SOME ASPECTS OF GRAZING MANAGEMENT IN DAIRYING.

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In connection with the process of rotational grazing of pastures, the two following questions are of great practical importance.

(1) Just how closely should be pastures be eaten down before the stock are removed?.

(2) What should be the length of the period of spelling between successive periods of grazing?

As a general rule in descriptions of rotational grazing, the severity of grazing is not specified, though there is evidence that really hard grazing is commonly accepted as advisable. For instance, in England, Brunton, at a Cambridge Conference in 1927, in describing his methods at Tollesby Farm said:-

"Each paddock after grazing resembled a meadow which had'been Uosely mown."

Further, Woodman's'results at Cambridge, which feature in so much advice relative to rotational grazing, were based on the use of a lawn mower and he and his disciples make a good deal of the necessity for close grazing.

As a natural consequence of this attitude, we find the use of store cattle as "followers" to "wet" stock widely recommended on the assumption that wet stock, such as dairy cows, could not advantageously be employed to-graze the pastures closely enough to meet the requirements of a system of efficient rotational grazing. In view of all this it is not altogether surprising to find that in the minds of many, rotational grazing is associated with repeated bare or hard grazing of, pastures.

Before considering the duration of resting of pastures, it is desirable to make clear how the words "long" and "short" are used in this connection. The period of spelling or resting that should be adopted is governed not by mere lapse of time, but by rate of growth of herbage. Hence, a period of specified time value may vary from "short" to "long" from one season to another according to growth conditions. For instance, in August an interval of three weeks' spelling may not be as great as one week's spelling in November or December. From all this we cannot say a period is "long" or "short" absolutely. Hence the terms "long" and "short" applied to periods of spelling in the following remarks will be used only relatively - the comparison implied having regard to the same , set of conditions.

With this explanation let us pass on to the practice in regard to the spelling of fields in rotational grazing.

The duration of the period of spelling be'tween successive grazings is, as a rule, but poorly defined. Some few seasons ago there was an inclination to favour relatively long periods, the only limit to their duration being that necessary to avoid the development of flowering stalks. However, practical difficulties to long periods of spelling soon made their presence felt. It was found, for instance, that if a system involving long periods of spelling were adopted then either grazing periods wouid have to be made of 4 to 6 days duration or an abnormally heavy number of stock would have to be run on each acre during a grazing period in order to effect the consumption of the herbage in one to three days. Both of these alternatives are unattractive to certain successful farmers of the Wellington Province whose methods. and results will be considered.

:@ Against fairly long grazing periods, these farmers advance the observation that there is a falling off in the production from cows which are kept for more than three days on the same field; that this loss of production occurs even if there is still a good deal of feed on the fields at the end. of a three day grazing period and that it occurs even if a system of grazing at night on other paddocks is adopted. There appears to be justification for these views of practical farmers who, indeed, cannot be persuaded to persist in the use of long periods; On the other hand, if a system of long periods of spelling is adopted, then short grazing periods can be made possible. But this can be done only by heavy stocking which calls for close subdivision, with its attendant expenditure,, to enable the stock to be sufficiently concentrated to consume the bulk of feed with desirable rapidity.

In brief, many successful farmers contend that with relatively long spelling of pastures between successive grazings, it becomes necessary to choose between undesirable alternatives.

The necessity for making a choice between these alternatives could be avoided by resorting to a system correlatively short spells between grazings.

At first sight this latter method seems sound and it has been adopted fairly widely. But certain investigations which have been carried out independently have disclosed its weakness when made part of a system involving periodical really close grazing. These investigations indeed strongly suggest the need for long intervals between grazings, when a system of close grazing is adopted. As the result of the work of Dr. Woodman and his colleagues, we are now told from Cambridge that cutting pastures at intervals of three weeks has given 62% more dry matter than cutting at weekly intervals and,further,that so far as digest ibility is concerned, there is little to distinguish grass grown under systems of. weekly, fortnightly and three-weekly cuts. Again, Fagan and his co-workers at Aberystwyth compared the amount of nutrients produced under systems of weekly and monthly cutting. The difference in yield from the two systems was weekly: monthly:: 100: 269. In this case the grass, from the- monthly cutting was not as highly nutritive as that from the weekly; but. nevertheless it was exceedingly high in nutriment. Incidentally, this would most likely not prove true of the monthly cutting in New Zealand at certain seasons.

