Centre for Agricultural Strategy

Food production and our rural environment – The way ahead

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4 Intensive Systems – Their Effects on the Environment

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It is now generally accepted that farming systems and the pattern of farming in the UK will need to change to take account of the surplus production of some of the main commodities within the EEC. The two which are at present under pressure are milk and cereals. We already have quotas for milk, and threats of lower prices and some as yet undefined control measures which will be aimed at limiting cereal production. I would hesitate to speculate about a quota system for cereals and perhaps those concerned will wait to see how the milk quotas work in practice before embarking on quotas for other commodities. Whatever happens, it seems certain that limits, either fiscal and physical or fiscal alone, will be placed on the production of milk and cereals. Plant breeders talk of spectacular yield increases and ten million tonnes of cereals in surplus this year is forecast by some to become twenty million by the 1990s.

Production levels in the EEC, in this country and on individual farms, are determined by two main factors:

yield per unit – that is per cow or per hectare; and

the total number of units – that is numbers of cows or hectares of crop.

Total production can be reduced by limiting the yield or reducing the number of units or by doing both. During an emergency – as in the last War and the years just after – governments increased total supply by encouraging extra units, that is hectares of the desired crops. In the USA the Government pays to take land out of production so reducing overall supply.

Faced with milk quotas which limit production, farmers will seek to reduce total output and reduce input costs. They could reduce output through lower

yields per cow or they can keep fewer cows. Lower output per cow might be achieved by using fewer concentrates, but the genetic make-up of the national dairy herd is disposed towards higher yields. Breeding and selection has concentrated on yield, regular calving index and other attributes of high levels of milk production. Breeding policy could change, but this would be a very long-term project. Control of yield through feeding is uncertain, feeding cows is not a precise science and cutting feed could reduce yields to lower levels than is desirable and have other unwanted consequences. Each cow carries total overheads of around £280 a year which have to be met whatever the yield level.

The most positive and controllable move will be to reduce cow numbers while seeking to maintain yield levels and producing as much milk as possible from home-grown food – especially grass. A joint GRI, ICI production "Milk from Grass" (Thomas and Young, 1982) shows how nitrogen can be used to replace purchased feeds. Research has demonstrated that it is possible to achieve high levels of milk production on much higher levels of silage than is normally thought, even with silage of modest quality. The potential for replacing concentrates with forage grown by applying more nitrogen, should certainly be considered where at present forage quality is limiting and is capable of improvement.

Such a move will result in more intensive grassland management, higher levels of nitrogen use and silage cut three or four times a season to produce high quality feed.

Although overall the intensity of grassland utilisation may fall, through the less fertile soils and difficult areas moving to less intensive use, the remaining areas will be used as intensively as they are now, possibly even more under the pressure to produce milk from grass and grass products rather than purchased concentrates.

Land released from the dairy herd may be used for alternative crops, the production of bulky home-grown feed or grazed by other types of stock depending on its location.

Very similar arguments apply to cereals. Reducing inputs in order to achieve lower yields at a controlled level is virtually impossible. A cereal crop – of wheat for example – represents an investment in growing costs of £195 per hectare with a potential return on good land of £700. To attempt to save on costs by reducing relatively inexpensive inputs which will protect or improve the growing crop, would be folly. A 1% reduction in yield at average levels results in a loss in cash return of £7 a hectare (Nix, 1984).

The effects of lower prices will lead to a concentration of production on soils and in those areas of the country where returns from the inputs are likely to be satisfactory, ie areas which have the potential to produce good results. Areas which are marginal for cereal production through limitations of soil,

aspect, drainage, climate, will move to other uses. Land capable of producing 6+ tonnes per hectare will continue to grow cereals. The variable costs are virtually the same, £195 a hectare whether yields are potentially high or low.

Thus, cereal production will continue using inputs wisely and to meet the needs of the crop, but control of weeds, pests and diseases will remain essential in order to protect the investment. This will call for skill and precision in carrying out the necessary operations, not to a pre-determined formula but to meet the requirements of each field and the crop growing in it. Similar arguments apply to other high value crops such as potatoes, sugar beet and vegetables.

