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Impact of REPS on Fertilizer Use
by Mr. Frank Rath, Dept. of Agriculture

Introduction

In this presentation I will be making an estimate of the impact of REPS on the use of nitrogen, phosphorus and liming products. These estimates, are based on a number of assumptions the magnitude of which it is difficult to predict.

Firstly I will outline some of the criteria that must be complied with by REPS participating, then I examined some relevant statistics and thirdly I will provide an estimate of the impact of the Scheme on fertiliser use. The impact of REPS will gradually increase over the next five years in line with farmer participation.

Farmers in REPS must comply with the undertaking that are specified for 11 measures. Measure 1 of REPS specifies most of the undertakings that will have relevance for fertiliser use.

IMPACT OF REPS ON FERTILISER USE

Measure 1 of REPS requires participants to prepare a waste management, liming and fertilisation plan for their farms. The objective of this measure is to protect and improve the quality of our water resources and to promote the efficient use of nutrients in an environmentally friendly manner. A baseline soil fertiliser survey of the farm is required. Maximum permitted levels of nitrogen use and phosphorus use are specified in the plan which reflect the intensive or extensive nature of the farming carried out and the environmental sensitivity of the area.

Nitrogen Limits (a) Grassland

The maximum permitted level of total N for grassland may not exceed 260 kgs/ha. The permitted level of organic N may not exceed 170 kgs/ha. The planner is also required to identify areas within the farm where chemical and organic N use must be further restricted in accordance with the environmental sensitivity, and the marginal nature of these areas.

The level of N produced by the range of livestock types are set out in the REPS Agri-Environmental Specifications. Some absolute maximum stocking rates assuming all the organic N is applied to the applicants grassland are as follows:

- 2 dairy cows per hectare
- 2.6 suckler cows per hectare
- 11.3 lowland ewes per hectare

Table 1 Data on Nitrogen Applications and Impact of Nitrogen Restrictions on Eligibility of Grassland Farmers to participate in REPS.
<table>
<thead>
<tr>
<th>Total kgs Nitrogen use/ha</th>
<th>&lt;260/kgs/ha</th>
<th>260 – 300kgs/ha</th>
<th>&gt; 300kgs/ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>All farmers</td>
<td>77%</td>
<td>6%</td>
<td>17%</td>
</tr>
<tr>
<td>Chemical Nitrogen</td>
<td>33%</td>
<td>10%</td>
<td>57%</td>
</tr>
<tr>
<td>Organic Nitrogen</td>
<td>53%</td>
<td>10%</td>
<td>37%</td>
</tr>
</tbody>
</table>

*Source: Unpublished Data from Teagasc Farm Management Survey 1993*

**Table 1** shows that based on the 1993 situation 77% of farmers could comply with the nitrogen restrictions with a further 6% who could comply if minor adjustments were adopted. The analysis shows that 57% of total chemical nitrogen was applied on the 17% per cent of farms too intensive to participate in REPS.

**Impact of REPS on Nitrogen Usage**

It is unlikely that REPS will have any effect on nitrogen used by farmers too intensive to participate in REPS who currently use 57 per cent of total chemical nitrogen.

For the purposes of this analysis it is assumed that one third of the eligible and potentially eligible grassland farmers will participate in REPS and that the range measures to improve the efficiency of nitrogen usage will give rise to a 20 per cent reduction in chemical nitrogen.

The overall reduction in chemical nitrogen usage arising from REPS on all grassland farms is therefore projected to be 2.9 per cent.

**Impact of REPS on Nitrogen Use on Tillage Crops**

Nitrogen limits for different crops are set out in the REPS Specifications. For all crops the maximum permitted level of chemical fertiliser N is 80% of the economic optimum level. Therefore if it is assumed that 25% of the tillage land is farmed by REPS applicants the reduction of chemical nitrogen use on tillage farms will be 6.25%.

**Conclusion**

The overall conclusion therefore is that REPS will only have a marginal impact on chemical nitrogen use – perhaps resulting in an annual reduction of the order of 4% after five years of the programme.

**Phosphorus Limits**

The permitted upper limits of P application for a range of soil fertility levels/indices for the following crops (a) grassland (b) cereals are set out in Tables 2 and 3.

