

Down on the Farm ...What is EM?

How to use it, How to expand it, EM use on the farm, pastures, animals

Last month I gave us a bit of a rev up about our need to get a bit more environmental in our farming approach. This month I want to share some of the practical applications I learned at Saraburi in Thailand. Firstly, why do we need to get EM? What is the advantage? Do we need it at all?

Perhaps the simplest way to explain it is to compare it with winemaking. Any of you who brew your own wine or beer will understand the importance of putting the right yeast in when getting a brew started. Once it is there, that good yeast will multiply merrily and produce a nice tasting drop.

A load of grapes or blackberries will ferment just fine even if you don't add the good yeast to start with. There are plenty of wild yeasts in the air and on the fruit to start the process. After all it is part of the natural cycle of decay. But while they might ferment and produce bubbles and even alcohol, there is no guarantee the stuff will be drinkable. I once tasted wine that an experienced wine maker gave me as an example of "mouse" flavours from the wrong yeast getting hold. Talk about stale cat breath! It tasted just like I imagine a slightly dessicated dead mouse would.

Yet the same fruit fermented with the correct wine yeast tasted exquisite. The same goes for our soils. Put a heap of organic matter down, and it will decay all right. But some of the agents of decomposition will be nasty beggars and decay could be by putrefaction resulting in a stinking mess. By seeding the soils or organic matter with EM before applying it to the soils, we are putting in some of the good guys: health giving lactic acid bacteria suppress harmful micro-organisms and help break down the tough stuff like lignin and cellulose. They can reduce nematode populations and disease inducing fusarium. The right yeasts produce bioactive substances, hormones, and enzymes that are useful to plants and promote cell and root division. The photosynthetic bacteria in EM produce amino acids, which increase the amount of mycorrhizae around the plant roots, which in turn improves the plant's uptake of phosphorous. They also improve the plant's ability to fix nitrogen from the atmosphere.

So it sounds good. But how do we get hold of the stuff. Well EM was originally developed in Japan in the 1980's under Professor Dr Teruo Higa. It is now cultured in over 45 countries around the world. And fortunately for us in Godzone, we have a production unit and distribution base here in Christchurch. EM can be ordered in one to twenty litre multiples.

The costs are based on its production. Currently that is about \$15 a litre. Less for bulk orders. Don't go thinking you are supporting just another capitalistic venture trying to milk money from the organic minded. The Christchurch unit is audited and run purely at cost with its manager Mike Daly putting in a fair proportion of his time for free. The EM you buy just helps him to produce a bit more and continue getting the word out there.

One of the advantages of EM is that the little bit you buy can be extended. Massively. But remember we are dealing with living organisms here. It is not some chemical. It is alive and must be treated with the appropriate care. So correct storage is important. The EM concentrate is in an inert state. It will be in a sealed container and stored anaerobically. That means no oxygen. It also doesn't want to overheat or get

blasted with sunshine, which the photosynthetic bacteria will like and be activated by. So keep your EM container closed and in a coolish place out of direct sunlight.

The EM concentrate will keep for about a year from its date of manufacture. Of course it will not suddenly be no good once the use-by date has gone, but that is the recommended shelf life.

Once you have extended your EM, it is called Activated EM. It's recommended shelf life is much shorter, only about a week. So plan how you are going to use the stuff and have any materials you might need organised before you "activate" it in the first place.

Extending or activating EM is relatively simple. We are just going to wake it up with a good feed. Firstly you need a decent sized drum. A plastic or stainless steel 200 litre drum is ideal. I used a steel one that had a previous life as a bulk molasses container. It worked fine. If 200 litres is too much or too hard to handle go for 100 litres or even just twenty litres. But the drum needs to be air tight, clean and free of chemical residues. You will need molasses. Make sure it is good thick heavy stuff with a specific gravity of at least 1.35 kg per litre. If it is less than that and watery, you will have to judge it for yourself a bit and add more to compensate.

Most animal feed stores, vet clinics and farm supply shops will have molasses in stock. But if you cannot get hold of any, then brown sugar is an acceptable alternative. All we want is a food source for our hungry EM's.

And you need clean water; preferably drinkable. But if you are on town supply and the water is chlorinated then you need to either filter it or store the water for about three days with the lid off to allow the chlorine to dissipate. You can speed the process up by pumping air through the water for half a day or so.

