



Department of Agriculture and Food


# Farmnote




## Cadiz French serradella : a new pasture variety for deep acid soils


**Farmnote 12/97**




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Cadiz  is the first variety of French serradella to be developed in Australia and was released to producers in the 1996 growing season.


Cadiz  is a medium maturing variety with a variable date to flower: 80 days in Geraldton, 105 days in Perth and 140 days in Manjimup. Cadiz  has been particularly developed for low fertility, acid soils and is recommended for use in areas with greater than 400 mm rainfall. The most attractive attributes of Cadiz  are the low cost of producing its seed and the fact that it is 'soft-seeded'. This means that it will germinate readily without the need for de-hulling, a process which has been a major limitation to the establishment of yellow serradella.


The pods of Cadiz  remain on the plant at maturity and because the plant grows upright (Figure 1), they can be harvested with a conventional header (Figure 2). This, coupled with the fact that the seeds are 'soft-seeded', makes seed production very economical.

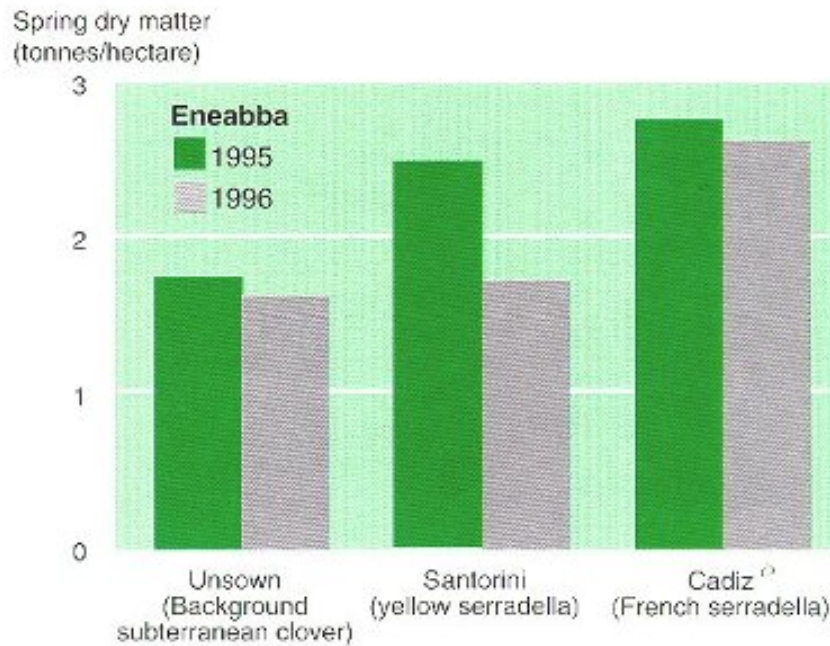
Cadiz  germinates readily from the first year of sowing onwards, which dramatically improves productivity and profitability on deep acid sands.

### **Uses for Cadiz French serradella**

#### ***Permanent pasture on deep, acid sands***

Cadiz  is soft-seeded and because of this it can be used as a permanent pasture on poor acid soils where subterranean clover has failed. However, its soft-seededness does not allow it to regenerate after cropping. For rotational systems, use yellow serradella or a mixture of yellow and French serradellas (see below).

Cadiz  provides good dry matter yields during spring on deep acid sands (see Figure 3) and has been shown to increase the carrying capacity of these poor soils by up to five times, from 1 DSE/ha to 5 DSE/ha.



*Figure 3. Dry matter production in spring at Eneabba by swads of French and yellow serradella compared with an unsown sward of background subterranean clover.*






While yellow serradella is as well-adapted to acid sand as Cadiz , its requirement for de-hulling makes it more expensive to establish at optimum densities compared to the soft-seeded Cadiz . The preferred option now is to sow either pure Cadiz  or a mixture of Cadiz  and yellow serradella, depending on the farming system required.