To sum up, practical farmers point to unattractive aspects of a system .of. rotational grazing, consisting of intermittent periods of hard grazing during spring and summer and periods of relatively long spelling. Some of the unattractive aspects would be removed by making the duration of the periods of spelling relatively short. But research has shown that without long periods of spelling repeated close grazing would bring about a serious falling off in the yield of nutriment from a pasture. Further, apart from any falling off in total yield, experience has shown that pastures suffer if close clipping of the growth is done just prior to or during a dry summer spell.

The question Of practical importance is whether any alternative and possibly preferable system has been evolved.

The answer may be found by considering the methods adopted and the results obtained on two farms which are in the neighbourhood of Palmerston North, and which are typical of many of those farms of this district which in respect to grass management, are most successful.

One of these farms is that of Mr. J.Spall, Whakaronga, and consists of 60 acres.

The other is that of Mr. H.Burrell, Bunnythorpe, and consists of 148 acres. These have been. selected for consideration.

(1) Because they are wholly in permanent pasture - a fact which greatly simplifies examination of the influence of grazing management since the part played by supplementary crops has not to be taken into account.

(5) Because on both farms the grazing management was changed in an identical manner a short time ago, and it is possible to compare the production obtained before and after.. the change. ,

The change that took place involved the introduction of- a system of grazing of which the main features are:-

(1) Intermittent grazing and spelling along the lines of the orthodox system of rotational grazing from which there are differences of practical moment, because

(2) Really close grazing is not' carried out during the spring and summer. It is customary to remove the stock from a field when there is still much fresh growth on it. There is no attempt t o achieve. by hard grazing the appearance that would result from mowing. ,

(3) The periods of *spelling* are of relatively short duration and consequently the grazing periods are correspondingly short. What is done in this respect is, exemplified by records made of the actual grazing of specific fields. On each of two fields on Burrell's farm grazing was carried out 'on 26 occasions during the period August to January inclusive. This is equivalent *to a* grazing. every week during the main growing period of pastures.

On one field on Spall's farm grazing was carried Out on 35 occasions during September to May inclusive, while on another field it was carried out on 37 occasions during the same period. This is equivalent to a grazing at intervals of 7 to 8 days. On both farms the grazing periods ranged from 1 to 3 days' duration, the majority of the periods not being more than 2 days,

(4) Store stock as "followers" are not employed.

(5) Any surplus growth in. addition to that dealt with in ensilage and haymaking is simply "topp e d" with the mower which is manipulated so that it cuts practically nothing but flower stalks.

(6) Grass harrowing is looked upon as an 'essential feature of the system though it by no means becomes a heavy task. Up-to the present it has been confined to two or three harrowings a year and it remains to be proved whether more would give any worth while improvement.

The results obtained under the sys tem just outlined have been noted.

'On Burrell's farm of. 148 acres the number of cows milked increased in three seasons from 75 to 110. These figures are particularly significant because the lower carrying was looked upon as a good performance and indeed it still is on the high side as a basis for assessing the present carrying capacity of neighbouring farms. It is impossible to compare. the earlier. with the later production on a butterfat basfs for latterly a considerable quantity of the milk produced has been sold on a gallon basis for city supply.

