

## 2017 NCR-SARE Graduate Student Grant Proposals Recommended for Funding

Project #	Project Title	Grad Student Last Name	Major Professor Last Name	Primary Grantee	State	Requested	Cumulative	Systems	Commodity	Description
GNC17-235	Enhancing edge-of-field woodchip bioreactors to reduce nitrogen leaching using bioaugmentation and biostimulation	Anderson	Ishii	University of Minnesota	MN	\$11,929	\$11,929	Natural Resources/ Environment	Grain Crops	This study will reduce nitrate leaching from cropland through the enhancement of edge-of-field woodchip bioreactors. These bioreactors are a low-cost, low-maintenance method for reducing the flow of nitrates into surface waters by providing the means for biological nitrate reduction to nitrogen gas. This study will use two approaches to enhance nitrate removal: bioaugmentation, in which known denitrifying bacteria are introduced, and biostimulation, in which additional carbon is added to stimulate denitrification.
GNC17-236	Integration of poultry and cover crops for soil health in vegetable production	Bilenky	Nair	Iowa State University	IA	\$11,977	\$23,906	Integrated Crop & Livestock System	Vegetable Crops	The proposed project will investigate the impact of integrated production on crop and animal growth, soil health and economic feasibility. Project will test three different integrated vegetable-poultry crop rotation systems: two will be poultry-vegetable-cover crop rotation systems and one will be a traditional vegetable-cover crop rotation.
GNC17-237	Integrating weed and nutrient management in hop ( <i>Humulus lupulus</i> ) production using organic amendments	Butterfield	Wortman	University of Nebraska - Lincoln	NE	\$11,990	\$35,896	Crop Production	Other	Hop ( <i>Humulus lupulus</i> ) production represents a great opportunity for agricultural sector growth in Nebraska. However, there is limited information available to growers in the North Central region about sustainable management strategies for hops, including integrated weed and nutrient management with seed meal amendments.
GNC17-238	Understanding aphidophagous hoverfly winter survival strategies in Midwest farmscapes to improve conservation biological control	Clem	Harmon-Threatt	University of Illinois	IL	\$11,993	\$47,889	Pest Management	Vegetable Crops	As both pollinators and predators, hoverflies (Syrphidae) are among the most important beneficial insects in agricultural landscapes, yet most aspects of their biology are not well-understood. This research project will explore diapause and migratory winter-response strategies of hoverflies in Midwestern agricultural landscapes, and how they can be used to improve efficacy of conservation biological control of aphids, saving growers both time and money.
GNC17-239	Effect of landscape on migration of Japanese beetle into vineyards across Southern Wisconsin	Henden	Guédot	University of Wisconsin-Madison	WI	\$11,919	\$59,808	Pest Management	Small Fruits	This project will study how the composition of the surrounding landscapes, classified as high or low cropland, impacts levels of Japanese beetle migrating into vineyards across Southern Wisconsin, using isotopic analysis to determine if sampled beetles are migrant or resident to respective vineyards. The results are intended to be used by grape growers to assess risk to their crop based on surrounding landscape, and inform decisions about management of Japanese beetle.
GNC17-240	Unlocking wild wheat potential for enhancing water use efficiency and to sustain yield gains under extreme water-deficit and heat stress	Jayaram Shetty	Jagadish S V	Kansas State University	KS	\$11,984	\$71,792	Crop Production	Grain Crops	Exploring wild wheat accessions ( <i>Aegilops tauschii</i> and <i>Triticum dicoccoides</i> ) with superior rooting biology for enhancing water use efficiency and to introduce novel sources of terminal water-deficit and heat stress resilience into local popular varieties. The primary region of focus is western Kansas, but varieties or traits developed can be deployed across Ogallala aquifer jurisdiction, for conserving water and simultaneously increasing the economic status of the growers under harsher environments with limited water available conditions.

