The Levels of Nitrogen and Phosphorus Compounds in Run-Off After Using Various Types of Fertilizers

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The overuse of chemical fertilizers causes eutrophication, which can damage aquatic ecosystems; I set out to determine whether alternatives to chemical fertilizers could decrease nitrate, nitrite, and phosphate levels in surface run-off, thus minimizing eutrophication and damage to aquatic ecosystems. To find the best alternative to chemical fertilizers, four containers with the same type of microgreen plants were filled with equal amounts of topsoil and one of the following: more topsoil, manure, compost, or diammonium phosphate (DAP). Each day for eight days, plants were watered with distilled water; the run-off water was collected and added to two cups of distilled water. This run-off was tested for nitrate, nitrite, and phosphate levels using water testing kits. The data showed that run-off from containers with DAP had the lowest levels of phosphorus (P) and nitrogen (N) compounds, but no improvement in plant growth. Manure had low levels of N compounds but high levels of P compounds, and improved plant growth. Though DAP did not promote plant growth, I concluded that DAP is the best fertilizer; it produced the lowest amounts of plant nutrients in its run-off and its concentration can be explored to improve plant growth. The data did not support the hypothesis that plants grown with manure will yield lower levels of plant nutrient in its run-off. My recommendation is that farmers reduce the amount of chemical fertilizer in place of finding an alternative. I believe this will be more effective in both reducing eutrophication and promoting plant growth.

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