

Field trials of the reactions of sheep to goose droppings on pasture

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Introduction

Farmers frequently complain that cattle and sheep avoid pasture on which there are goose droppings and that the effective loss of herbage is considerably greater than that actually eaten by the geese. In a previous trial under somewhat artificial conditions, sheep offered grass in a bare pen chose clean turves in preference to those with fresh goose droppings (Rochard and Kear 1968). They were not deterred by imitation droppings lacking the chemical constituents of excreta. The present trials were designed to test, under more natural conditions, the stability of the presumed chemical repellent factor.

Methods

Strips of pasture, 60ft. × 10ft., were fenced off at the Department of Agriculture and Fisheries for Scotland's Agricultural Scientific Station near Edinburgh. Each strip was divided into six 10ft. squares, marked by the fence posts. Half the squares were left clean (c) and half scattered, at the start of each trial, with droppings (d) in randomised sequences. In the three main trials these were c, d, d, c, d, c; c, c, d, d, c, d and d, c, c, d, d, c, respectively. Owing to priority requirements at the research station, the trials had to begin when fresh droppings of Greylag Geese *Anser a. anser* were not available. Droppings from a feral flock of Canada Geese *Branta c. canadensis*, feed-near Slimbridge, Gloucestershire, were therefore collected fresh, deep frozen and transported to Scotland for use in the first trial. These droppings had a much higher average fresh weight (14.5 gm.) than Greylag droppings (approximately 4.7 gm. according to Kear (1963)). Nevertheless they were applied to relevant squares at a density of three droppings per square foot. This had been used in the previous experiments as being the highest density of fresh droppings found on natural pasture grazed by Greylag geese. In the second and subsequent trials Greylag droppings became available from the margins of Duddingston Loch, Edinburgh. To keep the 'contamination' level equivalent to the first trial, the same *weight* of droppings was scattered on the relevant squares. Thus, in the present series, the level of contamination was some three

times that ever likely to be encountered under Scottish farming conditions.

Four Blackface × Cheviot ewes, individually marked and without previous experience of goose droppings, were used. They were kept in a holding pen which they had grazed bare before the trials started. In it they were provided with concentrated feed, hay and water. In each trial they were introduced into a fenced strip for two hours each day for six successive days. Feeding and resting activities, and the square occupied, were noted for each individual at five minute intervals. Between trials one and two the sheep were rested for six days, between trials two and three for 11 days.

During the three trials the sheep were thus faced at the start of the period with fresh droppings and then with droppings that had been exposed to one to five days of weathering. The series was completed by facing the sheep, after a rest period of seven days, with droppings of trial three which had then weathered for 14 days. Finally, after a rest of 33 days, the sheep were returned to the strip of trial one on which fresh droppings had been spread four days previously, in the same sequence.

Results

The total time each sheep spent in grazing and the proportion of that time spent on the clean squares was recorded. If there were no discrimination this would be around 50%. It is clear from Table I, which combines the results of the first three trials, that only on the first day, with completely fresh droppings, was there any marked avoidance of the 'contaminated'

Table I. Discrimination by sheep between clean pasture and pasture with droppings fresh at start of trial. Feeding on clean pasture is expressed as a percentage of total feeding.

Sheep No.	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6
1	92	61	45	40	63	53
2	63	46	54	60	58	44
3	85	64	55	68	70	54
4	89	64	48	60	44	53
Total	82	58	53	59	58	51

squares, and one of the sheep (No. 2) did not even show this initial reaction. Subsequently none of the sheep showed any significant deviation from a chance selection of feeding site.

It might be argued that, having grazed predominantly in the clean squares on the first day, the sheep were forced by shortage of grass to graze in the 'contaminated' squares subsequently. This is not a plausible explanation of the results. In the first place, two hours grazing is unlikely to reduce the sward sufficiently. Secondly, there is no indication that the sheep were grazing preferentially in the 'contaminated' squares—only that there was a lack of discrimination. Nevertheless the point was further tested by exposing sheep to weathered droppings after periods during which both the sheep and the sward were rested (it was still in the growing season for grass). Table II shows that there was again a simple lack of discrimination.

The station's meteorological records were examined in relation to the feeding patterns. There did appear to be less feeding in wet weather, but no variation in the rate of 'weathering' of the droppings could be detected.

Summary

Four sheep were required to graze on strips of pasture, half of which were scattered with fresh goose droppings in a density much greater than encountered under natural conditions. The sheep avoided the 'contaminated' areas only during the first day.

References

- KEAR, J. 1963. The agricultural importance of wild goose droppings. *Wildfowl Trust Ann. Rep.* 14 : 72-77.
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Table II. Discrimination by sheep between clean pasture and pasture with weathered droppings. Feeding on clean pasture expressed as a percentage of total feeding.

Sheep No.	4-day weathered droppings	14-day weathered droppings
1	50	75
2	71	46
3	50	36
4	29	43
Total	53	46

Conclusion

It would appear that only goose droppings that are completely fresh, less than 24 hours old, have any repellent effect on sheep. The repellent factor would thus appear to be rapidly volatile. The concentrations of fresh droppings used were in any case far greater than any likely to be encountered under natural conditions. The so-called 'fouling' of pasture by wild goose flocks is thus only a transient effect and not one likely to result in any real loss to the farmer.

