



Agricultural Marketing Service

U.S. DEPARTMENT OF AGRICULTURE

AWARD YEARS 2022 AND FORWARD

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.)	Profitable early market sweet corn using clear plastic mulch with cover crops for weed control.
Organization Name (250 char.)	Cox Farm Stand
Project Start Date	4/1/2023
Project End Date	9/30/2024

ORGANIZATION POINT OF CONTACT

Full Name	Kyle Cox
Phone Number	(605) 210-3567
Email Address	info@coxsfarmstand.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".	☐

PROJECT BACKGROUND (REQUIRED FOR FINAL REPORTS)

Provide enough information for the reader to understand the importance or context of the project and any key findings. This section may draw from the background and justification contained in the accepted project plan. As the project has been completed, write this section in past tense. If this is an annual report, please skip this section. (1200 char.)

The purpose of this project was to explore innovative methods for extending the growing season of sweet corn in South Dakota, specifically through the use of clear plastic mulch and cover crops. By planting early and accelerating maturation, we aimed to capture a larger share of the early-season market, enhancing profitability for producers and expanding consumer access to locally grown produce.

To achieve these goals, we investigated the feasibility of utilizing clear plastic mulch to elevate soil temperatures and accelerate plant growth, and explored the potential of cover crops to suppress weeds and improve soil. Economic viability research non conclusive for the reasons 1) year 1 Cox wasn't able to plant and Cedar Creek had very to few ears harvested to test price points 2) year 2 weed pressure caused crops to be terminated because cover crop did not suppress weeds and weeds over took the corn.

Knowledge gained through this project - planting corn under plastic is viable planting it organically or with a cover crop or weed suppression is not. Producers will continue to plant early spring corn under plastic to extend the

growing season and enhancing profitability.

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	Assess is clear plastic mulch a viable season extension for early sweet corn in South Dakota to warm soil faster and protect against frost once corn emerges.	Yes
-	2	Determine if cover crops broadcast before planting is a viable methods of weed control under plastic mulch. If not, what methods will work for termination to insure a sweet corn harvest?	Yes
-	3	Is before 4th of July sweet corn economically viable with the additional cost of plastic mulch and early weed control for growers. Create an excel template for distribution to other producers to help them figure profit and loss.	Yes
-	4	Field Days and Social Media Posts	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. INCREASING CONSUMPTION AND CONSUMER PURCHASING OF SPECIALTY CROPS

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2. INCREASING ACCESS TO SPECIALTY CROPS AND EXPANDING SPECIALTY CROP PRODUCTION AND DISTRIBUTION

☒

Indicators	Value	N/A
2.1 Number of stakeholders that gained technical knowledge about producing, preparing, procuring, and/or accessing specialty crops	35	☐
2.2 Number of stakeholders that reported producing, preparing, procuring, and/or accessing more specialty crops		☒
2.3 Total number of market access points for specialty crops developed or expanded, and of those:	11	☐
2.3a Number of new online portals created to sell specialty crops		☒
2.3b Number with expanded seasonal availability	2	☐
2.3c Number of existing market access points that expanded specialty crop offerings		☒
2.3d Number of new market access points that established specialty crop offerings		☒
2.4 Number of stakeholders that gained knowledge about more efficient and effective distribution systems		☒
2.5 Number of stakeholders that adopted best practices or new technologies to improve distribution systems		☒
2.6 Total number of partnerships established between producers, distributors, and/or other relevant intermediaries related to distribution systems, and of those established:		☒

Indicators	Value	N/A
2.6a Number formalized with written agreements (i.e. MOU's, signed contracts, etc.)		☐
2.6b Number of partnerships with underserved organizations		☐
2.7 Total number of new/improved distribution systems developed, and of those, the number that:		☐
2.7a Stemmed from new partnerships		☐
2.7b Increased efficiency		☐
2.7c Reduced costs		☐
2.7d Increased specialty crop grower participation		☐
2.7e Expanded customer reach		☐
2.7f Increased online presence		☐
2.8 Number of specialty crop-related jobs:		☐
2.8a Created		☐
2.8b Maintained		☐
2.9 Total number of new individuals who went into specialty crop production as a result of marketing, and of those, the number who are:		☐
2.9a Beginning farmers or ranchers		☐
2.9b Socially disadvantaged farmers or ranchers		☐
2.10 Number of market access points that reported increased:	1	☐
2.10a Revenue	\$0.00	☐
2.10b Sales		☐
2.10c Cost-savings		☐

