

Berseem clover

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Introduction

Berseem clover (*Trifolium alexandrinum*) is an annual pasture legume originating in eastern Mediterranean regions. It is widely grown in its area of origin as a high-quality forage conservation crop, and has been introduced to many other countries, such as India, Pakistan, South Africa, USA and Australia, where it is also primarily used for fodder conservation purposes. Berseem clover is also known as Egyptian and Alexandria clover.

In Australia, it is most commonly grown in combination with other annual legumes, such as arrowleaf clover (*Trifolium vesiculosum*), Persian clover (*Trifolium resupinatum*) and balansa clover (*Trifolium michelianum*), to increase the bulk of forage conserved. It is also suitable to sow in a mixture with winter cereals, such as oats, to make high quality silage or hay.

Adaptation

Berseem clover grows best on fertile, medium to heavy textured soils of mildly acidic to neutral pH. It can be grown in dryland situations, requiring a minimum average annual rainfall (AAR) of 550 mm for high production in southern NSW, or 750 mm in northern NSW.

Berseem clover is frequently grown under irrigation, where, with good management, two to five forage cuts are possible in the growing season.

It has moderate tolerance of salinity, and will tolerate short periods of waterlogging.

Berseem clover is generally only sown as a one-year fodder conservation crop, as it produces soft seed, which is highly susceptible to loss via false breaks (out of season rainfall with no follow-up rain) in summer and early autumn. As false autumn breaks are common in areas where berseem clover is sown, second year stands are usually very sparse.

Berseem clover does not tolerate shading, and has moderate tolerance of cold conditions.

Description

Berseem clover is an erect annual legume, which can grow 60–80 cm tall. It has a shallow taproot. Leaflets are commonly 4–5 cm long and 2–3 cm wide.

Flowers are round, white and approximately 2 cm in diameter. Seeds are yellow, with approximately 400,000 seeds/kg.

Varieties

All varieties of berseem clover are very late maturing and have very low levels of hard seed.



Figure 1. Berseem clover. Photo courtesy of Steve Hughes, South Australian Research and Development Institute (SARDI).

Varieties differ mainly in their disease tolerance.

Elite II® has tolerance of clover scorch (*Kabatellia caulivora*), and is resistant to root rot (*Phytophthora* spp. and *Pythium* spp.).

Memphis® has tolerance of clover scorch.

Carmel (Multicut) is susceptible to clover scorch

Alexandria has good tolerance of clover scorch.

Big Bee has moderate tolerance of clover scorch.

Establishment and management

Sowing

Berseem clover can be sown into a conventional seed bed, or direct drilled to a depth of no more than 10 mm. The optimal sowing time is mid-autumn in dryland situations, or late summer to mid-autumn if irrigation is available. Early sowing increases the opportunity for multiple forage cuts. Later autumn sowings are acceptable, but overall herbage production will be decreased.

When sown in a mix with other legumes or cereals for a forage or fodder conservation crop, berseem clover should be sown at 2–4 kg/ha in dryland

situations, and up to 6 kg/ha under irrigation.

When sown as a monoculture, it can be sown at rates of up to 10 kg/ha dryland and 20 kg/ha under irrigation.

Inoculum

Berseem clover requires Group B rhizobia for nodulation.

Fertiliser

Adequate phosphorus (P) is required to optimise growth of legumes. At least 10 kg P/ha should be used when sowing Berseem clover. Added sulphur (S) and molybdenum (Mo) may be required in some areas. Consult your local agronomist for further information.

Grazing

Berseem clover is better suited to fodder conservation than grazing, as it has high growing points that can be easily damaged by inappropriate grazing.

A rotational grazing strategy should be used if berseem clover is to be used for grazing purposes.

Table 1. Herbage production (t/ha) of several annual pasture legumes sown as a one year fodder conservation crop at various locations in NSW.

	Rand	Grogan	Holbrook	Burruga	Curban	Moree	Moree
Average annual rainfall (mm)	500	525	600	750	550	600	600
pH	6.0	5.4	4.2	4.3	5.1	5.6	5.6
Exchangeable aluminium (%)	0	0	5	25	0	0	0
Soil type	Red earth	Grey clay	Loam	Sandy loam	Sandy loam	Red clay loam	Black earth loam
Location ¹	sNSW	sNSW	sNSW	cNSW	nNSW	nNSW	nNSW
	Herbage production (t/ha)						
Elitel [®] berseem clover	3.7	4.3	12.4	2.1	3.9	7.2	7.1
Bolta [®] balansa clover	1.6	1.8	10.5	5.4			
Persian clover ²	2.5	2.1	13.9	2.4	7.4	7.5	6.0
Zulu arrowleaf clover	1.8	2.0	16.0	4.7	2.8	12.6	13.7
Electra [™] purple clover	1.9	1.3	14.6	3.5			
Caprera crimson clover	3.6	2.5	8.0	3.0	5.2	5.9	6.1
Hykon rose clover					5.1	7.2	7.5
Clare subterranean clover ³					7.5	5.9	6.9

¹ Refers to southern, central or northern NSW

² Laser[®] was used in southern and central NSW; Prolific was used in northern NSW

³ Clare belongs to the subterranean clover sub-species *brachycalycinum*

The sward should not be allowed to become too erect prior to grazing.

Hard seed

The hard seed content of berseem clover is very low, making it susceptible to germination under false break conditions. Seedling mortality under these conditions can be very high, resulting in poor second season stands.

Pests and diseases

The main disease affecting berseem clover is clover scorch. Varieties differ in their tolerance; however, even tolerant varieties may require chemical applications to control outbreaks.

Berseem clover may also be affected by root rot.

Berseem clover is susceptible to attack by red-legged earth mite, blue-green aphid, spotted alfalfa aphid, blue oat mite and heliothus.

Seed production

Berseem clover seed can be harvested using a conventional header. Field experiments in southern NSW have found that berseem clover can produce 500–1200 kg seed/ha, with highest yields occurring in areas with reliable late spring rainfall.

Herbage production and quality

Herbage production

Berseem clover is capable of producing moderate to high quantities of herbage across a range of environments (Table 1). It performs best in areas with reliable late spring rainfall, where acidity or, perhaps more importantly, aluminium levels are low.

Herbage quality

Berseem clover is capable of producing herbage of very high quality. Herbage quality generally declines as plants approach maturity (Table 2). In this experiment, bud development commenced in early November, with flowering commencing in mid-November; therefore, to maximise quality of conserved forage, harvesting should be done before flowering commences.

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Table 2. Cumulative herbage production, dry matter digestibility (DMD), crude protein (CP) and metabolisable energy (ME) of berseem clover in spring–summer 2005 at Cootamundra, NSW.

	11 Oct	26 Oct	8 Nov	22 Nov	6 Dec
Herbage (t/ha)	2.6	4.2	6.1	7.4	6.7
DMD	79	76	69	68	65
CP	24	20	17	16	16
ME	11.4	11	10.0	9.7	9.2

Note: The herbage production and quality figures were taken from previously uncut swards on each sampling date.

Warnings

Pasture improvement may be associated with an increase in the incidence of certain livestock health disorders. Livestock and production losses from some disorders are possible. Management may need to be modified to minimise risk. Consult your veterinarian or adviser when planning pasture improvement.

Legislation covering conservation of native vegetation may regulate some pasture improvement practices where existing pasture contains native species. Inquire through your office of the Department of Natural Resources for further information.

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