

Trial success for cattle slurry treatment

by Stuart Aitkenhead, managing director, Epizym Ltd, UK.

Kingshay, the independent dairy specialists, have trialled Epizym's cattle slurry additive at their base on a commercial dairy farm in the heart of Somerset, UK.

Kingshay, which offers practical, unbiased information based on its own technical farm trials, selected Epizym Cattle for use in the first stage of a set of trials looking at the effect of a range of slurry additives.

"This first stage was designed to develop a protocol which allows any benefits of slurry additives to be evaluated," Martin Yeates, technical manager, told International Dairy Topics.

Epizym Cattle, launched in 1997, uses bacteria to liquefy and deodorise slurry in livestock systems. This makes slurry management easier, improves fertiliser value and significantly reduces odour and other gaseous emissions.

"We are delighted to be working with Kingshay," Stuart Aitkenhead, managing director, told us.

"We value their independent analysis and welcome the results from any work they do around slurry additives, as this product is so often undervalued in its ability to save farmers time, hassle and money in a very cost effective, simple way."

The trial was initiated by Jo Scamell of Ground Level Nutrition Ltd, who works as an independent adviser to offer a soil improvement programme to farmers on behalf of Kingshay.

"Healthy soil is arguably the most valuable natural resource on any farm yet its potential is often underestimated. Enhancing the value of slurry and ensuring intelligent application can significantly improve soil performance and offer valuable savings on artificial fertilisers," Jo added.

Table 1. Nitrogen increase.

| Fresh slurry (kg/tonne) | Non-treated | With Epizym | Difference (%) |
|-------------------------|-------------|-------------|----------------|
| Total nitrogen | 1.85 | 2.24 | +20.9 |
| Ammonium N | 0.88 | 0.93 | +6.08 |
| Organic N | 0.97 | 1.31 | +35.0 |



Healthy soil is a valuable natural resource on the dairy farm.

"Livestock farmers are becoming increasingly interested in the potential to increase the value of slurry and FYM on farm. Advice relating to the performance of slurry additives is key in progressing the efficiency with which natural fertilisers can enhance biological agriculture and soil nutrient availability."

Key areas were investigated to evaluate:

- Nitrogen increase.
- Aerobic bacteria count.
- Slurry crust reduction.

A trial period was set at six weeks.

Trial results

● Nitrogen increase.

Epizym Cattle produced statistically significant increases in total nitrogen (total N) and ammonium nitrogen (ammonium N) compared with non-treated slurry after just six weeks.

Organic N is the difference between total N and ammonium N, as the levels of nitrate and nitrite are very low indeed in slurry. Much of the increase in organic N is expected to be in the bacteria that have multiplied from the initial

Epizym culture. Once this slurry has been spread, organic N will become quickly available to the plants as the bacteria die. This will then supplement the ammonium N.

● Aerobic bacteria count.

Table 2 shows Total Viable Count (TVC) aerobic bacteria, after five days, in colony forming units per gram of slurry (cfu/g).

| Control (cfu/g) | Epizym (cfu/g) | Increase (%) |
|-----------------|----------------|--------------|
| 7,933,333 | 33,210,000 | 319 |

Table 2. Aerobic bacteria count.

The results suggest that Epizym increases the beneficial, aerobic bacteria. These then have the potential to multiply quickly and offer enhanced nutrient availability to the soil and crop. The trial was performed using slurry from a commercial dairy farm, containing parlour washings and yard runoff to reflect the typical environment in which additives have to work in practice.

● Crust reduction.

These results give some support to Epizym's claim to substantially reduce the formation of the crust on

a slurry storage facility. The additive ensures slurry organic matter remains in suspension rather than naturally settling in solid form at the bottom of a tank or on the surface as part of a crust. Over a period of time Epizym management would expect the slurry crust to become fully digested.

"Most of our customers go from a significant crust to very little depending on the amount of bedding material put in the tank," explains Giles Dadd, principal agricultural consultant for Epizym.

Conclusion

Within six weeks Kingshay found that Epizym Cattle:

- Significantly increased total N and ammonium N.
- Had a lower average crust weight.
- Had a three-fold increase in aerobic bacteria count.

These results illustrate the potential benefits which significantly enhance the value of raw slurry.

Initial results suggest that treatment of slurry with Epizym will reduce nitrogen losses and crust formation. Both of these could have significant effects on the efficiency of nutrient use on farm, as well as positive environmental consequences.

In order to validate this work further, the trial will now be replicated over an extended 12 week period. This will bring results more into line with what is likely to be achieved through typical farm practice.

Allowing Epizym to work throughout the whole winter period in an active slurry lagoon has the potential to produce high value results which not only facilitate good slurry handling practice but also will offer significant savings on fertiliser costs.

Kingshay will continue with this work and report the results to its farmer members.

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Table 3. Crust reduction.

| Crust weight (kg) | Control with Epizym (kg) | Difference (%) |
|-------------------|--------------------------|----------------|
| 4.6 | 3.5 | -19.0 |