Figure 3 shows that on deep sands in the West Midlands, more pasture was available to grazing animals by sowing either yellow or French serradella compared with the background subterranean clover. This is because the deep-rooting serradella varieties require less phosphorus and potassium to achieve good growth rates.

Since Cadiz  is soft-seeded, it provided a good pasture in the first (1995) and the second (1996) year. In contrast, Santorini is hard-seeded and yielded less dry matter in the second year.




The most important quality of Cadiz  is that it has the potential to regenerate well in the second season after sowing, at much higher densities than the hard-seeded yellow serradellas. The pasture can then carry more stock from the second year onwards without waiting until the third or fourth year to increase stocking rates, as can be the case with the hard-seeded yellow serradellas.

Figure 4 shows that on the deep sands of the West Midlands, Cadiz  produced about as much seed as Santorini in the first year of sowing (1995). However, because Cadiz  is soft-seeded, it regenerated very well in the second year and produced a much better pasture than the hard-seeded Santorini. Santorini takes another one to two years to establish a germinable seed pool that will result in a productive pasture.

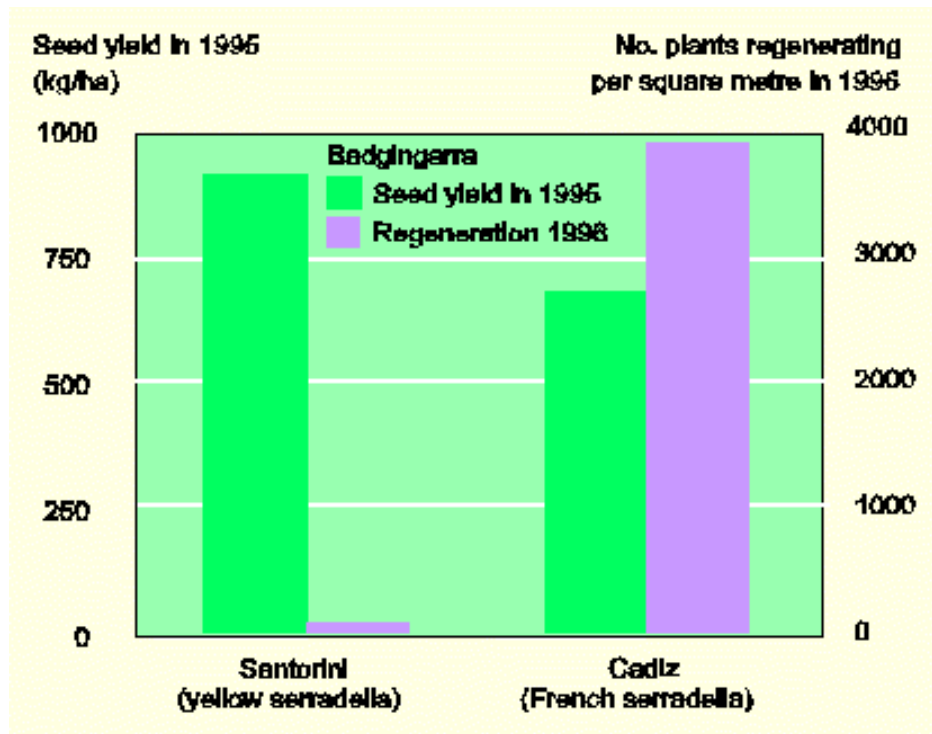


Figure 4. Comparison of French and yellow serradella seed production and plant germination at Badgingarra.

In seasons where there is a serious false break, survival of Cadiz seedlings, as with other soft-seeded annual species, can be poor. If little seed is produced by the plants which survive the false break, reseeding may be required in the following year to re-establish the variety.



Figure 5. A stand of Cadiz growing on deep grey sand at Medina Agricultural Research Station. The photo was taken in July when the stand was growing at about 117 kg of dry matter per hectare per day.

## In crop-pasture rotations as a mixture with yellow serradella

Cadiz can also be mixed with the harder-seeded yellow serradella to prepare a paddock for a crop:pasture rotation. Because Cadiz seed is cheaper to produce than that of yellow serradella, mixing the two varieties reduces the cost of sowing while still providing a sufficient pasture density in the first

year.

