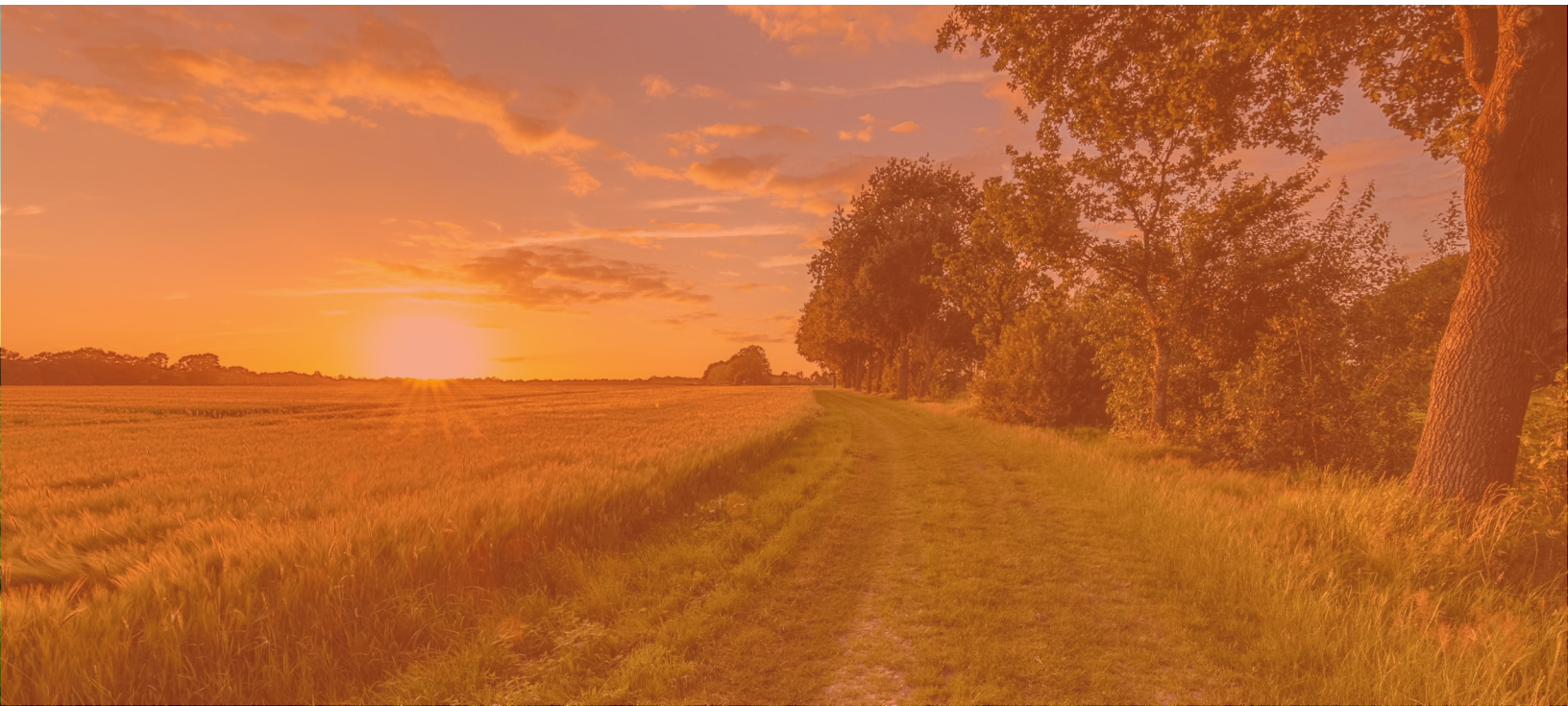
Field to Market®

CLOSING THE LOOP: Circularity in Sustainable Agricultural Supply Chains

Cross-Sector Dialogue Summary & Key Findings

October 25, 2022 | Washington, D.C.



INTRODUCTION

Field to Market: The Alliance for Sustainable Agriculture™ is working to meet the challenge of producing enough food, feed, fiber and fuel for a rapidly growing population while conserving natural resources and improving the ability of future generations to meet their own needs. Due in part to the complex and dynamic nature of agricultural supply chains, commodity crops can generate several co-products, which present opportunities for continuous improvement in environmental outcomes while simultaneously creating new markets and diversified revenue sources.

