

## FY 2020 Annual Report of Accomplishments and Results

WYOMING
University of Wyoming Extension
University of Wyoming Agricultural Experiment Station

### I. Report Overview

The NIFA reviewer will refer to the executive summary submitted in your FY 2020 Plan of Work located in the Institutional Profile. Use this space to provide updates if needed.

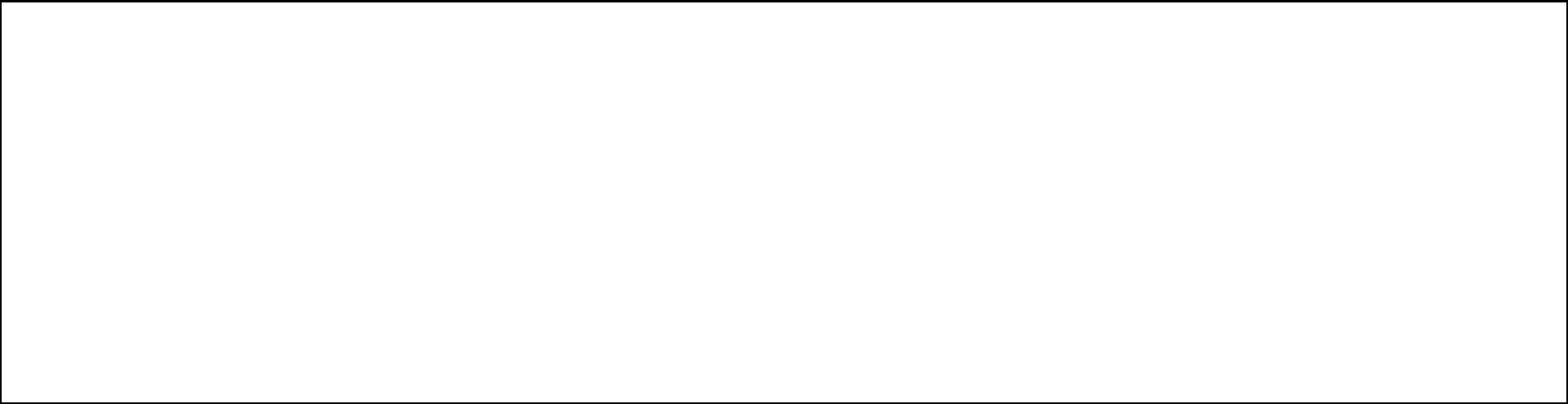
#### 1. Executive Summary (Optional)

The Wyoming economy has suffered significant loss of revenue due to reduced demand in the energy sector, and the economic situation has been exacerbated by the onset of the COVID-19 global pandemic. The University of Wyoming has been directly affected by ongoing statewide budget reductions resulting in faculty, staff, and program turnover and eliminations. The College of Agriculture and Natural Resources alone will face an additional 1.2 million dollars in annual cuts beginning in FY21—over 5% of our total state allocation.

Pandemic restrictions affected both research and extension programs. Research endeavors in the latter half of FY20 were severely curtailed, however, a research exception request process was implemented at the College and University levels allowing for continuation of mission critical research with strict COVID protocols. In March, all in-person Extension programs and activities were cancelled or pivoted to virtual delivery. Extension has used virtual platforms to conduct meetings for many years and that positively positioned us to also provide educational programs virtually. Examples of those educational efforts are highlighted in the annual accomplishment report.

The chart below highlights the number of programs taught and the participants reached in the critical issues.

Critical Issue	Number of Programs	Number of Adult Contacts	Number of Youth Contacts
Communities, Families and Youth (includes 4-H)	1,148	10,243	14,313
Community Socio-economic Prosperity	351	5,302	103
Human Health, Wellness and Nutrition	239	1,278	276
Natural Systems, Food and Fiber Production	137	6,838	215



## II. Merit and Scientific Peer Review Processes

The NIFA reviewer will refer to your 2020 Plan of Work. Use this space to provide updates as needed or activities that you would like to bring to NIFA's attention.

Process	Updates ONLY
1. The <u>Merit Review Process</u>	No update to report
2. The <u>Scientific Peer Review Process</u>	No update to report

### III. Stakeholder Input

The NIFA reviewer will refer to your 2020 Plan of Work. Use this space to provide updates as needed or activities that you would like to bring to NIFA's attention.

