

## Lucerne in the Top End

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### INTRODUCTION

Lucerne (*Medicago sativa*) is a high protein legume forage which makes excellent hay.

It is a native of the Mediterranean region and is primarily suitable for warm temperate climates. However, in Australia it is also grown extensively in the sub-tropics where annual rainfall is 500 mm or more.

Lucerne grows all year round but in winter its growth is slow. It has a high degree of tolerance to hot dry summers and to frost. Best results are obtained from intermittent grazing or cutting. It does not tolerate waterlogging; it requires fertile well drained soils and plenty of nutrients, particularly phosphorus and sulphur.

Lucerne does not survive for long and may last for a few years under continuous or heavy intermittent grazing particularly in areas with predominantly summer rainfall. Its main drawback in the tropics is its inability to persist due to rotting of crowns during hot moist summers.

The Top End (from Katherine northwards) has a tropical monsoonal climate with predominantly summer rainfall. The wet season is hot and humid.



## HISTORY OF LUCERNE IN THE TOP END

In the early 1960s Hunter River lucerne was planted at two sites near Darwin during the wet season. Establishment and growth were poor. The crop suffered from insect attack and did not survive the wet season.

Trials were conducted in the 1970s at the Douglas Daly Research Farm (DDRF) on Blain soil (*L. Falvey*) and at the Katherine Experiment Farm (now Katherine Rural College) on Tippera soil.

At DDRF, a wet season sowing on January 5, 1973 of six varieties failed because of excessive seedling mortality during a long dry spell. Lucerne was re-sown on January 20, 1973. While establishment was better than for the earlier sowing, all of the stands were extremely poor on March 20, 1973 because of heavy invasion by annual summer grasses. A few plants survived the dry season and two cultivations with an offset disc prior to the 1973/74 wet season.

On 13 September 1973 at DDRF, two plots were sown with Hunter River lucerne to observe growth under irrigation. One plot was invaded and swamped by grasses before the onset of the wet season. Lucerne in the other plot failed to persist through the 1973/74 wet season.

Three varieties of lucerne were sown at DDRF on 2 June 1974. Emergence was patchy, and all seedlings died.

At Katherine, eight varieties were sown on 19 September 1979. Due to high temperatures, irrigation was required every second day. Emergence was satisfactory. There were some early losses due to waterlogging around sprinklers. After four weeks, weeds became a serious problem. Lucerne was unable to compete with Buffalo clover, summer grasses, Sida and Caltrop. Insects, particularly larvae of *Hecoverpa* spp., the cluster caterpillar *Spodoptera litura*, unidentified looper, and pumpkin beetles (*Aulocophera abdominalis*) severely attacked in late October/early November. By early November, the lucerne plants appeared to be in a state of dormancy, and no further growth was detected up to the end of the trial in mid January. Only a few lucerne plants were noticed during the 1980 dry season.

Lucerne was again sown on Blain soil in the late 1990s at DDRF and on a Tippera soil at Katherine Research Station (KRS).

At DDRF, the lucerne, which was sown as an insect trap crop, had fair establishment but its performance in terms of growth and yield was poor.

There were two sowings of eight varieties over two years, 1977 and 1988, in an irrigated trial at KRS. These varieties were grown in small, well managed plots with high inputs. Two of the varieties established in 1977 yielded in 1988 a total of 22.2 tonnes/ha of hay from two wet season cuts (February - March; 2.2 t) and nine dry season cuts (11 May – 7 December; 20 t). One of the varieties established in 1988 yielded 14.6 tonnes of hay from seven cuts between 7 July and 7 December 1988. Two other varieties from the same sowing yielded 13.4 and 12.7 tonnes/ha. These plots persisted for three years. These newer varieties can withstand temporary waterlogging, and appear to be more disease resistant than earlier varieties.

In recent years larger areas of lucerne have been grown successfully as hay crop under irrigation at KRS and DDRF. The main problem has been the build of legume little leaf disease in the crops. This disease stunts the plants and makes them unproductive. The build up of diseased plants in the crop over time progressively reduces hay yield until the area is unproductive and needs to be replaced.

Legume little leaf is spread by small leafhoppers, jassids.

## SUMMARY OF TRIAL RESULTS

- Is capable of producing yields of 15–20 tonnes of hay from nine dry season/early wet season hay cuts at Katherine.
- Does not compete with fast growing weeds, particularly grass weeds which are very difficult to control for the lengthy period that lucerne requires to establish. Establishment is critical to the success of the crop.
- Would need to be sown post-wet season, i.e. April/May.
- Needs a well-drained, weed-free site (this is essential).
- Will have problems with caterpillars in larger areas.

## CONCLUSION

The trials showed that as expected from its climatic adaptation, lucerne is not a good option for hay or fodder production in the Top end of the Northern Territory during the wet season. In this situation, it would be better to use an adapted tropical legume such as Bunday or Cavalcade (*Centrosema pascuorum*) or Amiga or Verano (*Stylosanthes hamata*).

Lucerne has been grown successfully as an annual dry season irrigated hay crop at Katherine with a post wet season planting. There are small areas being grown commercially now in Katherine. Older varieties which appear to be most suitable for Katherine are the winter active Trifecta and Quadrella and the highly winter active CUF101, Maxidor11, Pioneer 577, Pioneer 5929, Sequel and WL605.

The newer varieties with their better persistence should need to be resown only about every three years. Newer varieties which appear to be most suitable for Katherine are the winter active Eureka, the highly winter active Sceptre and the semidormant Faulkner, Hunterfield, Prime, Pioneer L56 and Pioneer L90.

North of Katherine the shorter length of the cooler, dry growing season makes it difficult to get enough hay cuts to recover costs, while the longer, more reliable wet season makes it difficult for the lucerne plants to survive.

## WARNING

Pasture plants have the potential to become weeds in certain situations. To prevent that, ensure that pasture seeds and/or vegetative materials are not inadvertently transferred to adjacent properties or road sides.

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