For a 100 litre drum mix up five litres of molasses in 90 litres of warm water. Once the molasses is well and truly dissolved, add five litres of EM concentrate. If you can keep the brew warm then so much the better. I wrapped my drum in an old electric blanket and a couple of old sleeping bags, which kept it snugly at about blood temperature. Some farmers use a fish tank heater submerged in the brew. Heat is not essential, but it speeds up the process.

The solution is ready to use when the pH drops below 3.5. It should have a sweet sour sort of smell. If the pH won't come down or it smells bad, then somehow you have got the wrong bugs in your brew and don't use it. I got a dinky little pH meter from Dick Smith. It wasn't cheap (\$130) but my highschool memories of litmus paper etc were too rusty to rely on.

To avoid contamination, keep the area you mix in clean and tidy, wipe up any spills. Store your extended solution the same as you would the concentrate. Keep it airtight (but ease the lid after a few days in case there has been any gas build up). And keep it out of the sunlight.

So now you've got some... what are you going to do with it?

Well the most obvious one for pastoral farmers is...get it on the pasture. Spray or dribble the stuff out on a soft sort of day when it might get washed in with a bit of drizzle or light rain. Put it on paddocks with either a bit of length to them or, put it on after topping or mowing when there is a bit of organic residue for the bugs to get started on. How much to apply? Well remember that you are not applying nutrients, where more is better. But you are applying a living population, that given the right conditions will

multiply of its own accord. Now bacteria are perfectly capable of multiplying at exponential rates. In fact one study I read suggested if conditions were perfect and self limiting factors were negated, an enterprising bacteria could produce enough offspring to outweigh the world in a matter of a week or so.

Of course our EMs are not likely to find conditions in the front paddock to match the laboratory, but they should reproduce quite merrily. (Providing they don't get washed out in torrential floods first and so long as the sheep and cattle haven't grazed your land so bare there is nothing left for them to live on). How often you apply it will depend on your finances and work schedule. But ideally one would start in spring and repeat sprayings every couple of months until late autumn or until the risk of fungal pasture diseases pass.

Besides applying the activated solution to pasture, you can use it around the farm in a variety of ways. In the chook house use a bit of EM to ferment a portion of their feed (chooks will go crazy for it). Spray a diluted solution around the hen house and floor. It reduces harmful bacteria, cuts the bad smells and keeps the chooks healthy. It is reputed to reduce mites, lice and harmful insects and lowers the need for antibiotics and disinfectants. The recommended dilution is between one and five litres of your activated solution to 100 litres of water. The worse the smell, the stronger solution you need. Bad smell is simply the ammonia and hydrogen sulphide given off by the undesirable microbes attacking the animal manure. Replace them with beneficial bacteria and the smell goes. Believe me. I walked through the piggery at Saraburi and in spite of 40 degree heat those pigs were just clean and happy and there was no odour whatsoever from them or their housing. Whereas in New Zealand nobody wants a piggery within cooee as a neighbour because they know it will be a big stink with major effluent problems. But at Saraburi, the pig effluent was piped into a huge pond where it fed carp and catfish. That's right, it is healthy enough to be used as a food source. And the lake smelt fine as well.

Back home well...begin by spraying the hen house out about once a week. As the odour decreases you can reduce the frequency.

I will be trying the stuff in the calf pens, in the chook house, around the dog kennels ...my partners gumboots...the possibilities are endless.

Its also been trialled as an addition to stock drinking water at rates of about one litre to 5000 litres. It can be added to septic tanks, to stock bedding and believe it or not helps in farm cement too. The concrete around dairy sheds, pig sheds and calf pens gets eaten away as a result of the urine and the bacteria that feed on it. Well EM can protect your concrete! Mix one percent of extended EM in the cement water next time you are mixing concrete for use around the farm.

And its use is not limited to outside. Try EM around the home to reduce dust mites, mould and harmful bacteria. Use a dilute solution, about one to one thousand for spraying on the carpet, the curtains, on tube lights and the like where dust accumulates.

In the toilet, shove a gloop down at regular intervals. Both the drains and the septic tank will benefit. Likewise in the kitchen, laundry and washing machine. Use a dilute solution for cleaning the bath.

That is some of the practical applications for your extended solution as a liquid. Next month I want to look at how EM can also be applied with organic matter in the garden, on the farm and as an environmental tool. As I said last month, a lot of countries

in the world have worse problems than us to clean up, and they have already worked out practical ways of doing so. EM is an important part of the answer.