

2023 NCR-SARE Graduate Student Projects Recommended for Funding

Project Number	Title	Graduate Student	Major Professor	Primary Grantee	Project State	Amount Funded	Cumulative	Brief Description
GNC23-362	Harvest Weed Seed Control: An Integrated Approach to Sustainable Weed Management in Western Kansas	Alec Adam	Sarah Lancaster	Kansas State University	KS	\$ 14,795	\$ 14,795	This experiment will generate quantitative data related to the efficacy of weed seed control through the implementation of mechanical seed destruction machines at harvest. Objectives for this project focus on weed suppression, economic viability of such machines, and environmental sustainability.
GNC23-363	Integrated weed management of herbicide resistant kochia in North Dakota	Waqas Ahmad	Greta Gramig	North Dakota State University	ND	\$ 14,525	\$ 29,320	This project will evaluate the efficacy of a novel electrocution system combined with single glyphosate application to control herbicide resistant (HR) kochia. This system will yield a highly effective and sustainable HR kochia control approach to benefit farmers in ND and north central Great Plains.
GNC23-364	Strengthening Community Connections in the Regenerative Poultry Value Chain	Ana Fochesatto	Adena Rissman	UW-Madison	MN	\$ 14,999	\$ 44,319	This project uses participatory action research with Latino and white regenerative poultry farmers to study supply chain justice. Affinity groups and learning circles will facilitate community discussions to empower farmers to collaboratively develop strategies for building a just food system.
GNC23-365	Understanding the Effects and Relationship of Regenerative Agriculture Practices on Grains Nutritional Quality	Cesar Guareschi	Chuck Rice	Kansas State University	KS	\$ 11,863	\$ 56,182	This project aims to evaluate the effect and correlation between regenerative agricultural practices on wheat and soybean grain's nutritional quality. We intend to use on-farm data to sustainably increase grains nutritional value, and promote farms and community financial well-being.

GNC23-366	Evaluating smooth sumac (<i>Rhus glabra</i>) management in rangelands through development of high-resolution GIS maps	Lillian Hoffart	Sabrina E. Russo	University of Nebraska-Lincoln	NE	\$ 15,000	\$ 71,182	Smooth sumac (<i>Rhus glabra</i>) is a woody encroacher which degrades rangelands. By combining ground-based data, USDA-NAIP imagery, and machine learning, this project maps sumac distributions in north-central Nebraska and investigates its spread.
GNC23-367	Direct Quantification of Manure Derived N Retention in Cover Crops After Fall Applications via ¹⁵ N Enrichment	Tanner Judd	Matthew Ruark	University of Wisconsin- Madison	WI	\$ 14,993	\$ 86,175	Cover crops are a promising strategy to reduce N leaching and groundwater contamination from fall manure applications. This study leverages ¹⁵ N tracer technology to study the capacity of typical overwintering and winter-killed cover crops to retain manure derived N from fall applications.
GNC23-368	Can low-cost NIR reflectometers predict Potential Mineralizable Nitrogen in organic farms?	Rabin KC	Sieglinde Snapp	Michigan State University	MI	\$ 14,999	\$ 101,174	VIS-NIR reflectometer, Potential mineralizable N, cover crops, estimation, reflectance, spectroscopy, hand-held spectrometers.
GNC23-369	Develop grower-appropriate plant residue management methods to reduce asparagus beetle damage	Laura Marmolejo	Zsofia Szendrei	Michigan State University	MI	\$ 14,988	\$ 116,162	My goal is to develop a residue management method to reduce asparagus beetle damage during harvest. Learning how to manage plant residue to suppress beetles will reduce the number of insecticide applications and the costs of production. This project will increase the sustainability of the asparagus.
GNC23-370	Investigating the effect of a commonly used apiculture antibiotic on honeybee colony thermoregulation and health	Justine Nguyen	Chelsea Cook	Marquette University	WI	\$ 14,930	\$ 131,092	A research study that aims to understand the effect of antibiotic treatment on Western honeybee (<i>Apis mellifera</i>) colony thermoregulatory behavior and health to inform beekeepers with best practices regarding antibiotic usage in their hives.

