



The Role of Microbes in Your Garden

Microbes play a crucial role in releasing nutrients that are trapped in the soil through a process called nutrient cycling. Through this ongoing process of decomposition, mineralization, transformation, and plant uptake, nutrients are recycled in the soil. Microbes drive the breakdown, release, and transformation of nutrients, making them available for plants to use.

Nutrient Cycling

1. Decomposition

When dead plant and animal material, such as leaves or dead organisms, accumulate on the soil surface, microbes begin the process of decomposition. They break down complex organic compounds into simpler molecules, releasing nutrients in the process.

2. Mineralization

Once organic matter is broken down by microbes, the nutrients it contains, such as nitrogen, phosphorus, and potassium are transformed into their inorganic forms, in a process known as mineralization. These mineralized nutrients are soluble and can be taken up by plant roots.

3. Nutrient Transformation

Microbes also play a role in transforming and converting nutrients between different forms. For example, nitrogen-fixing bacteria convert atmospheric nitrogen into a form usable by plants, while mycorrhizal fungi enhance the availability of phosphorus to plants by mobilizing it from insoluble sources.

4. Nutrient Uptake

Microbes act as essential facilitators in the nutrient cycling process, ensuring that nutrients trapped in the soil are released and made available for plant growth, ultimately contributing to a healthy and fertile soil ecosystem. As plants grow, their roots absorb the mineralized nutrients released by microbes in the soil.

Plant roots and soil microbes have a symbiotic relationship, as some plants release organic compounds known as exudates into the soil, which can stimulate microbial activity and, in turn, enhance nutrient availability.

