

QUEENSLAND DEPARTMENT OF PRIMARY INDUSTRIES  
DIVISION OF PLANT INDUSTRY BULLETIN No. 691

A NOTE ON THE EFFECT OF CUTTING ON LUCERNE  
IN WET SOIL

By H. G. BISHOP, D. H. LUDKE and D. GRAMSHAW

SUMMARY

Cutting during a period of hot wet weather in January-February 1971 killed many lucerne plants while uncut plants in the same plots were only slightly affected. Two consecutive cuttings, 3 weeks apart, caused the most serious damage.

I. INTRODUCTION

Lack of long-term persistence of lucerne for grazing and hay production is a major problem in subtropical Queensland (Cameron 1968). Reasons suggested for this lack of persistence have included high summer temperatures (soil and air), wet soil conditions, disease and poor management techniques.

This note reports the effect of various frequencies of cutting during an extended period of abnormally wet weather during January-February 1971 on persistence of lucerne plants 4 months later.

II. MATERIALS AND METHODS

At the Biloela Research Station (lat. 24°24'S) of the Queensland Department of Primary Industries, a trial studying the effects on lucerne persistence of three cutting frequencies (3, 6 and 9-week intervals), two lucerne cultivars (Hunter River and Siro Peruvian), two sowing rates (1 and 4 kg/ha), with and without competition from *Cenchrus ciliaris* cv. Biloela sown at 1 kg/ha, was in progress when an exceptionally wet period occurred in January-February 1971 (Fig. 1). The trial was planted on September 2, 1970, and cutting commenced on November 25, 1970.



Fig. 2.—One of the twice-cut strips, taken several months later, showing loss of lucerne and invasion by weedy grasses.

Normal cutting procedures were possible on January 27 (3 and 9-week treatments) and February 17 (3 and 6-week treatments), except that on each occasion the growth on the plot areas outside the sampling strip could not be cut and removed. The sampling strip was 1 m x 5 m cut to 2.5 cm with an "Autoscythe". Each plot was 5 m x 10 m.

After the February 17 harvest the cutting sequence was temporarily abandoned because of continued wet weather. When the ground had dried out sufficiently the whole area was cut three times at 4-weekly intervals with a forage harvester.

With the return to normal conditions it became apparent (Figure 2) that those areas cut twice during the wet weather, on January 27 and February 17 (treatment 1), had lost substantial numbers of lucerne plants compared with those cut once, either on January 27 (treatment 2) or on February 17 (treatment 3).

On May 12, 1971, following the final forage harvesting, the surviving plants were counted in a 0.3 m x 4.3 m area within each cut strip and a similar area adjacent in the same plot that had been left uncut during the wet weather.

### III. RESULTS

There were no pronounced effects of cultivar, sowing rate or competition on the reaction of the lucerne, and mean results for cutting treatments only are presented in Table 1.

A highly significant reduction in lucerne plants occurred in the twice-cut swards (treatment 1) while a single cut (treatments 2 and 3) caused a marginal reduction only. The plant numbers for the uncut portion of each treatment indicate that lucerne plant numbers were initially uniform over all treatments.

