THE FERTILIZER ASSOCIATION OF IRELAND

STRATEGIES FOR NITROGEN USAGE IN REPS
Dr. N. Culleton & Dr. W. Murphy

IMPACT OF REPS ON FERTILIZER USE
Mr. Frank Rath

A CHANGING FERTILIZER INDUSTRY
Mr. Tom Jago, President EFMA

FACTORS AFFECTING FERTILIZER SPREAD PATTERNS
Dr. R. A. Fortune

GOOD FERTILIZER PRACTICE – A FARMER VIEW
Mr. Mick Magan, President Grassland Association

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STRATEGIES FOR NITROGEN USAGE IN REPS

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Under REPS the permitted level of total nitrogen for grassland should not exceed 260 kg/ha. The permitted level of nitrogen from animal and other wastes on the same area should not exceed 170 kg/ha. The REPS regulations state that a cow can produce up to 85kg N in wastes products (Table 1). The amounts of N produced from various categories of livestock are included in Table 1 (P figures are included for completeness). This means that farmers can have stocking rates of up to a maximum of 2 dairy cows/ha. Many dairy farmers having stocking rates that are well within these limits. Many more could qualify by some adjustments to their stocking rates.

<table>
<thead>
<tr>
<th>Type</th>
<th>Nitrogen kg/head</th>
<th>Phosphorus kg/head</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dairy Cows</td>
<td>85</td>
<td>13</td>
</tr>
<tr>
<td>Suckler Cow (0 -1 year)</td>
<td>65</td>
<td>10</td>
</tr>
<tr>
<td>Cattle 50 - 275 kg</td>
<td>24</td>
<td>3</td>
</tr>
<tr>
<td>Cattle (275 - 500 kg)</td>
<td>57</td>
<td>8</td>
</tr>
<tr>
<td>Cattle (&gt; 2 years)</td>
<td>65</td>
<td>10</td>
</tr>
<tr>
<td>Horses</td>
<td>50</td>
<td>8</td>
</tr>
<tr>
<td>M.T.Ewes + Lambs</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Low Ewe + Lambs</td>
<td>15</td>
<td>3</td>
</tr>
</tbody>
</table>

At these stocking rate with cows, the maximum permitted level of fertiliser N is 90 kg N/ha if we wish to stay within the REPS limits. This article explores the possible strategies to adopt if stocking rates are at or near 2 LU/ha.

The first priority must be to ensure that adequate winter feed is conserved and work at Johnstown Castle has suggested the following strategies should be adopted.

1. Only a single cut of silage is possible within the REPS N limits. The N limits will be exceeded or there will be no fertiliser N available for early grass in the grazing areas if a second cut is taken.

2. Close off 60% of the farm for the 1st cut silage. Assuming a yield of 10 tonnes of silage/ac, this gives a total yield of 14.8 tonnes of silage/ha. Assuming a cow eats 7 tonnes of silage, this should provide enough for a stocking rate of 2 LU/ha. If the stocking rate is lower, i.e. less than 2 LU/ha the amount of land closed off can be less. If the stocking rate is 1.8 LU/ha, 50% of the land closed off will be adequate.
3. Apply the “normal recommended” amounts of N of 115 kg/ha on the silage area. REPS policy is to encourage the spreading of slurry during the grass growing season and there is approximately 8 units of nitrogen per 1000 gallons of slurry applied available to the grass roots from March application as opposed to a summer application when very little of the nitrogen in the slurry is available to the grass. Thus, if land is dry enough to hold the weight of slurry tankers without tearing up the soil, in March, every effort should be made to spread in the order of 3000 gallons of slurry/acre. This will supply the silage crop with 20-25 kg N/ha. The amount of ‘bagged’ fertiliser N can therefore be reduced to 90-95 kg N/ha.

**Early Grass**

4. Because 60% of the land is closed off for silage in late March, it means that one cow is being grazed on 0.4 acres for the months of April, May and early June. It is therefore imperative that good grass growth can be achieved in order to have sufficient grass at turn out. 45 kg/ha of N should be spread before turn out. If the slurry has been spread, the 25 kg N/ha saved on the silage ground can be spread for the second grazing.