On October 25, 2022, Field to Market held a Cross-Sector Dialogue titled, "Closing the Loop: Circularity in Sustainable Agricultural Supply Chains," which explored ways our members can forge new partnerships to close the loop in their supply chains by designing projects that intentionally reuse and recycle co-products to reduce crop inputs, retain value on the farm, and protect increasingly scarce natural resources. Participants worked across sectors to develop scenarios for applying principles of circularity to commodity crop systems, including animal feed and biofuels.

The October Dialogue, just like others within Field to Market's Cross-Sector Dialogue series, is part of a strategic initiative that brings together diverse stakeholders from across the agricultural value chain to advance shared learning and drive collective action by focusing on seizing opportunities and overcoming systemic barriers to scaling sustainable agriculture.

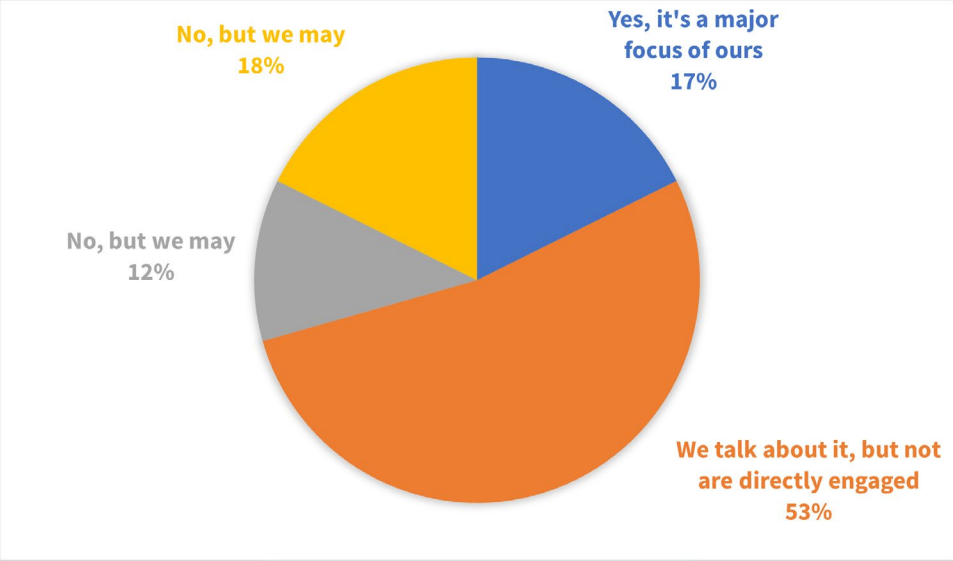
This Dialogue convened approximately 50 stakeholders to explore circularity within sustainable agriculture supply chains. This report summarizes the event, highlighting key takeaways from both the Dialogue's presenters and attendees.

Please note that the following summary provides a synthesis of key remarks and observations from the event and does not necessarily represent the views or perspectives of Field to Market.

WHAT IS CIRCULARITY?

Scott Herndon, Field to Market President and **Sarah Alexander**, Keystone Policy Center Vice President of Programs and Field to Market Board Member, welcomed participants, who each represented organizations from across the agricultural value chain.

To gauge the group's familiarity with circularity, they were asked to respond to a poll asking, "Is circularity commonly discussed in your work environment?" A summary of participant responses is below.



After the survey, **Ernie Shea**, President at Solutions from the Land presented the case for circularity as an approach to sustainability by highlighting the global challenges before us.

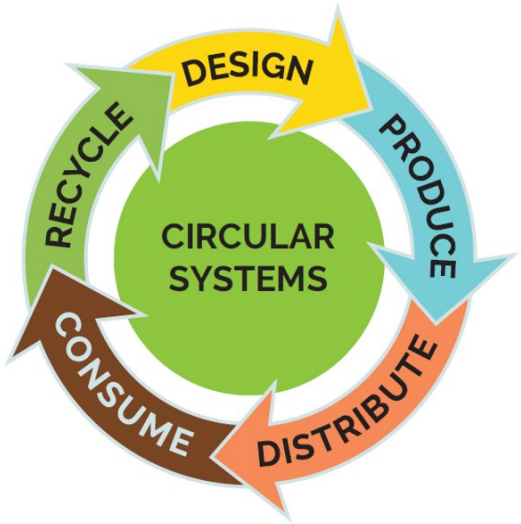
"Co-products that are intentional, planned, processes and products, add value by contributing to farm profitability and quality ecosystem services (compared to by-products which are not intentional)."
-Ernie Shea

