Biobased fertiliser from co-digested pig slurry

Demonstration fields

November 27, 2019, Phillip Ehlert & Kees Kroes
Pilot Biobased Fertilisers Achterhoek

- Pilot of the 6th action program of the Nitrates Directive of the Netherlands
- 2018 – 2021 (4 years)

Activities:
- Production of high quality fertilising products based on animal manure
- Testing of agronomical, environmental and technical aspects of these fertilising products from manure.
Monitoring programme WUR-WENR

1. Risk assessment

2. Field trials on grassland and arable land (maize) 2019-2020, NFRV & risk on nitrate leaching

3. Demonstration fields 2018, 2019 & 2020

4. Technical reports & Synthesis
3. Demonstration fields 2018, 2019 & 2020

1. Allow farmers to gain experience

2. Demonstration of the agricultural effectiveness of the biobased fertiliser with equal application rates of N and S with a mineral NS fertiliser (blend) as reference fertiliser.

3. Demonstration of an equivalent environmental effectiveness of the biobased fertiliser at equal application rates of N and S as with a mineral NS fertiliser (blend) as reference fertiliser.
Green Mineral Central Groot Zevert Digestion
Biobased fertiliser production

Mineral concentrate is used as a component material for the production of a biobased fertilising product tailored to crops need (grassland, silage maize).

Other component materials:
- Ammonium sulphate from scrubber
- Concentrated ammonium water
- (urea)
Design demonstration field

- 10 demonstration fields on grasland (sand, clay)

- Each field (~5 ha) split into two blocks:
  - Block A: Biobased fertiliser
  - Block B: Regular blend NKS
Adapted techniques of application

Composition based on soil testing for fertiliser recommendations

N requirement  320 kg N/ha  
385 kg N/ha

Equal composition of biobased fertiliser and regular mineral fertiliser blend (N, S)
Demonstration field De Marke
Estimating grass yield with platemeter

Holshof en Stienezen, 2016
Relative yields, estimated, 2018

Relative Yield, %

<table>
<thead>
<tr>
<th>Cut</th>
<th>BBF</th>
<th>Blend</th>
</tr>
</thead>
<tbody>
<tr>
<td>1\textsuperscript{e} cut</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>2\textsuperscript{e} cut</td>
<td>120</td>
<td>120</td>
</tr>
<tr>
<td>3\textsuperscript{e} cut</td>
<td>140</td>
<td>140</td>
</tr>
<tr>
<td>4\textsuperscript{e} cut</td>
<td>160</td>
<td>160</td>
</tr>
<tr>
<td>5\textsuperscript{e} cut</td>
<td>180</td>
<td>180</td>
</tr>
</tbody>
</table>
Overall score of the yield, 2018
Mineral nitrogen at three sampling times

N mineral, kg N/ha in three soil layers and their total (0-30, 30-60 en 60-90 cm)

<table>
<thead>
<tr>
<th>Blend</th>
<th>0-30</th>
<th>30-60</th>
<th>60-90</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>At the start</td>
<td>After the 2nd cut</td>
<td>After the last cut</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0-30</td>
<td>30-60</td>
<td>60-90</td>
<td>Total</td>
</tr>
<tr>
<td></td>
<td>At the start</td>
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<td>After the last cut</td>
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Biobased fertilisers Achterhoek

Wageningen University & Research
Mineral nitrogen & sod quality

Good

Fair

Poor
## Mineral nitrogen and sod quality

<table>
<thead>
<tr>
<th>Fertiliser</th>
<th>Layer, cm</th>
<th>Good ( (n=4^*) )</th>
<th>Fair ( (n=3) )</th>
<th>Poor ( (n=2) )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blend</td>
<td>0-30</td>
<td>20</td>
<td>23</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>30-60</td>
<td>15</td>
<td>18</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>60-90</td>
<td>6</td>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Total 0-90</td>
<td>41a</td>
<td>46a</td>
<td>89b</td>
</tr>
<tr>
<td>BBF</td>
<td>0-30</td>
<td>16</td>
<td>34</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>30-60</td>
<td>15</td>
<td>29</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>60-90</td>
<td>8</td>
<td>6</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Total 0-90</td>
<td>39a</td>
<td>70ab</td>
<td>91b</td>
</tr>
</tbody>
</table>
Concluding remarks

Demonstration fields in 2018 indicated an equal agronomic and environmental performance of both biobased fertiliser as a regular mineral nitrogen fertiliser (blend) at identical ratio of N/S

Monitoring of agronomic and environmental performance of biobased fertiliser of Groot Zevert Digestion has been continued this year and will be continued in the next year. Incubation studies, Field trials (NFRV, risk N leaching) and demonstration field will be conducted.
Thank you for your attention!

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https://kunstmestvrijeachterhoek.nl/?lang=en