Case study on the effects of compost tea on soil & pasture

Nar Nar Goon 2017

Australian Government | National Landcare Program

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The Story: The application of compost tea and its effect on soil and pasture

Name: Alison Livermore and John Murphy

Farm: Nar Nar Goon

Alison on their farm

Overview

In 2014 Alison Livermore and John Murphy took part in a trial supported by the Western Port Catchment Land Network (WPCLN) to see whether the application of compost tea could improve the quality of their soil. They had read about compost tea online and attended field days at farms that were trailing compost tea. Much of the research suggested compost tea was an easy process that was good for the environment and cheap to implement.

The trial included making two batches of compost tea which was then spread on the pastures. The first batch of compost tea had no activity at all; the second was a better 'brew' with good bacterial activity. The soil results showed no significant improvement, although there was a positive trend in the protozoa organisms. While there is some evidence that the tea had a positive impact, Alison and John decided that the process was too difficult. They found the timing of the 'brew' and application difficult, the additional equipment and testing expensive, and level of science

involved complex and time-consuming. Following the trial they decided not to continue using compost tea.

Background

Alison Livermore and her husband, John Murphy, owned 28 acres in Nar Nar Goon where they ran horses and cattle The pasture on their property was poor and they were keen to find ways to increase the quality of the soil, without spending too much money or introducing harmful, chemical products. Having already undertaken a trial on their farm to assess the benefits of surface versus sub-surface application of compost, they were interested in finding alternative ways to enhance the soil and pasture production. Alison says *'it was terrible country, terrible ground and we were trying anything to get some improvement'*.

Alison went on the Internet to research how to improve their soil and came across a number of articles talking about compost tea. The evidence suggested that it was cheap, easy to implement and produced excellent results. Alison then attended a field day where the farmers were using compost tea and seemed happy with the results. The farmer showed the tea he was making, explained how it was made, and how he used it on his pasture. Alison says '*that whetted my appetite to see what it was all about'*.

Alison and John decided to attempt a batch of compost tea themselves using knowledge from the Internet, and from the brief discussions with the farmer at his field day. '*John purchased a 1000litre IBC and attempted to make compost tea'*. Alison says that that from the start they didn't find it an easy process. After investing in an aerator, they poured in their water and brewed it up according to the instructions but she admits '*we were still none the wiser whether it was still just brown water we were putting out'*.

The motivation for the trial

Alison says that a major driving motivation for the compost tea trial was to simply to find a sustainable method of farming that could help people in the same situation as herself and John – people who '*have a property that gobbles up dollars and who haven't got a lot of money to splash around'*. She wanted to find a method of fertilising the land that was easy, could be implemented quickly, and was good for the environment.

Armed with a basic knowledge of how to make compost tea and some satisfactory results, Alison was keen to investigate further and verify that compost tea was viable for long-term usage.

The Trial

The aim of the trial was to make an effective compost tea with enough bacterial activity improve soil and pasture quality. The tea was applied to a 'control' area of 37m x 80m and compared with an area of 30m x 80m, which had compost applied to the surface. In 2014 two batches of tea were made for the trial – one in Spring and one in Autumn. Agpath laboratories assisted Alison and John in both the testing of the tea, and teaching the correct method to make the tea.

Spring: The First Batch

Having previously attempting to make the compost themselves, Alison and John decided to buy high quality compost from AgPath for the trial, to ensure it was a premium quality. They then made a 'teabag' for the compost, suspended it in aerated water for 24-36 hours and took the water to Agpath for testing. The results showed that there was no biological activity of any value in the tea.

Following the failure of the first batch, Agpath came to inspect the system being used by Alison and John. They recommended purchasing a bag specially designed for compost tea and investing in an oxygen meter to keep the compost tea aerated. Alison and John were also informed that the equipment must be completely sterile before starting the tea, which meant purchasing a new 200litre round drum that was easy to clean and sterilise. The changes to the system worked and the tests results from AgPath showed that the tea had the appropriate biology to be applied. After purchasing the correct spray jets, John applied the tea to the control area.

Autumn: The Second Batch

The second batch worked better and the results from AgPath also showed that the compost tea contained suitable levels of appropriate biology.