The other benefit of mixing the two varieties is that Cadiz provides good regeneration in the second year following sowing while yellow serradella alone has a poor regeneration.

Thus, while yellow serradella is developing a seed bank, Cadiz provides a good pasture for grazing animals. After three years of pasture, yellow serradella will have established a seed reserve that, due to its hard-seededness, will survive a cropping phase. The yellow and French serradellas therefore have different qualities which work well together in a crop:pasture rotation.

## In the control of ryegrass

Another use for Cadiz is in the control of ryegrass in paddocks managed as lupin-wheat rotations. Because Cadiz is cheap to sow and provides good regeneration in the second year after sowing, it can be used as a pasture phase for two to four years before resuming the lupin:wheat rotations. This also improves soil fertility for crop growth because of the addition of nitrogen and organic matter to the soil from the legume pasture phase.

If there are ryegrass populations resistant to herbicides in the paddock, a Cadiz pasture phase, coupled with grazing management and the use of non-selective herbicides, can reduce this problem.

Delay sowing the Cadiz pasture phase so that at least two weed kills are possible, which should achieve about 70 per cent weed control. Following this, Cadiz can be sown and grazed lightly in the first year. In the second year, graze the pasture hard to an even height and then spray-top in spring to kill the ryegrass before the seeds become viable.

If ryegrass resistance is not a problem, it is preferable to use a Cadiz pasture phase coupled with grazing management to reduce ryegrass in the paddock. Not using herbicides reduces the risk of ryegrass resistance developing at a later date. Hard grazing from the second year onwards will help to control the ryegrass population and after two to three years (depending on the farming system) the pasture can be spray-topped to kill the ryegrass seed heads or used to produce hay.

## Establishment of Cadiz French serradella

The use of certified seed is recommended to ensure the variety purchased is Cadiz, and that it is of high germination and free of prohibited weeds.


An initial weed kill with a knockdown herbicide is essential prior to sowing because it is difficult to control broad-leafed weeds after the pasture is established without affecting Cadiz. Grasses can be controlled using selective herbicides.

Inoculate Cadiz seed with 'Serradella Special' peat inoculant as close to sowing as possible. It does not require lime pelleting even when mixed with superphosphate, provided the pods are dry and mixed with superphosphate immediately before sowing.

Sow the pods at a rate of about 10 kg/ha of pod at the break of the season. Under weed-free conditions and little or no grazing, the rate can be halved. Sow the pods about 1 cm deep. One way to achieve this is



to tie the tubes behind the cultivating tines to drop the pods on the surface of the cultivated soil and then cover the pods with trailing harrows. Good results have been achieved using light rotary harrows. It is important to avoid dry-sowing the pods.



Although Cadiz  is adapted to infertile soils, it will respond well to fertiliser, especially phosphate. The amount of fertiliser application depends on previous paddock history and whether the pasture is intended for animal use or seed production. As a guideline, first year stands should be sown with 120 to 150 kg/ha of superphosphate or equivalent. On very sandy soils, a late winter application of muriate of potash at 70 kg/ha or 3:2 potash at 100 kg/ha will increase seed production. For seed crops these applications can be doubled and the application of potash is essential.

At germination, monitor the pasture for redlegged earth mite and pasture loopers and apply an appropriate pesticide if present. Often it is best to apply a redlegged earth mite spray regardless. At pod formation, monitor for native budworm and spray accordingly, if present.

Graze the pasture lightly in the first year, removing the stock in early spring. Lightly graze over the summer to reduce the stubble but do not over-graze, since very little of the seed will survive ingestion by sheep. In late autumn, lightly scarify the paddock to bury pods to protect them from excessive grazing. This also encourages a good germination.

In later years, it is essential to graze the pasture heavily during winter to maintain a serradella-dominant pasture. During spring, the grazing pressure should be reduced to encourage good seed production.

