Alaska Division of Agriculture	Low-Cost Multispectral Mapping for Early Detection of Plant Stress	Corax, LLC will develop methods and quantify the utility of using drone imaging for early identification of crop stress. The goal of the project is to document low-cost methods that suit small scale Alaska agriculture and help producers respond more quickly to challenges within the short growing season. The project will focus on specialty crops which are typical Alaska crops (i.e., greens, brassicas, beets, peas, onion, rhubarb, carrots) using multispectral sensors and vegetation indices such as Normalized Difference Vegetation Index (NOVI). For the staple crop of potatoes, the project will additionally focus on developing an even lower cost method of VisualNOVI which does not require specialized sensors. The project results will be disseminated to stakeholders through events such as the annual SARE conference and/or a workshop for grower outreach through the Matanuska Experiment Farm and Cooperative Extension Service.	$13,529.50
Colorado Department of Agriculture	Expanding Potato Exports to Mexico	The Colorado Potato Administrative Committee will establish a potato promotion program in the interior of Mexico working with retailers and importers in Mexico. Working with our consultant in Mexico, G&G Gestoria en Comercio Exterior, we will partner with interested retailers to promote Colorado Potatoes through in-store displays, sample demonstrations, point of sale displays, recipe postcards, and posters. We will conduct market analysis to determine the best potential importer partners and provide them with point of sales material for their customers. This program will establish brand recognition for Colorado Potatoes in Mexico and increase the demand for Colorado Potatoes in Mexico.	$80,000.00
Colorado Department of Agriculture	Improved Irrigation Management for Sustainable Potato Production in Colorado	GeoVisual Analytics will help advance irrigation scheduling capabilities towards cost-effective, precise, and uniform water application, specific to potato farmers in the San Luis Valley but applicable to other Colorado specialty crops. GeoVisual will track scheduling recommendations, soil moisture measurements and crop conditions during field trials for a better understanding of crop irrigation needs in relation to actual applied amounts. This	$95,354.61

information will be used to identify and share with the grower community best-of-class technologies and practices to help drive water conservation and sustainable water use.

Idaho State Department of Agriculture	Enhancing the Competitiveness of Frozen, Dehydrated, and Fresh Idaho Potatoes in Mexico	The Idaho Potato Commission will focus on enhancing the distributor and partnerships relationships to ultimately increase consumption of Idaho potatoes, in all forms, throughout Mexico. This will be achieved by developing strategic partnerships with retailers and operators where program objectives will focus on increasing consumption and sales of the targeted Idaho potato product.	$159,500.00
Idaho State Department of Agriculture	Enhanced In-Season Nitrogen, Pest, and Irrigation Management for Idaho Potato Cropping Systems.	Idaho State University is seeking to improve the competitiveness of Idaho agronomists and potato growers by developing and implementing technology-based methods to improve in-season potato crop pest sampling, tissue sampling and soil moisture measurement practices in Idaho and subsequent data interpretations that drive in-season agronomic recommendations to improve environmental and economic sustainability outcomes.	$130,412.20
Idaho State Department of Agriculture	Developing Optimum Management Strategies for Bacterial Rot Diseases of Potato	The University of Idaho will develop best practices for the optimum management of bacterial rot diseases in potato caused by Pectobacterium and Dickeya species. This will be achieved by determining which bacterial species are present in Idaho potatoes and then designing species specific real-time PCR protocols for the most important pathogens. These assays will be used to develop a seed testing system and also to determine the relative importance of the individual sources of inoculum (seed, soil, water). The project results will be disseminated in grower meetings and field days.	$144,617.00

Maine Department of Agriculture, Conservation, and Forestry	Investigating Cultural Practices to Improve Integrated Pest Management Practices for Potato Viruses of Potato. (Year 2 of 3)	The Maine Potato Board will investigate the efficacy of cultural practices to reduce the incidence and spread of potato virus Y (PVY) and Potato Leafroll Virus (PLRV); specifically the practices of intercropping (mixed- species planting or nurse cropping), grain-seeded spray alleys to prevent potato plant damage and mechanical PVY infection, grain-seeded field borders as PVY buffers, and improved targeting and management of environmental inoculum provided by volunteer potatoes and solanaceous weeds. Project results will be shared with Maine potato producers through grower meetings, and through a written report on Integrated Pest Management Strategies for PVY in Maine.	$83,705.00
Maine Department of Agriculture, Conservation, and Forestry	Enhancing the Efficacy of Managing Soilborne Diseases in Potato Production through Integrated Soil Improvement	The University of Maine propose to conduct laboratory and field studies to identify the microorganisms responsible for accelerated degradation of fumigant and find a solution to remediate impaired soil. The outcome will be expected to improve soil fumigation and soil health. We will team up with potato extension specialist and plant pathologies. Data from these studies will aid in soil treatment and disease management. Information generated will be disseminated to stakeholders though field days, Maine potato conferences, Extension meetings and academic conferences.	$76,280.00
Michigan Department of Agriculture and Rural Development	Integrated Volunteer Potato and Colorado Potato Beetle Control for Sustainable Potato Production in Michigan	Michigan State University will conduct field studies to assess impacts of integrated volunteer potato and Colorado potato beetle (CPB) control on commercial potato production. This project will investigate new control options for volunteer potatoes and CPB in Michigan and includes partners that will create multi-disciplinary interactions (MSU Potato Specialist, Weed Scientist, Entomologist, and Pathologist) to form integrative solutions and make long-lasting contributions to the Michigan agricultural industry. The findings of this research will be disseminated to local, regional, and national stakeholders through extension and scientific meetings.	$100,000.00

