
Dry Matter Production of Grazed Lucerne Cultivars under Dryland in the Overberg

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Pastures in the Rûens area of the Western Cape are mainly legume based, with lucerne the most important and productive pasture legume. Most lucerne pastures in the area are traditionally sown to the land race cultivar SA Standard, which is persistent under grazing, but has poor resistance to endemic insects and other pests. The presence of the blue-green aphid (*Acyrtosiphon kondoi*) and the even more destructive spotted aphid (*Therioaphis trifolii*), resulted in intensified efforts to introduce more aphid resistant cultivars and to test them country wide. Due to the continuous input of new commercial cultivars in South Africa for both hay and grazing purposes, the evaluation of new cultivars is an ongoing process. Two trials were conducted consecutively over an eight year period and involved the evaluation of two sets of lucerne cultivars for yield in the Overberg under local grazing conditions.

In Trial 1 eleven lucerne cultivars were evaluated (Figure 2) and in Trial 2 twenty three cultivars/lines (Figure 3). The cultivars were compared to SA Standard under dryland conditions and heavy continuous grazing with Merino sheep at the Roodebloem experiment farm of Overberg Agri in the Caledon district of the Overberg.

Trial 1 was conducted from 2001/2002 to 2005/2006 and Trial 2 from 2005/2006 to 2008/2009.

The cultivars, which were evaluated, varied in winter dormancy (Figures 2 and 3). PAN 4956, which is a class nine and hay only cultivar and very sensitive for grazing, was included as one of the controls in both trials. PAN 4956, not recommended for grazing under these conditions, was used as a control to measure the severity of the grazing treatment. The third cultivar of special interest, SA Select, is a local cultivar and was included in Trial 2. SA Select was selected from SA Standard. The other cultivars/lines in both trials are imported and intended for grazing and/or hay production by farmers in the area.

The trials were fenced off in areas of approximately two hectares and continuously grazed at a stocking rate of 10 Merino sheep.ha-1. Grazing of the two trials started during October 2001 (Trial 1) and October 2005 (Trial 2) respectively. The sheep were removed when feed shortages occurred, but were placed back on the trials as soon as sufficient grazing was available.

Before sowing the soil of the trial sites were fertilised with P, K and lime, based on soil analyses and well cultivated. Seeds were sown shallowly at 25 kg.ha⁻¹ in 150 mm wide rows during May of 2001 (Trial 1) and 2005 (Trial 2). All seeds were inoculated with standard commercial root nodule bacteria before sowing.

Yield was determined by cutting samples with sheep shears to ground level every six to eight weeks in- and outside round randomly placed welded galvanised wire mesh enclosure cages. The cages were moved to a new random position in a plot after each sampling. The cut samples were washed, dried to constant mass at 59°C and weighed. Yield was expressed as kg DM.ha⁻¹.season⁻¹ for each of four seasons (May to July, August to October, November to January and February to April). The seasonal rainfall (mm/season) at the trial site during the trial period (May 2001 to April 2009) is shown in Figure 1.

The period May to October tended to be wettest (183 + 47 mm), with the rainfall most stable. The rainfall in November to April tended to be lower (104 + 60 mm) and to vary more. Due to this and the lower temperatures, the moisture regime during the first mentioned period was generally most favorable for lucerne growth. The relative annual dry matter yield of the cultivars varied between years in both Trials 1 and 2. The average annual dry matter yield of the eleven cultivars evaluated in Trial 1 during five years (2001/2002 to 2005/2006) is shown in Figure 2.

SA Standard was out yielded by most of the other cultivars. WL320, WL414, PAN4546, Alfagraze and Aquarius were on average the highest yielding. The annual dry matter yield of the twenty three cultivars/lines which were evaluated in Trial 2 during four years (2005/2006 to 2008/2009) is shown in Figure 3.

The average production of five of the cultivars/lines WL 414, KKS 3864, Magna 601, Venus, PAN 4764, and SA Select were on average the highest yielding. SA Standard was once again very low yielding. In contrast to the Trial 1, PAN4546 and WL320 did poorly. This difference in results is difficult to explain, but may be attributed to the poor stands in Trial 2 due to water logging.

