LUCERNE GRAZING MANAGEMENT

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THE NEED to spell lucerne adequately between cutting or grazing has been clearly demonstrated by numerous workers. However, in a grazing system, a second factor arises, namely, the time taken to consume the lucerne on offer in each paddock. This is termed the grazing duration and has considerable practical significance since it affects such things as degree of subdivision, mob size and frequency of shifting. It has received very little attention relative to other aspects of lucerne management.

This **note** is a preliminary report of a few observations emerging from work currently in progress at Massey University on this topic of lucerne grazing duration.

A field trial was conducted during the 1975-6 season on a two-year-old stand of Wairau lucerne growing on a Manawatu sandy loam. The effects of three grazing durations, 2 to 4, 15 and 30 days, were compared in a randomized block layout with-four replicates. Treatments commenced on November 9, 1975,. for, by then, vigorous new shoots were appearing at the base of the lucerne which was at the late bud to early flower stage. Romncy hoggets were allocated to the treatments at a grazing pressure calculated to remove the herbage to a mature stem stubble height of 10 to 12 cm in 2 to 4, 15 and 30 days. This required a concentration of approximately 1400, 180 and 80 sheep per hectare, respectively, for this **first** grazing. Small alterations to sheep numbers were made during a grazing if **it** was apparent the herbage was being consumed either too quickly or too slowly.

At the end of each grazing, the lucerne regrew to the early flower/basal shoot appearance stage when, once again, the appropriate grazing duration was imposed. Two full cycles were traversed under the 30-day treatment, 3 under the 15-day **treatment** and 4 under the 2- to 4-day treatment before cool autumn conditions severely reduced growth. The final cut on all treatments was taken at the end of May 1976.

The spell to early flowering between each grazing must be emphasized because it reduced the possibility of any cumulative detrimental effects. Irrigation restored soil moisture to field capacity whenever the deficit reached 40 mm.

The sheep removed apices and leaves in preference to stem, and the upper parts of the leaf and stem fractions in preference to the lower parts. The 2- to 4-day grazing duration was too short for any significant change to occur during grazing in the new shoots which were just appearing at the base of the plant when grazing commenced. However, on the 15- and 30-day grazing durations there was adequate time for development of this new shoot population. The principal change was a large increase in the number of new shoots. They could increase very little in size because the sheep quickly began to decapitate these new shoots once the leaf and upper stem fraction of the mature herbage was consumed.

Growth during grazing was measured by the "difference" technique using large cages shifted frequently. Within the limitations of this technique, the average growth rate *during* grazing for the 15- and 30-day treatments was 32 kg/ha/day, while the average growth rate for all treatments over the full regrowth period from the end of each grazing to its recommencement some 35 to 40 days later was 107 kg/ha/day.

Because of the low shoot numbers present at the end of the 2- to 4-day grazing duration, regrowth on this treatment exhibited a definite "lag phase" for the first 6 to 10 days after the sheep were removed. This did not occur following the 15- and 30-day grazing durations, for shoot numbers were plentiful by the time each grazing had finished.

However, there were differences in regrowth rates between treatments which were quite independent of shoot number effects. For example, growth rate following a 30-day grazing duration was consistently lower than following a 15-day grazing duration, and neither of these treatments was able to attain the growth rate following a 2- to 4-day grazing duration once the "lag phase" was passed. This effect of an extended grazing duration on lucerne regrowth is currently being studied in detail.

Lucerne yield under the three grazing systems is shown in Table 1. Clearly these figures, incorporating, as they do, "growth

TABLE 1: TOTAL LUCERNE YIELD FOR SEPTEMBER 1975 TO MAY 1976

Grazing Duration (days)	*Lucerne Yield (kg/ha DM)*
2-4	18 300
15	16 000
30	13 000

during grazing", must be treated with caution. However, they do indicate the probable size of the total treatments effects.

These values have considerable significance for lucerne grazing management on a farm scale. The relatively small difference between the 2- to 4- and 15-day grazing duration treatments indicates there is potential for a longer grazing duration than has normally been accepted for lucerne. This would obviously confer very real practical advantages in terms of subdivision, stock handling and overall flexibility. However, the yield under the 30-day treatment emphasizes the need for caution in unduly extending the grazing duration during periods of active growth.

It is probable that the impact of grazing duration will vary with season and site factors and for this reason studies have been initiated under controlled environmental conditions to determine the size and cause of any variations.