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Studying the conception of livestock farmers to improve grazing management models

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Summary

The authors show that there are numerous discrepancies between the way farmers and agricultural theory conceive of the grazing management of cow herds. The discrepancies concern the management objectives: herds, assessment of feeds, construction of the time-space relation and of management indicators. Knowledge of these conceptions may help improve the models produced by agronomists to represent grazing management by adjusting them more closely to the conceptions of farmers.

Keywords: grazing management, conceptions of livestock farmers, management of a technical process

Introduction

Modelling the material practices of livestock farmers has been a long-standing concern of agricultural research. Agricultural scientists such as Schilote & Soler (1990) developed "Action models" based on management theories. What is represented in these models are the decision processes of farmers when planning and implementing a technical process. However, scientists and farmers view these practices differently. They have different approaches to categorising "objects" and positioning them in a wider whole and in relation to each other (Landais & Lasseur 1993). The aim of our work is to improve the action model by introducing information about the conceptions of farmers. This information relates to the way a social group mentally constructs a technical process.

To this end we investigated the way livestock farmers approach the grazing management of dairy and suckler herds in two grazing regions of France, the Jura Plateaux and the Marshlands (Marais) of Western France: we used this approach to i) build a representation of grazing management in the Jura which we then compared with the action model, and ii) validate certain features of the action model in relation to the management of forage areas on Marais farms.

1. Material and methods

We interviewed all the livestock farmers of one village in each region to explore the way they approach the management of their grazing areas. These interviews aimed to induce them to explore their ideas and convey information which, to them, "goes without saying". In subsequently analysing these interviews we sought to highlight the "objects" which the farmers identify, the criteria they use in qualifying and assessing them, and the way they associate or oppose them (Darré 1993). Alongside, we conducted surveys on field and herd management patterns in a diversified sample of farms in both regions. The surveys were associated with a questionnaire on variations in these practices between years.

2. Grazing management as conceived by the farmers and comparison with some elements of agricultural theory

We selected the main features in the farmers' conceptions about grazing management and compared them to the principles set out in agricultural theory. Points 1 to 6 relate to the Jura area. Points 2 and 3 were also confirmed in the Marshlands.

Main conceptions of farmers	Corresponding principles in agricultural theory
1- No set production target. Milk output, which is also an indicator of herd functioning, must not drop unduly. Consequently feed supply must be as stable as possible.	There is a set production target. Feed rations are calculated so as to meet the targeted production.
2 Extensive consideration is given to cow "feelings", which the farmers infer from their behaviour. The farmers strive to make their animals content.	Little or no consideration given to cow behaviour.
3 Feed quality is assessed on the basis of amounts eaten by the cows. A good cow feed is a feed the cows eat readily.	Assessment of feeds based on nutritional value. Difficulties in assessing the value of grazed grass.
4- Grassland areas are designated according to the way they are used and their evolution over the grazing year. At onset of the grazing season, grassland areas are all designated as "fields", which does not anticipate their future use.	Grasslands are once and for all divided up into plots and named specifically. The use of grass plots over time is described by allocating specific functions to the plots.
5 Farmers describe their grazing management in relation to grass quantities, i.e. herbage available for the cows, amounts of refused herbage, speed of herbage consumption and speed of grass regrowth. Area per animal and stocking rates are never mentioned.	Reasoning of grazing management is based on area per animal and stocking rates. Situations in which the available herbage is not totally consumed by the cows are difficult to deal with.
6 There are two variants in the way farmers view the grazing management: • some farmers want their cows to constantly dispose of large supplies of herbage; • others accept that their cows dispose of more limited supplies of herbage.	

3. Two examples of use of farmers' conceptions in agricultural research

3.1. Building a model to represent the grazing management of dairy cows in the Jura hills

Based on the above conceptions of farmers, we produced a grazing management model for dairy cows. The following criteria were taken into account: i) farmer attitudes regarding the amount of herbage available to the cows, ii) farmer attitudes about rationing, iii) farmer attitudes about drops in milk yield. We linked these attitudes to the farmer practices observed. By applying these models to the observed grazing management in the region, we were able to represent the diversity of grazing patterns. Thus, five types of grazing management were described for the Second Jura Plateaux. Two of these are given here.

I- Little grass is available to the cows. The animals are turned out very early in the season. The cows are rationed, and are moved quickly across the grazing area. The grazing area is quite extensive and, most important, there are few patches of refused grass.

II- The cows always have abundant herbage at their disposal. They are turned out late. They are rationed and are moved across the grazing area according to amounts of available

herbage. There is a risk that the grazing area is too restricted, with patches of refused grass. Hay is cut very early and the cows can be grazed early on grass regrowth.

3.2. Comparing the way farmers conceive grazing management with the action model

The action model produced by the scientists to represent the management of forage areas on a farm is based on the grouping of animals into batches, and of fields into blocks of fields, and on associating these blocks to the grazing of animal batches and to mowing (Girard *et al.* 1994). These associations are adjusted to the year's conditions. We have shown that the Marshlands livestock farmers indeed consider these groupings and associations in their ways of conceiving things. In their discourse, the livestock farmers group their animals according to criteria linked to production type and age (*small heifers, 2-year old heifers, large females, milk cows, dry cows, whites [i.e. Charolais suckler cows]*) and according to management criteria (*I took out the heifers that were with the dams of large males, to avoid them being mated*). They mention parcel size (*the small fields*), shape, topography, location among the farm fields. Possible uses of these fields are related to some of their features: environment (*there's a ditch on one side only, so there's fewer risks of small calves falling into the water*), shape (*it's a longish field, we take silage from it*) and also to animal preferences.

A great flexibility is also shown to exist in these associations, expressed in the use of words such as "*depending on, sometimes, possible if...*" For example, at regrowth, one may speak of "*localised moments of available herbage*"; "*sometimes there's re-growth, it's green, we put the milk cows there because there's plenty for them, then at other times it's really too limited, so we put the whites out, they graze closer down*".

Conclusion

We have shown that the management of grazing is conceived in widely different ways by the livestock farmers and by agronomic theory. Views differ on the management objectives, the herd, the assessment of feeds, and the construction of the time-space relation and of management indicators.

These results pose several questions to agricultural research. We have used them to validate and improve the models produced by agronomists to represent grazing management. They can also be useful for improving the relevance of advice to farmers and technical references.

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