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Lowering nitrogen inputs reduces vegetables' environmental impact and maintains yield

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Fertilizer applied to a young celery crop, showing the disconnect between fertilizer placement and plant location. Photo by Shu Kee Lam.

Intensive vegetable producers in Australia apply high rates of nitrogen and manures to ensure production of vegetables meets the standards required by buyers. Nitrogren application is commonly greater than 300 kg—and sometimes greater than 600 kg—per crop. Much of this applied nitrogen is not utilized by the plants, resulting in a substantial risk for adverse environmental impacts.

One strategy to minimize the environmental impact is to apply nitrification inhibitors with the manures and fertilizers. Simply reducing N inputs may also be a solution. The impact on yield is not known for either strategy.

A new *Journal of Environmental Quality* study found that multiple applications of nitrogen over a growing season in a typical vegetable system exceeded the plant's needs. Reducing inputs by one-third had no adverse effect on crop yield in celery and significantly reduced losses of nitrous oxide greenhouse gas. The study showed that the supply of nitrogen at recommended rates early in the growing season had the lowest efficiency.

A simple solution for minimizing the environmental impact and improving nitrogen use efficiency in vegetables is to reduce nitrogen inputs and to consider the use of variable application rates across the season.

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Suter, H., Pandey, A., Lam, S.K., Davies, R., Hassan, R., Riches, D., & Chen, D. (2021). Opportunities to improve nitrogen use efficiency in an intensive vegetable system without compromising yield. *Journal of Environmental Quality*, *50*, 791–798. https://doi.org/10.1002/jeq2.20225

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