

REVIEW OF RECENT UK AND EUROPEAN RESEARCH REGARDING REDUCTION, REGULATION AND CONTROL OF THE ENVIRONMENTAL IMPACTS OF AGRICULTURE

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PART 1

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1 Overview of Findings

1.1 Focus of Review

The Review focused on the relationships between recent research findings and practical solutions for environmental issues associated with agriculture in Scotland. The findings relate to the principal agricultural systems in Scotland, namely arable and livestock.

1.2 Methodology

The desk-based Review was conducted by a team of nine experts and a research assistant. Each expert reviewed one or two individual issues based on their own knowledge of current UK and European research. This was supported by bibliographic details (see Part 2). The Review was limited to English-language publications and, given the budgetary constraints, each expert only had a maximum of two working days available. It is possible therefore, that relevant applied research reported in the “grey” literature or in other European languages has been missed.

1.3 Summary of Main Findings

- i) There appears to be a relative abundance of strategic research being conducted on the interactions of agriculture and specific aspects of environment (air, water, soil, species, habitats etc). However, there is little evidence that this research is being effectively integrated to create an overall understanding of the interactions between agriculture and environment.
- ii) There is a comparative lack of research on the effectiveness of “practical” management solutions, particularly concerning their transferability from one site to another. This is closely related to iii below.
- iii) Demonstration projects generally lack inter-organisational involvement in their establishment and in relation to their specific objectives. There is a general failure to capture potential wider benefits through improved siting or design choices. This limits both their practical value (i.e. of local relevance only) and their value to improving our scientific understanding. There is a strong argument for creating a “network” approach to demonstration projects.
- iv) “Practical solutions” currently appear to be based upon a general understanding of component processes (eg nitrate leaching) and their environmental effects, and the adoption of a precautionary approach to reducing the risk of their occurrence.

- v) Demonstration farms are considered as the only management unit. There is little apparent consideration given to the environmental benefits that could be obtained from targeting clusters of farms at the larger landscape/catchment scale. This would be of relevance to both nutrient management and the development of ecological structure.
- vi) There is little evidence of a systematic approach being developed or adopted as regards environmental risk management. This is particularly true in relation to introducing time windows where land applications of slurry are prohibited, necessitating increased on-farm storage capacity. This might be expected to increase the risk of major pollution incidents through physical failure (e.g. recent incident on the Ury in Aberdeenshire), the biohazard associated with bacterial build-up in slurry during storage, and possibly, ammonia volatilisation from uncovered stores.
- vii) Few, if any, practical measures have been subjected to full cost-benefit analyses. This may be related to our uncertainty about the actual effectiveness of any particular measure in any particular context (ie a solution that works in one place may not work in another).
- viii) There is a lack of consensus about what we collectively are trying to achieve in relation to environmental impacts of agriculture. Do we have a vision for sustainable multifunctional agricultural landscapes, which supports a thriving agricultural sector and which is environmentally benign everywhere? Alternatively, are we prepared to trade-off environmental gains in one area for losses in another?
- ix) Despite what appears to be a comparative wealth of scientific information on the environmental impacts of agriculture, there is survey evidence suggesting that the level of adoption of Codes of Good Practice amongst Scottish farmers is very low. There appears to be a lack of information on why this is the case. Because the codes aim to be widely applicable, there is an argument that a regional approach sensitive to local conditions/farm types might have more success.
- x) There is a need to develop better appreciation that farming units contain a range of activities that can have an impact on the environment. Whilst each activity can be individually audited on separate farms, a longer-term solution would be to identify priorities across farms and landscapes.

1.4 Overall Conclusions

Whilst we have been able to identify gaps in our knowledge about the environmental impacts of agriculture, **we are particularly concerned about the low standard of environmental management that appears to be practised by a majority of Scottish farmers**. Improved education, extension and advice are important factors to improving this, and thought needs to be given to the process and mechanisms of dissemination and technology transfer.

Further consideration should also be given to the scale of agricultural management in relation to the scale that environmental issues need to be dealt with. Because many of the environmental impacts interact and tend to propagate to the catchment or landscape scale, it would appear sensible to develop approaches to managing them at these scales. This suggests an approach based upon clusters of farms rather than individual farms might be sensible.

A particular discussion point is whether the farming community should receive payment for delivering public goods through adoption of higher standards of environmental management. Whilst it can be argued that this payment might be provided via farm accreditation schemes which are linked to increased product price, it is most likely that it must also be delivered via public funding support. It might be appropriate to link the two, and make public funding conditional upon achieving the necessary environmental management standards for entry to a farm accreditation scheme. Work needs to be done on precisely what such a publicly acceptable environmental standard might look like (ie specific, measurable and enforceable).

