DEPRESSION OF LAMBING PERCENTAGE FROM MATING ON LUCERNE

I. E. Coop
Lincoln College, Canterbury

SUMMARY

Two trials were conducted in which ewes were grazed on lucerne or on grass pasture for four weeks pre-mating and for the first 3 to 6 weeks of mating. In both trials lucerne depressed multiple births by 20% and increased barrenness by 2%. Some evidence was produced that lucerne is potentially more dangerous when grazed during mating rather than in the pre-mating period.

INTRODUCTION

Infertility in sheep arising from the presence of phyto-oestrogens in subterranean clover has received much attention in Australia where the problem has been acute. In New Zealand the legumes used (mainly white clover and lucerne) are low in oestrogen, as are the strains of subterranean clover. However, Coop and Clark (1960) in a series of trials found that barrenness was increased by 2%, multiple births decreased by 10%, and mean lambing date delayed by 2 to 3 days in ewes flushed and mated on lucerne in comparison with those on grass pasture. These results were not taken very seriously by farmers, farm advisers and agronomists since lucerne possesses some highly valuable agronomic virtues; also other factors, such as selenium deficiency, complicated the issue.

The expanding use of lucerne has resulted in renewed interest in its effects on fertility. This paper presents the results of two trials at Ashley Dene.

1975 TRIAL

A mob of 900 2½- and 3½-year-old Border-Corriedale ewes previously grazing on lucerne was divided into two groups on 17 March. They were flushed for four weeks until April 14 and mated for six weeks from then until May 25. One group was put on to grass pasture and the other continued on lucerne for the whole experimental period. All ewes were dosed with selenium.

Feed conditions were excellent. Initial liveweight in March was 70 kg. During the pre-mating period the liveweight gains were

6 kg and 8 kg for grass and lucerne, and during the mating period 4 kg and 3 kg for the grass and lucerne groups, respectively. After mating the groups were united and 10 kg liveweight taken off before the end of July. Samples of lucerne taken during the trial showed 80 to 120 ppm coumestrol, and the grass none. The lambing results are given in Table 1.

TABLE 1: LAMBING PERFORMANCE 1975

	Barrenness %	*Mean Litter Size*
Grass	0.3	1.80
Lucerne	2.6	1.60

1976 TRIAL

A mob of 800 2½- and 3½-year-old Border-Corriedale ewes was divided into four groups of 200 ewes. The grazing period was divided into two — a four-week pre-mating period (March 15-April 15) and a three-week mating period (April 15-May 5). Two groups were changed from grass to lucerne or lucerne to grass on April 15, the day of joining.

Feed conditions were initially good but the farm ran short of lucerne, so that during the mating period the fresh lucerne was supplemented by 0.4 kg lucerne hay per head per day. Lucerne feeding ceased entirely on May 5 after the first cycle. Initial liveweight was 69 kg. Gains during pre-mating were 6 kg and 5 kg for grass and lucerne, respectively, and during mating 0.5 and 0.2 kg. All ewes were dosed with selenium. Oestrogen assays of the lucerne showed low levels in January, moderate levels in February, low levels (25-40 ppm coumesterol plus 10-20 ppm 4′ methoxycoumestrol) in March, but rising to 60-150 ppm coumestrol and 40 ppm 4′ methoxycoumestrol in April during the mating period (Table 2).

The lambing performance is given in Table 3.

Comparing the all-grass and all-lucerne groups, there was again a marked reduction in multiple births and a 2% increase in

TABLE 2: MEAN PHYTO-OESTROGEN LEVELS IN LUCERNE 1976

	Jan.	*Feb.*	*Mar.*	*Apr.*
Coumestrol (ppm/DM)	30-80	60-190	25-40	60-150
4′ Methoxycoumestrol (ppm/DM)	0-55	20-160	0-25	0- 40

TABLE 3: LAMBING PERFORMANCE 1976

	Barrenness %	*Mean Litter Size*
Grass-Grass	1.0	1.69
Grass-Lucerne	1.5	1.57
Lucerne-Grass	3.0	1.75
Lucerne-Lucerne	3.0	1.49

barrenness. Results from the interchanged groups would suggest the mating period rather than pre-mating as the danger period, but whether this is due to the higher oestrogen content of the lucerne in April or to the increased effect of oestrogen at that period cannot be decided.

DISCUSSION

The present observations differ from the initial results of Coop and Clark (1960) in that mean lambing date was not delayed but the depression in litter size or multiple births was increased (20% *v.* 10%). Scales and Moss (1976) observed a bigger depression in high-fertility sheep than in low-fertility sheep. The difference between the present and earlier results may be associated with the higher fertility of the ewes in 1975-6.

These results confirm that there is a real problem that can no longer be ignored. The conditions under which lucerne may be grazed at this period of the year must be found so that its agronomic advantages may be fully used. Factors influencing phyto-oestrogen level must be determined so that the relative safety or danger of the lucerne can be predicted. The sensitivity of the ewe's reproductive system at different times must be studied to predict when the ewe is most likely to be affected. It may then be possible to avoid using lucerne for a shorter period or to continue using it at minimum penalty.

ACKNOWLEDGEMENTS

To Invermay Research Station for conducting the oestrogen assays, J. Anderson and R. J. Keeley of Ashley Dene, and N. P. Jay and V. R. Clark of the College staff for assistance in conducting the trials.

REFERENCES

Coop, I. E.; Clark, V. R., 1960. *N.Z. Jl agric. Res.*, *3*: 922.
Scales, G. H.; Moss, R. A., 1976. *N.Z. Jl agric.*, *132*: 21.