Monitoring productivity of a UK dairy system aiming to increase soil carbon, based on diverse swards and incorporating mob grazing

By K LEACH[1], R RICHMOND[2] and W WATERFIELD[3]
1: Organic Research Centre, Elm Farm, UK 2:Manor Farm, Chedworth, UK 3:Waterfield and White, UK

Rob Richmond, a UK organic dairy farmer in the Cotwolds, has been working with diverse swards and a "mob grazing" system over seven years. As part of the participatory research in SOLID in the UK, the performance of these diverse swards under mob-grazing conditions has been

Discussion Group members discuss Mob Stocking and diverse swards with Farmer Rob Richmond (on the right) and Alan Savory (on the left)

Rob Richmond, a UK organic dairy farmer is very interested in increasing soil organic matter (SOM), both to improve plant productivity, and augment carbon sequestration. One practice that may contribute to increasing SOM is a "mob grazing" approach. This involves high stocking density for a short period of time, and grazing more mature swards, leaving higher cover and longer recovery times between grazings than in typical UK grazing rotations. This approach is likely to be best suited to swards that include a wide variety of grass and herb species, giving greater resilience than a purely ryegrass sward. The approach was developed by Alan Savory in Southern Africa. On 27 September Alan Savory was visiting the UK, so the Organic Research Center, UK took the opportunity to invite him and farmers of a dairy discussion group to take a look at the farm. The performance of dairy herds on such swards under this type of management in the UK has not been documented.

Manor Farm is a 220 ha organic dairy farm in the Cotswolds with 188 spring calving dairy cows. Soils are shallow with brash over limestone, and prone to drought. The grazing area for the milkers is 74 ha, with an additional 20 ha following first silage cut, which is grazed on a 40 day rotation. Cows are allocated a fresh area of approximately 0.8 ha twice a day (117.5 LU/ha/day). Beginning in March 2013, at 2-3 week intervals, dry matter per hectare and botanical composition of the sward available to the cows and remaining immediately post-grazing were measured by sampling 3 x1m^2 quadrats. Metabolisable energy content of the sward available and rejected was evaluated by wet chemistry on two dates and used to estimate energy intake. Feed use and milk sales were recorded (see Table 1 and 2 on following page.)

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Table 1 Intake from grazing and cow performance at Manor Farm from March to July 2013

Month	Estimated grazed intake (kg DM/cow/day)	Supplementary feed/cow/day	Milk sales (l/cow/day)
March	4.25	Silage + 6 kg cake	18
April	7.45	Silage + 4 kg cake	22
May (14th onwards)	18.0	2 kg cake	22
June	14.0	1 kg cereal meal	21
July	18.0	1 kg cereal meal	16

Table 2 First results of the characteristics of herbal sward ahead of the cows (NA – not available)

Month	Herbage available (t DM/ha)	Estimated herbage residual (above 6 cm) (t DM/ha)	Estimated energy intake from grass (MJ/cow/day)	Sward clover % (DM basis)	Sward broadleaf % (DM basis)
March	0.4	0	NA	NA	NA
April	0.7	0	87	12	9
May	1.7	0	206	14	9
June	1.8	0.5	141	27	8
July 1	3.4	1.3	180 - 199	13	22
July 21	2.3	0.8		17	38

Diverse sward composition just prior to grazing in September 2013

Cold spring conditions restricted early herbage growth, requiring supplementary silage feeding and higher than expected concentrate feeding into May. Grazing allocations resulted in increasing amounts of residual herbage from June onwards. The proportion of broad leafed species increased over the summer. By late July, cows were selectively grazing legumes and broadleaves, rejecting stalks of grasses, chicory and plantains. The estimation of herbage availability and intakes from such variable swards presents a large challenge. Monitoring is continuing to increase the availability of information.