Gosse

Sub Clover

Subterranean/Sub clover (ssp. yanninicum)

INTERNATIONAL

KEY FEATURES

- Mid season type 126 days to flowering
- The superior seedling vigour of Gosse allows it to establish better plant numbers than Trikkala while producing later into the season due to its maturity
- This produces better quality feed by maintaining a good legume component raising the nutritional status of the pasture
- Gosse contains very low oestrogen levels and is unlikely to cause any fertility problems to grazing stock
- Good tolerance to waterlogging
- Good levels of hard seed (25%)

GOSSE is a large white seeded sub-clover variety that was developed as part of the National Subterranean Clover Improvement Program. GOSSE demonstrates a prostrate to semi-erect growth habit and is particularly well suited to moderate to heavy soils and is able to tolerate short periods of waterlogging. It has mid-season maturity which makes GOSSE suitable for medium to high rainfall zones. GOSSE was developed as a replacement for Trikkala and as an alternative to Larissa. It is suited to regions with a 7-month growth period. It was selected for improved seedling vigour, increased hard seed, disease resistance, and winter and spring herbage production. The superior hard seed levels of GOSSE makes it well suited to either permanent pasture or medium-term cropping rotations. GOSSE will provide the benefits of soil nitrogen along with an effective disease break.

Growing Conditions

Soil Type:
Well suited to moderate to heavy soils and is able to tolerate short periods of waterlogging

Sowing Rate:
Pure 5 - 10kg/ha Dryland
Pure 11 - 15kg/ha Irrigated

Rainfall:
500mm+

pH:
4.5 - 7.0 ($CaCl_2$)

Inoculant:
Group C Rhizobium

Pest Resistance

Gosse, as with all sub-clovers, is susceptible to red-legged earth mite (Halotydeus destructor), blue-green aphid (Acyrthosiphon kondoi), blue oat mite (Penthaleus major) and spotted alfalfa aphid (Therioaphis trifolii). Therefore, control is essential at the early seedling stage and appropriate pest management must be implemented as required.

Disease Resistance / Tolerance

Gosse is resistant to clover scorch (Kabatiella caulivora) and has demonstrated high resistance to phytophthora root rot (Phytophthora clandestina) strains 0 and 2 and is resistant to strain 1. Gosse is resistant to root rots caused by pythium (Pythium spp.), leaf diseases such as leaf rust (Uromyces trifolii-repentis) and cercospora leafspot (Cercosprora zebrine).

Agronomy and Management

Regeneration: Gosse has a higher level of hard seed (20–25%) compared to that of Trikkala (5–10%) and Larissa (10–15%). Gosse and Trikkala produce similar levels of seed production, however, due to a high hard seed level it is able to build up a greater reserve of seed in the soil over time, thus enhancing persistence and productivity for many years.

Grazing: Gosse produces excellent forage for grazing, hay and silage. Care must be taken with new sown pastures so as not to overgraze too early as plants can be pulled from the ground. Light grazing during the establishment period will help control weeds and encourage dense prostrate growth. Once established, heavy grazing of Gosse, up to flowering, will improve seed set. When flowering begins, stocking rates should be reduced to optimise seed set and prolong the life of the stand.

Cultivar Agronomic Guide	
Maturity	Mid
Days To Flower	126
Burr Burial Strength	5
Hard Seed Level	4
Waterlogging Tolerance	Good
Hard Seed Level	1 = Least Hard 10 = Most Hard
Burr Burial Strength	1 = Very Weak 10 = Very Strong

Subteranean/Sub Clover Agronomic Information

Scientific name(s)

Trifolium subterraneum ssp. yanninicum

Strengths

- Tolerant of heavy grazing under set stocking
- Vigorous seedlings provide good winter feed
- Adapted to soils prone to winter waterlogging
- Very persistent in high rainfall areas

Limitations

- Poor persistence on well-drained sandy soils
- Insufficient hard seededness for persistence in tight cropping rotations (1 year crop:1 year pasture)
- Susceptible to germination following ‘false breaks’
- Shallow-rooted, so unable to capture deeper soil moisture and susceptible to premature death in dry springs
- Some older cultivars have high oestrogen levels contributing to ewe infertility

Plant characteristics

A prostrate self-regenerating annual pasture legume tolerant of waterlogging and heavy grazing that grows from autumn through to spring and buries its burrs.

Pasture type and use

Suited to permanent and semi-permanent pastures and to crop rotations where cropping is infrequent. Other subspecies (subterraneum and brachycalycinum) are better suited to soils not prone to waterlogging.

