GROWTH OF MERINO WEANERS BORN IN JUNE COMPARED TO THOSE BORN IN AUGUST WHEN GRAZED ON GUNGURRU LUPIN STUBBLES

C. L. McDONALD[A], K. P. CROKER[B] and J. G. ALLEN[C]

[A]Sheep and Wool Branch, Dept of Agriculture, Geraldton, W.A, 6530.
[B]Sheep and Wool Branch, Dept of Agriculture, South Perth, W.A, 615 1.
[C]Veterinary Toxicology, Dept of Agriculture, South Perth, W.A. 615 1.

SUMMARY

The aim of this study, which was conducted over 2 consecutive summers, was to test whether August-born weaners could attain the same liveweight as June-born weaners when grazed on stubbles from the new, Phomopsis-resistant lupin cultivar, Gungurru. Groups of weaners were stocked on Gungurru stubbles at 15/ha in 1989/90 and 5 and 10/ha in 1990/91. In both years and at all stocking rates, the rates and patterns of growth were very similar for the weaners born at both times. Although the August-born weaners made substantial liveweight increases on the stubbles, these were not greater than those of the June-born animals.

Keywords: lupin stubble, late-born, weaner sheep.

INTRODUCTION

Many farmers in Western Australia are reluctant to lamb later than June because this results in small, light weaners at the start of summer. With the lupin cultivars of the 1970's it was shown that weaners can achieve moderate growth rates over summer. However, lupinosis was usually a problem (Croker *et al.* 1979). The Gungurru cultivar of lupins was released in 1988 by the Western Australian Department of Agriculture because of its increased resistance to *Phomopsis leptostromiformis,* the fungus that produces the toxins that cause lupinosis in sheep (Cowling *et al.* 1988). The aim of our experiments was to test whether August-born weaners could attain similar liveweights to June-born weaners when grazed on Gungurru lupin stubbles from early in summer.

METHODS

The experiments were conducted in the summer-autumn periods of 1989/90 and 1990/91 at Badgingarra Research Station, approximately 250 km north of Perth. Each year, a ewe flock was divided into 2 groups for mating at different times. Lambings started in the first weeks of June and August in both years. On December 4, 1989 and December 10, 1990, randomly selected weaners from each group were allocated from stratified liveweight lists to plots of Gungurru lupin stubbles. The stocking rates used were 15 weaners/ha in 1989/90 and 5 and 10 weaners/ha in 1990/91 there being 5 animals per plot with 4 replicates in 1989/90 and 5 replicates in 1990/9 1.

In both years, liveweights (unfasted) were measured every 2 to 3 weeks and counts of the numbers of seeds were made at 4 to 5 weekly intervals. Measurements of the stubble material were also made at the start and finish of grazing. Pegs were placed at 6 sites in each plot in 1989/90 and eight sites in each plot in 1990/9 1. The successive seed counts and stubble measurements were made close to these pegs. Quadrats (0.1 by 1 .0 m for seed and 0.5 by 1.0 m for stubble) were placed so that both trash lines and the areas between were sampled. All above-ground stubble material was collected. In 1989/90 only, all dry matter samples were analysed for *in vitro* digestibility and crude protein. In both years, the quantities of weeds and pasture plants in the stubbles were judged to be insignificant.

The plan was to continue each treatment until the sheep had lost weight for 2 weeks after reaching their peak liveweight. An exception was the August-born treatment in 1989/90, which was finished on day 91 after a heavy rainstorm washed the stubble into clumps which were partly submerged in mud, thus preventing further collection of reliable seed and stubble data.

Liver biopsies were performed on all animals under local anaesthesia when they had been removed from their plots. The histopathology results from these samples indicated that lupinosis was not a significant factor in the experiment.

RESULTS AND DISCUSSION

There were no significant differences ($P > 0.05$) in the growth rates of the weaners born in August compared to those born in June in either year.

In the 1989/90 experiment, the August-born weaners remained approximately 7 kg lighter than the June-born weaners until the June-born groups reached their peak weight (Fig. la) on about day 52 when the seed in the plots averaged about 70 kg/ha for both treatments (Fig. 1 *b).* Subsequently, the June group lost weight,

probably because they could not eat sufficient seed to maintain their heavier liveweights, whereas the August group maintained weight until day 82 when there was about 40 kg/ha of seed on the plots. The weight-loss recorded after day 82 is likely to have also been influenced by the rainstorm on day 91.

