



Value of Biosolids

Introduction

Biosolids are nutrient rich organic material created through the treatment of domestic sewage, and they are considered beneficial for agricultural use since they contain many essential plant nutrients. Biosolids are typically classified as Class AA, A and B, according to the level of treatment. Class AA and Class B are readily available for producers, and this analysis focuses on these two types. Class AA biosolids meet more stringent processing requirements, broadening the application to not only agricultural land but also to public access areas including private lawns and home gardens. Class B biosolids are almost exclusively applied to agricultural land and are prohibited from public access areas.

Most facilities will provide Class B biosolids to landowners without any cost and apply them free of charge, reducing commercial fertilizer costs. In some cases, landowners may formulate some type of agreement with the supplier and provide payment for the service and material. Usually this type of arrangement must be made when the distance between the agricultural operation and the biosolids supplier may prove to be a hardship and/or the amount of biosolids the landowner requests is more/less than typical.

The use of biosolids are can result in a cost savings by reducing the amount of commercial fertilizer typically applied. Table 1 displays the average primary nutrient content of both Class AA and Class B biosolids in various forms including pellets, compost, heat dried granular or cake residuals. As you can see, there exists a considerable range of primary nutrient content for both Class AA and Class B biosolids. Some biosolids suppliers may have material that exceed the range and average nutrient content displayed below. Table 2 shows the nutrient content of some typical nitrogen (N) fertilizers or blends used in Florida.

Table 1. Average Primary Nutrient Content of Biosolids on a Dry-Weight Basis

Range of Nutrient Content			
Biosolid Type	Nitrogen (N %)	Phosphorus (P %)	Potassium (K %)
Class AA	0.80 – 7.50	0.40 – 4.00	0.2 – 1.80
Class B	4.00 – 9.00	1.00 – 3.70	0.01 - 0.70
Average Nutrient Content			
Biosolid Type	Nitrogen (N %)	Phosphorus (P %)	Potassium (K %)
Class AA	4	2	0.5
Class B	6	2	0.3
Average Cost per Ton*			
Biosolid Type			
Class AA	\$60.00		
Class B	---		
Average Cost per Lb. Nitrogen (N)*			
Biosolid Type			
Class AA	\$0.75		
Class B	---		

**Costs are based on a statewide average in June 2009. Class B biosolids average cost are zero or dependent upon landowner agreement, if applicable.*

Table 2. Nutrient Content and Average Cost of Commercially Available Nitrogen Fertilizers

Nutrient Content			
Commercial Fertilizer	Nitrogen (N %)	Phosphorus (P%)	Potassium (K %)
Ammonium Nitrate	34	0	0
20-0-20	20	0	20
20-0-10	20	0	10
Average Cost per Ton*			
Commercial Fertilizer			
Ammonium Nitrate	\$355.00		
20-0-10	\$350.00		
20-0-20	\$450.00		
Average Cost per Lb. Nitrogen (N)*			
Commercial Fertilizer			
Ammonium Nitrate	\$0.52		
20-0-10	\$0.88		
20-0-20	\$1.13		

**Costs are based on a statewide average in June 2009.*

Typically, N is the most expensive component in fertilizer and is the deciding factor in selecting fertilizer material. Based on the average nutrient content of Class AA and Class B biosolids, the two classes have approximately 80 lb. and 120 lb. of N per ton, respectively, compared to ammonium nitrate (34-0-0), which has 680 lb. of N per ton. Both 20-0-10 and 20-0-20 commercial fertilizers, which are typically used for pasture fertilization, have 400 lb. of N per ton.

Table 3 lists all the nitrogen options for established bahiagrass pastures, as recommended by the University of Florida – Institute of Food and Agricultural Sciences and the corresponding cost per acre of N by fertilizer type.

Table 3. Nitrogen Options and Cost Per Acre

Nitrogen Option	Nitrogen Recommended (lb./acre)	Cost Per Acre (N)				
		Class AA	Class B*	Ammonium Nitrate	20-0-10	20-0-20
Low	60	\$45.00	----	\$31.00	\$52.00	\$68.00
Medium	100	\$75.00	----	\$52.00	\$88.00	\$113.00
High	160	\$120.00	----	\$83.00	\$140.00	\$180.00

**Class B biosolids average cost are dependent upon landowner agreement, if applicable.*

Given current statewide averages prices and based on N content alone, ammonium nitrate is less expensive than Class AA (\$0.52 vs. \$0.75 per lb of N, respectively). If potassium (K) is not required, Class AA biosolids have a cost savings based on N, when compared to 20-0-10 or 20-0-20 blended fertilizer. Obviously, the use of Class B biosolids, if applied without any cost to the landowner, result in a cost savings equivalent to the cost of using an alternative commercial fertilizer. Costs could be further reduced by using those biosolids that are considered to be lime-stabilized, which would reduce the amount of dolomite needed.

Additional Information

Nutrient content of biosolids vary by type. Producers should retain a nutrient analysis in order to record and track nutrient application accurately. Landowners are subject to Chapter 62-640, Florida Administrative Code (FAC) when applying biosolids. Further information regarding the FAC is available at <https://www.flrules.org/gateway/ChapterHome.asp?Chapter=62-640>. Regulations require residuals to be applied at an agronomic rate to minimize or prevent nitrogen leaching. Florida also requires phosphorus to be considered in certain geographic areas.

References

1. Conversation with Maurice Barker, Residuals Coordinator, Florida Department of Environmental Protection, May, 2009.
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3. Faulkner, David, “*Applying Biosolids: Issues for Virginia Agriculture*,” USDA - NRCS, April, 2001.
4. Florida Department of Environmental Protection, “*Domestic Wastewater Residuals – Fact Sheet for Florida’s Farmers and Ranchers*”, February, 2005.
5. Florida Department of Environmental Protection website, <http://www.epa.gov/OWM/mtb/biosolids/genqa.htm>.
6. Foess and Fredericks, “*Comparison of Class A and Class B Private Biosolids Stabilization Technologies*”, Florida Water Resources Journal, May, 1995, pp. 28 – 29.
7. National Agricultural Statistics Service, “Prices Paid,” March, 2009.
8. Newman, Y.C., et. al, “*Fertilizing and Liming Forage Crops*,” University of Florida – Institute of Food and Agricultural Sciences (UF-IFAS), January, 2008.

