Lucerne establishment on the West Midland sandplain

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WEST of Dandaragan and the Midland line from Watheroo to Mingenew there are four million acres of scrubplain commonly called the Western Sandplain.

All virgin soils in this region are acutely nitrogen deficient so that the agricultural future of the region depends on how successfully legumes are grown.

The main broad groups of soils are:

1. Gravelly soils, that is those in which a gravel layer occurs within 15 to 18 in. of the surface.
2. Deep grey, pale yellow or yellow sands, that is the very sandy soils in which there is no gravel layer and little clay in the top 18 to 24 in.
3. Miscellaneous types, which includes those soils having clay within 2 ft. of the surface and the more limited areas of sandy clay and loamy sands.

For soils in groups (1) and (3) there are annual legumes such as subclovers, rose clovers and W.A. serradella which can persist from year to year and which give a good level of production. One soil type may grade into another and where this happens it is usually very noticeable that production and persistence of these species is progressively worse with increasing depth of sand and/or decreasing colloid content of the surface soil.

The Deep Sands

The deep sands are usually grey on the surface overlying white or pale yellow sand to a depth of 18 inches or more. They are problem soils and although they account for only 30 per cent. of the area of Badgingarra Research Station the proportion on some blocks is greater than 80 per cent. Where the deep sands are freely drained, shallow rooted species usually suffer from both severe moisture shortage and potash deficiency while clovers are severely afflicted by the nodulation problem known as “second year mortality.”

Hunter River lucerne grows well on the worst of the sands on Badgingarra Research Station. Once established, lucerne can obtain moisture and potash from several feet below the surface. It can survive severe drought and is not affected by nodulation problems after the first year.

Establishing Lucerne on Deep Sands

Lucerne is a small seedling requiring special care in its establishment. Because lucerne will not persist under waterlogged conditions it should not be planted on the poorly drained flats that occur in some parts of the West Midlands.

Weeds reduce the chances of successful lucerne establishment and must be eliminated by thorough cultivation before seeding. In spring weeds rapidly deplete the moisture contained in the top few feet of soil which may cause the young lucerne plants to die through drought. Competition from weeds can also result in a reduction in the root development of the
young lucerne plants so that they are less able to recover soil moisture and are again more likely to die in the long dry periods of summer.

The seed must be inoculated with medic culture and lime pelleted. Many early attempts to establish lucerne on sands in other areas failed because of the poor quality of cultures available at that time. These defects have now been overcome and as long as farmers take good care to store their culture in a cool place, inoculation and lime pelleting will ensure excellent nodulation of the young plants whereas failure to inoculate will result in failure of the stand.

In the virgin state these sands are particularly phosphate deficient. Even after past applications of several bags to the acre of superphosphate, relatively high rates of phosphate must be applied when seeding lucerne. Lucerne however is a plant with a high calcium requirement and normal superphosphate is not a suitable fertiliser for lucerne establishment on these sands. Trials on sands in several areas have shown that at least 300 lb. per acre of 50-50 superphosphate-ground limestone mix is needed for good establishment.

Copper is important for lucerne and if it has not already been applied it should be included in the lime super to give an application equivalent to 5 lb. of bluestone per acre.

At Badgingarra molybdenum has given a small response in the second year and further work is planned to determine whether it is important in establishing lucerne on these sands.

The inoculated pelleted seed can be sown through some small seeds boxes but it often blocks the tubes. If this happens or if you don't have a small seeds box, the seed should be thoroughly mixed with the fertiliser just before sowing or alternatively sown through the grain box using the reduction gear to get the low seeding rate required.

The seeding rate should be from 3 to 4 lb. per acre which is about 4 1/2 to 6 lb. of pelleted seed.

The importance of not sowing too deep cannot be overstressed. It should be sown no deeper than three quarters of an inch.

On sands the wheels of the machine often sink in so that the seeds are sown too deeply. If this occurs the drill must be adjusted immediately.

**Sow Early**

In seeding lucerne it is also important to sow as early as possible after the opening rains to allow maximum root growth before the first summer drought. In this region spring sowing will usually be unsatisfactory and the young plants will die in a dry summer.

Where wind erosion is a hazard a cover crop of cereal rye at not more than 5 lb. per acre should be sown with the lucerne.

Graze only lightly in the first summer and don't graze at the time that new shoots are emerging from the crowns.

Farmers must expect total failure of first year sowings when a very dry spring is followed by an exceptionally dry summer in the initial year. An example of an unusually long dry period occurred when a total of only 32 points of rain fell in the four months October to January (inclusive) at Badgingarra this 1963-64 season; 28 points of this rain fell in the first week of October. On the Research Station all first year sowings died whereas second and third year stands were barely affected.

Lucerne cannot give much green feed in the normal dry summer nor will it be as productive as the good subclover pastures that can be grown on the gravels. However because it extends the period of green feed into early summer and produces some fresh growth following summer thunderstorms and because the dry lucerne material is highly nutritious, it can be very valuable summer grazing for weaners, rams or ewes in lamb. Its ability to make rapid growth in early winter when there may be a shortage of feed is one of lucerne's most useful characteristics.

It is one of the few plants that give reasonable production on the problem soils, and for many farmers in the West Midlands a small trial could be well worthwhile.

- Any farmer intending to grow lucerne is strongly advised to plan his trial with his local agricultural adviser.
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