On Spall's farm a similarly striking increase in production has marked the introduction of the system of grazing already outlined. Spall's experience *is* possibly more interesting because it can be expressed in terms of butterfat. Prior to Spall making the change in his grazing management, the production of his farm was the best of all similar farms in the neighbour-, hood, so his is not a case of good management replacing abnormally poor management, and this explains the sudden increase. The neighbourhood average was 120 lbs. butterfat an acre. His was 159 lbs, an acre. During a period of two years the Spa11 farm production rose from 159 to 216 lbs. butterfat an acre. During that period there was no change in the topdressing programme, no material change in the herd average, so that the increased production could not be attributed to better stock, and indeed, the *only* change apart from the method of grazing was the erection of about twelve chains Of internal *fencing.* Hence, it would seem that the substantial increase in returns is due essentially to the method of grazing management.

Apart from the substantial increase in the annual production Of butterfat an acre, a most significant feature of the Spall farm production was the way it held up in the late summer and early autumn dry period.

During the first year in which Mr. Spall took special measures to keep his pastures leafy during summer his February daily production of butter-fat was. 90% of his December daily production, while his March production was 76% of his December production. As this rate of production was maintained on grass only, it must be considered really good when viewed in the light of the fact that the corresponding figures for the average farm of the same district were 84% and 70% respectively. To understand the full significance of these figures it must be kept in mind that the farms on which the average is based would include many which had the assistance of special supplementary feed in maintaining late summer and autumn production. The second year's figures relative to the Spall farm production for the same period are also interesting. In the second year the February daily production was 89% that of the December, while the March production was 78% that of December. These figures are specially good for they cover the driest February-March period for at least 10 years, which is as far back as the available records go. The rainfall for the two months was 1. 41 inches and the average rainfall over ten years for these two months is 5.53 inches.

This aspect of Spall's production has been mentioned in detail because, on the assumption that rotational grazing calls for periodical bare grazing, it is frequently contended that rotational grazing is unsuitable when dry conditions may be expected, The point of practical interest is that the Spall farm on its system, using grass alone, went through an abnormally dry spell with much better results than those obtained by most other farms on other systems of feed management. From this it is not to be inferred that one should plan to go through the dry-period on grass alone as Spall did, but it is to be inferred that a dry period presents no obstacle to the adoption of a system of rotation grazing in which there is no hard grazing of the sward during summer.

A system of grazing management, such as is exemplified by the practice on the farms already considered, seems fitted to minimise , if not to eliminate, the loss in quantity of digestible nutriment to which Woodman and Fagan have directed attention as a potential disadvantage attaching to rotational grazing. A pasture grazed to a height of 2 inches is surely not so grievously injured as one eaten back to a height of 1inch, and it will not be so slow to recover and return to the stage which allows of most rapid growth. To realise this one needs merely to keep in mind 'that hard grazing means the almost complete removal of the organs on which the growth of the plants depends.

A further point of importance is that those who practice the grazing system adopted on the Spa11 farm have demonstrated that quite good control of the pastures in respect to stag@ of growth can be secured without resorting-to what farmers have been accustomed to look upon as unusually close subdivision. Already reasonably good control has been obtained on farms Consisting of from 9 to 12 fields available for dairy stock..Fortunately, a great number of farms already are divided into this number of fields or could be so subdivided without any great further expense. So much has been made of the necessity of close subdivision that many farmers may be hesitating even to enquire about the means towards better utilisation of their pastures because they believe that this desirable better utilisation is synonymous wfth considerable expenditure on subdivision which they cannot finance.

To sum up, on a number of dairy farms we have in operation a system of grazing management which calls for -

(1) Even, but not really hard grazing, of fields during spring and summer.
(2) Short grazings periods with relatively short periods of spelling of the swards.

The advantages of this system are:

(1) No necessity to punish the aet stock,
(2) The use of followers is not essential.
(3) The advent of a dry summer or autumn period is not an occasion of so much danger as in a system which calls for the hard summer grazing of fields.
(4) The absence of hard grazing minimises the injury to the pasture plants and lessens the period occupied in recovery and return to the stage of maximum rate of growth.
(5) It presents no abnormal subdivision requirements.

The advantages of the system are matters which may be left for the present to be raised in any discussion which arises from this bare outline of the system.