



Agricultural Marketing Service

U.S. DEPARTMENT OF AGRICULTURE

AWARD YEARS 2021 AND PRIOR

This annual Performance Progress Report (PPR) must illustrate the progress made toward the completion of your project. If this project is completed at the time of the annual PPR submission, the project report should be marked as final. Please note character limits (abbreviated "char.") throughout.

PROJECT INFORMATION

Project Title (250 char.)	Increasing the Competitiveness of South Dakota Grown Specialty Cut Flowers through Season Extension
Organization Name (250 char.)	Stems LLC
Project Start Date	09/30/2021
Project End Date	09/29/2024

ORGANIZATION POINT OF CONTACT

Full Name	Sienna Wegehaupt
Phone Number	(605) 206-0606
Email Address	sienna.wegehaupt@gmail.com

BACKGROUND INFORMATION

PROJECT PROGRESS

Please provide the total percentage of work completed on the project.	100%
Is this a final report? Please select the box to the right if the answer is "yes".	☐

OBJECTIVE(S) (REQUIRED)

Please provide the approved project's objectives from the accepted project plan. Use the boxes to indicate if the objective is in progress, has been completed, or is not (and will not be) completed. At the final report, if "no" is selected for any of the listed objectives, you must expand upon this in the Challenges and Developments Section. Additional objectives may be added as needed.

+	#	Objective (2,000 char.)	Objective Completed?
-	1	Determine varieties well-suited for season extension through trials.	Yes
-	2	Determine certain cultivars that have been bred for early or late season extension conditions.	Yes
-	3	Determine season extension techniques and structures that are profitable, attainable, and well-suited to South Dakota and that separately or in combination achieve four months of extension.	Yes

-	4	Create a printable, shareable, clear & concise template schedule for annual production and growing calendar suggestions.	Yes
-	5	Transfer this knowledge to local cut flower and market garden producers through publications, conferences, and other outreach efforts.	Yes

OUTCOMES

Please only report on the outcomes and indicators that are selected and approved for this project. Use the check boxes to indicate which outcomes and indicators are selected. Select the "N/A" box for any indicators that are not applicable.

1. ENHANCE THE COMPETITIVENESS OF SPECIALTY CROPS THROUGH INCREASED SALES	☐
2. ENHANCE THE COMPETITIVENESS OF SPECIALTY CROPS THROUGH INCREASED CONSUMPTION	☐
3. ENHANCE THE COMPETITIVENESS OF SPECIALTY CROPS THROUGH INCREASED ACCESS AND AWARENESS	☐
4. ENHANCE THE COMPETITIVENESS OF SPECIALTY CROPS THROUGH GREATER CAPACITY OF SUSTAINABLE PRACTICES OF SPECIALTY CROP PRODUCTION RESULTING IN INCREASED YIELD, REDUCED INPUTS, INCREASED EFFICIENCY, INCREASED ECONOMIC RETURN, AND/OR CONSERVATION OF RESOURCES	☒

Please provide the numbers of plant/seed releases (e.g., cultivars, drought-tolerant plants, organic, enhanced nutritional composition, etc.) for this reporting period.

Indicators	Value	N/A
1. Number of plant/seed releases		☐

Please select the applicable indicators and provide data for the adoption of best practices and technologies resulting in increased yields, reduced inputs, increased efficiency, increased economic return, and conservation of resources for this reporting period.

Indicators	Value	N/A
2.a. Number of growers/producers indicating adoption of recommended practices		☐
2.b. Number of growers/producers reporting reduction in pesticides, fertilizers, water used/acres		☐
2.c. Number of producers reporting increased dollar returns per acre or reduced costs per acre	1	☐
2.d. Number of acres in conservation tillage or acres in other best management practices		☐

Please provide the total number of adults reached and select the applicable indicators for this reporting period.