Ernie Shea
President
Solutions from the Land

By 2050, world population will reach nearly 10 billion people, escalating the need for accessible, healthy food. Meeting that need in the face of increasingly frequent and extreme weather events without accelerating natural habitat and biodiversity losses poses a wicked challenge.

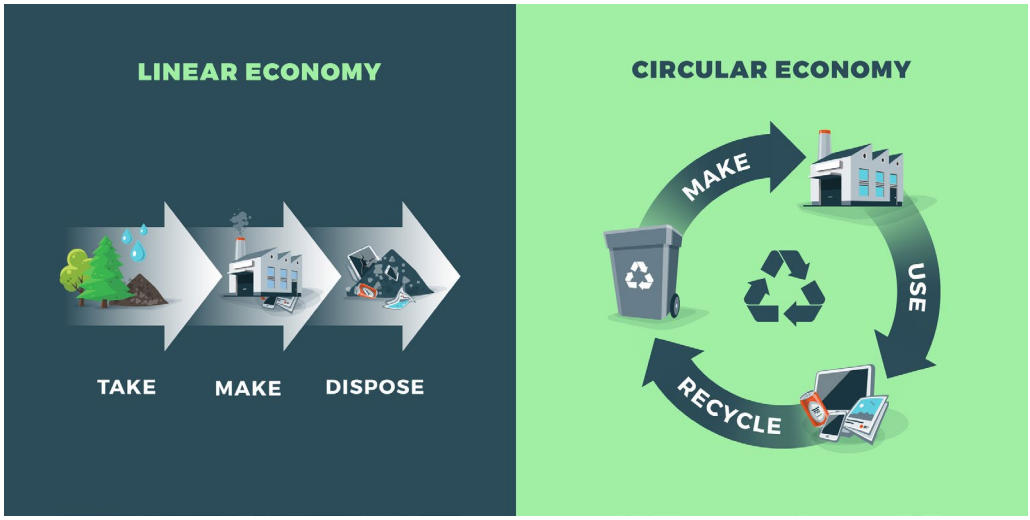
"A circular economy promotes responsible and cyclical use of resources, contributes to sustainable development, creates environmental quality, economic prosperity, and social equity to the benefit of current and future generations.

The main objective of a circular economy system is to couple economic growth with sustainable resource use through the implementation of three key principles:



1. Regenerate natural systems through the control of finite stocks and balancing of renewable resource flows.
2. Optimize resource yields by keeping materials within biological and technological cycles for as long as possible
3. Design-out waste and pollution from production and consumption."
(Basso, et al. 2021)

"Circular economies keep products and materials in use, regenerate natural resources, drastically reduce waste and pollution, and increase economic value."
- Jones, et al. (2021)



CLOSING THE LOOP: CIRCULARITY IN ACTION

After Shea laid the foundation, participants heard from sustainability specialists representing three different commodity crops currently using circularity in their supply chains.

Ariel Wiegard, Director of Government Affairs at the American Soybean Association told soy's sustainability story. Next, **John Fuher**, Vice President of Government Affairs at Growth Energy presented information on corn for biofuels and the generation of co-products such as animal feed and liquid CO_2. Then, **Steve Pires**, Sustainability Manager with Cotton, Incorporated, shared the opportunities the cotton supply chain is taking to apply circularity to reduce post-consumer waste.

Ariel Wiegard
Director of Government Affairs
American Soybean Association

John Fuher
Vice President of Government Affairs
Growth Energy

Steven Pires
Sustainability Manager
Cotton, Inc.

> "Calling something 'waste' dismisses the fact that it has inherent value."
> *– Affiliate Sector Representative*

Discussion

Equipped with a deeper understanding of circularity and how it is currently being used to improve sustainability outcomes in example supply chains, participants broke into small groups to re-imagine other supply chains, with either provided examples or one of their own. Together, breakout group members identified links in the supply chain where carbon, water, and nutrients are lost to the environment and suggested strategies to capture those lost resources. The groups considered the industries and organizations that would be needed to partner for success and where producers can capture or retain the value using this approach.

