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Environmental Balance Through Science

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April 14, 2004

Katherine Benham
National Organic Program
USDA-AMS-TMP-NOP
1400 Independence Avenue SW
Ag Stop 0268
Washington, DC 20250-0200

RE: NOSB Committee Recommendation for Soy Protein Isolate

Dear Ms. Benham,

Please find below additional material for NOSB Committee consideration with respect to the soy protein isolate which we asked to be accepted as an appropriate organic fertilizer. We are responding to the questions which the NOSB Committee indicated that the TAP did not address in their Form NOPLIST1. After some four years of attempting to achieve organic registration for our organic products, it would be again a costly and, we feel, unjustified further deferral of our request. We ask that these materials be distributed to each of the NOSB Committee members in a timely fashion so that they may have an opportunity to review them in advance of the meeting on April 28, 2004.

1. Use of the material as a soil amendment

The soy protein isolate, which we call SoylMicrobial, has demonstrated its capacity to generate significant enhancement of microbial populations as noted in Figure 1, and in microbial biomass as noted in Figures 2.7 and 2.8. SoylMicrobial (F), which refers to the flowable form, and SoylMicrobial (G) to the granular form. It will be noted that SoylMicrobial adds significantly to soil microbial biomass and is able to sustain this for the two week period, which would be within the cycle of applications for a typical golf course turf system. Additional data on soil response to the application of our SoylMicrobial is provided in Table 2, in which turf quality is maintained with the SoylMicrobial equivalent to that yielded with inorganic fertilizer application. These data are confirmed in Tables 3.5, demonstrating the positive effects on clipping yields of creeping bentgrass, in Figure 3.5 showing enhanced root growth and in Tables 3.6 and 3.7 showing the positive effect of SoylMicrobial (F) and (G) on creeping bentgrass root biomass under different soil profiles. The beneficial effects, both on the soil ecosystem as well as on plant growth, have consistently been demonstrated.

2. Is soy protein isolate synthetic or non-synthetic?

Our original application was under Rule 205.601 (j) 1 ...as plant or soil amendments...in which we requested that since the treatment process to yield the protein isolate also employed sodium hydroxide as an ultimate neutralizing agent, that we be granted equivalent status to aquatic plant extracts which use similar neutralizing processes. It is our contention that the protein isolate, which is used exclusively for crop production, readily falls within this definition apart from its essential organic nature.

3. Is soy protein isolate processed more or less than other materials that have been determined to be synthetic or non-synthetic?

Our point of departure has been the model of aquatic plant extract and humic acid preparation. The preparation of the protein isolate represents essential equivalence in its release from the soybean matrix and thereby remains a true, non-synthetic organic product.

4. FDA information as a soil amendment

No information is currently available on the use of soy protein isolate as a soil amendment. This is a novel use which we have pioneered and patented.

5. Genetic modification

In light of its use as a fertilizer, and its consequent complete decomposition in the soil, the issue of genetic modification is moot. The rapid availability of this material to microbial decomposition, as reflected in the immediate enhancement of microbial numbers after its application, and the decline in numbers until a subsequent application, demonstrate its conversion both to plant tissue and microbial biomass. The extremely narrow C/N ratio, ca. 2/1, is a further lever to complete utilization. The issue of genetic modification and the potential cross contamination are further militated against in that the material is applied directly to soil either as a flowable or pelletized agent with virtually no possibility of drift or inadvertent exposure. Finally, genetic modification is by design limited in its expression and the protein isolate would not be the exclusive bearer of any such modification.

6. Basic manufacturing process

As indicated in the soy bean processing chart attached, the final result is the neutralization of the soy protein. There is no acid residual and the maximum sodium residual is no more than 900-1200mg/100g final product, an inconsequential concentration in soil systems where the recommended application rate is typically between 1-1.5lbs/1,000 square feet.

7. Are there adverse effects on the environment from manufacture, use or disposal?

Our primary supplier, ADM, Decatur, IL, is bound by all local and national regulations with respect to environmental contamination and is fully committed to compliance.

8. Category 1 question 5, Is there potential for detrimental chemical interaction with other materials used?

The rapid and complete decomposition of this highly available organic material to microbial action would render it highly unlikely for detrimental interaction with other materials used.

9. Category 1 question 8, toxic or adverse reaction of the material or its breakdown products

Four years of field experiments and commercial distribution have revealed only substantial and impressive plant nutritional and soil biological responses to the application of the soy protein isolate.

10. Undesirable persistence or concentration of the material

As indicated previously, the narrow C/N ratio and other attributes of this material (amino acids, short chain peptides) make it eminently accessible to microbial decomposition and it is rapidly and completely utilized by the soil biota and by plant uptake.