Where P from animal and other waste is available this should be used where practicable subject to not exceeding the N limits, to supply the P requirement on deficit soils etc. Any remaining P needed may be made up with mineral sources.
Notwithstanding the P limitations set out in Table 2 for grassland, cattle and sheep slurry may be recycled on the area used for conservation e.g. when soil index is at 4 and zero P is recommended, slurry can be applied to the area.

### Phosphorous for grazing, silage/hay (kg/ha)

**Table 2**

<table>
<thead>
<tr>
<th>Soil Index</th>
<th>P Level</th>
<th>P Grazed</th>
<th>P Cut once</th>
<th>P 2nd or 3rd cut</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0–3 mgs/kg</td>
<td>40</td>
<td>50</td>
<td>20</td>
</tr>
<tr>
<td>2</td>
<td>4–6 mgs/kg</td>
<td>30</td>
<td>40</td>
<td>15</td>
</tr>
<tr>
<td>3</td>
<td>7–10 mgs/kg</td>
<td>10</td>
<td>25</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>10–15 mgs/kg</td>
<td>0</td>
<td>15</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>&gt;15 mgs/kg</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

### Phosphorous for all cereals (kg/ha)

**Table 3**

<table>
<thead>
<tr>
<th>Soil Index</th>
<th>P Level</th>
<th>P + Straw</th>
<th>P - Straw</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0–3 mgs/kg</td>
<td>35</td>
<td>45</td>
</tr>
<tr>
<td>2</td>
<td>4–6 mgs/kg</td>
<td>30</td>
<td>35</td>
</tr>
<tr>
<td>3</td>
<td>7–10 mgs/kg</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>4</td>
<td>10–15 mgs/kg</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

It is evident from the REPS plans submitted to date and also from the feedback received in the context of REPS training courses that the specifications that must be followed is proving to be a very useful learning experience for the REPS planners. The permitted use of P on grassland with an index of 3 or 4 is far less than the normal current recommended levels. Also in many situations the P content of applied animal waste has often been ignored. This has resulted in 2 to 3 times more P being recommended that is permitted by the REPS specification. Far too much P is being used by many of our intensive farmers.

**Conclusion**

It is possible that the direct and indirect impact of the REPS could give rise to a 50% reduction in chemical P usage from 60,000 tonnes to about 30,000 tonnes without reduction in agricultural output. This would result in savings of the order of £30m per year. There would also be environmental benefit arising from lower P leakage to our lakes and rivers.
Lime Specification

In the interests of minimising the requirements for other nutrients and controlling acidification of water resources, a target pH of 6.5 for mineral soils and 5.5 for peats is required. For beet, beans and peas the pH target is 7. On high Molybdenum soils the pH target is 6. Lime shall not be applied to blanket bogs, raised bogs or heather moorland.

The planner shall exercise his/her discretion in relation to the liming of lands that are extensively farmed or marginal in nature. The maximum permitted level of chemical fertiliser N per hectare (on any plot/s) which may be used on grassland, where this discretion applies, is 25kg. per hectare per annum.

The planner shall specify the tonnage of lime to be applied each year having regard to crop requirements to achieve the targets specified.

Where the lime requirement is more than 8 tonnes of ground limestone per hectare, at least half of the recommended level shall be applied during year 1 or year 2 of the REPS plan, with the remainder being applied before the end of the 5 years.

Lime products which comply with the requirements of the Regulations on the marketing of non-EEC fertilisers (S.1.248 of 1978) shall be applied to meet these requirements.

Impact of REPS on used Lime Products

Based on an overall participation rate of 25% of all farmers it is projected that 1.5 million hectares will be farmed by REPS applicants. When allowance is made for “habitat lands” on which liming is not permitted and land which is extensively farmed, on which the planner can use his/her discretion relating to the use of lime, it is estimated that the area of land to be limed by REPS applicants will be 1.1m hectares. Soil analyses results to date indicate a lime requirement of the order of 5 tonnes per hectare. Based on the above assumptions REPS applicants would apply 5.5m tonnes of ground limestone or other approved liming compounds. In the absence of a REPS programme it is estimated that approximately 1 million tonnes of ground limestone would be applied by these farmers over the five year period. The prediction therefore is that REPS will result in the application to farmland of an extra 4.5 million tonnes of ground limestone or other officially approved liming products.