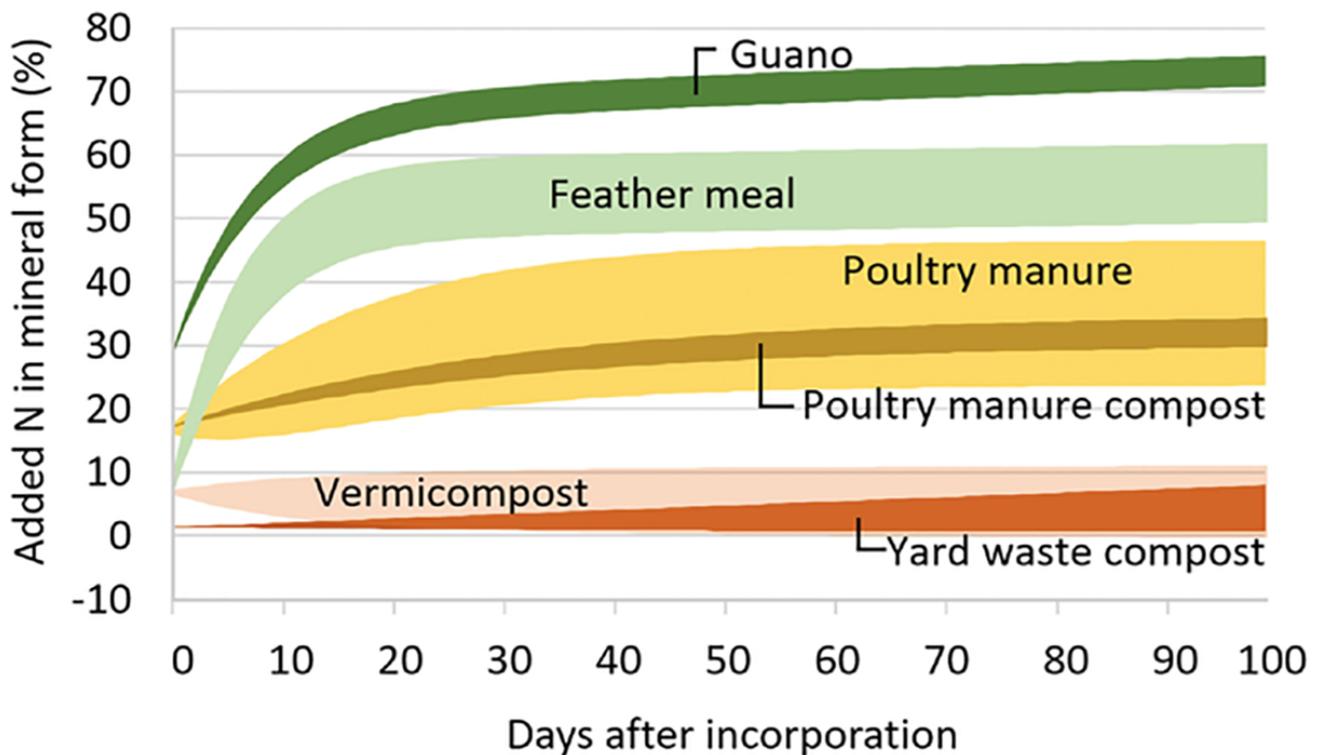




Nitrogen availability from organic amendments

December 27, 2021



Simulated nitrogen availability from organic fertilizers and composts. The range shows nitrogen availability for materials with the lowest and highest carbon-to-nitrogen ratio from a literature survey. The calculations assumed optimal moisture content and a constant temperature of 77 °F. Created by Daniel Geisseler.

The nutrient availability of organic fertilizers and composts is often not known and can be variable. Many studies have investigated the availability of nitrogen from organic amendments in laboratory incubations. Comparing the results from different studies is challenging because protocols are not standardized with respect to duration and temperature. To overcome this challenge, data from the scientific literature were compiled and fit to a model that simulates gross nitrogen mineralization and immobilization to determine daily net nitrogen mineralization rates for different amendments.

The results, published in the *Journal of Environmental Quality*, showed that the simulated nitrogen availability after 100 days and a soil temperature of 77 °F ranged from less than 10% for yard waste compost and vermicompost to more than 70% for guano. At the end of the 100-day simulation, 25–45% of total N in poultry manure and poultry manure compost were in the mineral form. Some types of materials are very heterogeneous. This hampered the performance of the model, which uses the carbon-to-nitrogen ratio of the amendments to calculate N turnover.

The results can support nitrogen management decisions in crop production. To facilitate these decisions, the authors developed an online tool that estimates nitrogen availability based on local soil temperature in different regions of California (http://geisseler.ucdavis.edu/Amendment_Calculator.html).

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Geisseler, D., Smith, R., Cahn, M., & Muramoto, J. (2021). Nitrogen mineralization from organic fertilizers and composts: Literature survey and model fitting. *Journal*

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