Stakeholder Input Aspects	Updates ONLY
1. Actions taken to seek stakeholder input that encouraged their participation with a brief explanation	No update to report
2. Methods to identify individuals and groups and brief explanation.	No update to report
3. Methods for collecting stakeholder input and brief explanation.	No update to report
4. A Statement of how the input will be considered and brief explanation of what you learned from your stakeholders.	No update to report

**IV. Critical Issues Table of Contents**

No.	Critical Issues in order of appearance in Table V. Activities and Accomplishments
1.	Communities, Families and Youth
2.	Community Socio-economic Prosperity
3.	Human Health, Wellness and Nutrition
4.	Natural Systems, Food and Fiber Production
5.	
6.	
7.	

**V. Activities and Accomplishments**

Please provide information for activities that represent the best work of your institution(s). In your outcome or impact statement, please include the following elements (in any order): 1) the issue and its significance (e.g. who cares and why); 2) a brief description of key activities undertaken to achieve the goals and objectives; 3) changes in knowledge, behavior, or condition resulting from the project or program’s activities; 4) who benefited and how. Please weave supporting data into the narrative.

No.	Project or Program Title	Outcome/Impact Statement	Critical Issue Name or No.
1.	<b>Civic Health</b>	<p>Examples of Extension programs in Civic Health include board trainings, leadership programs for community leaders, engaging youth in leadership programs and community service, and facilitation of public issues. Educators reported 566 individuals adopted best practices to increase civic engagement.</p> <p>In partnership with the Wyoming Business Council, University of Wyoming Extension educators, worked with communities to identify community</p>	Communities, Families and Youth (1)

2020 Annual Report of Accomplishments and Results (AREERA)

		<p>needs, build community capacity, and provide resource information to address community needs. Two hundred and sixty-two (262) individuals in three communities were engaged in the community review. Community strengths, opportunities and aspirations were identified for each community. Additionally, each community reached agreement about community priorities and economic development opportunities. Through working groups, participants identified actionable plans to address the community needs. Individual participants gained a greater understanding and appreciation for community engagement in community decision making. Participants also increased their skills in working in a group setting and gained a greater understanding of facilitation techniques through the strategic planning experience.</p>	
<p><b>2.</b></p>	<p><b>Peer educators teach relationship workshops</b></p>	<p>Romantic relationships have a significant impact on individual well-being and family stability. A concerning trend is that both perpetration and victimization of relationship violence peak during emerging adulthood. Prevention approaches aim to reduce negative attitudes and behaviors before they become established patterns in young adults. The majority of young adults are unmarried with the average age of marriage now 29 for men and 27 for women. Educating young adults (18-25) is important for preventing negative patterns in committed relationships and eventually marriages. During 2018-2020, undergraduate social science students enrolled in a service-learning course called Relationship Education and Leadership. These students were trained as peer educators to provide educational content about romantic relationships. Seventeen undergraduate peer educators taught a four-session workshop series to 102 University of Wyoming students. Pre- and post-program surveys indicated that the participants' knowledge of relationship topics improved from before to after the program. For instance, participants had improved</p>	<p>Communities, Families and Youth (1)</p>

2020 Annual Report of Accomplishments and Results (AREERA)

		<p>knowledge of healthy communication, greater awareness of warning signs of abuse, and increased understanding of how family background can influence romantic relationships. Participants reported high satisfaction with the program with 85% reporting high satisfaction, 82% stating they would recommend it to a friend, and 67% reported that the program exceeded their expectations.</p>	
<b>3.</b>	<b>Mediation</b>	<p>Mediation programs involve specific mediation between individuals as well as educational programs for groups such as Deliberative Dialogue: A House Divided. Two hundred and twenty-eight (228) individuals benefited from mediation programs. Extension educators teach and provide coaching during role plays in several sessions of the Mediation Certification Program offered by the Wyoming Department of Agriculture. Sixty-seven (67) participants completed a recent Mediation Certification Program. The following changes were reported in the evaluation: 100% of the respondents indicated their understanding of conflict style improved; 82% indicated their ability to communicate in conflicts improved considerably; 18% indicated a slight improvement.</p>	Communities, Families and Youth (1)
<b>4.</b>	<b>Niobrara County 4-H STEAM Fridays</b>	<p>The Niobrara County School District moved to a four-day school week for all students, kindergarten through twelfth grade in fall of 2019. This coupled with a lack of state inspected childcare facilities in the community created a need a safe place for youth to gather during the non-school hours. The Niobrara County Extension Office, both Nutrition and Food Safety and 4-H teamed up with 4-H Volunteers, Niobrara County Homemakers and other community partners to offer a hands-on STEAM (science, technology, engineering, art and math) activity each Friday morning throughout the school year. Any school-aged youth was invited and encouraged to participate. The topics provided experiential, hands-on interactive learning of lifelong skills such as leadership development, food</p>	Communities, Families and Youth (1)