Marginal cereal growing land is likely to revert to grassland, very difficult areas and awkward corners which slow down operations may grow trees or cover for game.

The overall effect of these changes will be felt over a wider area than the intensive arable and grass farms. As their marginal areas move to less intensive cropping (or even in a few cases out of production and into conservation), so the pressure will move along to the less favourable land which in turn will withdraw from those areas where production is only justified at times of crisis. This has happened before as anyone who can read the signs can see in the hills and uplands where land which was grazed or even cropped during the last century has reverted to bracken and scrub. Land in the uplands, which grew potatoes during the last War has long since returned to heather and molinia.

Such a scenario does not mean that there will be large areas of the country intensively farmed and devoid of scenic interest and wildlife apart from pigeons and starlings. There is considerable evidence from all over the country to show that high farming aiming at optimum yields can fit very nicely with a proper regard for wildlife and landscape. But as with crop and stock production it demands thought, care, skill and management.

In what ways is it possible to minimise the impact of high farming techniques and to encourage the integration of wildlife and landscape conservation with the overall management of the farm?

First of all, by running a profitable farming business with clear long-term objectives.

- By securing the goodwill and open-mindedness of the farmer (landowner where appropriate) and the farm staff.
- By providing a sound basis for plans and compromise action through good survey information and a source of practical and understanding advice.
- By setting out a farm plan which includes conservation, which is clearly understood by all concerned and which will not cause inconvenience to the farming system.

Such a plan will identify areas of the farm which are of minimal or no

agricultural importance, and assess their value for wildlife and landscape. It should also take account of their potential for field sports, either now or in the future as land managed for game conservation also contributes to other wildlife and often to landscape.

The movement of land into production from agriculturally unproductive uses is, if my thesis is correct, unlikely to be attractive in future, indeed the reverse is more likely to happen. Any land-use changes should be carefully budgeted.

Greater precision is called for in the use of fertilisers by moving from spinners to full width distributors, so avoiding harmful enrichment of hedge bottoms. Farm wastes should be disposed of by incineration or using purpose-built pits rather than polluting farm ponds. Silage effluents and slurry from buildings should never be discharged into water courses, settlement pools or other systems should be installed to handle them.

There will inevitably be a move towards more single species (or four or five species) grassland through more intensive use. This will make setting aside small areas of species rich grassland with less intensive management even more important. Such areas can be useful for grazing young stock, rams and sick animals and, when their value to conservation and contribution to the farm can be clearly shown, most farmers are sympathetic.

There are some interesting developments which help intensive arable farming to co-operate with wildlife. These include the concept of the sterile strip around cereal fields which, with the loss of a small amount of land, provides the means of keeping hedge weeds out of the crop, ensures that the crop is uniform throughout and unaffected by shading, etc, and provides a good drying area for partridges and other wildlife. Some farmers sow a grass strip around arable fields, which provides a turning area for machinery and also helps wildlife.

The work of the Cereals and Gamebirds Project offers another way in which intensive cereal production can come to terms with wildlife, it is true, through an interest in game, but other wildlife will also benefit. Here, strips around some cereal field headlands have received no spring sprays of any kind, an area amounting to 2.5% of the total area of cereals on the farm. These small, unsprayed areas greatly enhanced both game and wildlife populations. Grey partridge covey size trebled; 21 different varieties of butterfly were seen compared with only 4 in the wholly sprayed fields. Total cereal yields were not affected. (Game Conservancy, 1983/84.)

There is increasing evidence of the importance of "polyphagous" predators, which are known to feed on cereal aphids and play an important part in reducing the numbers of insect pests in cereals. Hedgerows, grassy banks and shelterbelts are important overwintering habitats for these desirable insects. Such habitat is threatened by irresponsible straw burning, pesticide spray drift and

erosion or removal of field boundaries. Recognition of the value of these predators leading to greater care to conserve their habitat will help other wildlife.

Productive farming and the proliferation of game and wildlife in traditional habitats need not be in conflict. The secret lies in well planned development closely integrated with the farming policy. There are many hundreds of farms and estates which demonstrate that this is possible.

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