## Production and marketing

Cadiz  has been granted provisional protection under the Plant Breeders Rights Act (application number 96/019). Under the Act there is no restriction on producing seed of Cadiz  for personal use. However, propagation for sale can only be carried out by agreement with a licensee. There are 58 licensees in Western Australia, two in New South Wales and one in Victoria. All licensees have approval to produce and sell seed until 30 June 1998. CLIMA will provide information by May 1997 as to what arrangements will prevail after that time.

## Further information

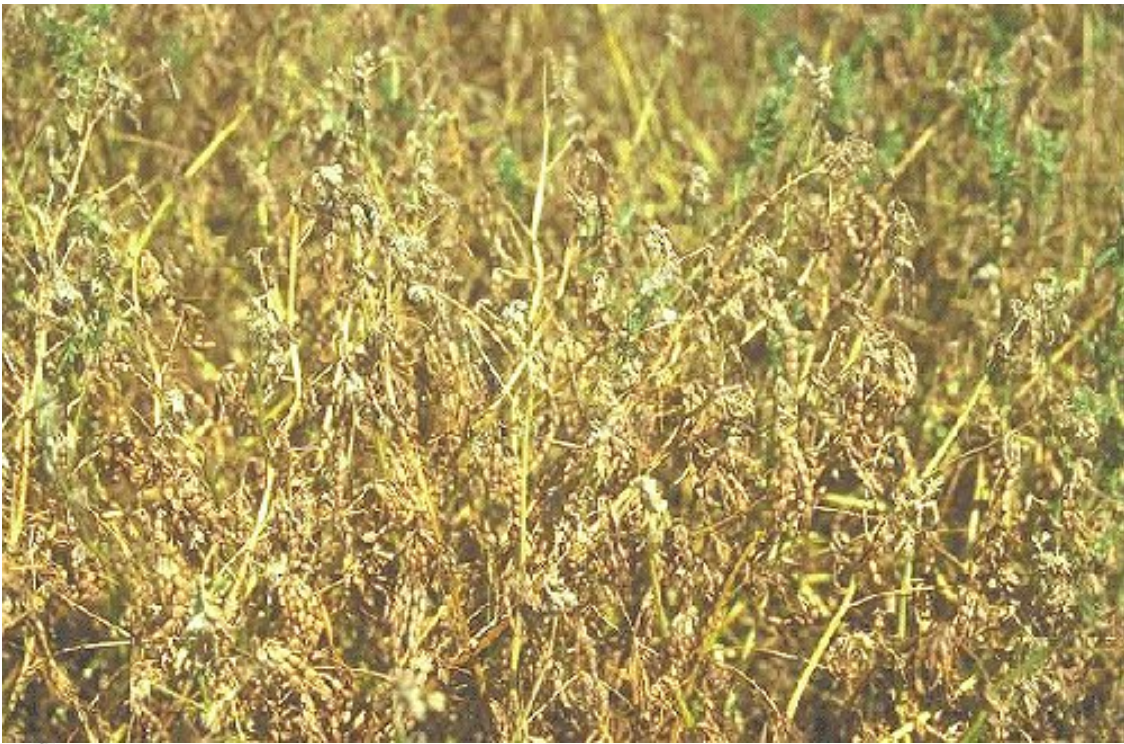
For more information, phone Brad Nutt (CLIMA) on (08) 9387 7423 or Clinton Revell (Agriculture Western Australia) on (08) 9622 6100.


## Further reading

- Bulletin 4238 'New developments in serradella' (Agdex 137/20).
- Farmnote No. 15/97 'Inoculation of Cadiz  French serradella with 'Serradella Special' inoculum' (Agdex 137/23).


## Acknowledgment

Cadiz  was developed from the CLIMA P3 sub-program and the input of P3 staff is acknowledged.



*Figure 1. Cadiz  at maturity. Note the erect growth habit and the pods still on the plant. This allows the pods to be harvested with a conventional header.*



*Figure 2. A conventional header harvesting Cadiz  pods from a mature stand.*

### **Important Disclaimer**

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