

SLURRY ADDITIVES TRIAL

Slurry additives are sold with a range of product claims. These include enhanced nutrient availability, improved slurry consistency with less crust development and reduced odours.

As part of a muck management strategy, additives could improve profitability. A Kingshay trial was conducted during the winter of 2010/2011 assessing 5 slurry additives to determine their potential benefits and found the increased value of available Nitrogen (N) and Phosphorous (P) to be worth up to £11/cow for a 7 month winter.

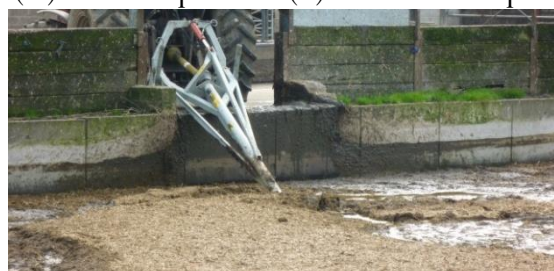
Key Points:

- Slurry additives increase Nitrogen levels
- Gain in nutrients is potentially cost effective
- Use slurry appropriately to realise the financial benefit

The Slurry Additive Trial

The 5 products tested in the trial were:

- slurriNprove
- Digest-it
- N-Hance+
- Epizym
- SlurryBugs
- Plus a no additive Control



The content of these products is not normally declared although most of the products are believed to rely on strains of aerobic bacteria and in some cases this is coupled with nutrients to feed bacteria. N-Hance+ also requires an application of a separate detoxifying agent.

Increased Total Nitrogen

Total Nitrogen increased for all of the slurry (4% DM) treatments during the first 2 months of the trial. The increases were significantly greater for those treated with an additive compared with the no additive control (Figure 1).

SlurryBugs achieved a greater increase in Total N after the first month, whereas **Digest-it** and **slurriNprove** showed the greatest increase after 2 months.

After 3 months of the trial the Total N level of all treatments, including the control, all declined. A change in the weekly addition of slurry to the trial, due to cows grazing during the day, could have caused a change in the microbial populations. Bacterial populations need time to adjust to changes in slurry constituents.

Increased Plant Available N

Ammonium (NH₄), which is readily available nitrogen for plant uptake, increased for all the trial treatments and the difference was statistically significant compared with control.

N-Hance+ had the greatest increase after the first month whereas there was little difference between the products at the end of three months with **Epizym** just ahead of the other products (Figure 2).

Figure 1 Total Nitrogen. Kingshay Slurry Additive Trial 2011

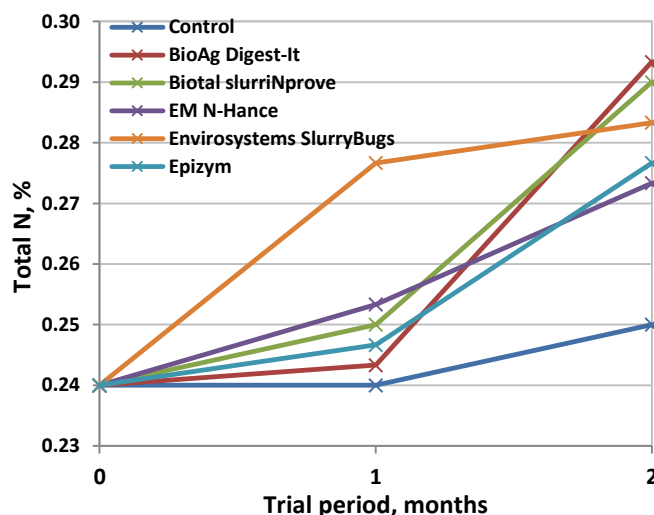
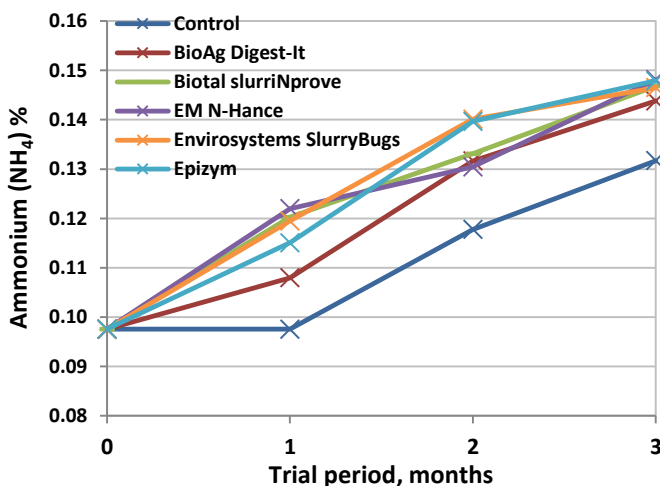


