

Biofertiliser trials

-at Pantirion Farm 2023/2024

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Pantirion Farm is a 400 acre farm in St Dogmaels, West Wales which grows a mixture of herbal lays and fodder crops to feed cattle and sheep. It is an exposed coastal site with clay soil.

Lyn Evans has been working the land for 50 years. Up until recently he used conventional fertilisers to replace nutrients in the soil. Commercial fertilisers are currently costly for farmers, making natural alternatives more appealing.



What are Biofertilisers? Biofertilisers are non-chemically synthesised fertilisers which contain living micro-organisms to help stimulate plant growth or soil health. Used correctly they have the potential to replace, or partly replace chemical fertilisers. More farmers and land managers are considering biofertilisers as a practical part of their approach to soil fertility because:

- they are cost effective.
- they can be made on site with materials which would otherwise be considered farm waste.
- they are biodegradable and safer for the environment.

Experiment

Our aims were to investigate how bespoke natural biofertilisers can be made on farms to provide soil fertility on a field scale.

We trialled two low cost Biofertilisers; Supermagro and Hummus Hydrolyslate.

We tested them on two fields: one growing a herbal lay and the other a fodder crop. Our testing period was one year.



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Supermagro biofertiliser¹.

Supermagro is made from cow manure, milk, yeast and basalt rock dust. Powdered minerals can be added to address specific site or crop needs. In this case we added molybdenum to fortify the mixture because the soil tests had indicated that it was lacking. After 60 days of fermentation in a 1000l IBC the biofertiliser is ready to use. The mixture of yeast, milk and cow manure stimulates microbial activity and fermentation. This 'unlocks' nutrients, making them more easily digestible for plant roots and boosts microbial life in the soil which is easily destroyed by ploughing.



Humus Hydrolysate².

We made Humus Hydrolysate, using the humus from the local woods and mixing with potassium hydroxide and water. The process of hydrolysis breaks down raw materials (in this case humus found in soil) to make them soluble and easily assimilated by plants. Humus contains complex molecules such as humines, fulvic and humic acids. Humus hydrolysate makes Potassium and Phosphorus available to plants.

Method

We assessed the soil for deficiencies and excesses, and adapted our biofertiliser recipes appropriately. The fields were mapped and divided into three strips.

On each field we ran two trials and left one control strip without intervention. One field was down to a herbal ley and the other was growing turnips as a fodder crop. We applied the spray using a standard quadbike and sprayer.



1. (Restrepo Rivera, 2017), ABC of organic agriculture
2. (López, 2022), The Biofertiliser Manual- 2nd edition, Pg.22

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Herbal lay:

Strip 1 was sprayed with Hummus hydroslate and water at 1:100 dilution.

Strip 2 was left untouched as a control.

Strip 3 was sprayed with a mixture of Hummus hydroslate, Supermagro and water (1:5:100 dilution).

The strips were sprayed six times in November 2023, April, June, September, October and November 2024.

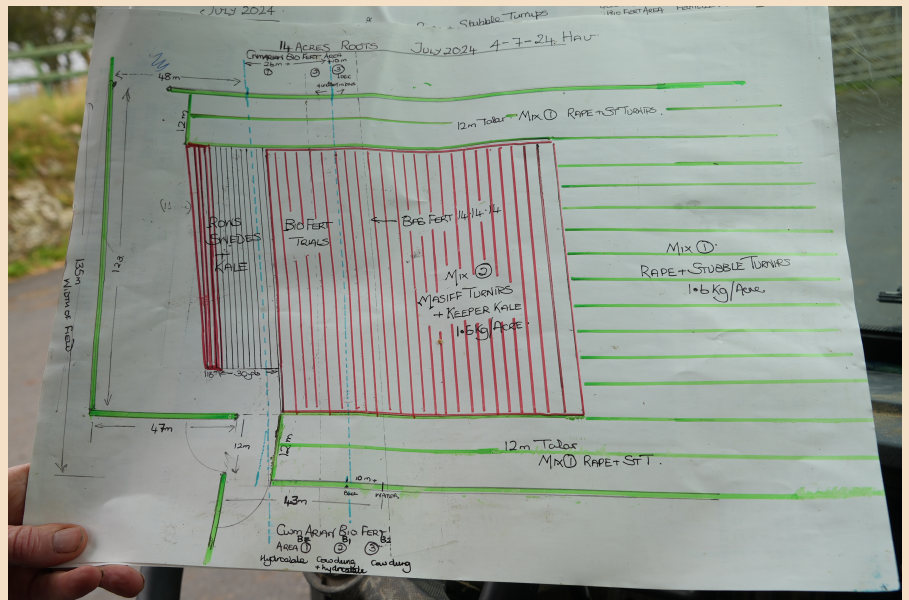
Fodder Crop:

Strip A was left as a control

Strip B1 was sprayed with Hummus hydroslate and water (1:100 dilution).

Sample B2 was sprayed with Supermagro and water (1:10 dilution).

The strips were sprayed four times in November 2023 April, June and November 2024.



Outcomes

We were able to make and administer the biofertilisers on farm with existing materials and equipment at very low cost.

We found we could easily make enough biofertiliser in 2 days to treat 100 acres for 1 year.

Brix test measuring the sugar content (and therefore plant health) of the fodder crop showed an increase of 4 degrees Brix in crops which were treated with Biofertilisers.

There were visibly fewer pests on the fodder crops treated with biofertilisers.

We are encouraged to continue further field tests over longer periods of time, monitoring variables such as yield, pest resistance, brix content and soil nutrient level.