John spreading the compost tea

Financial impact

The overall financial cost for compost tea was relatively low after the set up costs. The biggest expense was the testing of the tea, which could be carried out in a laboratory ($132 per test) or at home using a microscope (costing approx $2000). Tests conducted at home require a high level of scientific knowledge to correctly examine the mixture for the right level and types of biology. It is recommended to use a laboratory for all testing to ensure accurate results.

The table below gives a high level summary of the main costs:

Set-up costs

Aerator	$160
Suitable spray nozzle	$200
Tea bag	$80
Thermometer	$50
Drum that can be sterilised	Negligible cost
Hose	Negligible cost
Compost or equipment to make the compost	$0. Can adapt existing piece of equipment
Vehicle to pull tank (sprayer) fire fighting pump. Tank on back of Rhino.	$5,000 (most people would own this, therefore not included in overall cost)
Total	**$490**

Cost per batch of compost tea

Laboratory test	$132 per test*
Time taken to make compost and tea	$ 150 (approx. 6 hours per batch/$25 per hour)
Total	**$282**

*Compost tea applications require at least one test per application

The results

Agpath Laboratories tested all batches of compost tea used in the trial. Agpath found no activity in the first batch in Spring, but the second batch made in Spring was analysed and displayed a good diversity of fungi and bacteria. The Autumn batch also tested displayed a good diversity of fungi and bacteria.

There was no change in the soil chemistry results from applying the compost tea and no observable change in pasture growth under the compost tea compared to the control.

Alison and John's experience

Alison and John found the process much more complex than they had expected. They had little idea of the science in involved in the process and the level of detail required to produce positive results from the tea. During the trial Alison realised they needed the right compost, the correct material for the 'teabag', sterile containers that could easily be cleaned, and the right nozzles for applying the tea. She says '*we found that this process, which was supposed to be dunk a bag and bubble it, suddenly became a lot more complicated and scientific than we first thought'.*

In addition to the equipment needed was the intricacy around the timing of the tea. It had to be brewed for 24-36 hours, taken for testing during this process to check its biological content, and applied to the land within hours of it reaching optimum activity level, preferably before or during rain. Alison says that this was a complex process to manage and would be difficult for the average farmer who already has a busy daily schedule.

Alison is grateful to WPLCN for supporting the trial and thinks there are some great learnings to come out of the trial, but ultimately *'I found out what I needed to know'.* Despite lots of literature promoting the ease of making compost tea, Alison and John found the reality was much more complex. It was highly scientific and required pinpoint accuracy to get the process right. For Alison, the results did not justify the time, effort and expense of making of the tea and it is not a process she will continue in the future.

What could be better next time?

Alison and John strongly felt that the research and information about compost tea in the public domain did not accurately reflect the reality of making the tea, at least for the average farmer. For those considering trialing compost tea, Alison suggests that it is probably best left to professionals. However, if a farmer was interested, they would need the correct equipment and a realistic expectation of the time and effort required to make and apply the tea.

What next?

Alison and John have since sold the farm at Nar Nar Goon and have purchased a larger 325 acre farm in South Gippsland. They farm miniature Herefords, a popular small breed due to their big bodies, short legs and good temperament. The business is proving to be very popular thanks to Alison's blog and media work, which give regular updates about the farm and more information about the great breeding potential for miniature Herefords, especially for families living on smaller acreages. While they have decided not to continue with compost tea they are continuing to aerate the soil, a practice that produced positive results in a separate trial conducted at their property. Their next challenge is to continue improving the land and manage the kangaroo population on the property.

Conclusion

The use of compost tea can be appealing to some farmers appealing for many reasons – it is a cheap material, uses waste matter and is good for the environment. To make a biologically active tea, however, requires science, the right equipment and accurate timing. Even when this was achieved, no effect on soil or pasture could be measured in this case. It is these factors that led Alison and John to conclude that the method was not for them. Like most farmers '*we have to consider different alternatives just to keep up*', and while they are happy to have trialed this method, they will keep an open mind on other technologies in the future.

Key learnings from demonstration

- There was no change in pasture composition or yield from the compost tea application
- On-Farm compost tea brewing proved to be more difficult than anticipated
- Monitoring of the compost tea is critical to ensure a biologically aerobic product
- Every stage of the process requires constant monitoring and testing to minimize problems

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