3. INCREASE FOOD SAFETY KNOWLEDGE AND PROCESSES

☐

4. IMPROVE PEST AND DISEASE CONTROL PROCESSES

☐

5. DEVELOP NEW SEED VARIETIES AND SPECIALTY CROPS

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6. EXPAND SPECIALTY CROP RESEARCH AND DEVELOPMENT

☐

7. IMPROVE ENVIRONMENTAL SUSTAINABILITY OF SPECIALTY CROPS

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Indicators	Value	N/A
7.1 Number of stakeholders that gained knowledge about environmental sustainability best practices, tools, or technologies	35	☐

Indicators	Value	N/A
7.2 Number of stakeholders reported with an intent to adopt environmental sustainability best practices, tools, or technologies		☒
7.3 Number of producers that adopted environmental best practices or tools		☒
7.4 Number of new tools/technologies developed or enhanced to improve sustainability/conservation or other environmental outcomes		☒
7.5 Number of additional acres managed with sustainable practices, tools, or technologies that focused on:	5	☐
7.5a Water quality/ conservation		☒
7.5b Soil health	5	☐
7.5c Biodiversity		☒
7.5d Reduction in energy use		☒
7.5e Other positive environmental outcomes (optional)		☒
7.6 Number of additional acres established and maintained for the mutual benefit of pollinators/specialty crops		☒

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.)

2.1/7.1/7.5b Season Ext-Weed Control - Soil Health: Clear plastic mulch proved effective, advancing sweet corn emergence by 7 days and 21 days earlier planting. Methodology for data collection was done through planting journals. Cover crops under plastic mulch for weed control were ineffective; other weed control methods are needed. 35 producers learned this via training/field days. 5 acres were planted but soil health benefits were negated by poor cover crop germination and extra tillage.

2:10a/2.3/2.3b Economics: Cedar Creek Gardens July 4th sales were attained with economic gains of \$4/dozen to one vendor and direct off-farm. While economic gains were obtained, other methods for weed control are recommended. Revenue was not collected, but sales were verbally confirmed. The additional cost breakdown per 100 foot row is \$3.60(mulch) + \$1.50(cover crop) = \$5.10. We did not achieve average yield due to challenges - lack of water, excessive temperatures baking sweet corn plants, excessive weeds leading to termination of crop, but based on producer production history without season extension and over cropping their average yields, are around 16 dozen ears per double two rows planted per 100-foot row with a single row. With the \$4/dozen economic gain on 16 dozen average - cost of \$5.10 the economic viability would be \$64 per 100 foot and even greater if you deduct cover crop cost.

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	Year 1 Acquire planter, and started planting - to see if cover crops under plastic a viable option for weed control. Year 2 determined it is not viable to use cover crops under plastic for weed control	Outcome 7, Objectives 1-2

-	2	Year 1: Field Days/OneonONE, all participants said they gained knowledge about this practice but to our knowledge none have purchased a P7050 corn planter to implement this practice Year 2: Field days participants said they gained knowledge about this practice but with all of the data we presented from year 1 most agreed it wasn't viable to use cover with this type of growing method	Outcome 7, Objectives 3-4
-	3	Year 1 We found customers will pay a high price of \$10 per dozen for early sweet which was a economic gain of \$4 per dozen. Year 2 no corn was grown to maturity utilizing this growing method so no data was collected.	Outcome 2, Objective 3
-	4	Year 1 We did increase market access point for specialty crops Year 2 crop failure no additional access points created	Outcome 2

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	Termination of crop due to dry well	new well was dug in fall of 2023
-	2	Cover crop did not germinate	Will plant it earlier before we lay plastic to give it a chance to germinate and then try to plant directly into it. Year 2 tried this method but the planter when digging the furrow for the corn just either tore out or covered up the cover crop. We only did a partial row and determined it wasn't going to work
-	3	Didn't get corn planter as early in the season as we expected	Will try to plant earlier since we now have.
-	4	Terminated crop due to poor germination of corn because of the competition from the cover crop	recommend don't use cover crop
-	5	Terminated crop due to burned from one day of excessive heat	We plan to monitor crop in the early season if a rare excessive warm day occurs
-	6	Year 2 Corn germinated but cover crop didn't suppress weeds and corn was over taken by weeds so crop was terminated	recommend don't use cover crop

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
-			

LESSON LEARNED (REQUIRED FOR FINAL REPORTS)

The recipient or subrecipient is required to provide recommendations or advice that others may use to improve their performance in implementing similar projects. If this is an annual report, please skip this section. (1200 char.)

