



Technical Bulletin

Factors Influencing Soil Microbial Activity

Temperature: Optimal temperature ranges vary among micro-organisms, but generally warmer temperatures stimulate microbial activity.

Moisture: Adequate soil moisture is essential for microbial activity, but excessive wet conditions can lead to anaerobic environments, particularly in compacted soils in poor condition.

Organic Matter: The availability of organic matter (i.e. crop residues, manures etc.) provides energy and nutrients for microbes to live and function.

Soil pH: Most micro-organisms thrive in slightly acidic to neutral soil pH (6.0 to 7.0).

Aeration: Adequate soil aeration is essential for microbial respiration and activity. Earworms and deep rooting crops greatly improve soil aeration.

Importance of Soil Microbial Activity

Nutrient Cycling: Micro-organisms break down organic matter, releasing nutrients for plant uptake.

Soil Structure: Micro-organisms produce extracellular polysaccharides which help bind soil particles together to improve soil structure.

Plant Disease Suppression: some micro-organisms produce antibiotics and other compounds that inhibit plant pathogens.

Plant Growth Promotion: Micro-organisms produce auxins and cytokinins among others which promote plant growth.

Practical Measures to Aid Microbe Survival

- Use cover cropping and min-till practises to reduce soil disturbance and promote microbial activity and preserve soil structure.
- Add organic matter and or manure, incorporate crop residues, this provides nutrients and energy for micro-organisms.
- Avoid excessive applications of nitrate fertilisers, this can disrupt soil microbial activity and lead to nutrient imbalances.
- By understanding and promoting soil microbial activity you can create a balanced and resilient soil ecosystem, which will lead to improved plant growth, reduced soil-borne diseases, and enhanced soil health.





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