The average annual dry matter yield of the cultivars was higher in Trial 1 than in Trial 2. This may be attributed to the poorer lucerne stands in Trial 2 than in Trial 1. In both trials the annual yield declined significantly in the final year. This can also be attributed to the sharp decline in lucerne stands during the last season of each trial. The dry matter yield of the cultivars was not influenced by winter activity and probably more related to the level of persistence.

In conclusion, it is clear that the cultivars SA Select, WL414 and Magna 601 should be recommended for use under dryland in the area.

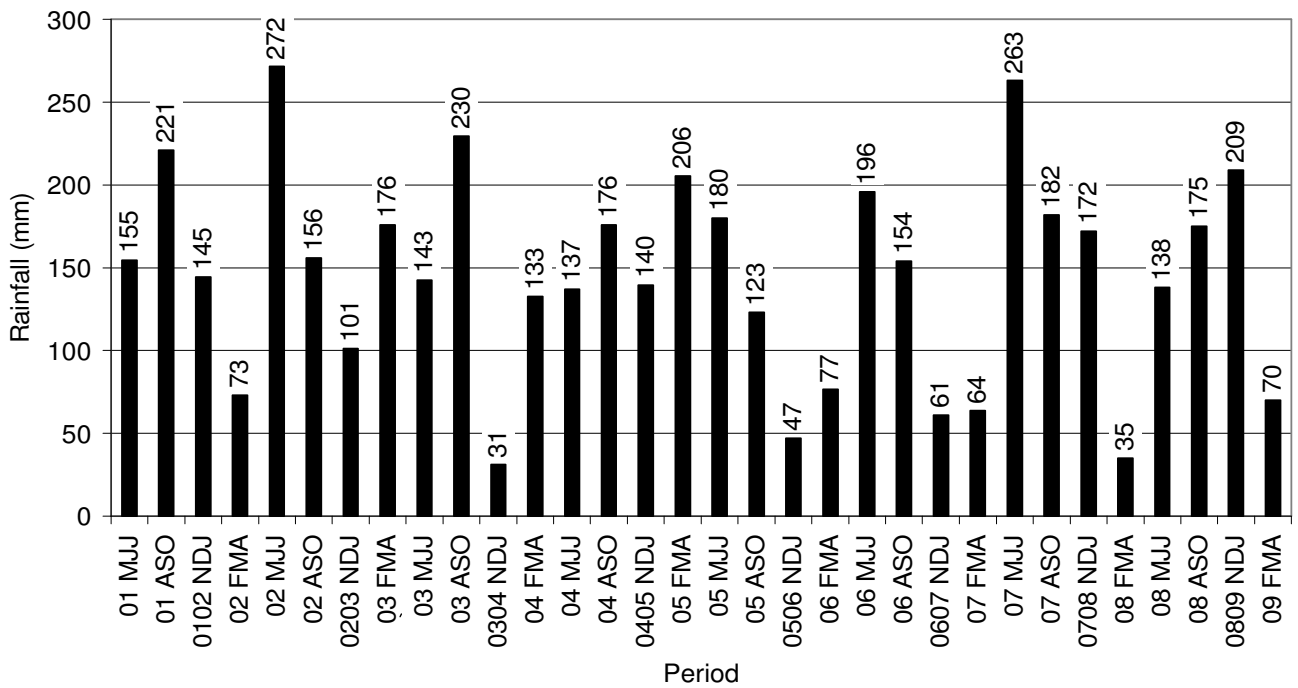


Figure 1. Seasonal rainfall (mm) at Roodebloem between April to July (MJJ) 2001 and February to April (FMA) 2009