Lesson 1. Don't use cover crop for weed control under plastic
 Lesson 2. Not a viable option for organic operations a pre-emergent for weed suppression in our experience is a must
 Lesson 3. Monitor day temps closely and cut vents to allow adequate ventilation so your crop doesn't burn up.
 Lesson 4. Some years weather in SD in the springs isn't conducive to for this type of growing method.....late snow cover prevents planting
 Lesson 5. Economic benefits are only gained if you can plant before end of April

CONTINUATION AND DISSEMINATION OF RESULTS (REQUIRED FOR FINAL REPORTS)

Describe your plans for continuing the project (sustainability; capacity building) and/or disseminating the project results. If this is an annual report, please skip this section. (1200 char.)

To ensure the sustainability of our project, we plan to continue utilizing the knowledge and experience gained through this grant. We will refine our planting practices based on the lessons learned, such as adjusting planting dates, not using cover crop for weed suppression but explore other sustainable weed suppression techniques. A grower in Delmont is interested in also using the planter,

At this time so much of the data is inconclusive because of the challenges, we wouldn't recommend cover crop for weed suppression or soil health building with this type of season extension. We would recommend this type of season extension for covering early sweet corn to raise soil temp and encourage early maturity, but we still have a lot to figure out how to suppress weeds so they don't over take the corn Cedar Creek Gardens, a key partner in this project, will continue utilize the corn planter for season extension and when feasible host on-farm tours and demonstrations to share their experiences and knowledge with other producers. These events will highlight the successes and challenges of using this type of growing method for season extension.

PROJECT BENEFICIARIES (REQUIRED FOR FINAL REPORTS)

Provide the number of project beneficiaries. If this is an annual report, please skip this section. (12 char.)

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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	\$0.00	\$0.00
Fringe Benefits	\$0.00	\$0.00
Travel	\$780.00	\$277.50
Equipment	\$8,865.00	\$8,538.22
Supplies	\$5,051.00	\$2,962.40
Contractual	\$0.00	\$0.00
Other	\$1,600.00	\$0.00
Direct Costs Sub-Total	\$16,296.00	\$11,778.12

Indirect Costs	\$1,303.00	\$942.00
Project Expenditure Total Federal Costs	\$17,599.00	\$12,720.12

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, as well as the date that the state approved the budget amendment. (1,200 char.)

The Supplies budget was lower than anticipated due to the following reasons:

- 1.Delayed Planting: Cox Farms was not able to plant the first year to due a farm accident, resulting in unused plastic mulch from the first year being carried over to the second year.
- 2.Cedar Creek Gardens' Late Start: Due to a delayed corn planter arrival, Cedar Creek Gardens had fewer planting opportunities in the first year, leading to excess plastic mulch that was used in the second year.
- 3.Trailer Rental: Cedar Creek Gardens purchased a car trailer after the grant was written, eliminating the need for rental expenses and utilized
- 4.Cover Crop Seed: Both entities participated in another research project, providing them with leftover cover crop seed that could be utilized, reducing the need for additional purchases.
5. Producers didn't ask for travel funds to cover the cost of transporting the planter between operations because they used the \$200 from income to defray the cost. The \$277.50 was to cover the cost of gas to go get the planter because the shipper was waiting for a back haul and it would of delayed the planter arrival by another two weeks.

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
-	Selling of Sweet Corn	\$2,000.00	\$400.00

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.)

\$400 income from the sale of sweet corn was used to cover cost Kyle Cox cost of travel to field day to Cedar Creek Gardens which was not originally budgeted for in the grant. 344 miles @ .58 a mile - \$199.52
\$200 was used for gas to move the planter between operations and not utilize the original travel funds in the budget.

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
-		