		<p>safety, food science and preparation, career exploration, math and problem-solving skills. Additionally, the youth were able to participate in service-learning opportunities to encourage a lifetime of community service participation.</p> <p>With the COVID pandemic, STEAM Fridays moved to a virtual platform utilizing Facebook Live in March. The kids watched in real-time and then posted or emailed pictures of themselves completing the projects at home. Many watched the recordings when it was convenient for them. In 2019-2020 a total of 51 youth were reached, representing 32 families over 29 sessions. At the end of the school year, an evaluation was e-mailed to each family. When asked what they liked most about 4-H STEAM Fridays, the top three were activities, content and food. One parent noted, <i>“These 4H Fridays are an invaluable asset for kids, parents, and the community; for a few hours they provide activities for kids when parents/kids need alternative methods and variety for daily activities (like childcare, peer-to-peer contact, school-like structure. or recreation); they aren't required; go with other 4H activities outside of the 4H Fridays; and they re-enforce healthy habits, etc. The benefits are endless. Many kids (like in our household) do well in school, and instead of going to Enrichment Fridays (school-related activities at school during the same time frame as 4H Fridays) they can go to 4H Fridays. Multiple choices for all. They’re fun learning activities. Please continue them.”</i> Another parent notes <i>“My family is very grateful for what 4H offers our community. I absolutely love the staff and volunteers.”</i></p>	
<p>5.</p>	<p><b>Soil amendment impact on heavy metal contamination in urban garden soils</b></p>	<p>The cultural, ecological, and health benefits of gardening are well-documented, and gardens are especially important in urban areas, where gardening can play a critical role in food access and community-building. However, these benefits must be balanced with increased risk of exposure</p>	<p>Community Socio-economic Prosperity (2)</p>



		<p>to pollutants that are common in city spaces, especially toxic heavy metals. This project examined the concentration of the heavy metals lead and cadmium in 25 urban gardens in Laramie, Wyoming, along with how soil amendments influence the bioavailability of these heavy metals. The levels of lead and cadmium observed do not pose significant health risks to humans or crops, although significant differences in available cadmium based on historical land use were evident, with agricultural/rangeland soils containing greater amounts of available cadmium than residential- or community-gardens. This pattern may be due to repeated additions of soil amendments in residential and community gardens, which are known to lower soil pH, and in turn, reduce soil cadmium availability. However, high soil lead concentrations may not be alleviated by adding soil amendments; instead, soil lead availability and plant uptake may be enhanced. Finally, low gardener awareness of potential soil contamination indicates the need for improved community outreach and more robust soil testing.</p>	
<p>6.</p>	<p><b>Counties of Wyoming Handling Ag Disasters (COWHAND)</b></p>	<p>Wyoming resources for disaster response are limited. A massive percentage of Wyoming landscape, industry and rural community vitality is tied to the livestock industry. Knowledge of disaster resources, development of disaster plans, and effective decision-making strategies prepare individuals, families, and communities to mitigate potential disasters and engage appropriate responses to reduce their vulnerability to disasters. Ten (10) programs on the topic of disaster mitigation reached 257 individuals.</p> <p>Collaborative efforts with UW Extension, State Veterinarians, State Livestock Board and USDA Veterinarians provided an opportunity to enhance livestock &amp; agriculture emergency and disaster resilience in Wyoming. Twenty individuals (20) representing law enforcement, brand inspectors, veterinarians, emergency managers, and agriculture producers participated in the COWHAND program. The program was offered twice in</p>	<p>Community Socio-economic Prosperity (2)</p>