We trust this material will provide the information which you require to accept the registration of our soy protein isolate as an organic product for inclusion on the National List.

Thank you for your consideration.

Yours sincerely,

Haim B. Gunner

Haim B. Gunner, Ph.D.
President

CC Arthur Neal

HBG/dab

Attachments:
Figure 1. Enhancement of microbial populations in response to SoylMicrobial, Inorganic and Milorganite applications on a USGA sand green profile
Table 2.7. Effects of fertilizer treatment on microbial biomass C on golf fairway soil (June 2002)
Table 2.8. Effects of fertilizer treatment on microbial biomass C on golf fairway soil (July 2002)
Figure 2. Seasonal Turf Quality comparison of SoylMicrobial with Inorganic fertilizer on a silt-loam native soil
Table 3.5. Effects of fertilizer sources and application frequencies on creeping bentgrass clipping yields under different soil profiles (3 MAT)
Figure 3.5. Root distribution on different soil profiles under different fertilizer treatments.
Table 3.6. Effects of fertilizer sources and application frequencies on creeping bentgrass root biomass under different soil profiles (1 MAT)
Table 3.7. Effects of fertilizer sources and application frequencies on creeping bentgrass root biomass under different soil profiles (2 MAT)
Soybean Processing

Figure 1. Enhancement of microbial populations in response to SoylMicrobial, Inorganic and Milorganite applications on a USGA sand green profile

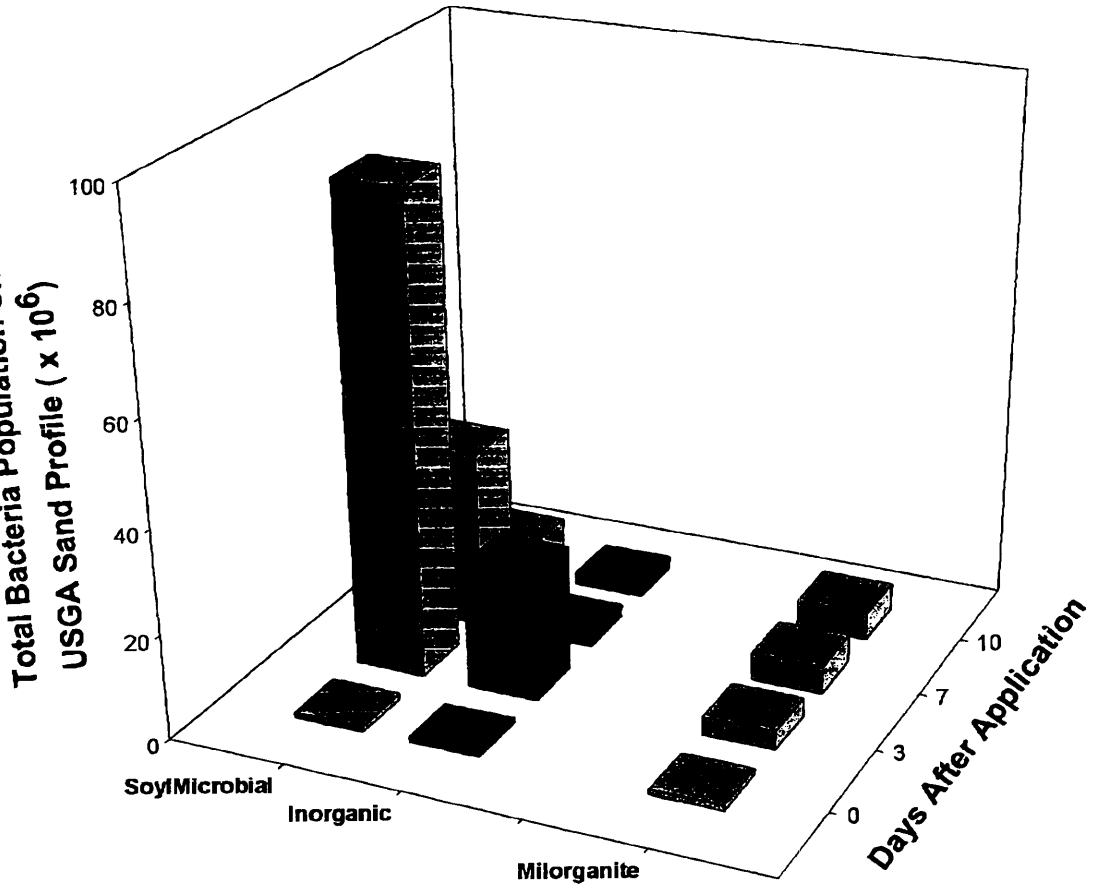

Table 2.7 Effects of fertilizer treatment on microbial biomass C on golf fairway soil (June 2002)

Treatment	Days after treatment*				
	0 day	2nd day	4th day	7th day	14th day
	Microbial biomass C (μg/g dry soil)				
SoylMicrobial (F)	82.5	159.4	56.1	127.9	133.7
Scotts	82.5	79.8	38.7	106.0	117.6
Milorganite	82.5	120.9	48.5	167.0	101.3
NatureSafe	82.5	88.8	53.9	82.5	104.4
LSD	25.7	64.1	25.8	98.2	84.9

*means separation within each column by LSD ($P = 0.05$).