Minnesota Department of Agriculture	Developing Variable Rate Nitrogen and Water Management Strategies for Sustainable Potato Production	This University of Minnesota project will develop and evaluate variable rate nitrogen and irrigation management strategies to increase nitrogen and water use efficiencies and reduce nitrate leaching losses to support sustainable potato production in Minnesota. The University of Minnesota is submitting this grant proposal to evaluate the potential benefits of variable rate nitrogen (N) and irrigation management in terms of potato tuber yield, quality, N and water use efficiencies, economic returns, nitrate-N leaching losses and develop integrated variable rate N and irrigation management strategies to support sustainable potato N management in Minnesota. Minnesota stands as the seventh potato-producing state in the country with 42,000 acres planted for potatoes in 2021.	$124,663.00
Minnesota Department of Agriculture	New Dual-purpose Potato Clone MN13142 with Long Dormancy: Extension Bulletin Development for Growers	This University of Minnesota project will improve potato production sustainability in the Midwest by adopting a new variety with improved tuber quality, long-term storage, and reduced chemical use. Certified seeds will be developed for commercial potential evaluation. The University of Minnesota is submitting this grant proposal to release a new potato variety for local fresh pack and organic potato growers. With increasing concern over the use of chemicals in our food supply, the potato industry must identify/develop cultivars with minimal or no chemical use	$124,978.00
Missouri Department of Agriculture	Fingerling Potato Production in Moveable High Tunnels	The University of Missouri will evaluate eight different cultivars of fingerling potatoes in both the hoop house and compared to in field production. There is tremendous interest in fingerling potato by consumers and the profitability is great for Missouri specialty crop growers.	$28,216.88

Montana Department of Agriculture	Sniffing Out PVY: Using Dogs to Detect PVY in Potatoes	Dogs have been trained to detect potato virus PVY and have demonstrated detection efficiency similar to laboratory methods. Montana State University proposes to evaluate dogs for their sensitivity of detection for PVY in postharvest potato test samples and early generation plantings of seed potatoes. For postharvest tuber samples, this project will have the dogs smell the samples and record the sample as positive or negative for PVY. Sniffing results will be validated in the Hawaii winter grow out and in the lab at MSU using Immunocapture RT qPCR. If the dog can reliably detect PVY in tuber samples, seed lots testing negative would not require further testing (postharvest grow out or lab testing) saving considerable expense to the farmer. For early generation potatoes, MSU will test the dog's ability to pre-screen clonal seed potato families before they are planted in the field. In this study, the sniffing results will be compared to visual inspection of the emerged plants for disease, followed by laboratory screening for PVY in leaves using Elisa.	$110,214.00
Montana Department of Agriculture	Building Specialty Crops Water Management Network (SCWMN) for Drought Resiliency in Montana	This project is to be carried out by an interdisciplinary research group at Montana State University and includes - the precision ag lab, seed potato lab, plant sciences and plant pathology, and MSU Western Agriculture Research Center. In this research, MSU proposes the development of a Specialty Crop Water Management Network (SCWMN) for MT using an irrigation decision support system (IDSS) based on time and cost-effective soil, canopy, and aerial reflectance (drones and satellite imagery) sensors. The IDSS will be a practical tool for growers to lower production costs, increase profit margins, and conserve water. Research results and management practices will be shared through publications and workshops.	$402,257.00

