary to prevent overly bulky pastures which are more susceptible to moisture stress and foliar fungal disease.

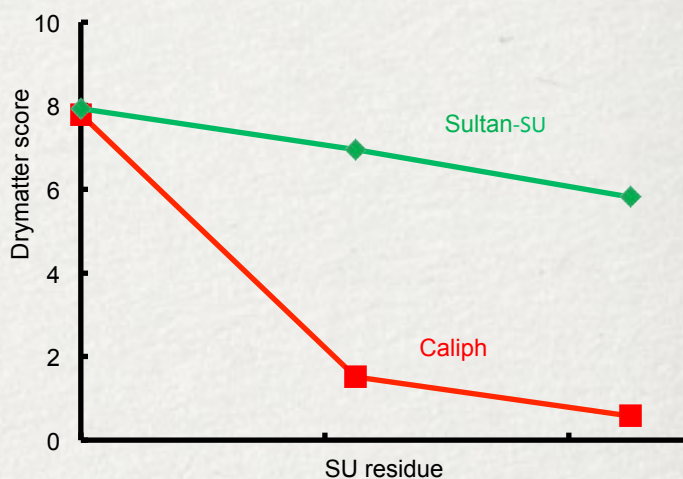
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Ensure a good seed-set at least one year in four to maintain adequate seed-soil reserves for maximum persistence, regeneration and production.

Fig 1. Dry matter response of Sultan-SU and Caliph chlorsulfuron at 0, 1.125 and 2.25 g/a.i./ha at Mallala, SA.



L: Caliph (intolerant),

R: Sultan-SU (tolerant)

* "SU tolerant" refers to ability to tolerate sulfonyleurea herbicide **residues** (ie not direct foliar application) at levels that typically occur in the year following application at standard rates to crops.

Sultan-SU was bred by the South Australian Research and Development Institute (SARDI) assisted by Heritage Seeds and the Australian Government (Climate Ready).