Many ideas surfaced regarding the capture of resources that may be lost, some that are already in use and could be expanded into more supply chains. Examples included:

- Using manure from animal feeding operations on feed crops to reduce synthetic fertilizer needs;
- Feeding livestock crop co-products and by-products such as peanut skins and cotton seed;
- Capturing CO_2 from fermentation processes to reuse in carbonating beverages, refrigeration and anesthetizing livestock; and
- Capturing methane from animal operations for energy use.

Implementing more circularity in a supply chain requires partnerships and coordination. Some of the needed partners identified by participants are highlighted below:

- Crop input providers
- Trusted farmer advisers
- Product packaging manufacturers
- Composting facilities
- Trucking and other transport companies
- Researchers
- Engineers
- Farmer-led organizations
- Farmer and consumer educators

When asked how the farmer might capture or retain value from this approach, participants offered these possibilities:

- Reduced input costs, particularly fertilizer;
- Ecosystem payments – such as carbon markets; and
- Price premiums for commodities procured from farms with documented circularity processes.

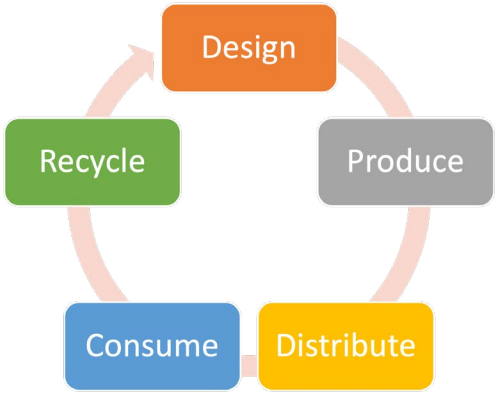
Although circularity offers many potential benefits to farmers and the environment, participants identified several potential challenges or limitations to taking a circular approach, which are highlighted below.

- To work, we must get beyond the pilot phase. Scaling up can be a significant challenge.
- The cost to implement may be too high and the learning curve too steep for growers to take the risk of trying something new.
- Growers fear that the value potential realized by downstream companies will not passed back to them.
- Less perishable commodity crops aren't likely to be brought back to the farm to enrich the soil in the same way as fresh produce, which can be composted.
- Circular energy sources are not available yet to the average farmer.
- Packaging materials may not compost efficiently or may leach potentially harmful substances.

> "We're running out of resources, so we need to reduce use and reuse things. That's the driver for this circularity discussion."
> *– Grower Sector Representative*

CONCLUSION

There are many approaches to improve the environmental impacts of farming on the natural environment. Whether described as "sustainable", "regenerative" or "climate-smart," the agricultural system needs to be re-imagined in a way that sequesters carbon in the soil and intentionally improves soil health, biodiversity, water quality and air quality while ensuring the viability of farm production.



Circularity, when applied to agriculture, reduces needed external inputs by retaining nutrients in the field and regenerating soils. Although circularity is not a new concept, new partnerships and innovations are key to enabling widespread adoption on farms and in processing facilities.

Learn more about circular food and agriculture systems by accessing these resources referenced in this document:

- Webinar Recording: Field to Market In Focus: Circular Bioeconomy Systems, presented by the American Society of Agricultural and Biological Engineers and Field to Market on September 27, 2022
- Article: Frontier: Beyond Productivity—Recreating the Circles of Life to Deliver Multiple Benefits with Circular Systems by Lois Wright Morton and Ernie Shea (2022)
- Article: Enabling Circularity in Grain Production Systems with Novel Technologies and Policy by Bruno Basso, James Jones, John Antle, Rafael Martinez-Feria and Brahm Verma (2021)
- Special Publication: Transforming Food and Agriculture to Circular Systems: A Perspective for 2050 by James Jones, Brahm Verma, Bruno Basso, Rabi Mohtar and Marty Matlock (2021)

To suggest topics for future dialogues, please contact **Kelly Murray Young**, Senior Director of Education and Inclusion at Field to Market.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