

Name _____

Nourishing the Earth: The Impact of the Nitrogen Cycle on Soil Fertility

Open-Ended Response Answer Key

1. Human activities, such as agriculture and industrial processes, can disrupt the nitrogen cycle by increasing nitrogen inputs through fertilizer use and atmospheric emissions, leading to soil degradation, water pollution, and biodiversity loss.
2. Nitrogen-fixing plants, such as legumes, play a crucial role in enhancing soil fertility by forming symbiotic relationships with nitrogen-fixing bacteria in their root nodules, which convert atmospheric nitrogen into ammonium for plant use.
3. Managing nitrogen inputs in agriculture involves balancing fertilizer application with crop demand, adopting precision farming techniques, and promoting sustainable agricultural practices to improve soil fertility while minimizing environmental impacts such as nitrogen pollution and greenhouse gas emissions.
4. The nitrogen cycle interacts with other biogeochemical cycles, such as the carbon and phosphorus cycles, through processes like decomposition, nutrient cycling, and microbial interactions, influencing ecosystem dynamics, productivity, and resilience.