Nebraska State Department of Agriculture	Potato Cyst Nematode 2022	This project is designed to maintain Nebraska's Potato Cyst Nematode (PCN) pest-free status by the Nebraska Department of Agriculture (NDA) conducting comprehensive soil surveying throughout Nebraska to confirm the presence or absence of PCN in Nebraska. Maintaining Nebraska's PCN pest-free status requires official annual soil surveys of potato fields, to confirm the presence or absence of PCN in the state. This data makes it possible to certify potato products, particularly seed potatoes, for international trade. The cumulative years of data is beneficial in maintaining markets and opening new markets. Should PCN be found, survey data could be used to determine the extent of the infestation, and potentially mitigate the impact on trade.	$85,000.00
North Carolina Department of Agriculture and Consumer Services	Smart Farming Using Digital Diagnostic Sensors	Emerging plant diseases and pest outbreaks reduce crop production with serious economic implications for North Carolina growers. In this project, research scientists and extension specialists at NC State will work with extension, grower, and crop consultants to understand the pathogen biology of an emerging Phytophthora species attacking the tomato and potato. We have identified a Phytophthora infestans look-alike, P. nicotianae, as the cause of severe disease in some potato and tomato fields. This more heat tolerant Phytophthora species has emerged with climate change. We will use smartphone-based LAMP technology to deliver a cost effective molecular diagnostic assay to the field so that we can identify Phytophthora species that infect potato and tomato in NC more rapidly.	$101,593.00
North Dakota Department of Agriculture	Supporting Seed Potato Exports to Canada	The North Dakota Department of Agriculture (NDDA) will support exports of seed potatoes grown in North Dakota to Canada by conducting a survey of Potato Cyst Nematodes or PCN (Globodera pallida and G. rostochiensis). A survey showing field specific negative results for PCN is required for shipments of seed potatoes into Canada. Results will be disseminated to participating potato growers. NDDA will partner with North Dakota State Seed Department (NDSSD) to complete this project.	$79,925.00

North Dakota Department of Agriculture	Improving Management of Two Important Foliar Leaf Spotting Diseases of Potatoes Improving Management of Two Important Foliar Leaf Spotting Disease	Plant pathologists from North Dakota State University will conduct research to improve management recommendations for early blight and brown leaf spot of potato caused by Alternaria pathogens. Results from pathogen aggressiveness trials, fungicide efficacy evaluations and pathogen sequencing will increase our understanding of the brown leaf spot pathogen complex including the levels of SDHI fungicide resistance.	$197,715.00
North Dakota Department of Agriculture	Defining Verticillium on Tubers with Image Analysis During Bulking	North Dakota State University will develop improved grower recommendations, earlier diagnosis for Verticillium dahliae, and increase economic return by determining bulking rate of three russet potatoes. The purpose of this study is to understand the effects of planting dates on the develop of bulking rates and to define V. dahliae accumulation of Dakota Russet, Bannock Russet and Russet Burbank utilizing traditional laboratory methods and developing a new imaging analysis.	$141,392.00
North Dakota Department of Agriculture	Fumigation Effects on Carryover of Herbicides in Potato Production	North Dakota State University will determine the effects of fumigation on herbicide carryover in potato production systems. This project will determine the breakdown rate of herbicides when fumigated the fall after summer herbicide application. Research plots will be established to include different herbicides with and without fumigation. Soil samples will be taken and evaluated for herbicide residues to determine what effects fumigation has on the availability of these herbicides. Plants growth with be monitored and yield taken to be associated with soil samples.	$132,368.00
Oregon Department of Agriculture	Cultivating Seed Starting Champions! Driving Sales Of 50 Specialty Crops	The Oregon Potato Commission (OPC) will establish agreements with Oregon State University Extension (OSU), with OSU Food Hero leading this project and coordinating partners. This is a market access and development project rigorously designed to enhance the competitiveness of 50+ specialty crops through increasing child and adult nutrition knowledge and consumption of specialty crops by expanding access and sales at schools. Project activities will expand OSU's successful Grow This! social marketing campaign to strategically reach up to 60,000 youth across Oregon	$174,998.00

through curating and distributing (1) 500 Oregon Potato Champion classroom kits and (2) 1,500 Seed Starting kits.

Pennsylvania Department of Agriculture	Evaluate and Identify Early Fresh Market and Chipping Potato Varieties for Pennsylvania Growers	The Pennsylvania State University will cooperate with Pennsylvania Co-Operative Potato Growers, Inc. to conduct this project to evaluate and identify early season potato varieties with high qualities for early fresh market and for early chipping under Pennsylvania field conditions. We will select two to three potato varieties with high yielding, attractive appearance, and disease resistance for early fresh market and one to two varieties with high yielding, good chipping color out of field and disease resistance for early chipping market under Pennsylvania field conditions. These selected varieties will be recommended to all Pennsylvania potato growers and industry.	$74,592.00
Pennsylvania Department of Agriculture	Enhanced Preparedness Against Diverse Pathogens Threatening Specialty Crop Production and Markets	This proposal builds on a long-term partnership between Penn State and the Pennsylvania Dept. of Agriculture (PDA) Plant Disease Diagnostic Laboratory (PDDL) to enhance the state's preparedness against diverse pathogens. This project aims to carry out the following objectives: a) evaluate the risk of Phytophthora pathogens to specialty crops, b) characterize bacterial pathogens collected from tomato, potato, and pepper by PDA to determine their diversity and variation, c) optimize molecular diagnostic protocols for three regulated pathogens, and d) disseminate the resulting resources to diverse stakeholders via multiple channels.	$75,888.00
Virginia Department of Agriculture and Consumer Services	Field Pea Production for Virginia: An Emerging Market?	Diversifying Virginia's crop production sector is always a useful venture, especially when considering a late winter/early spring crop that will not directly interfere with other vegetables in production. The yellow field pea would be an ideal rotation host for crops that have high cyst nematode pressure (i.e., potato, soybean, etc.) as the field pea is not a nematode host, while many legume cover crops are nematode hosts. So, while we often plant legumes as cover crops, a non-nematode host legume that doubles as a soil protectant, offers the soil living roots over an	$74,970.92