2020 Annual Report of Accomplishments and Results (AREERA)

		Wyoming, and participants learned protocols for responding to disease outbreaks and transportation accidents including use of containment equipment, sanitation guidelines, euthanasia guidelines and legal parameters for response and ownership verification. As a result of the program six counties now have livestock response corrals and chutes available and three additional counties are in the planning stages for equipment. Additionally, county emergency managers in 10 counties have hosted training for agriculture response. Most importantly, livestock emergency response time has been reduced from 1.5 hours to 50 minutes.	
7.	<b>Industrial Hemp Basics</b>	<p>Diversification of crops and outputs will bring economic value and sustainability to Wyoming farmers. Extension educators indicated 23 producers reported growing a multitude of crops impacting 2,581 acres.</p> <p>Interest in industrial hemp has increased as an opportunity for crop diversity. One hundred and sixteen (116) individuals participated in 4 programs on industrial hemp basics. Participants increased their knowledge of industrial hemp, different product markets for hemp and untruths about the hemp production.</p>	Community Socio-economic Prosperity (2)
8.	<b>Wind River 4-H COVID Care Packages and Green Cover LIVE</b>	During the beginning months of COVID March through June, the Wind River Indian Reservation was on a stay-at-home order. They could only leave their homes for food and medical attention. Every week, the Extension educator put together care packages for the 61 Native American 4-H youth and others who requested them. The care packages included a craft, stem activity, a physical activity, ingredients, and recipe the youth could prepare and share with their families. Partnering with the Cent\$ible Nutrition educator and with approval of the Northern Arapaho and Eastern Shoshone Tribal Councils, care packages were delivered to the doorsteps of each family. Although, the exact impact was not formally measured, the educator received requests from families asking to be included in the care	Human Health, Wellness and Nutrition (3)

		<p>packages for their kids. She also received phone calls and notes thanking her for the packages.</p> <p>As school resumed in the fall, the school district provided each home with a hot spot to access internet. As a result, Green Clover LIVE was introduced to supplement the 4-H COVID Care Packages. Green Clover LIVE focused on the health of the youth on the Wind River Indian Reservation with weekly live zoom calls featuring healthy eating, ways to deal with stress, and opportunities to see and visit with peers. Supplies for each program continued to be packaged and delivered to participants. Between 18 and 22 4-H members join the Green Clover LIVE calls weekly. Parents shared that their children look forward to Fridays just so they can get on the Green Clover LIVE calls. Another parent shared that their child’s favorite part was being able to create a snack to share with the family and that they are proud to be able to help at home.</p>	
<p>9.</p>	<p><b>Cent\$ible Nutrition Program for Adults</b></p>	<p>Food insecurity is an issue faced by many Wyoming families. From 2015 to 2017, 13.2% of Wyoming households were food insecure, with 5.1% of households reporting very low food security. Additionally, Wyoming has not been immune to the obesity epidemic affecting the country. Wyoming overweight and obesity rates have remained high in the past several years.</p> <p>Adult participants enroll in a series of lessons in the Cent\$ible Nutrition Program. Eighty-eight (88) percent of enrolled adults are below 125% of poverty; 99.8% of enrolled adults are below 185% poverty. The Cent\$ible Nutrition Curriculum was updated in 2019/20 to include 8 lessons designed to fit participants’ needs. The core elements include food preparation, food safety, food resource management, basic nutrition, menu planning, and physical activity. Seven hundred and forty-four (744) adults completed the evaluation and reported the following outcomes:</p>	<p>Human Health, Wellness and Nutrition (3)</p>

