Managing Cattle Slurry Efficiently

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Johnstown Castle
Organic fertilisers generated on farms can effectively replace a proportion of chemical fertilisers.
# Fertiliser Replacement Values

## Available Nutrient Values

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>kg/m³</th>
<th>units/1,000gals</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>1.0</td>
<td>9</td>
</tr>
<tr>
<td>P</td>
<td>0.5</td>
<td>5</td>
</tr>
<tr>
<td>K</td>
<td>3.5</td>
<td>32</td>
</tr>
<tr>
<td>DM%</td>
<td>6.3</td>
<td>6.3</td>
</tr>
</tbody>
</table>

## Factors to Consider

- ✔ Slurry dilution with water?
- ✔ Slurry DM$ - 10 fold variation
- ✔ Testing slurry nutrient levels

$DM$, dry matter %
## Slurry Dilution vs. N-P-K Value

The effect of slurry DM on the N, P & K Values of cattle slurry

<table>
<thead>
<tr>
<th>DM %</th>
<th>N kg/m³ (units/1,000 gals)</th>
<th>P kg/m³ (units/1,000 gals)</th>
<th>K kg/m³ (units/1,000 gals)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0.4 (4)</td>
<td>0.21 (2)</td>
<td>1.4 (13)</td>
</tr>
<tr>
<td>4</td>
<td>0.7 (6)</td>
<td>0.35 (3)</td>
<td>2.3 (21)</td>
</tr>
<tr>
<td>6</td>
<td>1.0 (9)</td>
<td>0.5 (5)</td>
<td>3.5 (32)</td>
</tr>
<tr>
<td>7</td>
<td>1.1 (10)</td>
<td>0.6 (6)</td>
<td>4.0 (36)</td>
</tr>
</tbody>
</table>

### Example: Cattle Slurry @ 33m³/ha - First Cut Grass Silage

<table>
<thead>
<tr>
<th>Nutrients</th>
<th>Crop Req. (kg/ha)</th>
<th>Nutrients applied</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>4% DM Slurry</td>
</tr>
<tr>
<td>P</td>
<td>20</td>
<td>12 (-40%)</td>
</tr>
<tr>
<td>K</td>
<td>125</td>
<td>76 (-50%)</td>
</tr>
</tbody>
</table>
Nitrogen (N) in slurry

**Organic N**
- 50% Organic N
- Not immediately plant available
- Becomes available over time through N mineralization in the soil

**Mineral N**
- 50% Ammonium N
- Plant Available N in season of application
- Risk of loss depends on:
  - Timing of application
  - Weather conditions
  - Application Method
- N recovery 15 to 40%
Where should I spread slurry?

Where can I best maximise the value of slurry nutrients?

**Nutrient Profile**

- N: 70%
- P: 20%
- K: 10%

**Crop P & K Needs**

- Soil Analysis
- Fertiliser Plan
- Crops
  - Grass Silage
  - Slurry - Balanced Fertiliser
  - Adjust slurry application rate based on slurry DM
Reducing slurry N losses

Best practice for reducing ammonia-N volatilisation loss

Timing of App.

- Application in Spring
- High crop N demand
- Maximise N recovery
- Aim to have 75% slurry applied by end of April

Weather

- Apply slurry during
  - Cool, damp, overcast or even misty conditions
- Avoid slurry application
  - Warm, dry, sunny weather
Reducing slurry N losses

*N value with different slurry application methods*

Dribbler Bar / Trailing Shoe Benefits
- Less grass contamination / More precise app. of nutrients
- Increased Flexibility - Spread on higher grass covers
- Wider window of application / better soil condition
Fertiliser replacement value?

Maximising the value of slurry N

Cattle slurry applied at 33 m³/ha
by splash-plate (SP) in summer vs. trailing shoe (TS) in spring

Supplying ⅓ of 1st Cut Silage N Req.

+ 23kg N worth €20/ha

Slurry Nitrogen (kg N/ha)

Summer SP

Spring TS

9.9

33
### Planning Slurry Applications

<table>
<thead>
<tr>
<th>Where?</th>
<th>When?</th>
<th>How?</th>
<th>Rate?</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="crop_p_k.png" alt="Crop P &amp; K requirements" /></td>
<td><img src="spring.png" alt="Spring better than summer" /></td>
<td><img src="application_method.png" alt="Use LESS application method" /></td>
<td><img src="nutrition.png" alt="N-P-K 9-5-32 €25" /></td>
</tr>
<tr>
<td><img src="target_fields.png" alt="Target fields with highest nutrient need" /></td>
<td><img src="cool_damp.png" alt="Cool, Damp Conditions" /></td>
<td><img src="adjustment.png" alt="Adjust slurry application rates based on DM%" /></td>
<td></td>
</tr>
</tbody>
</table>

- **Crop P & K requirements**
- **Target fields with highest nutrient need**
- **Spring better than summer**
- **Cool, Damp Conditions**
- **Use LESS application method**
- **Adjust slurry application rates based on DM%**