Table 2.8 Effects of fertilizer treatment on microbial biomass C on golf fairway soil (July 2002)

Treatment	Days after treatment*				
	0 day	2nd day	4th day	7th day	14th day
	Microbial biomass C (μg/g dry soil)				
SoylMicrobial (F)	133.7	182.8	181.4	70.2	93.3
Scotts	117.6	171.2	157.5	89.2	73.6
Milorganite	101.3	211.0	122.5	87.8	79.7
NatureSafe	104.4	169.1	176.3	41.8	108.9
LSD	84.9	101.2	88.5	95.9	92.5

*means separation within each column by LSD ($P = 0.05$).

Fig. 2. Seasonal Turf Quality comparison of SoylMicrobial with Inorganic fertilizer on a silt-loam native soil

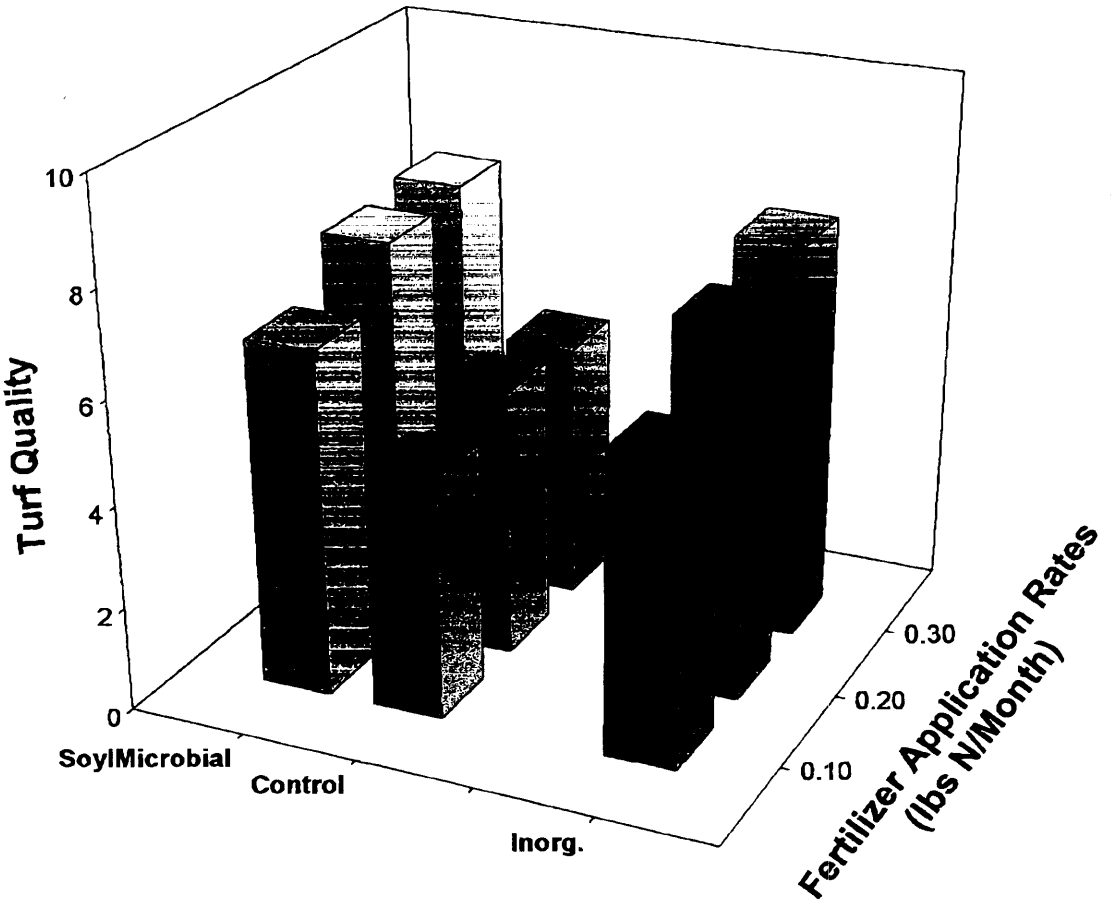

Table 3.5 Effects of fertilizer sources and application frequencies on creeping bentgrass clipping yields under different soil profiles (3 MAT).

