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Road-testing Nitrous Oxide Emissions Protocols in the PNW

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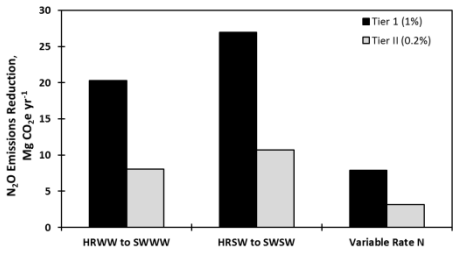
Impact Statement: Assesses the relevancy and potential financial incentive of existing N_2O offset protocols to PNW wheat production systems.

Greenhouse gas emission reduction programs (e.g. Cap & Trade) establish the potential that voluntary farmer actions to reduce N_2O emissions may be eligible for incentive payments through carbon offsets and REACCH Stakeholders have indicated significant interest in this strategy. We reviewed five available methodologies for N_2O reduction protocols and performed a road test to quantify N_2O emission offsets generated under three alternative nitrogen management scenarios relevant to PNW dryland wheat-based cropping systems. Our results provide quantitative assessment of N2O reduction potential using available methodologies and the financial incentive provided for each scenario. Our specific objectives were to: i) use the protocol methodology to quantify emission reductions; ii) evaluate the relevance of the protocol methodology to PNW wheat-based cropping systems; and iii) consider the relative importance offsets may play in incentivizing future N_2O emission reduction strategies. Using data and modeling assessments based on the WSU Cook Agronomy Farm (CAF), three N_2O emission reduction scenarios were developed that could be feasible under PNW dryland wheat production; (1) switching from hard red to soft white winter wheat, (2) switching from hard red to soft white spring wheat, and (3) adoption of variable rate N application in soft white winter wheat.



Figures shown, from left to right are:
1) Reductions in N_2O emissions for Tier 1 and Tier 2 emissions factors for three N management scenarios
2) Protocol Quantification Methodology Reviewed and General Eligibility Requirements

Program	Protocol Title	Eligible Project Locations	Eligible Crops
Alberta Offset System	Quantification Protocol for Agricultural Nitrous Oxide Emissions Reductions.	Canadian province of Alberta	Fertilized Agricultural Crops
American Carbon Registry	ACR1 - The American Carbon Registry Methodology for N_2O Emission Reductions through Changes in Fertilizer Management.	Global	Fertilized Agricultural Crops
	ACR2 - Methodology for Quantifying Nitrous Oxide (N_2O) Emissions Reductions through Reduced Use of Nitrogen Fertilizer on Agricultural Crops.	Global	Fertilized Agricultural Crops
Climate Action Reserve	Nitrogen Management Project Protocol.	North Central Region of U.S.	Corn
Verified Carbon Standard	Quantifying N_2O Emissions Reductions in Agricultural Crops through Nitrogen Fertilizer Rate Reduction.	U.S.	Fertilized Agricultural Crops

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