GNC23-371	Improving Nitrogen Efficiency in Corn Production Systems with Data and Modeling	Harsh Pathak	Dennis Buckmaster	Purdue University	IN	\$ 14,901	\$ 145,993	Predicting the right amount and timing of nitrogen fertilizer is paramount but challenging. Integrating crop growth model with easy to use and open-source user-interface could help farmers to make an informed decision for their field based on their soil, weather, and management conditions.
GNC23-372	Characterizing husbandry practices on dairy sheep farms in the North Central Region	Gretchen Peckler	Sarah Adcock	University of Wisconsin-Madison	WI	\$ 15,000	\$ 160,993	This project aims to survey dairy sheep producers in the North Central Region on common husbandry practices and concerns that they face in their flocks, with the goal of using this information to inform targeted research and extension efforts to support producer decision-making.
GNC23-373	Investigating mulches to suppress the invasive swede midge in urban agriculture	Christina Perez	Mary Rogers	University of Minnesota	MN	\$ 14,946	\$ 175,939	Swede midge is an invasive insect pest that threatens organic production of brassica vegetables. We will investigate mulching as a strategy to interrupt development and movement of SM by preventing individuals from reaching favorable pupation habitat in the soil.
GNC23-374	Quantifying the impact of cover crop implementation on sediment and nitrogen export in small agricultural watersheds and beyond	Abagael Pruitt	Jennifer Tank	University of Notre Dame	IN	\$ 14,917	\$ 190,856	We are using sensor, grab sample, and USGS monitoring data to quantify the effect of cover crops on sediment and nitrogen export at field-, agricultural watershed- and river basin-scales in Indiana.
GNC23-375	Integrating long-lasting insecticide netting tactics into integrated pest management programs for food facilities	Sabita Ranabhat	Kun Yan Zhu	Kansas State University	KS	\$ 14,993	\$ 205,849	This project aims to integrate a novel tactic, long-lasting insecticide netting, with existing tactics at food facilities to combat resistance while reducing inputs and helping to increase the sustainability of integrated pest management after harvest.

GNC23-376	Developing A Genomic Breeding Program for Indiana Bee Breeders	Dylan Ryals	Brock Harpur	Purdue University	IN	\$ 14,999	\$ 220,848	Working alongside Indiana commercial beekeepers and bee breeders to 1) establish the theoretical and practical ground work for Genomic Selection in honey bees; 2) establish a reference population for implementation; and 3) disseminate findings through extension material, workshops, and courses.
GNC23-377	How farmer cognition of complexity in agroecosystems affects decision-making about cover cropping	Prabhjot Singh	Matthew Hamilton	The Ohio State University	OH	\$ 15,000	\$ 235,848	Improving our understanding of how farmers grapple with complexities in agroecosystems and make cover crop decisions. Surveys will measure farmer cognitive maps of agroecosystems. Farm/farmer attributes' impact on cognition of complexity and how complexity drives decisions will be determined.
GNC23-378	Utilizing Shallow Geothermal Resources for Low-Cost Season Extension of Controlled Environmental Agriculture: Performance Evaluation and Design Tool	Jaden Tatum	Ajay Shah	Ohio State University	OH	\$ 13,636	\$ 249,484	This project will quantify the costs and heating and cooling capacity that can be delivered by adding a shallow geothermal earth-to-air heat exchange system to passive high tunnels and create a user-friendly design and decision-making tool for farmers to expand their season extension capabilities.
GNC23-379	Assessing High Tunnel Soil Health Under Prolonged Cover Cropping Methods	Hannah Walsh	Julie Grossman	University of Minnesota	MN	\$ 14,996	\$ 264,480	High tunnels (HT) are being rapidly adopted by vegetable producers in Minnesota, but require sustainable practices to be established in order to maintain soil productive capacity. This study seeks to quantify long-term effects of cover crops in high tunnels as a way to mitigate soil health issues.

GNC23-380	Synergistic effects of entomopathogenic nematodes and trap cropping on adult and larval flea beetle population	Julia Wooby	Ian Kaplan	Purdue University	IN	\$ 14,974	\$ 279,454	Combining the use of entomopathogenic nematodes and trap cropping, two methods previously used individually for control of flea beetles, aims to provide more comprehensive control across multiple life stages.
GNC23-381	Unearthing the Scent of Soil Health: A Validation of Smell through Odorant VOCs for Farmer Assessment	Finnleigh Woodings	Andrew Margenot	University of Illinois Urbana-Champaign	IL	\$ 14,492	\$ 293,946	To validate soil smell as an interpretable and accessible farmer based soil health indicator, this interdisciplinary project will qualitatively characterize soil smell in conjunction with VOC emission profiling to investigate the scent of healthy soil across a diversification gradient in the corn belt.
GNC23-382	Investigating Wheat Stem Sawfly's Impact on Winter Wheat Residue, Soil Health, Soil-Water Storage, and Corn Yield in a Dryland Cropping System	Vinicius Zuppa	Cody Creech	Department of Agronomy & Horticulture, University of Nebraska-Lincoln	NE	\$ 14,850	\$ 308,796	This project explores how Wheat Stem Sawfly affects Winter Wheat residue and its relation to soil-water storage, soil health, and subsequent crop yield in a dryland cropping system. Results will help maintain winter wheat production and assist farmers in improving soil health and crop productivity.
GNC23-383	Evaluating Efficacy of Organic Herbicides on Common Weed Species in the North Central Region	Carly Strauser	Ajay Nair	Department of Horticulture, Iowa State University	IA	\$ 14,879	\$ 323,675	Organic herbicides are tool vegetable growers can integrate into a weed management plan. This project will evaluate the efficacy of six organic herbicides on six common weed species in the North Central region. Results will evaluate organic herbicide efficacy and economic viability for adoption.