

Breeding Lucerne for the Southern Australian Cropping Districts.

Aim: This project aims to develop lucerne cultivars, specifically for the southern Australian cropping districts, that are compatible with existing farming systems as well as being productive and persistent. The breeding program is focusing on improving tolerance to acidic soils, persistent grazing and establishment with companion crops.

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Company: Department of Agriculture, Western Australia



Farmer: Kim, Diane, Neil and Joanne Diamond

Location: Buntine

Background: With the increased recognition that dryland salinity poses a major threat to the cropping districts of the southern agricultural regions of Australia, the need to increase the use of perennial species in these farming systems has been highlighted. Lucerne has been listed as an agricultural plant that can aid in controlling ground water recharge, the main cause of dryland salinity. Up until recently, lucerne cultivar development has been aimed at the high production, irrigated forage industry, concentrated on the East Coast of Australia. There is a need for the development of new cultivars specifically targeted to use in the types of farming systems prevalent in southern Australia. The trial located at Diamond's is one of a series of trials looking at the persistence of new lucerne breeding lines in these farming systems.

Trial Details:

Plot size and replication	1.2 x 5 m plots – 60 entries x 3 replicates = 180 plots
Soil type	Red/brown acid wadjil sand
Sowing date	August 2002
Conditions at sowing	N/A
Machinery	Small plot cone seeder – 6 row double disc openers with press wheels, small Kubota tractor
Seeding rate	4 kg/ha
Fertiliser	100 kg/ha Super Potash 2:1
Herbicides and Insecticides	Sprayseed and Talstar at seeding
Paddock History	2002 = Lucerne

Results: This trial is a long-term trial set up to look at the persistence of lucerne in the farming system. The trial is sown into a commercial paddock of lucerne and is managed with the rest of the paddock so that it receives the exact same treatment. Periodic measurements are taken on plant density and persistence and biomass production of each of the 60 different lines and varieties. To date, an establishment rating in 2002 and a plant density count in 2003 have been taken. The trial has survived remarkably well after a very long drought in its establishment year and heavy grazing by cattle throughout the 2003 season. A table is presented below summarising the performance of the commercial cultivars included in the trial, along with some of the better performing breeder's lines.

Line	Establish rating (1-10) Sept 2002	Plant Density/m2 Oct 2003	Line	Establish rating (1-10) Sept 2002	Plant Density/m2 Oct 2003
Aurora	2.67	7.67	Sequel HR	4.67	6.00
Eureka	2.33	5.67	Super 10	4.00	9.67
Genesis	2.67	8.67	Super 7	2.67	7.00
Hallmark	2.67	5.33	Venus	2.67	12.67
Hunterfield	1.67	5.67	A42	4.67	17.67
PL 55	2.00	4.33	A45	5.00	16.67
Prime	1.67	10.67	A57	4.67	16.67
Rippa	3.67	7.67	L151	5.00	16.33
Sceptre	4.00	5.33	A48	4.00	15.67

Summary:

- Highly winter active lucerne varieties had better establishment than the winter active or semi winter dormant varieties.
- Many of the breeder's lines showed better establishment than the commercial cultivars.
- Breeder's lines persisted better over the 2002/03 summer and into the 2003 season.
- Early results would seem to indicate the potential for lucerne varieties better adapted to WA farming system pressures to be released in the near future.
- Results will be ongoing until at least 2006.