EFFECT OF CUTTING ON LUCERNE

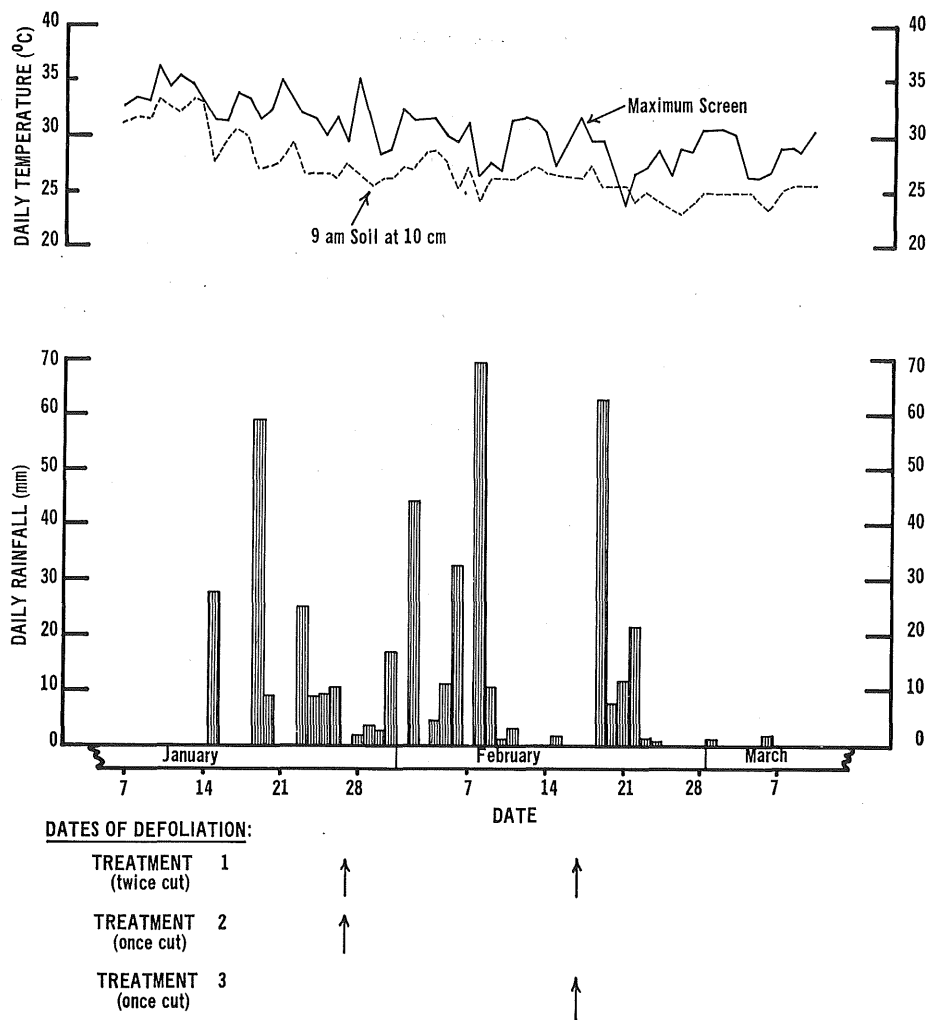


Fig. 1.—Daily rainfall, maximum screen temperature and 9 a.m. soil temperature recorded at the Biloela Research Station in summer 1971.

TABLE 1

MEAN LUCERNE PLANTS/m<sup>2</sup> IN CUT AND UNCUT PORTIONS OF EACH TREATMENT ON MAY 12, 1971

	Treatment 1 (Twice cut— January 27 and February 17)	Treatment 2 (Once cut— January 27)	Treatment 3 (Once cut— February 17)
Cut .. ..	3.8	10.9	10.8
Uncut .. ..	13.6	13.9	13.1
Significance (Student's "t")	$P < 0.001$	N.S.	N.S.

\* N.S.: Not significant  $P < 0.05$ .

#### IV. DISCUSSION

These observations support the work of Cameron (1973), who found a positive correlation between high soil temperature, saturated soil conditions and cutting of lucerne plants in pots. He found that plants subjected to constant root and air temperatures of 30°C and saturated soil for 5 days immediately following cutting reacted more severely than plants allowed to regrow for 5 days before being waterlogged.

It is concluded from the reported results that if excessively wet weather occurs during the summer months, lucerne is best left uncut if management allows. In particular, frequent cutting in a wet summer period should be avoided.

#### V. ACKNOWLEDGMENTS

The financial support of the Australian Meat Research Committee is gratefully acknowledged. The late Mr. L. A. Philips assisted with data collection.

#### REFERENCES

- CAMERON, D. G. (1968).—Lucerne as a pasture legume. *Qd agric. J.* 94:534-43.  
CAMERON, D. G. (1973).—Lucerne in wet soils—the effect of stage of regrowth, cultivar, air temperature, and root temperature. *Aust. J. agric. Res.* 24:851-61.

(Received for publication January 2, 1974)

The authors are officers of Agriculture Branch, Queensland Department of Primary Industries.