2020 Annual Report of Accomplishments and Results (AREERA)

		<ul style="list-style-type: none"> <li>• 81% showed improvement in one or more food resource management practices.</li> <li>• 31% improved in having enough to eat more often.</li> <li>• 27% improved in having enough money for food.</li> <li>• 95% showed improvement in one or more nutrition practices.</li> <li>• 84% showed improvement in one or more food safety practices.</li> <li>• 75% reported an increase in physical activity.</li> </ul>	
10.	<b>Cent\$ible Nutrition Program for Youth</b>	<p>Grazing with Marty Moose is a curriculum designed for youth in 3<sup>rd</sup> to 5<sup>th</sup> grades. It includes 5 lessons which focus on eating healthier and physical activity. Four hundred and eighty-two (482) youth graduated from Grazing with Marty Moose. The following indicators showed an improvement as reported by the students:</p> <ul style="list-style-type: none"> <li>• How often do you drink fruit flavored or sports drinks? 41% improvement</li> <li>• How often do you drink soda or pop? 38% improvement</li> <li>• How often do you eat vegetables? 43% improvement</li> <li>• How often do you eat fruits? 36% improvement</li> <li>• How often do you do physical activities? 37% improvement</li> <li>• How long do you usually do physical activities? 42% improvement</li> </ul>	Human Health, Wellness and Nutrition (3)
11.	<b>Fresh Produce Donations from the Farmers Market to the Food Pantry</b>	<p>According to Feeding America, 11.7% or 11,440 people in Laramie County were food insecure in 2018. The onset of the novel coronavirus pandemic exacerbated food insecurity issues for previously at-risk families as well as families experiencing financial hardship for the first time. While the number of families experiencing food insecurity in Laramie County was climbing, the ability of local organizations to provide food was diminished because of restrictions on in-person contacts. Laramie County Extension employees partnered with the Cheyenne Rotary After Hours Club to coordinate weekly food distributions through Needs. Inc. For the 10 weeks</p>	Human Health, Wellness and Nutrition (3)

2020 Annual Report of Accomplishments and Results (AREERA)

		<p>of the Saturday Farmers’ Market, a representative from each organization assisted and oversaw the gathering and delivery of the donated produce. Additional volunteers helped gather and load produce, clean up debris, and help unload produce. Nine thousand, five hundred and eighteen (9,518) pounds of produce was donated. The donations to Needs Inc. through this partnership significantly increased the amount of fresh produce provided to Laramie County families. As a result of these efforts, 75 families (approximately 1, 875 people) received a box of donated produce each week.</p>	
<p><b>12.</b></p>	<p><b>Ranching through COVID-19: Because Ag is Essential</b></p>	<p>Through the spring of 2020 an unprecedented global pandemic emerged causing many businesses and agencies to shift to remote work. However, agricultural enterprises continued due to their very nature. Collaborating with the Wyoming Stock Growers Association, Extension educators and specialists identified the unique health concerns, restrictions, and altered public services and associated impacts for ranchers. Videos were developed that had a timely relevance to the ranching community. The videos focused on grazing management and how to coordinate with federal agencies on public grazing allotments, brandings and coronavirus safety, finding coronavirus research that is credible and trustworthy, toxic plants which are often a problem beginning in the spring and forage testing. As of January 2021, there were 450 views of the series. The most viewed episode was “Branding and Coronavirus Safety” which had 200 views and relied upon guidelines promoted by the Wyoming Stock Growers Association. This episode was of high importance because of the social nature of brandings which created a situation where ranchers and employees could be at the most risk of exposure for coronavirus. Brandings are often multigenerational with family and friends traveling from out of town to help. Feedback from social media was encouraging as</p>	<p>Natural Systems, Food and Fiber Production (4)</p>

		<p>shown in one comment from the UWE Facebook page that stated: <i>“Good guidelines. Oldest person at our branding this year was 51. It took 14 people, but we did try to give each other space. About half wore masks”</i>. The videos can be viewed on the University of Wyoming YouTube channel: <a href="https://youtube.com/playlist?list=PLBNu1peKp1UgdRUtd-drX-9vrUkkl62td">https://youtube.com/playlist?list=PLBNu1peKp1UgdRUtd-drX-9vrUkkl62td</a></p>	
<p>13.</p>	<p><b>Barnyards and Backyards LIVE! Small Acreage Outreach Project</b></p>	<p>Wyoming and the Western United States in general have undergone a very rapid shift in land use. Thousands of acres of former ranch, farm or wildlands have and are being subdivided into small acreage parcels. In Wyoming, approximately 35,000 small acreage landowners own 5-160 acres. Cumulatively they own 1,258,500 acres in Wyoming. To provide education to small acreage landowners and residents, the UW Extension Small Acreage Coordinator and the UW Extension educators developed a series of virtual live shows. The team produced 35, one-hour shows using the zoom webinar platform because it provided a structured environment for the show, could be broadcasted simultaneously on Facebook Live, and allowed for interaction with program participants. Each show featured a guest speaker and program hosts for a casual conversation on a range of topics including Soils for Successful Vegetable Gardens; Grazing Small Acreages; The Ins and Outs of Pasture Irrigation; Wyoming Pollinators; and Game Meat – Safety and Processing. Two thousand, two hundred and seventy-two (2,272) individuals participated in the live programs representing individuals who lived in town, on small acreages and on ranches. One hundred and fifty-two (152) individuals completed the online survey about Barnyards and Backyards Live! Twenty-six (26) participants indicated their level of knowledge prior to the show as “much or a great deal”. Following the show, 113 participants indicated their level of knowledge as “much or a great deal”. One hundred and twenty-three (123) of the participants indicated they would use the information to</p>	<p>Natural Systems, Food and Fiber Production (4)</p>