In 1990/9 1, the decrease in liveweight at the second weighing occurred after a plumbing failure left all sheep without water for approximately 36 h before weighing (Fig. 2*a*). Thereafter, the June-born sheep in 1990/9 1 gained weight faster and for a longer period than was observed in the June-born treatment in 1989/90 (127 compared to 52 days), probably because of the lighter stocking rates used and higher quantites of seed available at the start of the 1990/91 experiment (Fig. *2b* compared to Fig. 1 *b)*. However, as in the first year, there is still little evidence that the August-born weaners caught up to the weight of the June-born weaners, at either stocking rate (Fig. *2a).*

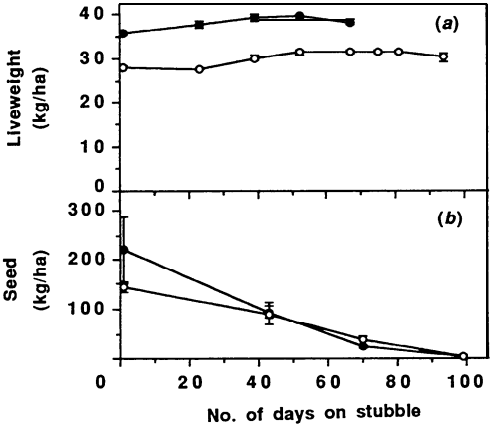

Fig. 1. The changes in (*a*) liveweights of sheep born in August (○) and June (●) and (*b*) deceases in amounts of lupin seed when grazing Gungurru lupin stubbles, 1989–90. Vertical bars indicate s.e.

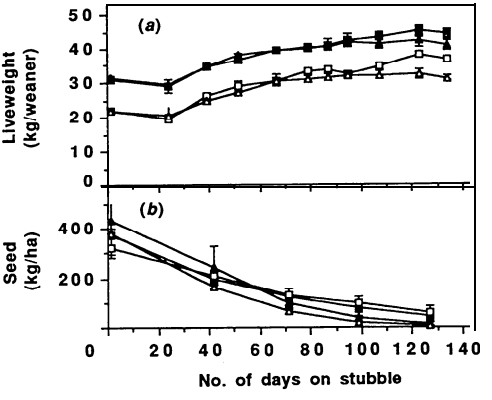

Fig. 2. The changes in (*a*) liveweight of sheep born in August (open symbols) and June (solid symbols) and (*b*) decreases in amounts of lupin seed when grazing Gungurru lupin stubbles at two stocking rates (△, □ 5 sheep/ha; ▲, ■ 10 sheep/ha), 1990–91. Vertical bars indicate s.e.

At 10 weaners/ha, the two goups had very similar liveweight patterns and finished with the same difference in weight as that at the start of grazing (Fig. *2a).* Although the August-born weaners gained slightly more weight at the 2 weighings after the water deprivation (a total of less than 2 kg/weaner), there was little difference thereafter. This small difference would be of little importance to farmers who would usually graze stubbles at a higher rate than 5 weaners/ha and would be unlikely to have the large quantity of seed on the ground that was present after harvest in the 1990/9 1 experiment Fig. *2b.*

The amounts of stubble dry matter available for the June and August treatments in 1989/90 decreased similarly from (mean ± s. e.) 4.7 ± 0.4 and 5.0 ± 0.4 t/ha respectively on day 1 to 2.2 ± 0.4 and 2.4 ± 0.4 t/ha on day 69 .The chemical analyses of the dry matter were also similar for the August and June treatments. The digestibility results being 52.5 ± 0.8 and 54.3 ± 0.6% for the June and August treatments respectively on day 1 and 45.1 ± 0.5 and 44.7 ± 0.6 % on day 69. The crude protein results were 5.2 ± 0.2 and 6.2 ± 0.1 % on day 1 for the June and August treatments respectively and 4.8 ± 0.2 and 5.0 ± 0.1 on day 64.

The June and August treatments also showed similar decreases in stubble dry matter at the 5 weaners/ha stocking rate in 1990/91, values decreasing from 3.8 ± 0.2 and 4.0 ± 0.3 on day 1 to 1.7 ± 0.3 and 2.0 ± 0.5 on day 127 for the June and August-born groups respectively. An exception was the 10 weaner/ha stocking rate, where the June-born sheep had more dry matter on day 1 than the August-born animals (4.6 ± 0.3 compared to 3.4 ± 0.2 t/ha), but reducing to similar levels on day 127 (1 .0 ± 0.1 compared to 0.9 ± 0.1 t/ha). However, this did not appear to affect the changes in liveweight.

CONCLUSIONS

It is concluded that, in Western Australia, lambs born in August can grow well over the summer/autumn period when grazed on Gungurru lupin stubbles. However, while on the stubble, they are unlikely to attain similar weights to those of weaners born in June.

ACKNOWLEDGMENTS

This work was partly funded by the Wool Research and Development Corporation. Our thanks are gratefully extended to Stewart Gittins, Gail Rix, Keith Devenish and the staff of Badgingarra Research Station and others for their technical assistance in running the experiments.

REFERENCES

COWLING, W. A., ALLEN, J. G. and WOOD, P. McR. (1988). *Aust. J. Exp. Agric. 28:* 195–202.

CROKER, K.P., ALLEN, J. G., PETTERSON, D. S., MASTERS, H. G. and FRAYNE, R. F., (197) *Aust. J Agric. Res.* 30: 511–64.