otherwise fallow winter season, and fixes N from the atmosphere is a beneficial addition to the rotation. The Virginia Tech Eastern Shore Agricultural Research and Extension Center will work with farmers, Extension agents, and industry to validate the utility of growing yellow field pea in Virginia and will develop production recommendations for vegetable production guides, field days, and grower meetings.

Washington State Department of Agriculture	Biological Control of Insect Pests in Non-Crop Habitats	USDA will establish an agreement with WSDA to research the biological control of insect pests in non-crop habitats. Many insect pests reside much of the year on non-crop plants outside of commercial fields. Three such pests in Washington include potato psyllid and beet leafhopper, vectors of vegetable crop pathogens, and pear psylla, the primary pest of pears. This project will benefit pear growers, potato growers, and other vegetable or seed specialty crop growers in Washington State.	$248,699.00
Washington State Department of Agriculture	Preemptive Cultural Management Strategies to Maximize Potato Production Under Extreme Heat and Water Stress	Researchers at Washington State University propose research to clarify best practices around planting timing, plant spatial arrangement, and soil moisture management as it relates to production and plant health under stressful growing conditions. We propose to 1) identify preemptive cultural management strategies to maximize potato production under extreme heat and water stress and 2) Identify methods to assess in-season heat stress and it impacts on plant phenotype, yield, and postharvest quality. The recommendations and data developed for conditions with heat and water stress will be presented annually to the potato industry at the WA/OR Potato Conference, local workshops, and field days. This research will potentially benefit all potato growers and processors directly while creating novel research tools.	$249,980.00

Wisconsin Department of Agriculture, Trade and Consumer Protection	Alice In Dairyland Education And Promotion Of Wisconsin Specialty Crops	Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP) staff in the Division of Agricultural Development (DAD) will promote Wisconsin specialty crops using our most recognized agriculture spokesperson, Alice in Dairyland. Through this project, Alice in Dairyland will use her established social media channels, promotional videos, and presentations with developed educational materials. She will highlight our specialty crops in the state, such as cranberries, ginseng, Christmas trees, maple syrup, apples, honey, potatoes, pumpkins, lavender and more. We will partner with Wisconsin's Ag in the Classroom Program to provide STEM focused, hands-on lessons for students to develop an understanding of how these crops are grown and how to use them.	$99,306.00
Wisconsin Department of Agriculture, Trade and Consumer Protection	Refining Integrated Disease Management Strategies For Environmentally And Economically Sustainable Processing Vegetable Production In Wisconsin	The University of Wisconsin Madison Vegetable Pathology Research and Extension Program will collaborate with the Midwest Food Products Association, the Wisconsin Potato and Vegetable Growers Association, the Wisconsin Fresh Market Vegetable Growers Association, and the Wisconsin Muck Growers Association to enhance the production of healthy processing and fresh market vegetable crops by developing scientifically-based practical measures to mitigate diseases that are emerging or of contemporary and growing concern. Specifically, we will investigate varietal resistance and disease management strategies to reduce vegetable yield and quality losses in carrots, snap beans, and sweet corn. Results will be disseminated to stakeholders through grower meetings and field days.	$87,111.00
Wisconsin Department of Agriculture, Trade and Consumer Protection	Hyperspectral Imaging For Sustainable Nitrogen Management Of Vegetable Crops	The University of Wisconsin – Madison will promote environmentally and economically sustainable vegetable crop production by 1) validating previously developed biophysical/machine learning models for efficiently monitoring and predicting crop nitrogen status and yield potential, using hyperspectral imaging and on-farm data collected on multiple vegetable crops including potatoes, snap beans, kidney beans, and	$72,314.00

sweet corn; and 2) disseminating results to stakeholders to encourage adoption of remote sensing through extension/outreach activities including industry-focused workshops, grower meetings, field days, articles in trade journals, etc.