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Bændablaðið
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Sustainable fertilizer production within reach

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Fish farming manure will be a very important raw material for fertilizer in the future. By mixing cow manure and ammonium nitrate and using it as a fertilizer, it will be possible to get higher yields in field cultivation and reduce costs in agriculture compared to the use of synthetic fertilizers.

These are among the main results from a collaborative project that has now officially ended and has had the main goals of mapping all organic raw materials in Iceland that are suitable for making fertilizers and testing the effectiveness of several types of fertilizers that have been combined with different organic raw materials.

Similar levels of nutrients

The project, called Sustainable fertilizer production, a holistic approach to circular economy, was launched at the beginning of 2021 and the results of the first part of the project were published in November of the same year. The main results were that the total amount of nutrients is the same in all usable organic matter that is produced in Iceland as in all imported synthetic fertilizers, but a considerable amount of nitrogen is missing.

Jónas Baldursson.

Jónas Baldursson, project manager at Matís, says that what is most significant about the current results is, among other things, that great opportunities will lie in the utilization of fish manure for organic fertilizer production in the coming years.

"Both it is because it comes out particularly well in regeneration experiments and was on a par with chicken manure and meat meal, both of which have proven to be good materials for regeneration. But also because of the increased amount that will be produced in the country in the near future.

It was also very positive to see that in field trials, where the effects of fertilizers need to be seen quickly, it was cow manure mixed with ammonium nitrate [which is usually around 30 percent nitrogen] that produced the highest yields and actually outstripped artificial fertilizers over two years' time period."

The fish farm fertilizer is more difficult to use

Although the fish farming manure turned out well, Jónas emphasizes that it will be more difficult to use than chicken manure and meat meal, for example, as it is watery, contains a large amount of salt and is expensive to transport.

"Innovative company Atmonia has managed to develop an environmentally friendly way to produce nitrogen from the atmosphere and is working to scale it up. The company was exactly our partner in these experiments. Therefore, it was a good result that with the addition of environmentally friendly nitrogen from Atmonia, it is possible to increase yields and reduce costs in agriculture," says Jónas.

He adds that with an increased supply of environmentally friendly nitrogen, it will theoretically be possible to close the cycle, as there is plenty of phosphorus and potassium in the organic waste generated in Iceland.

"It became clear in our experiments, which lasted during the summers of 2021 and 2022, that organic fertilizers are generally very suitable for long-term revegetation projects, since it takes longer for the nutrients to be released from them and become available to plants than from the synthetic fertilizers. The results of the project are intended to be used as knowledge for all interested parties to increase the use of organic fertilizers available in Iceland and reduce the use of imported synthetic fertilizers.

Vegetation cover was the most in the previous year with the ready-made fertilizers, but the organic materials took the lead later on."

Meat meal and cow manure are a good mix

The results of the project show that the harvest in experiments where meat meal was mixed with cow manure and used in field cultivation was comparable to that with ready-made fertilizers, and Jónas says that it is therefore worth investigating the effects of such a mixture. Other mixes also gave promising results. Chicken manure are considered an environmentally friendly option in terms of nutrients and dry matter content, but on the other hand, its use is considered to increase the risk of salmonella infection.

According to Jónasar, an enormous amount of knowledge has been built up about this enormous amount of nutrients that occurs in Iceland and is not used as it is today.

The main obstacles to putting these materials into use are the costs of collecting, transporting and distributing them from the producer to those who use them. He also points out that not all materials can be used directly as fertilizer and handling of the raw material is often necessary to prevent contamination and contamination.

Matís led the project, which was supported by Marketing fund from The Icelandic Center of Research (Rannís) . The partners were the Agricultural University of Iceland, Landgræðslan, Norwegian Marine Research Institute, Landsvirkjun and Atmonia.

About Atmonia

Atmonia is an Icelandic tech startup company developing a sustainable process for ammonia production. Atmonia‘s mission is to significantly reduce greenhouse gas emissions with new technologies in the field of ammonia and nitrate production. The company´s technology is both economical and environmentally friendly, and will contribute significantly in the fight against global warming. Atmonia´s new technology will produce ammonia from air and water and will emit no greenhouse gases, but the current ammonia production method is responsible for 1-2% of the world's anthropogenic carbon dioxide emissions.

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