

Title: The R. J. Cook Agronomy Farm, Long-Term Agro-Ecosystem Research Site, Pullman, WA

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Introduction and Research Mission: The *R. J. Cook Agronomy Farm (CAF)*, (<http://css.wsu.edu/cook/>) was launched as a long-term, direct-seed cropping systems research program by a team of USDA-ARS and Washington State University (WSU) scientists in 1998. Process-oriented and applied research is conducted at plot, landscape and farm scales to advance knowledge of field-scale biophysical and economic processes with the overall goal to advance sustainable agroecosystems and precision agriculture technologies. Collectively these projects: (1) assess the existing health of agroecosystems and the long-term prospects for their continued productivity and profitability; (2) provide a landscape perspective for studying agricultural systems and policies that emphasize connections to local and regional environments; and (3) address critical needs for investment in education and training for future farmers and stakeholders.

Site Management and Agroecological Conditions: The 0.57-km² CAF is located near Pullman, WA (46° 47' N, 117° 5' W) in the high annual rainfall zone (550 mm) where continuous cereal (wheat, barley, pulse crops) based farming is practiced (NEON Domain: D15, HUC2: #17, Farm Resource Region: Basin and Range). The CAF has soils and landscapes representative of dryland annual cropping systems of the inland Pacific Northwest and provides research data applicable to over 10,000 km² in WA and 4,050 km² in ID. The complexity of the CAF landscape offers a highly suitable environment for studies on landscape controls over soil and crop physiological processes.

Partnerships: The CAF functions as a key research facility for a suite of agricultural research projects that involve transdisciplinary research efforts developed through an on-going partnership among three Land Grant universities (Washington State University, University of Idaho and Oregon State University) and the USDA-ARS. These research projects include: USDA CSREES NIFA Planning Grant Award “Sustainable Agroecosystems Science Long-Term Agroecosystem Project” (LTAP); USDA NIFA CAP grant award “Regional Approaches to Climate Change for Pacific Northwest Agriculture” (REACCH); and USDA NIFA Standard grant award “Site-Specific Climate Friendly Farming” (SCF). In addition, the CAF is a major research site for the USDA-ARS CRIS 212 Climate Change, Soils & Emissions project “Mitigating Agricultural Sources of Particulate Matter and Greenhouse Gas Emissions in the Pacific Northwest” (Lead scientist, David Huggins, Land Management and Water Conservation Research Unit).

Research Emphases: Key elements of these projects integrate technical, biogeophysical, and socioeconomic aspects to advance sustainable agroecosystems including soil C and N processes, landscape hydrology, water quality, greenhouse gas monitoring, weed seed-bank dynamics, soil-borne pathogens, residue management, precision agriculture, direct-seed cropping systems, biophysical modeling, and economic analyses.