

Sulphur in Mink Manure

Why is Sulphur Important?

Sulphur (S) is considered a secondary element in soil fertility, like calcium and magnesium. Although sulphur is required in moderate amounts by plants, it is less likely to limit crop growth than a deficiency of nitrogen (N), phosphorus (P) or potassium (K). However, for some crops, sulphur requirements are in fact equal to phosphorus.

In recent years, the threat of S deficiency in soils has intensified. Environmental regulations have led to a reduction in air pollution, and although this is a positive change in terms of air quality standards, it follows that SO_2 inputs to soil through acid rain are reduced as well. Furthermore, since the mid-1960s, the use of high-analysis inorganic fertilizers containing less than 1% S has risen, especially following the introduction of triple superphosphate. The use of pesticides and fungicides containing S has been reduced as well. Historically, these were identified as the major sources of S for our soils. Intensive cultivation of S-deficient soils combined with projected further reductions in SO_2 emissions is expected to increase the occurrence of soil S deficiencies. (Sharifi, Mahoney and vanRoestel, 2010)

Soil Sulphur Levels in the Annapolis Valley

A survey of soil S levels in farms in the Annapolis Valley was done in 2010 by Jack vanRoestel (AgraPoint). Although most of the farms had a history of manure application, which is a source of S, the majority of the soils investigated were below the critical level to efficiently support crops with high S demand.

Sulphur in the Diet of Mink

Mink are carnivores, so require a diet much higher in protein than other domestic animals. Mink diets are typically high in sulphur-containing amino acids, methionine and cysteine, because these are required for fur production. Methionine gets converted to cysteine, a component of keratin, the main structural component of fur. Therefore, it was hypothesized that mink manure could have significantly higher S levels than manure from livestock on a non-carnivorous diet.



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Sulphur Content of Mink Manure

In October 2012, samples of mink manure from four mink ranches were collected by Nancy Smith (Perennia) and analyzed for S content. The values in semi-solid manure, from ranches on three different diets, ranged from 2000-6700 ppm, on a dry weight basis. Standard values for semi-solid manure of cattle, poultry and hogs are in the same range. Only one sample of liquid mink manure was sampled. On a dry weight basis, it contained around 10,000 ppm S, again, not unlike liquid manure of other species.

Sulphur in manure will vary considerably based on livestock type, manure type (semi-solid, liquid) amount and type of bedding, and diet. In this preliminary study of S in mink manure, it would appear that S levels are very similar to that of other livestock species. It suggests that the diets for these particular ranches were well balanced to meet the S needs of the furring mink. The addition of shavings as bedding, in the semi-solid manures, diluted the S content as compared to the liquid sample, which was expected.

Mink Manure - a Valuable Soil Amendment

Common S fertilizers used in crop production have considerably higher S content than manures -- for example, Ammonium Sulfate (24%) and K-Mag (22%). However, mink manure is a valuable source of organic matter, and contains appreciable amounts of N, P and K, other macronutrients, and micronutrients. The regular addition of mink manure to crop land will inevitably increase the soil S levels and lessen the requirements for inorganic sources of that nutrient.

Resources:

Schulte, E.E. and Kelling, K.A. 1992. Understanding Plant Nutrients, Soil and Applied Sulfur. Retrieved from <http://www.soils.wisc.edu/extension/pubs>

Sharifi, M., vanRoestel, J., and Mahoney, K. 2010. Survey of Sulphur Levels in Nova Scotia Soils. Retrieved from <http://www.perennia.ca/Fact%20Sheets/Other/Soils>

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