Syracuse Fiber Materials Testing & Evaluation

In the spring of 2013 Agricultural Consulting Services Inc. (ACS) was commissioned by Syracuse Fiber Recycling, LLC to evaluate the chemical analysis of their bedding product and a mined limestone product. Patty Ristow, agronomist with ACS, worked with A&L Eastern Laboratories to analyze one sample of each product that was provided by Syracuse Fiber. Each product was analyzed for;

I.   pH, calcium carbonate equivalent (CCE), granular size,
II.   total sulfur,
III.   heavy metals (Zn, Cd, Ni, Hg, Pb, Ar, Mo, Co).

I.   Material pH, Calcium Carbonate Equivalent (CCE), Fineness and Effective Neutralizing Value (ENV)

Results for pH and liming potential of the two materials provided by Syracuse Fiber are presented in Table 1 below. Material pH analysis shows both materials to be alkaline with a pH of 12.3 for the bedding material and 11.9 for the mined material. The CCE (%) of the bedding material was found to be 29.8% and 73.3% for the mined material. In New York State an ag lime material must have a CCE ≥60%. In addition, ag lime materials must have a granular size with ≥80% passing a 20 mesh sieve, and ≥30% passing a 100 mesh sieve. The fineness tests for the bedding material show 39.8% passed a 20 mesh sieve and 31.9% passed a 100 mesh sieve. The mined material had 76.4% passing a 20 mesh sieve and 41.2% passing a 100 mesh sieve.

A complete review of the NYS Ag Lime Law and a registration pack can be found at the provided internet links below.

Table 1: Laboratory analysis of two materials supplied by Syracuse Fiber

		Bedding Sample	Mined Material
pH	(s.u.)	12.3	11.9
Calcium Carbonate Equivalent	(%)	29.8	73.3
% Passing 20 Mesh	(%)	39.8	76.4
% Passing 100 Mesh	(%)	31.9	41.2
% Effective Neutralizing Value	(%)	11	46

NYS Ag Lime Law
http://public.leginfo.state.ny.us/LAWSSEAF.cgi?QUERYTYPE=LAWS+&QUERYDATA=@SLAGM0A9-A+&LIST=LAW+&BROWSER=BROWSER+&TOKEN=22148681+&TARGET=VIEW

II.   Sulfur Content

The two samples supplied by Syracuse Fiber were analyzed for total sulfur content. The results show 1.64% Total Sulfur for the bedding sample and 2.80% for the mined material (Table 2). <mark>Knowing the total sulfur content has become of more interest due to recent research showing the dangers of working with bedding materials with a high sulfur content. There isn't a standard threshold for what constitutes high sulfur bedding however as a comparative reference, commercially advertised gypsum bedding products range in sulfur content between 8% - 17%. The Syracuse Fiber bedding, which is not a sulfur bedding, has a sulfur content of 1.64%.</mark>

Table 2: Sulfur content of a Syracuse Fiber bedding sample and a mined material sample supplied by Syracuse Fiber.

		Bedding Sample	Mined Material
Total Sulfur	(%)	1.64	2.80

III.   Heavy Metal Analysis

A heavy metal analysis was completed on both materials; the bedding sample and the mined material sample (Table 3). Because both sampling materials are expected to end up as a land-applied substance through the manure management systems in dairy farms, average soil levels of each heavy metal and low in Arsenic, Mercury, and Zinc. The detection limit of the laboratory was not low enough to evaluate neither Cadmium nor Molybdenum.

Table 3: Heavy metal concentrations in samples from the Syracuse Fiber LLC. , typical NYS agricultural soils and recommended soil maximums.

	Bedding Sample	Mined Material	Lab Quantitation Limit	Typical NYS Ag Soil	Recommended Soil Maximum Concentrations
Arsenic	5	11	3	<9	1-10
Mercury	<0.2	<0.2	0.2	0.1	1
Nickel	15	14	5	16	30-60
Zinc	163	44	5	60	85-200