

Hard Facts about the Risks and Benefits of using Treated Sewage Sludge/Biosolids on Land

Benefits

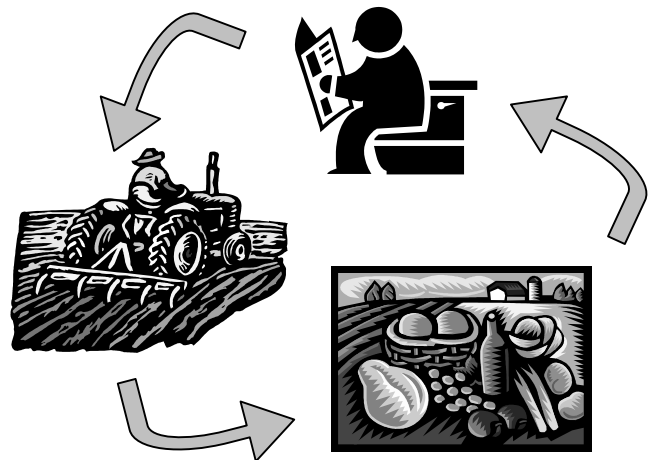
Biosolids, also known as treated sewage sludge are a source of organic matter, nitrogen, phosphorus, and micronutrients. These materials are beneficial to agriculture, silviculture, horticulture, and land reclamation activities and they improve agricultural productivity. More specifically, the benefits derived from biosolids used as a soil amendment are as follows:

- Nitrogen is a basic nutrient for plant growth. It is present in different forms. In biosolids, it is present in the forms of ammonia, nitrates, and organic nitrogen. The ammonia and nitrate forms of nitrogen are available for plant usage. Organic nitrogen is released slowly over many months, providing a continuous supply of nitrogen for crops and minimizing the potential for movement of nitrogen to ground water. Total nitrogen available to the plant at any given time is less than the total of these mineral forms due to the dynamic cycling of nitrogen in the soil.
- Phosphorus is a basic nutrient for plant growth and is present in all biosolids in varying concentrations.
- Micronutrients, including a variety of salts and metals, are necessary for plant growth and are present in biosolids in varying amounts.
- The addition of biosolids to soils can also be beneficial by enhancing soil structure. Organic matter assists in maintaining soil pores which allow water and air to pass through the soil medium. Such pores can be lost at sites under continuous cultivation and they are critical in maintaining an oxygen-rich environment for plant roots.
- Organic matter found in biosolids helps soils retain water. Additional water retention can

reduce the need for frequent water applications and can facilitate water conservation.

- Sometimes biosolids are chemically stabilized with liming agents. Liming agents increase soil pH and can improve the soils ability to soak in water. Higher pH soils tend to bind most heavy metals, decreasing the chance of the metals migrating to the ground water.

Risks and Benefits taken from the California State Water Resources Control Board, "General Waste Discharge Requirements for the Discharge of Biosolids to Land for Use as a Soil Amendment in Agricultural, Silvicultural, Horticultural, and Land Reclamation Activities." August, 2000.



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Risks

Biosolids have the following characteristics which can create water quality and public health problems if improperly treated and managed during use as a soil amendment:

- Pathogens can be present. Unless the biosolids are specially treated or disinfected to destroy pathogens, significant concentrations of bacteria, viruses, and parasites can remain. Public health problems can be prevented with appropriate control over public access to the application areas and restrictions on the type and use of crops grown on the application sites. Buffer zones around water supply wells, surface water drainage courses, and public areas are designated to prevent transmission of pathogens to the public. In San Luis Obispo County, biosolids may not be applied to land unless they have been treated to eliminate pathogens.
- Heavy metals will be present. If heavy metals are over-applied to a field, they can cause ground water pollution, toxicity to plants, adverse effects to soil microorganisms, or buildup in the plant tissues. Animals eating plants with a buildup of metals may suffer adverse effects and accumulate metals that are passed on to another animal feeding on the first animal. Future land uses such as growing crops could be restricted if heavy metal levels in soil are not limited, monitored and controlled. Only some of the metals commonly found in biosolids are known to cause water quality or public health problems. Application rates for those metals have been established to avoid the problems.
- Nitrogen can be over-applied, allowing a buildup of nitrogen in soils. Excess nitrogen will eventually be converted to the nitrate

form and it can migrate to ground water. High nitrate levels in drinking water is a known hazard to human health. Nitrogen over-application can be prevented by applying biosolids at “agronomic rates”. This is the amount of nitrogen that differing soil types and a particular plant or crop can take up and use without leaving an excess in the soil.

- Odor and insect nuisances can be caused if the biosolids have not been adequately treated prior to application or if wet biosolids are allowed to remain on the ground surface for several days. Compliance with State and Federal standards for treatment of the biosolids will minimize the potential for odors and insect nuisances. Proper management at the application site will prevent odor or insect nuisances. Properly treated biosolids will generate limited, transient odors in the immediate vicinity of the application operations. Adequate buffer zones around residences and public areas, therefore, should be provided.
- Discharge of organic matter, metals, and pathogens to surface waters can affect water quality. These effects can be prevented by controlling water runoff from fields. The threat to water quality from the organic matter coming from biosolids is no greater than for a similar quantity of other organic soil amendments.

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