

## Factsheet

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### Development of sterile/seedless leucaena

Although highly regarded as a cattle fodder, the legume shrub leucaena (*Leucaena leucocephala*) is considered an environmental weed in many parts of Australia.



*Leucaena* is used widely in tropical regions as a quality feed for cattle

The Department of Primary Industries and Regional Development WA with support from Meat and Livestock Australia is aiming to develop a leucaena variety that is sterile or without seeds, which poses much less weed risk to the environment.

Leucaena is a genetically diverse Central American legume fodder tree with many species, but essentially only one species, *Leucaena leucocephala*, has been commercialised for cattle fodder.

A conventional breeding strategy is being used to create the new lines based on the ploidy level – the number

of pairs of chromosomes in the cells of the plant – which differs between leucaena species.

Three leucaena species used in the breeding program have four sets of chromosomes referred to as tetraploids, while another eight species have two sets of chromosomes, called diploids. When a tetraploid species is crossed with a diploid, triploid progeny is created, which is typically sterile or has much reduced viable seed.

Over the past 18 months the project team has made more than 1000 crosses from 11 different species of leucaena in the department's South Perth glass house to create 130 hybrid lines. The original parent accessions came from gene banks in Australia, the United States of America and Colombia, as well as utilising locally collected accessions from naturalised populations.



*Leucaena* nursery - Broome

The project has worked closely with Murdoch University and New Mexico State University to develop molecular tools to confirm the crosses were successful.

More than 300 new triploid plants were divided across three secure trial sites at Carnarvon, Broome and Kununurra and transplanted in June 2020 using irrigation. Another generation of crosses between elite individual lines have been made in 2020 with approx. 2500 seedlings to be transplanted in May 2021.



*Triploid leucaena seedlings being transplanted at Kununurra*



*Kununurra leucaena nursery*

The next stage of research over coming years will be to examine whether these plants flower and produce viable seed. The plants will also be evaluated for their ability to recover after cutting to simulate grazing, as well as drought tolerance, feed quality and growth habit.

These are the first steps in the process of developing a new leucaena variety and there will be other challenges to meet before it becomes a commercial reality. Propagation will likely have to be vegetative and this will require further funding to develop a cost efficient methodology.

### **DPIRD Contacts**

Daniel Real ☎ 0409016422

Clinton Revell ☎ 0417183858

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