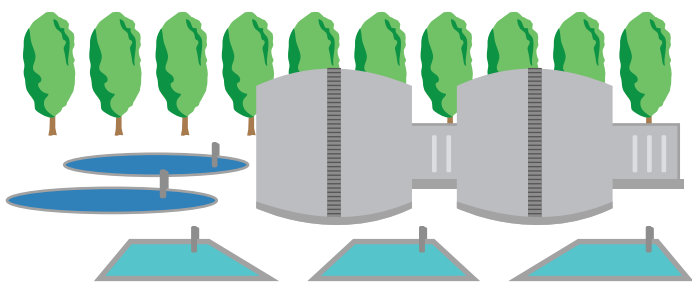


Use of Poplar Trees for Wastewater and Biosolid Utilization

Although biosolids and municipally treated wastewater (“recycled water”) have a long history of agricultural use in the Pacific Northwest, co-locating poplar (*Populus sp.*) plantations with wastewater treatment plants can provide an additional range of benefits. Hybrid poplar trees are fast-growing with a high assimilation capacity for water, nutrients, and soil contaminants. Poplar trees can be irrigated with recycled water or amended with treatment plant biosolids. Using poplars in tandem with land application of biosolids builds soil health while further reducing trace chemicals and metals that could persist in biosolids after the traditional organic biodegradation process. Use of poplars for irrigation with recycled water has similar benefits and reduces the discharge of treated effluent to waterways, thereby reducing the total load of heat, nutrients, and trace chemicals into the aquatic environment.

Economic benefits

- Lower costs for transporting biosolids offsite
- Potential economic gain from poplar harvest
- Sawn wood and veneer markets (rotation lengths of eight years or more)
- Paper products
- Mulch
- Biomass for energy



An aerial view of poplar trees at the Biocycle Farm operated by the Metropolitan Wastewater Management Commission in Eugene-Springfield, OR.

Environmental benefits and considerations

- Applying recycled water and biosolids to poplar results in lower nitrogen, phosphorus, heavy metals, contaminants of emerging concern and temperature inputs into waterways. This assists wastewater treatment plants in meeting regulatory requirements.
- Potential removal of a wide spectrum of other contaminants from biosolids and wastewater that are currently unregulated, including pharmaceuticals and personal care products that typically are not removed or significantly reduced through traditional treatment plant processes.
- Carbon sequestration.
- Reduced harvest pressure on forestlands.
- Reduced net greenhouse gas emissions when used as a biofuels feedstock.
- Subsoil denitrification is improved by movement of carbon into shallow groundwater from the root system.

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Steps in developing a poplar tree farm at a wastewater facility

- Develop an agricultural plan, operational expectations, and establish community familiarity.
- Acquire or lease suitable agricultural acreage within a feasible operating distance from the treatment plant.
- Permit the facility under local land and water regulations.
- Procure hybrid poplar planting stock and experienced planting crews.
- Acquire/contract skill sets, staff, and equipment needed to maintain the tree farm.

Potential detriments and considerations

- Market variability for poplar biomass.
- Insect or disease losses.
- Potential of plantation poplar to hybridize between native and non-native poplar, unless steps, such as planting sterile trees or harvesting on short rotations, are taken to reduce risk.
- Fire or wind damage.
- Increased land requirements.
- Increased/new equipment needs.
- Increased staffing and labor costs.



Biosolids are applied to a poplar tree farm in Oregon.



Recycled water is applied to a poplar tree farm at the MWMC facility near Eugene, OR.