Indicators	Value	N/A
3. Number of habitat acres established and maintained for the mutual benefit of pollinators and specialty crops		☐

5. ENHANCE THE COMPETITIVENESS OF SPECIALTY CROPS THROUGH MORE SUSTAINABLE, DIVERSE, AND RESILIENT SPECIALTY CROP SYSTEMS	☒
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Please provide data for the applicable indicators for this reporting period.

Indicators	Value	N/A
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Indicators	Value	N/A
1. Number of new or improved innovation models (biological, economic, business, management, etc.), technologies, networks, products, processes, etc. developed for specialty crop entities including producers, processors, distributors, etc.	1	☐
2. Number of innovations adopted		☐
3. Number of specialty crop growers/producers (and other members of the specialty crop supply chain) that have increased revenue expressed in dollars		☐
4. Number of new diagnostic systems analyzing specialty crop pests and diseases		☐
5. Number of new diagnostic technologies available for detecting plant pests and diseases		☐
6. Number of first responders trained in early detection and rapid response to combat plant pests and diseases		☐
7. Number of viable technologies/processes developed or modified that will increase specialty crop distribution and/or production		☐
8. Number of growers/producers that gained knowledge about science-based tools through outreach and education programs	60	☐

6. ENHANCE THE COMPETITIVENESS OF SPECIALTY CROPS THROUGH INCREASING THE NUMBER OF VIABLE TECHNOLOGIES TO IMPROVE FOOD SAFETY ☐

7. ENHANCE THE COMPETITIVENESS OF SPECIALTY CROPS THROUGH INCREASED UNDERSTANDING OF THREATS TO FOOD SAFETY FROM MICROBIAL AND CHEMICAL SOURCES ☐

8. ENHANCE THE COMPETITIVENESS OF SPECIALTY CROPS THROUGH ENHANCING OR IMPROVING THE ECONOMY AS A RESULT OF SPECIALTY CROP DEVELOPMENT ☐

ADDITIONAL APPROVED OUTCOME (IF APPLICABLE) ☐

OUTCOME REMARKS (REQUIRED)

Please explain any quantifiable results, along with an update on their progress and data collection efforts for each of the outcomes and indicators selected in the accepted project plan. It is understood that the results may not yet be final at the time that this report is submitted; however, please provide an update on progress to date. If you do not have any data on the indicator(s) listed above, you must explain why in this section. (2,000 char.)

4, 2.c. - Monthly flower producer meetings have allowed networking and dissemination of information about season extension techniques and what is working/not working as well as variety selection suggestions. Attending various field days, conferences, and events have allowed me to disseminate information effectively. Good feedback has been received about the quality and usefulness of the publication.
5, 8. - 60+ South Dakota growers/producers have been engaged on knowledge about trialed season extension findings along with 10+ out of state growers/producers.
5, 1. - The full model and template annual schedule has been finalized for specialty crop producer dissemination and has been distributed through physical copies and a digital publication. Digital publication attached as a PPR.

NARRATIVE

ACCOMPLISHMENTS (REQUIRED)

If this is an annual report, list your accomplishments for this reporting period. If this is a final report, your accomplishments should be cumulative and include all accomplishments previously reported on and updated to include activities conducted this past reporting period. Indicate how these accomplishments associated with each of your project's objective(s), outcome(s), and/or indicator(s). This listing should identify your project's partners and their contributions. Additional accomplishments can be added as needed.