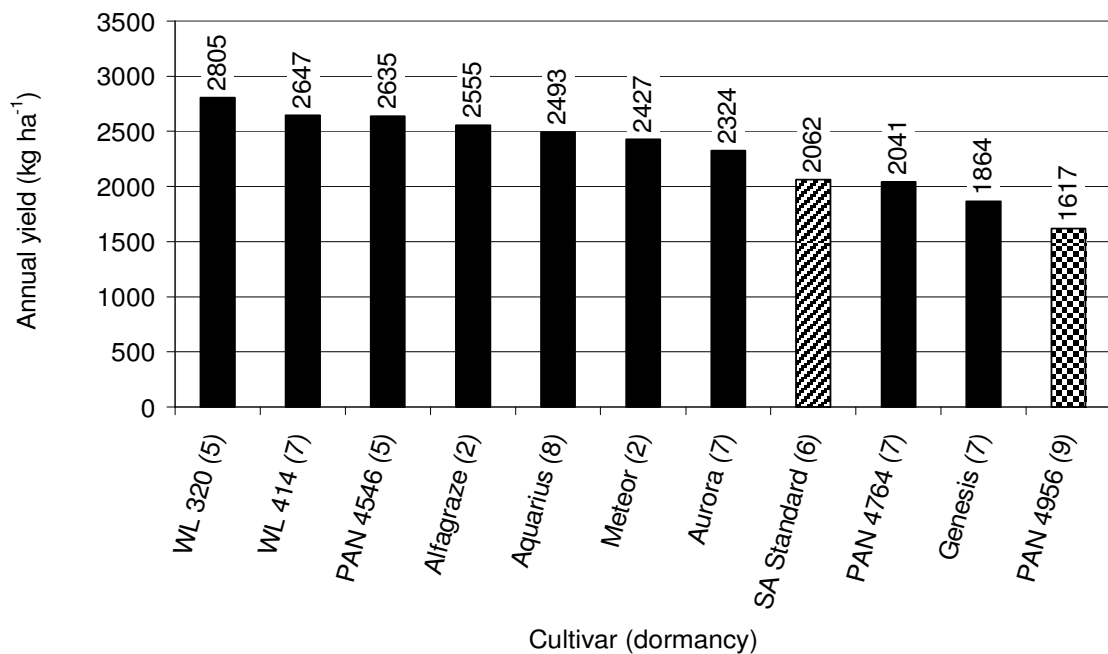


Figure 2. Average annual production of 11 lucerne cultivars at Roodebloem, Caledon from 2001 to 2006.

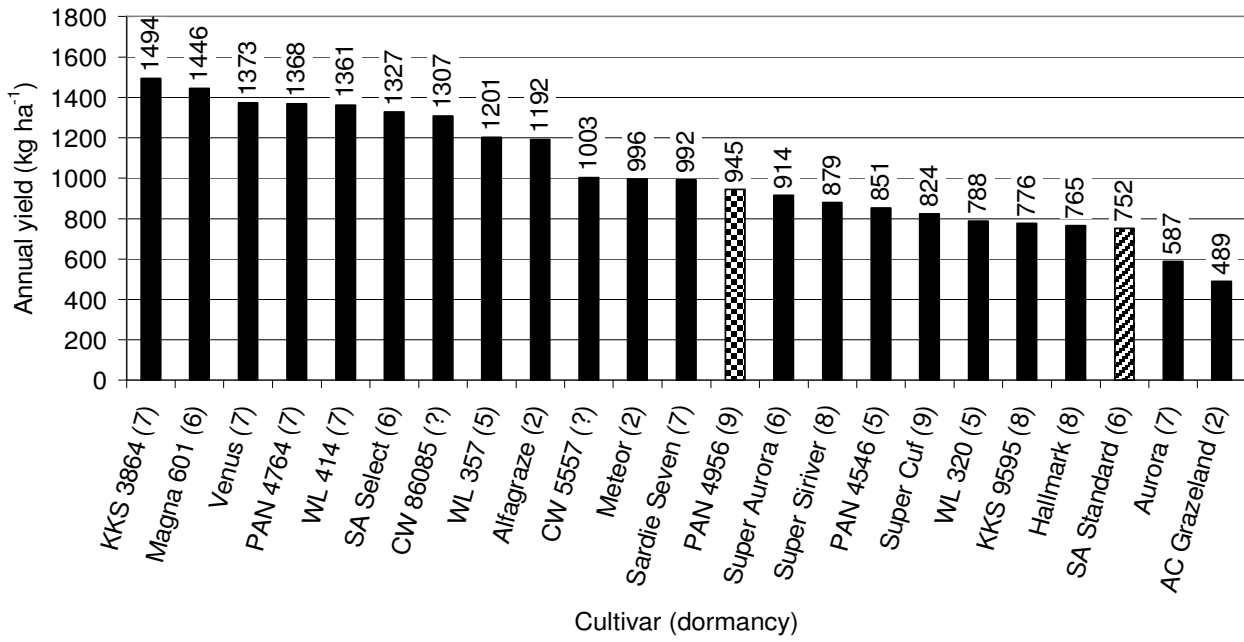


Figure 3. Average annual yield of 23 lucerne cultivars at Roodebloem, Caledon from 2005 to 2009



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