Agriculture and Climate Change

Examining the role of agricultural management practices in the emission of nitrous oxide, a greenhouse gas.

WITH THE PASSAGE of the California Global Warming Solutions Act of 2006 (AB32), California has begun an urgent effort to reduce greenhouse gas (GHG) emissions to 1990 levels by 2020. Of the three major greenhouse gases—CO₂, N₂O, and CH₄—nitrous oxide, or N₂O, has 296 times the radiative force of CO₂, greatly contributing to the destruction of the ozone and increasing global warming. Agricultural cultivation of soils is the main source of anthropogenic nitrous oxide emissions worldwide. However, very little data exists on annual nitrous oxide changes as they are erratic and highly dependent on management practices. In order to create an accurate greenhouse gas budget for California, we must first quantify greenhouse gas emissions resulting from different cropping systems and management practices.

The goal of our study was to quantify seasonal and annual nitrous oxide emissions in a California almond orchard and vineyard in order to contribute to the development of an accurate greenhouse gas budget for California. Furthermore, we wanted to determine how conventional agricultural management practices influence these emissions in order to develop best management practices to reduce N₂O emissions.

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