+	#	Accomplishment (1,200 char.)	Related to (Objective/ Outcome)
-	1	Operated ventilation of high tunnel through growing season.	Objective 3: Determine season extension techniques and structures that are profitable, attainable, and well-suited to South Dakota and that separately or in combination achieve four months of extension. Cyclical operation of structure to protect and insulate plans for season extension.
-	2	Removed black plastic fabric templates from high tunnel.	Objective 3 Determine season extension techniques and structures that are profitable, attainable, and well-suited to South Dakota and that separately or in combination achieve four months of extension. Black plastic fabric in previous season was found to heat the ground too much & was therefore removed to give plants better survival rates.
-	3	Installed and then removed spacing netting templates in high tunnel.	Objective 3 Determine season extension techniques and structures that are profitable, attainable, and well-suited to South Dakota and that separately or in combination achieve four months of extension. In place of black plastic fabric templates, a netting was used for spacing plants correctly and support. This was later removed and is determined to not be as successful or beneficial. Plant spacing can be achieved in other ways without the cumbersome netting.
-	4	Installed more irrigation in high tunnel.	Objective 3 Determine season extension techniques and structures that are profitable, attainable, and well-suited to South Dakota and that separately or in combination achieve four months of extension. Irrigation was expanded within high tunnel to cool and water plants more efficiently than in previous season. Additional irrigation lines were added in subsequent season.

-	5	Researched varieties well-suited for season extension and expanded selections.	Objective 1 Determine varieties well-suited for season extension through trials. Choosing correct plants for our zone and also ones slightly outside to try to extend season. Expanded selections to include more perennial or semi-perennial options.
-	6	Continued to note significant events and work on a calendar	Objective 4 Create a printable, shareable, clear & concise template schedule for annual production and growing calendar suggestions. Record-keeping.
-	7	Continued outreach to local flower growers during monthly calls	Objective 5 Transfer this knowledge to local cut flower and market garden producers through publications, conferences, and other outreach efforts. Shared knowledge, outreach, gain information for others as well.
-	8	Acquired, seeded, transplanted varieties well-suited for season extension through seeds, bulbs, corms, and plugs	Objective 1 Determine varieties well-suited for season extension through trials. Objective 2 Determine certain cultivars that have been bred for early or late season extension conditions. Steps for planting.
-	9	General maintenance of high tunnel structure in addition to fabric securing, fencing, irrigation, other necessary systems	Objective 3 Determine season extension techniques and structures that are profitable, attainable, and well-suited to South Dakota and that separately or in combination achieve four months of extension. Side walls, louvers, and doors must be opened and closed continuously. Care for the structures vents, fans, ropes, fasteners. Adjust automatic venting for more automation.
-	10	Photograph and document steps and procedures	Objective 4 Create a printable, shareable, clear & concise template schedule for annual production and growing calendar suggestions. Record-keeping
-	11	Stay informed of conference dates to plan ahead for attendance	Objective 5 Transfer this knowledge to local cut flower and market garden producers through publications, conferences, and other outreach efforts. Future planning/scheduling

-	12	Utilized and placed/uncovered plants with frost cloth protection.	Objective 3 Determine season extension techniques and structures that are profitable, attainable, and well-suited to South Dakota and that separately or in combination achieve four months of extension. Placing and removing multiple layers of frost cloth protection during spring months to protect plans and corms from freezing night temperatures.
-	13	Completed earthwork trenching for bulb planting	Objective 2 Determine certain cultivars that have been bred for early or late season extension conditions. Preparation for spring testing. One interesting aspect of season extension is that there is less of one season followed by another. The spring preparation begins before the extended version of the fall season is complete. Planning and field layout for crops while there are still crops in the ground has proved to be a challenge.
-	14	Planted bulbs.	Objective 2 Determine certain cultivars that have been bred for early or late season extension conditions. Crops for season extension.
-	15	Tended to and harvested flowers.	Objective 1 Determine varieties well-suited for season extension through trials. Crops for spring/summer/fall
-	16	Planted late summer flowers for fall growing.	Objective 1 Determine varieties well-suited for season extension through trials. Crops for fall
-	17	Compiled recorded information into a printable and digital publication that is graphically appealing and easy to share.	Objective 4 Create a printable, shareable, clear & concise template schedule for annual production and growing calendar suggestions. Created a printed publication, printed copies, and created a digital publication hosted online with QR code and short links.
-	18	Shared research findings and digital publication through cut flower conference.	Objective 5 Transfer this knowledge to local cut flower and market garden producers through publications, conferences, and other outreach efforts. Shared digital publication with attendees at an ASCFG cut flower conference.