Figure 2 Total Ammonium (NH₄). Kingshay Slurry Additive Trial 2011



Other Results of the Trial

- **The slurry crust** was measured for strength and depth with the average depth being 10cm. There was very little difference between any of the products or compared with control. The trial slurry contained straw and was not stirred during the trial. Crust reduction and improved slurry consistency could occur under different management conditions.
- **Odour.** No measurements were taken but increases in the capture of ammonia by bacteria is likely to have occurred which would

Cost: Benefit

Increased values of N and P ranged from £0.32 - £0.48 / tonne of fresh slurry for the products in the trial. The net benefit ranged from £0.10 to £0.98 per cow per month (see Table below). **Note:** This assumes that the increase in Total N is readily available for plant uptake.

Slurry additive suppliers and costs for products used in the Kingshay Slurry Additive trial 2011

Product	Supplier	Contact telephone	Dose frequency	*Cost / cow / month £	Improved N value / month £	**Net benefit / cow / month £
Digest-it	BioAg	01603 439511	Bi-weekly or Weekly	0.84	1.44	0.60
slurriNprove	Biotal	02920 475550	Once a week	0.51	1.54	0.98
N-Hance+ and EM-A	Effective Micro-organisms	01404 549000	Weekly for N-Hance+, 3 monthly for EM-A	0.98	1.08	0.10
SlurryBugs	Envirosystems	01722 860085	Weekly/ Every other week	0.69	1.35	0.66
Epizym	Epizym	0800 0830720	3 month	0.50	1.15	0.65

*Approximate costs. Contact the supplier for more details

**Based on Assumption that all extra N is plant available

Slurry Additive Trial Summary

- This trial was undertaken by Kingshay as a Members trial and the results are reported as found, unbiased by any product or associated organisation.
- This trial was conducted using a protocol agreed by the participating product suppliers. Results could vary under different management conditions.
- A previous trial undertaken by Kingshay during 2010 showed similar results.
- Kingshay will continue to evaluate the benefits of these products.

We would like to hear of any Members' experiences of the benefits, or otherwise, of slurry additives. Please phone Kingshay on 01458 851555

Slurry additives can improve the nutrient value of slurry but timing of the application of all slurry is crucial to maximising the benefit of plant available Nitrogen

lead to less ammonia released into the atmosphere and hence less odour.

- **Phosphorous** levels increased in all the treated slurry. This could be due to P fixation by bacteria.
- **Bacteria levels.** Bacteria levels dropped for all treatments, including the no additive control. The ratio of aerobic-to-anaerobic bacteria increased for all treatments. However this was only significantly greater than the untreated slurry for the **Digest-it** additive.



Summary of findings

- Increased N and NH₄.
- Small increases in P but no other nutrients.
- Change in bacteria balance in favour of aerobic bacteria.
- No reduction in crust formation in slurry tested.

Factors requiring further research

- The benefits of using an additive throughout the winter. The influence of temperature on the effectiveness of additives e.g. many bacteria are dormant below 4°C.
- Crop response to treated slurry i.e. to what extent are increases in Total N available to the plant.

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