AGRICULTURE

Fact Sheet

Biosolids recycled on agricultural lands provide plants with essential nutrients that enhance growth and increase crop yield.

SEEKING SOLUTIONS

We all need food to survive, and that means someone needs to grow that food. Maintaining healthy crop production and sustaining the environment are constant challenges to modern agriculture. Growing crops and raising livestock removes nutrients from the land and can make the soil unhealthy. Degraded soils also tend to have poor soil structure and are not able to hold water effectively, which can result in erosion and negative impacts to water quality.

BENEFITS OF BIOSOLIDS

Benefits of biosolids in agriculture	
Soil Property	**Benefits**
Biological	Increases soil micoorganisms
Chemical	Adds macro and micronutrients
	Increases cation exchange capacity
	Provides slow release nitrogen and other nutrients
	Keeps soil pH neutral
	Increases soil carbon storage
Physical	Helps soil hold water
	Improves soil structure (tilth)
	Loosens compacted clay soils
	Increases water drainage (infiltration)
	Add air to the soil (aeratess)
	Provides organic matter

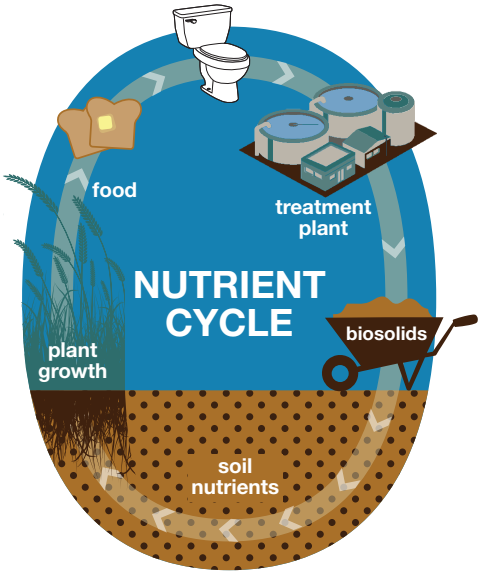
Given the challenges of sustainable agriculture, biosolids are an ideal soil builder and fertilizer replacement. They are renewable, sustainable, and provide essential plant nutrients to help plants grow greener and increase crop yields. Biosolids can also repair unhealthy soils quickly and effectively. Unlike synthetic fertilizers, biosolids increase organic matter. Organic matter can help suppress plant disease, help beneficial microorganisms like earthworms thrive, improve soil structure, increase soil water holding capacity and reduce erosion. The addition of biosolids can also help to moderate highly alkaline or acidic soil conditions.

Farmers in Eastern Washington who are lucky enough to use biosolids get healthy, green wheat fields like this one.

HOW IT WORKS – NUTRIENTS

Plants need nutrients to grow. Each growing season, plants take up nutrients from the soil and store it in their leaves and stalks and roots. When we harvest crops, which later end up on our dinner plates, we are removing these nutrients from the farm. In order to maintain fertile land and healthy soil, we must return those nutrients back to the soil, the same way nature would.

Since biosolids are largely comprised of our own broken down food waste, using them as a fertilizer recycles those nutrients back to the land.



In agriculture, biosolids are applied to soil to meet the exact nitrogen needs of the crop. Biosolids are typically applied with calibrated manure spreaders, while liquid biosolids can be sprayed or inserted below the soil surface.

Once applied, the nutrients in biosolids are released slowly as microorganisms break down the organic matter, which provides fertilization as the plants need it. There is no excess of nutrients, so nutrients stay out of local water bodies, which keeps our rivers and streams clean and healthy.

In addition to being environmentally friendly, using biosolids can save farmers a lot of money. Farmers pay for the main plant nutrient, nitrogen, but biosolids also contain all the macro and micronutrients that plants need, so farmers get bonus nutrients for the price of one!

KEY PLANT NUTRIENTS PROVIDED BY A TYPICAL APPLICATION OF BIOSOLIDS*

Nutrient		Pounds per acre
N	Nitrogen (available)	84
P	Phosphorus	158
K	Potassium	11
Fe	Iron	137
Mg	Magnesium	25
S	Sulfur (as sulfate)	3
B	Boron	0.2
Cu	Copper	5
Mo	Molybdenum	0.08
Mn	Manganese	9.8
Zn	Zinc	5.6
Ca	Calcium	194

* Based on a single biosolids application at the rate of 15 wet tons per acre, or 3 dry tons per acre

RESEARCH & DEMONSTRATION

Decades of research and demonstration have shown that the quality of crops grown on biosolids amended soils are equal or superior to those grown with commercial fertilizers.

Biosolids applications also benefit soil through the additional crop organic matter grown and tilled back into the soil, which improves water infiltration and moisture retention.

WHAT'S HAPPENING

In the Pacific Northwest, farmers are using biosolids as a fertilizer and soil conditioner for a range of crops. These include: pasture, dryland wheat, canola, hops, alfalfa, corn, grapes, and rangeland grasses. Additionally, gardeners and farmers use Class A biosolids on a wide variety of fruit and vegetables.

REFERENCES

Sullivan, D.M., C.G. Cogger, and A.I. Bary. 2015. Fertilizing with biosolids. Pacific Northwest Extension Publ. 508. Oregon State University Extension, Corvallis, OR

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