-	19	Shared research findings, printed physical publication, and digital publication through high tunnel field day.	Objective 5 Transfer this knowledge to local cut flower and market garden producers through publications, conferences, and other outreach efforts. Shared digital and physical publication with attendees at an SDSPA high tunnel field day.
-	20	Verbally presented findings of research to 60+ attendees through high tunnel field day.	Objective 5 Transfer this knowledge to local cut flower and market garden producers through publications, conferences, and other outreach efforts. Verbal presentation of findings to attendees at an SDSPA high tunnel field day.

CHALLENGES AND DEVELOPMENTS (REQUIRED)

Provide any challenges to the completion of your project or any positive developments outside of the project's original intent that you experienced during this reporting period. Also, provide the corrective actions you took to address these issues. If you did not attain an approved objective, outcome(s), and/or indicator(s), provide an explanation in the Corrective Actions column. For developments, you may put "N/A" under Corrective Actions. Additional challenges/developments may be added as needed.

+	#	Challenge or Development (1,200 char.)	Corrective Action
-	1	Challenge (Year 3): Mitchell, SD received record amount of rainfall this summer and flooded out the high tunnel and a majority of the flower field. All crops were lost in the high tunnel and a majority were in the field. Sensors, frost protection cloth, hoses, black plastic fabric, plants, and other tools were washed away. This created no crop for the Summer of 2024 or the Fall season extension of 2024.	Clean up is underway to prepare for coming seasons and replace and repair lost/damaged items.
-	2	Challenge (Year 3): The trial aims to extend from a 5 month growing season to a 9 month growing season. The current findings have not shown to extend sell-able flower blooms 2 months past the first frost.	Alternative methods for "heat-sink" or heated air piping may be solutions to keep insulation properties through long, cold nights.
-	3	Positive Development (Year 1): The flower farming community in South Dakota has continued to grow more active and connected. Monthly meetings through SDSPA are being held which helps with active and timely dissemination of information. I will be presenting to this group in the upcoming months.	(none)
-	4	Challenge (Year 2): Update on the previously reported challenge of SD winds. The caterpillar/low tunnel structure on its own without a high tunnel is not practical in South Dakota winds. The wind deems the structure unsustainable to upkeep.	This was not erected for the 2023 fall season.
-	5	Challenge (Year 1): The trial aims to extend from a 5 month growing season to a 9 month growing season. The current findings have not shown to extend sell-able flower blooms 2 months past the first frost.	The study encompassed two seasons of fall and two seasons of spring for this exact reason - to modify and improve upon the first season. Additional wind-proofing and securing of the structures within the high tunnel will hold in additional heat. This has not proved very effective to date.
-	6	Development (Year 2): Last year's high tunnel temperature swings were greatly improved with ventilation additions, automation of vents, expanded irrigation systems, the removal of black plastic fabric. Plant survival and production was greatly improved from the previous season.	Continue making improvements such as these!

-	7	Challenge (Year 2): Previously reported observation that season extension causes there to not be a clear beginning/end to each phase. The spring preparation begins before the extended version of the fall season is complete. Planning and field layout for crops while there are still crops in the ground has proved to be a challenge. Efforts were made to localize plants being studied more this year to contribute to plant insulation. Late fall clean up was delayed into early spring for this season which will provide a new set of challenges, but worth trialing.	Continued to centralize studied plants and experiment with spring field clean up over fall clean up for phasing purposes.
-	8	Development (Year 2): Irrigation was expanded and controlled much better this season and allowed for a greatly increased seedling germination and transplant rate. Overall plantings fared significantly better than last season. Irrigation changes include increased irrigation lines and above-fabric lines rather than below. Additional controls were added as well.	Continue improvements. Disseminate this information as crucial to season start success.
-	9	Challenge (Year 2): Tulip crop within high tunnel was negatively affected by high spring temps. Last year's report was that damage was out of high tunnel and suggested using high tunnel for wind protection with the caveat that it would further enhance heat damage. This proved to be very true. High tunnel tulips did not perform well.	Tulips were rethought as a sustainable season extension crop.
-	10	Challenge (Year 2): Was pregnant and due late January/early February which is prime seedling starting season and planning season gearing up for 2024 spring season.	Tried to plan ahead and plan around this. Shifted some tasks and goals to accommodate.

