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FACT SHEET

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Serradella - *a pasture legume for deep acid sands*

Serradella is a self-regenerating annual pasture legume particularly well suited to deep acid sandy soils.

There are five species of serradella. Two species have grown well in SA: yellow serradella *(Ornithopus compressus)* and French serradella *(Ornithopus sativus).* Serradella is a useful alternative to lucerne on deep sandy soils where lucerne is difficult to establish or maintain. Serradella is not as productive as lucerne, but it is adapted to continuous grazing. On deep acid sands serradella is more productive than sub clover. Like all pasture legumes, serradella improves soil fertility by nitrogen fixation.

Description

Serradella has fine 'vetch-like' leaves and produces seed in hard, leathery pods which can break-up into single-seeded segments. It is a deep-rooting plant, able to extract moisture and nutrients from the soil at depth. Because of this, serradella pastures tend to stay greener and retain quality longer in spring than subclover. It is essentially a spring grower with the bulk of production occurring from August onward. Both yellow and French serradella provide good quality, palatable stockfeed. They do not contain plant oestrogens and so will not cause sheep infertility.

Yellow serradella is an extremely hardy plant and demonstrates good persistence under grazing. It produces a tough, drought-tolerant seedling. It is capable of good seed yields and all varieties produce a high level of hardseeds at maturity.

French serradella varieties are usually more productive than yellow serradella in the first year, and until recently have produced a low percentage of hardseeds. This has limited their persistence to one or two years. However, the development of new, hardseeded French serradella varieties has largely overcome this limitation.

Areas of use

Yellow serradella's greatest potential is on the deep acid sands where sub clover growth is poor. Under these conditions its tolerance to low fertility, its deep root system and its high hardseed content can enable it to persist for many years. It also grows well on more fertile, better drained soils, although its production under these conditions is often lower than other species.

Yellow serradella is capable of tolerating extremely acid soils. However, it is susceptible to waterlogging and will not perform well in these areas. Early maturing varieties can be grown in as little as 350 mm annual rainfall.

French serradella is used overseas as a fodder plant on infertile, sandy soils. It can be used as an aid to improving the establishment of yellow serradella or as a component of a permanent pasture in its own right.

Varieties

A number of new yellow serradella varieties have been developed in recent times which allow this species to be grown successfully across a wide range of rainfall environments. However, seed supplies of some of these varieties are often limited and this affects variety selection. Most of the varieties listed below have been developed in Western Australia and have not been widely tested in South Australia. Given this lack of local testing, it is generally a good idea to sow a mixture of two or more varieties. Varieties which are likely to be available include :

- Charano (early season)
- King (early season)
- Santorini (early-mid season)
- Elgara (early-mid season)
- Avila (late season).

Yellow serradella varieties also differ in their degree of pod retention – this can have a significant impact when harvesting serradella seed.

French serradella has traditionally been recognised as a soft-seeded species displaying excellent herbage production but lacking long term persistence. Cadiz French serradella is an example of a soft-seeded variety – it establishes readily in the year of sowing and provides a bulk of early feed. However, of recent times two new French serradella varieties, Erica and Margurita, incorporate the vigour and productivity of traditional French serradella varieties with the hardseeded persistence of yellow serradella. These varieties were released in 2004 through the National Annual Pasture Legume Improvement Program. Both varieties were selected from Cadiz and are suited to longer term pastures and pasture-crop rotations where the crop phase is short (maximum 2 years). Erica is the more prostrate of the two varieties and is better adapted to grazing. In contrast, Margurita has a more erect growth habit and is better suited to fodder conservation. Both varieties are very productive in the first year and have a high nutritive value.

Establishment

Yellow serradella has traditionally been difficult to establish because of the unavailability of high germination seed. In the past almost all serradella has been sold "in the pod" and most had a very low germination percentage (2 to 3%). However, a “serradella dehuller” has resulted in high germination seed and “enhanced germination” pods becoming available. Enhanced germination pods typically have a germination rate of 40 to 50%.

Yellow serradella is best established by sowing either dehulled seed or enhanced germination pods on areas that have previously grown lupins. This technique ensures good nodulation of the serradella because both plants utilise similar inoculants.

The use of low-germination pods leads to very low plant numbers in the first year and poor seed set. Experience suggests that much of the remaining ungerminated seed will not survive, resulting in a very poor establishment in the second year. Also, far higher sowing rates are required to obtain a good establishment with low germination percentage pods.

Cadiz French serradella is useful in assisting the establishment of yellow serradella on areas where lupins have previously not been grown - it establishes readily and permits a build-up of soil rhizobia. A sowing rate of at least 5 kg/ha of pod should be used. “High germination“

yellow serradella seed or pods should be sown with Cadiz to provide a “long term” component to the pasture.

Direct drilling is generally the preferred approach for establishing serradella – it is more reliable than broadcasting – and minimises the risk of erosion on light soils and maximises seed-soil contact. Press wheels can further aid establishment. A knockdown herbicide prior to sowing can also be very advantageous. If sown onto worked ground, seed should be dropped on the soil surface and covered with light harrows. Do not sow serradella seed deeper than 1 cm.

Regardless of the establishment technique used, all serradella seed should be inoculated with Group S serradella inoculant before sowing. However it should be noted that if a well nodulated lupin crop has been grown in the paddock in the past two years, it is unlikely that there will be any response to inoculation.

Grazing management

In order to “set up” a new serradella pasture it is essential to maximise serradella seed production in the establishment year. To achieve this, grazing pressure should be reduced by removing stock at the start of flowering.

Established serradella pastures should be stocked from the beginning of the season and in most circumstances should remain so all year round. Pastures should be heavily grazed over winter to control the growth of vigorous volunteer species such as capeweed, geranium, brome and silver grass. Every 2 or 3 years stock should be removed from the pasture during spring to maximise seed set.

Well established pastures can withstand moderate, continuous grazing. However, more upright varieties can be damaged by heavy grazing if plants are allowed to grow erect. This can be avoided by grazing such varieties early in the growing season and force the plants to adopt a more prostrate growth habit. Producers should avoid overgrazing all varieties at flowering and seed set as it reduces seed yields.

Pests and diseases

Serradella is rarely affected by insect pests, root or foliar diseases. The one exception is native budworm (heliothis) which can severely reduce seed yields. Chemical control for this pest should be considered in seed crops and in first-year pastures. Redlegged earth mite can also cause damage at the cotyledon stage although only minor damage occurs to mature plants. Again, control in the establishment year and in seed crops should be considered.

Fertilisers

Serradella is a deep-rooted plant able to scavenge nutrients such as phosphorus. It is more tolerant of low-fertility soils than subclover. However interstate tests have shown that serradella can respond well to applied fertilisers. The best way to determine the specific requirements for a particular pasture is through soil testing.

Harvesting serradella seed

Serradella seed is usually harvested with a conventional crop harvester just before the pods dry and drop from the stems. Adequate seed will be left behind for re-establishment and plant material is retained to reduce wind erosion. Some farmers use clover harvesters to harvest serradella seed. Although this results in higher seed yields, it involves first removing all the dried herbage, leaving a bare, erosion-prone soil.

An early spring application of superphosphate and potash should be considered for seed crops. Stock should be removed from seed crops before flowering commences.

Seed producers should be aware that some serradella varieties are protected by Plant Breeders Rights Legislation.

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