

Innovation Inside Ingredient Companies: Opportunities across a Global Supply Chain

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ABSTRACT

Ingredion is a leading global ingredient solutions provider that processes grains, fruits, vegetables, and other plant materials into ingredients that enhance our customers' products. As a supplier to the food, beverage, papermaking, animal nutrition, and other industries, Ingredion is frequently asked to support the overall sustainability strategies of our customers. One of the most common topics of engagement with our customers concerns sustainable sourcing of the crops we purchase to manufacture our products. Implementing a sustainable agriculture program across multiple geographic locations is challenging, and a level of creativity and innovation is required to develop a program that will work, for example, in Thailand as well as the United States. This article focuses on the complexity inherent in developing a global sustainable agriculture program, describes the types of hurdles Ingredion has run into along the way, and highlights how the company was able to start making progress in its sustainable agriculture program through collaboration with our growers around the globe. Key steps for other organizations looking to implement similar programs within their supply chains are also outlined

As a global provider of ingredient solutions, Ingredion seeks to bring value-adding innovation to our customers. Although we normally think of this innovation as it pertains to our products, we sometimes have to think more broadly to stay on top of food industry trends and deliver the innovation our customers want for their businesses. The growing need to produce products from sustainably sourced agricultural crops is one area of increasing interest for our customers. Many of Ingredion's customers, both large multinationals and smaller local companies, have established targets for the crops used to make the ingredients used in their products, requiring that crops be sourced from sustainable agriculture programs. Meeting these expectations across a varying global supply chain provides many challenges, and opportunities, for Ingredion and other suppliers.

The Scope of the Ingredion Supply Chain

Ingredion makes a variety of ingredients from nature-based raw materials that are sourced in many different geographic locations around the world. About 95% of our raw material base is corn (maize), about 3% is tapioca (cassava), and the remaining 2% is comprised from a variety of crops, such as potatoes, rice, peas, and berries. Globally, we purchase crops from growers in more than 20 countries. These different countries often have farming models that are very different from one another. For example, specialty corn is sourced from around 150 large-scale growers in the United States, and corn is also sourced from between 5,000 and 10,000 smallholder farmers in China. This means that implementing a sustainable sourcing program

is not a one-size-fits-all effort for Ingredion's global operations. Although we came to this realization very early in our efforts, determining the best path forward was something that took time and considerable collaboration between Ingredion and our growers. On this journey to increased sustainability, Ingredion continues to explore innovative solutions that streamline the process for us, our growers, and our customers.

Identifying a Path Forward

When Ingredion began its efforts to encourage and support sustainable agriculture among its growers, we immediately faced a considerable challenge—how to satisfy the emerging and varying demands of our customers. Early on we had a considerable number of meetings with our customers to determine the intention of their sustainable agriculture programs (e.g., risk management, consumer marketing, etc.) and whether they used any external standards beyond their own company-specific programs.

After nearly 18 months of discussions and research, we came to the conclusion that many of our large food and beverage customers, particularly those with sustainable agriculture requirements, were members of an organization called the Sustainable Agriculture Initiative Platform (SAI Platform). The SAI Platform was founded by the food and beverage industries, and the development of the program was shaped by the same customers with which we had been speaking.

In 2014 Ingredion joined the SAI Platform, at a time when there were not many suppliers of consumer goods companies on the membership list. SAI Platform membership had a significant influence on moving Ingredion's sustainable agriculture program forward, because it put us in the room with multiple customers at once, giving us the opportunity to discuss the practical applications of sustainable agriculture across a variety of geographic locations. Up to this point, Ingredion's progress had not advanced as much as we would have hoped. By 2015, the company had progressed to sourcing around 225,000 metric tons of crops from sustainable farms. Although this was relatively humble progress versus its overall sourcing volumes, it was a firm step forward and paved the way for Ingredion to start making step-change progress. By 2016 Ingredion's sustainable sourcing volumes had risen to more than 800,000 metric tons. By the end of 2017 nearly 1.7 million metric tons of crops were sustainably sourced (Fig. 1).

Assessing Program Gaps

With the SAI Platform program adopted as Ingredion's global benchmark for sustainable agriculture, the company focused on assessing our growers. This, it turned out, presented different sets of challenges in the different geographic locations from which our crops are sourced. For example, in the United States where Ingredion's specialty-corn growers were already providing detailed traceability data, it was easy to, at least, have discussions concerning collecting additional farm information. The

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growers understood the assessment questions we were asking; however, they questioned the value of the time it would take to provide additional data. This contrasted sharply with smallholder farmers in China, where we encountered issues of literacy, as well as understanding of the concepts in the assessment, such as biodiversity protection. There was also the challenge of how to reach a grower base of 5,000–10,000 farmers with these issues in mind.

Exploring Innovative Solutions

The challenges associated with assessments led to several innovative approaches implemented by Ingredion's agricultural teams, which were already focused on issues such as yield improvements, sourcing needs, and seasonal challenges such as pest management. For example, the Pakistan team took advantage of existing meetings to begin introducing growers to the company's sustainable agriculture program. This allowed the team to engage multiple growers at one time, decreasing the time needed get the effort off the ground with a group of growers. This also enabled Ingredion to identify common grower issues, such as inefficient use of water, which is a highly constrained resource in many parts of Pakistan. The team then worked with Pakistani farmers to introduce and install technology such as drip-fed irrigation systems. This substantially increased the water use efficiency and improved yields by around 30%.