UPCOMING ACTIVITIES (REQUIRED FOR ANNUAL REPORTS)

Provide a description of the activities that you are planning to complete during the next reporting period. Additional activities can be added as needed. Please note, if this is a final report there should be no upcoming activities associated with the project, and this section should be left blank.

+	#	Activity (600 char.)	Anticipated Completion
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FEDERAL PROJECT EXPENDITURE

EXPENDITURE (REQUIRED)

You must respond to at least one cost category. Please note, the subtotal and total rows include formulas to auto-calculate totals. The approved budget should come from the accepted project plan or any approved budget amendments.

Cost Category	Amount Approved in Budget	Actual Federal Expenditures (Federal Funds Only)
Personnel	\$12,480.00	\$12,480.00
Fringe Benefits	\$0.00	\$0.00
Travel	\$2,794.00	\$3,237.00
Equipment	\$17,060.14	\$17,060.14
Supplies	\$10,659.84	\$10,771.72
Contractual	\$860.00	\$832.50
Other	\$600.00	\$591.13
Direct Costs Sub-Total	\$44,453.98	\$44,972.49
Indirect Costs	\$0.00	\$0.00

Project Expenditure Total Federal Costs	\$44,453.98	\$44,972.49
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DISCUSSION OF EXPENDITURES (REQUIRED)

For 1st Annual Reports, if total project expenditures is less than 30 percent, and for 2nd Annual Reports, if total project expenditures is less than 60 percent, include a statement explaining how the grant funds will be expended and project activities completed as planned by the end date on the grant agreement. Any state approved budget amendments should be included here; Include the line item that the funds are coming from and going to and when the state approved the budget amendment. (1,200 char.)

100% expended.

In September 2024 DANR and USDA agreed to an informal amendment to authorize DANR to reimburse Stems, LLC for an additional \$518.51 above the \$44,453.98 budgeted in the project work plan.

PROGRAM INCOME (IF APPLICABLE)

If program income was earned on the project, grant recipients are required to report on the source, amount, and how funds were expended. Program income is gross income --earned by a recipient or subrecipient under a grant --directly generated by the grant-supported activity or earned only because of the grant agreement during the grant period of performance. Program income includes, but is not limited to, income from fees for services performed; the sale of commodities or items fabricated under an award (this includes items sold at cost if the cost of producing the item was funded in whole or partially with grant funds); registration fees for conferences, etc.

+	Source/Nature of Program Income (100 char.)	Amount Approved in Budget	Actual Amount Earned
-	Flower Bouquets	\$2,000.00	\$2,000.00

USE OF PROGRAM INCOME (IF APPLICABLE)

Describe how the earned program income was used to further the objectives of this project during the performance period. Any income generated must be reinvested back into the project and not set aside or reserved for future expenses after the grant ends. (1,200 char.)

No additional program income was reported for Year 3 due to Challenge #1.

PPR ATTACHMENTS DESCRIPTION (IF APPLICABLE)

Grantors will rely on the data that is submitted in this form when they report to congress. However, if you think additional documents are necessary to support PPR, please attach then and provide a document name and description of document below.

+	Document Name	Document Description
-	Publication	https://bit.ly/stems605 Link to publication is above and is available for free in digital format for anyone that would like to view it. This link has been shared and is shareable. This publication summarizes my findings, research, suggestions, and deliverables.