		<p>change what they did on their property. Additionally, each program was recorded and made available on the UW Extension YouTube Channel. One thousand, nine hundred and eighty-three (1,983) individuals have watched these recorded programs.</p> <p><a href="https://www.youtube.com/user/BandBWY/channels">https://www.youtube.com/user/BandBWY/channels</a></p>	
14.	<b>Russian olive biological control</b>	<p>A University of Wyoming entomologist, along with collaborators from Canada and Switzerland, has been working to facilitate biological control of Russian olive, an invasive tree from southeastern Europe and Asia that has proliferated widely across the inland West displacing native species. Russian olive has spread from intentional plantings—windbreaks and suburban yards—to river bottoms and pastures, where it impacts native plants, birds and insects, reduces recreational access to water, and limits livestock grazing. Biological control, one of the cornerstones of invasive weed management, involves importing natural enemies from a weed’s native range. Investigators are seeking to import an Eastern European natural enemy of Russian olive—the mite <i>Aceria angustifoliae</i>, which forms galls on the tree’s flower buds and developing seeds. To this end, the investigators compiled information on the biology of the mite and Russian olive and submitted documentation to the U.S. Department of Agriculture to inform and help guide the approval process. Reviewers with USDA have recommended that the mite be approved for importation, and after completion of the permitting process, the investigators expect that <i>Aceria angustifoliae</i> will become a valuable tool to prevent the spread and impact of Russian olive.</p>	Natural Systems, Food and Fiber Production (4)
15.	<b>Subclinical mastitis and production efficiency</b>	<p>Increasing global demand for livestock products is occurring at the same time livestock production is being threatened by urbanization, drought conditions, variable markets, and policy pressures, as well as the effects of animal disease. Research at the University of Wyoming, Montana State</p>	Natural Systems, Food & Fiber Production (4)

		<p>University, and the United States Sheep Experiment Station, estimates the incidence of subclinical mastitis (inflammation of the mammary gland) in sheep to be between 11% and 74% of ewes—much greater than previously thought. A decrease in lamb performance of up to 35 pounds per litter when reared by ewes with subclinical mastitis was also shown, representing an economic loss of up to \$106 per ewe. Ongoing research at the University of Wyoming has discovered that the microbial ecology of the mammary gland throughout lactation is an important factor for understanding this disease and follow-up investigations of these microbial communities seek to identify the extent and duration of the negative impacts on lamb performance.</p>	
<p><b>16.</b></p>	<p><b>Narrow rows may improve dry bean yields</b></p>	<p>University of Wyoming crop researchers in Wyoming’s Bighorn Basin routinely seek new management practices to help increase producer profits. In a three-year dry bean project examining seeding rates, we identified a management practice that could improve producer profit. Typically, producers in this region grow their dry bean crop in 22-inch rows and plant about 100,000 seeds per acre. In this study, multiple bean varieties were tested at seeding rates of 50,000 to 120,000 seeds per acre. Each variety was also grown in 7-inch rows as well as the standard 22-inch rows, and at three different irrigation rates. Not surprisingly, narrow rows consistently outyielded wider rows independent of irrigation rate. A surprising finding, however, was that seeding rates at 50,000, or sometimes even lower, showed yields that were competitive with yields from the higher seeding rates. These results suggest that narrow rows combined with a modest seeding rate may help producers reduce seed costs with little or no loss in yield.</p>	<p>Natural Systems, Food &amp; Fiber Production (4)</p>



2020 Annual Report of Accomplishments and Results (AREERA)

<b>OPTIONAL Youth Development Expenditures (dollars)</b>	
State and/or Institution:	FY 2020 Expenditures (\$)
1862 Smith-Lever	
1890 Extension	