



Arrowleaf clover

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Arrowleaf clover (*Trifolium vesiculosum*) is a self-regenerating annual clover with good late season growth. This note describes the origin, management, varieties, Victorian trial work results and fodder conservation of this species.

Background

Arrowleaf clover (*Trifolium vesiculosum*) is a self-regenerating annual clover native to the Mediterranean region, Balkan Peninsula, Crimea and Caucasus. It has been cultivated in parts of the USA since the 1960's.

Arrowleaf clover is an aerial seeder and consequently it is easy to harvest with conventional farm machinery. The plant is adapted to well drained sandy or clay soils with a pH range between 5 and 7 (CaCl₂).

In Victoria it has performed well in a range of soils including basaltic clays, suggesting that it can tolerate some waterlogging. The species is hard seeded and has the ability to continue to germinate after the autumn break. Most available varieties are fairly late maturing but have a deep tap root which allows them to grow well into the summer months. Its winter production is poor compared with subclover, balansa and Persian clovers. Given its late maturity and hence requirement for a longer growing season, it is considered that most of Victoria can grow arrowleaf clover with the possible exception of the very dry areas in the NW of the state.

Victorian results

Recent work in southern Victoria has shown that arrowleaf clover is well adapted to a close 1:1 pasture:crop rotation with wheat or canola and excellent self regeneration is achieved following cropping. The plant produces less dry matter than other annual clovers in winter but has out-produced other annual legumes species between mid-November and late January. This late production suggests that the plant may have a "dewatering" effect on soils, as does Lucerne, which would lower water tables and reduce waterlogging in subsequent seasons.

In southern Victoria, the seed produced is very hard and consequently a crop following the first year pasture, after allowing full seed set, would be good practice. Little arrowleaf clover will regenerate in the second season because of hard seed dormancy or hard seed. In the third

season, arrowleaf clover will show excellent regeneration as the dormancy of hard seed has by then broken down.

If arrowleaf clover is part of a mixture with short-lived ryegrass it would be advisable to sow the grass at a very low rate and control excessive competition from the grass in winter with grazing. Perennial ryegrass will be less competitive with the clover than will short lived ryegrass. Winter production of the pasture is increased by the grass and the arrowleaf clover makes an excellent contribution in late spring and early summer provided the grass is controlled by late winter grazing.

Management

Paddock preparation and sowing

Paddocks should be made free of weeds by spraying with an appropriate knockdown herbicide. An insecticide should also be mixed with the herbicide to minimize populations of red-legged earth mites if they are present at the time of spraying.

With good sowing technique and favourable rain, a sowing rate of 5 kg/ha may be adequate but as the seed is small and seedling growth can be slow initially, and susceptible to red-legged earth mites, a rate of 10 kg/ha is safer.

Seed must be inoculated with group C (WSM 409) inoculant when sowing. Seed harvested on farm will have a very high proportion of hard seed and must be scarified before use to ensure good seedling germination and establishment. Certified seed purchased commercially will already have been scarified to ensure a high percentage of soft germinable seed. The seed should be placed no deeper than 1 cm. Light harrowing and rolling will improve establishment. If the arrowleaf clover is to be direct drilled the seed should be placed on a very shallow groove. This technique will give good weed control early as undisturbed ground stays weed free for longer after spraying.

The paddock can be grazed soon after sowing or just left set stocked lightly during the first winter.

Grazing

To achieve maximum seed set, arrowleaf clover must not be grazed once flowering commences in the first spring. Flowering can start as late as November or early December. In contrast, grass-subclover pasture needs to be kept short in spring for optimum clover seed production

and a high stocking rate is necessary to achieve this. Keeping a high stocking rate on grass-subclover pastures will allow spelling the arrowleaf pasture at this time and can therefore benefit both pastures.

Soon after maturity when the feed nutritive value is still high (late January or February when the seed heads dry off) arrowleaf clover paddocks must be heavily grazed. The optimum level of residual dry matter would be zero at the start of the autumn rains to achieve the best possible regeneration before returning to a pasture phase. Grazing hard in summer should not affect the seed bank as a large percentage of the seed can survive passage through the digestive tract of herbivores and will be returned to the paddock undamaged. Arrowleaf regrows well after cutting for hay or silage.

Varieties

Zulu, Seelu and Cefalu are available as commercial varieties in Australia. Cefalu flowers earlier than Zulu or

Seelu, which are of similar maturity. The new variety “Arrotas” is well adapted to areas of southern Victoria receiving more than 500 mm of annual rainfall. In northern Victoria it is safe to sow Arrotas in areas receiving more than 600 mm of annual rainfall.

Fodder conservation

The rapid growth of arrowleaf clover in spring and early summer, its erect growth habit and good regrowth after cutting and its high digestibility all make it ideally suited to silage and haymaking. Growth should be sufficient for two cuts without severely affecting seed set. Well established arrowleaf clover pastures that are cut for hay should still recover the following year from hard seed reserves set in previous years.

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