A similar approach was used by growers in Colombia, where the Ingredion team actually helped organize a group of farmer suppliers into a cooperative. By forming a cooperative, the growers were able to leverage their collective size to buy more

cost-competitive seed for planting, and even equipment to help with harvesting. Through the cooperative, Ingredion personnel were able to introduce growers to items such as crop insurance, which had not previously been economically feasible for the smallholder farmers supplying tapioca root.

Perhaps one of the most innovative assessment solutions was launched in the United States, where the Ingredion agricultural team was already working to update the online system utilized to collect farmer traceability data. Working with the software firm MyFarms (www.welcome.myfarms.com), Ingredion personnel tackled the challenges of 1) creating a one-stop platform for growers to provide farm data; 2) minimizing the time spent by growers; and 3) providing additional incentives for growers to share their data. The solution was to integrate sustainable agriculture assessment questions into the background of the online data collection system. The resulting software solutions allow growers to enter data into one Ingredion system, without the need to access the SAI Platform online system, decreasing grower data-entry time from about 45 min to about 7 min/farm. In addition, growers are provided with a report that helps them identify where they might find on-farm efficiencies that could generate further cost savings. This system has been recognized by some customers as a tremendous effort by the company, and one that has the potential to help significantly accelerate Ingredion's efforts.

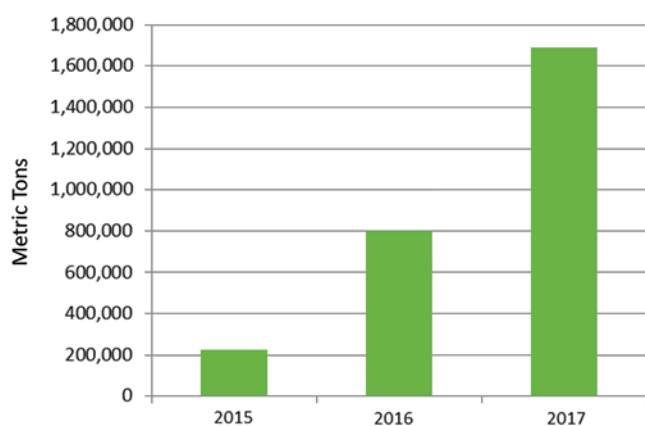


Fig. 1. Progress in sustainable sourcing of crops by Ingredion.



Ingredion agricultural team in Thailand working with local growers, government officials, and universities to help promote the Model Farmer program.



Ingredion agricultural personnel engaging with specialty grain suppliers to better understand their sustainable farming practices.



Ingredion agronomist at work in fields collecting data critical to supporting the efforts of local farmers to improve efficiencies.

Not all innovations that are helping to drive progress across Ingredion's supply chain have come from internal efforts. One of the most impactful and innovative tools we are working with to drive progress has come out of SAI Platform member collaboration. In March 2018, the SAI Platform launched a new tool called Spotlight (www.saiplatform.org/activities/sai-in-actions/spotlight). Spotlight is an online platform that allows member companies to register the areas where they currently have sustainable agriculture initiatives, highlighting any topics of particular interest or challenge (e.g., labor rights, water use, tillage practices, etc.). This tool shows member companies where other members are also working in the same geographic locations and on the same crops. It opens the door to collaboration so that companies can leverage their collective efforts to drive progress even faster.

Lessons Learned

Throughout Ingredion's journey to drive sustainable agriculture practices forward in our global supply chain, we have learned some valuable lessons.

- 1) **Adopt a global program for your organization** – Whether you utilize an existing global standard or create a program in-house having everyone in your organization working to the same standard is important to your success. The use of a common framework by Ingredion has enabled best practice sharing, tracking of progress, and allocation of support or other resources at the corporate level.
- 2) **Train your employees** – Once a global program (benchmark) has been selected or created for your organization, it is important to train all applicable personnel in the elements of that program. This was particularly important for Ingredion's agricultural teams, who were interacting directly with our farmer suppliers, as well as our sales team, which was interacting directly with our interested customers. Business leaders were another important group for us to train, because they help allocate resources for our efforts.
- 3) **Establish year-on-year targets** – In the early stages of our efforts, making progress was very difficult. We put a lot of pressure on our agricultural teams to make progress while trying to empathize when they encountered roadblocks. The problem with this approach was that it did not lead to actual progress. It wasn't until we worked with our agricultural teams and regional business leaders to establish year-on-year goals that we began to see step-change improvements. Having leaders buy in to the targets and internally reporting on the progress was critical to making certain sustainable agriculture was seen as a business imperative.
- 4) **Stay flexible** – Throughout our process we have tried to convey the importance of staying flexible. This may include the flexibility that helps us adjust our programs to meet individual customer needs or the flexibility required

to adopt local sustainable agriculture programs that will help us accelerate our efforts in a specific location. Sustainable agriculture is far from a one-size-fits-all solution that can be replicated and dropped into place in different countries around the world. It requires creativity and flexibility to drive progress and make certain that at the end of the day we are meeting our objective of producing mutual value within our supply chain.



Brian Nash is the senior director of sustainability for Ingredion, a global company operating in more than 20 countries around the world. He is responsible for implementing the company's global sustainability strategy and making certain it resonates with the expectations of its various stakeholders. He has more than 20 years of experience in sustainability and EHS (environment, health, and safety). Brian has a bachelor's degree in chemistry from Indiana University, a master's degree in environmental management from the

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