Fertilizer Type	USGA Sand		Mix		Native Soil	
	Bi-Weekly	Weekly	Bi-Weekly	Weekly	Bi-Weekly	Weekly
			(g/pot)			
SoylMicrobial (F)	0.275b	0.633ab	0.312b	0.693b	0.405	0.759b
SoylMicrobial (G)	0.308ab	0.652a	0.304b	0.654b	0.432	0.695bc
Scotts	0.358a	0.679a	0.439a	0.868a	0.469	0.897a
Milorganite	0.199c	0.390c	0.215c	0.449c	0.368	0.573c
NatureSafe	0.258bc	0.554b	0.253bc	0.627b	0.415	0.661bc
Significance +	+	+	+	+	ns	+
Mean*	0.28b	0.58a	0.30b	0.66a	0.42b	0.72a
	0.45c		0.51b		0.59a	

+mean separation by bonferroni ($P = 0.05$). ns means non-significant difference.
*mean separation with row by Duncann's new multiple range test ($P = 0.05$).

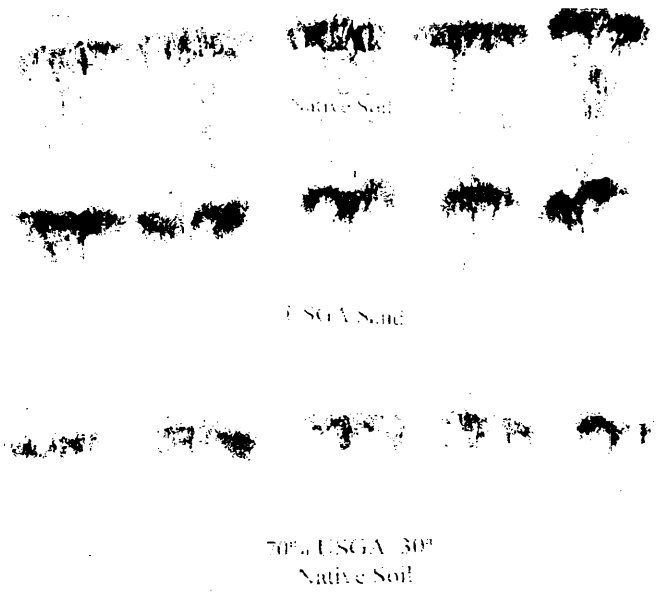

Figure 3.5 Root distribution on different soil profiles under different fertilizer treatments.

Table 3.6 Effects of fertilizer sources and application frequencies on creeping bentgrass root biomass under different soil profiles (1 MAT).

Fertilizer Type	USGA Sand		Mix		Native Soil	
	Bi-Weekly	Weekly	Bi-Weekly	Weekly	Bi-Weekly	Weekly
			(g/pot)			
SoylMicrobial (F)	0.28ab	0.28ab	0.36ab	0.29b	0.35	0.36
SoylMicrobial (G)	0.24bc	0.25b	0.31bc	0.22c	0.27	0.32
Scotts	0.32a	0.34a	0.43a	0.37a	0.26	0.38
Milorganite	0.22c	0.24b	0.27c	0.27bc	0.26	0.35
Naturesafe	0.23c	0.31ab	0.35b	0.36a	0.27	0.39
Significance*					ns	ns
Mean*	0.26	0.28	0.34a	0.30b	0.28b	0.36a
	0.27b		0.32a		0.32a	

+mean separation by bonferroni ($P = 0.05$). ns means non-significant difference.
*mean separation with row by Duncann's new multiple range test ($P = 0.05$).

Table 3.7 Effects of fertilizer sources and application frequencies on creeping bentgrass root biomass under different soil profiles (2 MAT).

Fertilizer Type	USGA Sand		Mix		Native Soil	
	Bi-Weekly	Weekly	Bi-Weekly	Weekly	Bi-Weekly	Weekly
			(g/pot)			
SoylMicrobial (F)	0.54ab	0.51bc	0.47ab	0.52bc	0.51	0.47
SoylMicrobial (G)	0.44bc	0.37d	0.44ab	0.41c	0.44	0.48
Scotts	0.57a	0.59a	0.53a	0.70a	0.46	0.48
Milorganite	0.42c	0.45c	0.44b	0.43c	0.52	0.55
NatureSafe	0.49abc	0.58ab	0.51ab	0.63ab	0.49	0.56
Significance*					ns	ns
Mean*	0.49	0.50	0.48b	0.54a	0.48	0.51
	0.50		0.52		0.50	

+mean separation by bonferroni ($P = 0.05$). ns means non-significant difference.
*mean separation with row by Duncann's new multiple range test ($P = 0.05$).