Where it grows

Rainfall
Adapted to winter-dominant rainfall area of southern Australia with annual rainfall 425 -1200 mm. Midseason varieties suited to medium rainfall zone, later flowering varieties suited to higher rainfall zone. Can also be grown under irrigation.

Soils
Prefers sandy loams to clays of moderate acidity (pH $CaCl_2$ 4.5-6.5) and good water holding capacity. Highly tolerant of winter waterlogging.

Temperature
Widely adapted to the agricultural areas of Western Australia, South Australia, Victoria, New South Wales and Tasmania. Good frost tolerance.

Establishment

Companion species
A range of perennial and annual grasses, balansa clover, gland clover, persian clover, purple clover, burr medic. On paddocks with patches of well-drained soils it can also be sown with subterranean clover ssp. subterraneum (black-seeded sub clover) and lucerne.

Sowing/planting rates as single species
5- 15 kg/ha.

Sowing/planting rates in mixtures
3-8 kg/ha, depending on the number of mixture components.

Sowing time
Sow April-June, into moist soil following good weed control. Shallow sowing (<40 mm) is essential.

Inoculation
Commercial Group C (subterranean clover).
Granular clay inoculants can also be used. Can biologically fix 25 kg nitrogen/tonne of herbage dry matter.

Fertiliser
Phosphorus (with potassium on deficient soils) at sowing – levels dependent on soil tests. Trace elements (Cu, Mo, Zn) may be required on very infertile soils.

Management

Maintenance fertiliser
Annual applications of superphosphate (with potassium or sulphur on deficient soils) are required to achieve maximum productivity. Levels are dependent on soil tests.

Grazing/cutting
Thrives under set stocking and can be grazed moderately hard while flowering. Likely to be shaded out from more erect plants under lax grazing. Can be cut for hay.

Ability to spread
Slow spread from site of sowing. Can spread by burrs attaching to wool.

Weed potential
Its slow rate of spread, its preference for moderate-high fertility soils and specific rhizobia requirement gives it low potential as an environmental weed. It is readily controlled by a range of broadleaf herbicides within crop.

Major pests
Red-legged earth mite is a major pest, particularly at plant establishment, where it can kill emerging seedlings, but also causes damage in spring. Timerite® has proved an effective means of control. Lucerne flea and blue- green aphids can also cause damage in spring. Refer to chemical labels for suitability and recommended rates for insecticides.

Major diseases
Some cultivars are susceptible to the foliar disease clover scorch (Kabatiella caulivora), found in high rainfall, humid areas. Other foliar diseases in higher rainfall areas include leaf rust (Uromyces trifolii-repentis), powdery mildew (Erysiphe polygonii) and cercospora leafspot (Cercospora zebrina). Several root rots can attack subterranean clover, causing most damage to emerging seedlings and young plants. They include Phytophthora clandestina, Fusarium avenaceum, Pythium irregulare and Rhizoctonia solani.

Herbicide susceptibility
Refer to chemical labels for suitability and recommended rates for herbicides registered for use on subterranean clover.

Animal production

Feeding value

Excellent as green feed with in vitro digestibility in the order of 70% and crude protein over 20% until mid-flowering. Quality reduces once plants hay off. Dry herbage feeding value over summer is less than maintenance value (often < 50% in vitro digestibility) although animals may be able to obtain sufficient energy and protein by digging up seed burrs.

Palatability

Readily consumed by livestock, either as green or dry feed.

Production potential

Vigorous seedlings provide good early season production. Later flowering varieties capable of more than 10 t/ha annual production in long-season environments.

Livestock disorders/toxicity

Some older varieties of subterranean clover contain high levels of phyto-oestrogens, which can affect the sheep reproductive system. The most active isoflavone is formononetin, which can cause a decline in ewe fertility. Two other isoflavones, genistein and biochanin A, are also present in all subterranean clover varieties, but these have less impact. If ewes are mated when they are grazing green, potent subterranean clover their reproductive performance can be temporarily impaired. Continued exposure over several years to high levels of formononetin, can lead to permanent infertility. Ram fertility is not affected.

Formononetin is present in subterranean clover only while the pasture is green. However, hay produced from oestrogenic varieties can be almost as potent as green pastures. Formononetin levels drop away during late flowering. Generally, dry subterranean clover pastures that result from normal haying-off are not oestrogenic. However, if there is a very early finish to the season, it is possible for oestrogenic varieties to retain some potency in the dry state. All recently released varieties have low formononetin levels. There have been isolated reports of cattle bloat on very clover-dominant, subterranean clover pastures.

Source: Pastures Australia and Barenbrug

Australian Government
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