GNC17-241	Evaluation of early maturing cereal rye / hairy-vetch cover crop varieties and their effects on subsequent cash crop planting date, maturity and yield in organic no-till summer squash production	Keay	Pinero	Lincoln University	MO	\$11,703	\$83,495	Crop Production	Vegetable Crops	Newly developed, early maturing varieties of hairy vetch and cereal rye allow organic vegetable growers to achieve earlier planting windows in no-till systems. Aroostock rye and Purple Bounty hairy vetch, developed with the organic no-tiller in mind, are evaluated against common hairy vetch and cereal rye varieties to assess impacts on cover crop maturity date, cash crop planting and maturity date, and yield in a summer squash production system.
GNC17-242	Evaluating nitrate toxicity potential in grazed cover crops	Lenz	Drewnoski	University of Nebraska- Lincoln	NE	\$11,947	\$95,442	Integrated Crop & Livestock System	Beef	Most studies evaluating nitrate toxicity have fed cattle dry forages, but there are many aspects of grazing fresh forages which may mitigate the toxic potential of high nitrate forages. By using a survey approach and cooperating with multiple producers, this study will evaluate the concentration of nitrates in cover crops/annual forages being grazed and effects by measuring the methemoglobin levels in the blood with the ultimate goal of refining guidelines for the risk of toxicity.
GNC17-243	Understanding irrigation technologies and grower decision-making in the Wisconsin Central Sands	McNamee	Kucharik	University of Wisconsin-Madison	WI	\$11,882	\$107,324	Crop Production	Vegetable Crops	Irrigation scheduling and precision irrigation are potential strategies to reduce consumptive groundwater use in the Wisconsin Central Sands, simultaneously supporting highly valued aquatic ecosystems and surface waters while preserving the irrigated-agriculture economy. This project will evaluate the effectiveness of these irrigation strategies and improve understanding of grower irrigation decisions using a combination of on-farm field experiments, remote sensing, and interviews.
GNC17-244	Measuring Farmer Response to the Rate of Agricultural Innovation: Experimental Evidence from Michigan	Morgan	Mason	Michigan State University	MI	\$11,979	\$119,303	Economic/ Marketing	Grain Crops	Rapid innovation in U.S. agriculture requires farmers to make difficult decisions about whether and when to adopt new on-farm technologies. Despite gains in profitability and sustainability, high costs combined with uncertain benefits may drive farmers to delay the adoption of new technologies. Through an economic experiment and survey with Michigan farmers, this project will identify farmer behavioral responses to rapid innovation, explore farmer decision-making processes, and recommend strategies to increase the profitability of adoption decisions.
GNC17-245	Identification and pyramiding of candidate genes controlling adult plant resistance in oats against crown rust disease	Nazareno	Kianian	University of Minnesota	MN	\$11,999	\$131,302	Crop Production	Grain Crops	Breeding for host resistance is one of the most sustainable and cost-effective means to manage plant diseases. This project aims to develop advanced lines with pyramided resistance genes against oat crown rust for release as breeding germplasm.
GNC17-246	Lady beetle in the city: Does diet overlap explain patterns of Native Lady Beetle Abundance in urban farms and greenspaces?	Parker	Gardiner	The Ohio State University	OH	\$11,924	\$143,226	Natural Resources/ Environment	Vegetable Crops	Native lady beetles are an important group of urban agricultural predators, but in recent decades many have declined dramatically coinciding with introductions of exotic lady beetle competitors. I will determine if the degree of overlap in predator diet, a form of exploitative competition, explains why some native species have declined while others have remained common following exotic establishment. Using this information, we can manage greenspaces to both conserve native biodiversity and promote urban farm sustainability.

GNC17-247	Developing an Innovative Approach for Control of Billbug on Sod Farms	Patterson	Xiong	University of Missouri - Columbia	MO	\$11,154	\$154,380	Pest Management	Ornamentals & Turf	Damage from billbug encroachment has become an emerging issue on turf, especially zoysiagrass turf in Missouri and surrounding states. Billbugs spend most of their life either inside the stems or underneath the soil, which makes them difficult to reach with insecticides. The proposed project will examine a novel approach of mechanically sweeping (collecting) the billbug adults up from the surface of the turf during the evening hours when they are active.
GNC17-248	Entomopathogenic Nematode Control of the Asiatic Garden Beetle, <i>Maladera castanea</i> , in Corn	Pekarcik	Tilmon	The Ohio State University	OH	\$11,995	\$166,375	Pest Management	Grain Crops	Asiatic garden beetle is an early season pest of corn in specific regions of Indiana, Michigan, Ohio and Virginia, but there are no successful tactics for management this pest. This project will isolate insect-killing nematodes naturally occurring on farms in northwest Ohio and assess their efficacy as a biological control agent of Asiatic garden beetle in order to provide a sustainable, environmentally sound management tool for farmers affected by this pest.
GNC17-249	The Effect of Best Management Practices on Soil Health in Wisconsin: A Comparison of Soil Biological Measurements Using Long-Term Trials	Richardson	Ruark	University of Wisconsin-Madison	WI	\$11,906	\$178,281	Soil Management	Grain Crops	This project will measure the influence of farm management practices on soil biological nutrient cycling, a key component of soil health. We will draw from 5 long-term research trials in Wisconsin that represent the majority of farmland in the region and host a range of tillage, cover crop, nitrogen fertilizer, and crop rotation gradients. This will complement parallel on-farm research and support adoption of management practices verified to promote soil health.
GNC17-250	Assessing microbial communities of aqueous compost extracts and their effects on mulch and crop residue degradation	Samuelson	Wortman	University of Nebraska - Lincoln	NE	\$11,993	\$190,274	Soil Management	Vegetable Crops	Differences in compost microbial communities may influence degradation when compost is applied to residues as an aqueous extract. The aim of this project is to understand biological characteristics of compost as it relates to the impact of compost extract on promoting soil ecological function, chiefly residue degradation, in diverse agricultural soils.
GNC17-251	Optimizing between-bed management strategies in plasticulture vegetables for improved crop production and soil health	Tarrant	Hayden	Michigan State University	MI	\$12,000	\$202,274	Crop Production	Vegetable Crops	The goal of this study is to evaluate the systems-level effects of different between-bed management strategies for vegetables grown on plastic mulch. A better understanding of how various strategies—from bare cultivation to living cover crop mulches—influence weed control, nutrient retention, soil health parameters, crop yield and quality, labor, and production costs will enable farmers to make decisions best suited to their unique farm landscape and management goals to ensure farm and environmental sustainability.
GNC17-252	Assessing agroecosystem services and end-use malting quality of winter barley in a soybean-winter barley double cropping system in the Upper Midwest	Zhong	Smith	University of Minnesota	MN	\$11,986	\$214,260	Crop Production	Grain Crops	This project aims to investigate the agroecosystem services and end-use quality of winter barley in a winter barley-soybean double cropping system. Specifically, the project will study nitrogen sequestration, biomass accumulation, and end-use malting quality in a double cropping system with winter barley and soybean.