5. These strategies should ensure the nitrogen is not a limiting factor for grass growth until early June. At this stage the balance of the slurry should be spread on the silage ground. The entire area can now be grazed for the balance of the year and if the stocking rates of 2 LU/ha are to be achieved, a good clover sward is imperative. A good clover sward is one that has clover with 80% of ground cover in July/August. The grazing interval in grass/clover swards from June onwards should begin at 24 days, lengthening to 30-40 days as the season progresses towards autumn and winter.

**How Can These Stocking Rates Be Achieved?**

At stocking rate of 2 LU/ha acres is extremely difficult to achieve with the REPS nitrogen restrictions. It can be done, but the following considerations need to be borne in mind.

I. Good lowland, well drained mineral soil with high soil fertility. On upland soils or wet soils the N restrictions will certainly not allow a stocking rate of 2 LU/ha. A more realistic stocking rate in such circumstances would be in the range of 1.4-1.8LU/ha.

II. **Grass Seed Mixtures for REPS:** The sward should be composed of perennial ryegrass and white clover. High stocking rates could not be maintained on old poor pastures dominated with grass like *Agrostis*. Neither can they be maintained if clover is absent or very poor. Therefore, if REPS is being considered by dairy farmers with pastures that have poor botanical composition they should consider either reducing the stocking rates even more or else reseed their pastures. The ideal type of mixture would consist of mid-season and late grasses and clovers. Tetraploids should be used to increase the palatability and hence intake of grass and also because they are very compatible with clovers. If grass to grass reseeding is being considered up to 3 kg of clover/ha should be included. It is advisable to use a clover blend.
An example of a mixture that could be used for REPS would be:

- **6kg**  Twins or Everest (Tetraploids)
- **10kg**  Morgana or Respect
- **4kg**   Tivoli, or Condesa (Tetraploids)
- **1.5 kg**  Aran (White clover)
- **1.5 kg**  Susi or Grassland Huia - White Clover

iii Slurry needs to be spread in March, in order that N rates for first silage can be reduced. Figs 1, 2 and 3 clearly show that it is difficult to reach 2 L.U./ha with this nitrogen allocation, unless either the winter is very short, significant amounts of concentrates are used or very high yields of first cut silage are attained.

iv Figure 1 demonstrates in more detail the effects of length of winter on potential stocking rate. In a 150 day winter, almost 2 cows/ha can be achieved when slurry is applied in spring. In a 170 day winter, 1.8 cows/ha is the maximum stocking rate that can be achieved even with slurry applied in spring and using 0.5 T of concentrates/cow.

v Figure 2 demonstrates the effects of feeding varying amounts of concentrates during a 150 day winter on potential stocking. As the amount of meal/cow increases the amount of silage required is less and the possible stocking rates rise. With 0.6 T of concentrates per cow, it is possible to carry 2 L.U./ha when slurry is applied in spring. When 0.4 T of concentrates per cow is feed, maximum stocking rates are 1.85 L.U./ha.

vi Figure 3 demonstrates the effects of silage yields on potential stocking rates. To carry a target stocking rate of 2 L.U./ha it is necessary to have 1st cut silage yields of 5.5t DM/ha. When slurry is not applied in spring this yields needs to 5.8 t DM/ha. When silage yields only reach less than 5 t DM/ha, it is extremely difficult to reach optimum stocking rates. This underlines the basic necessity of having predominantly Lolium perenne dominant swards that are capable of giving high yields of excellent quality silage at the end of May. If this is not achieved, the whole strategy of carrying 2 cows/ha with 90 kg N/ha will tend to fall apart.

Optimising the stocking rates under REPS is extremely difficult with the current nitrogen restrictions. The disciplines necessary to carry 2.0 cows/ha with 90 kg/ha of artificial fertiliser are as, if not more, severe than carrying 2.5-3.0 LU/ha with no restrictions on nitrogen use.