

The role of fertilizers in sustainable food production

A food retailer's perspective

by Hugh MacGillivray, Chief Commercial Officer, Anuvia Plant Nutrients, USA

Food retailers' ability to meet consumer demand relies on farm level sustainability. Today's consumers increasingly want to know what is in the foods they purchase and if they were produced using sustainably sourced ingredients. In turn, major food retailers are stepping up their involvement in partnering with crop input suppliers and farmers at the field level.

Sustainable fertilizer technology and crop production practices play a fundamental role in the circular economy of food production from the field to the consumer. That is why food retailers want to know more about fertilizer sustainability.

Challenges for food companies

"More and more, food companies are asking what can be done to ensure there will be a sustainable source of food ingredients to stock the shelves with the brands consumers want, know and love," says Paul Duncan, director of Sustainability for Anuvia Plant Nutrients. "There's a realization that if farmers can't profitably and sustainably produce the needed ingredients, the big food companies won't have a business."

“Food companies are increasingly being asked to be transparent about ingredients in their brands”

Duncan notes that large food companies all have corporate sustainability goals. These usually run along the lines of reducing greenhouse gases, reducing nitrogen leaching and pollution, improving water quality and advancing other environmental concerns.

"Some companies aren't reaching these goals and deadlines are being pushed back. Solving the challenge of producing sustainably-sourced ingredients to feed a growing population involves a close examination of the entire food supply chain," says Duncan. "It involves determining where in the supply chain can you reduce the carbon footprint during the life cycle of a product from field to consumer."

A growing trend

Rod Snyder, president of Field to Market, observes first-hand the efforts of food retailers to ensure the production of sustainably sourced ingredients.

"Consumer-facing brands are developing upstream relationships with farmers in their supply chain. Many food companies set specific sustainability targets or commitments," says Snyder. "These range from goals such as 100% sustainably-sourced ingredients to some percentage reduction in greenhouse gas emissions to water quality improvements."

"It's a trend that's only going to grow," says Snyder. "Food companies are increasingly being asked to be transparent about ingredients in their brands or perhaps committing themselves to changing practices to achieve specific sustainability outcomes for their products."

Field to Market is a collaborative alliance representing members from every link of the food chain from large food retailers to ag retailers and ingredient suppliers, farmers and conservation groups. Collectively, the alliance works to share best practices and combine forces to advance

sustainability of food, fibre and fuel production in the US.

"We need to understand how we grow food to feed a world population predicted to reach 9.6 bn people by 2050. Field to Market exists to bring together competitors such as Coca-Cola, Pepsi, Kellogg's and General Mills to find a pre-competitive approach to defining, measuring and improving sustainability outcomes," says Snyder.

"To remain credible with consumers, the food industry needs to measure and communicate sustainability indicators in a consistent fashion. Science and economics must be part of conversation," he says. Field to Market uses eight sustainability indicators agreed upon by its diverse membership – biodiversity, energy use, greenhouse gas emissions, irrigation water use, land use, soil conservation, soil carbon and water quality.

Food companies take a leadership role

To remain in business, farmers must turn a profit. There is an opportunity for food companies to help agricultural input providers to think about the ways their products and services can help profitably solve some of these sustainability issues for farmers and the supply chain. Companies can think creatively about the way current products or their product pipeline can bring solutions.

A case in point is Smithfield Foods. The company takes a hard-hitting approach to establish and measure sustainability goals to insure sustainably sourced ingredients for their food brands.

"We see concerns about sustainability expanding beyond the environment to include how food is grown and manufactured. More and more, food retailers are looking at their suppliers and expecting suppliers to do the same in their own supply chain," says Stewart Leeth, Vice President of Regulatory Affairs and Chief Sustainability Officer for Smithfield.

"For Smithfield, that means looking at how animals are grown on our farms and those of our contract farmers and the feed and medicines we use to raise those animals. Manure management is also part of it – how manure which

Figure 1. A circular economy, as opposed to a linear economy, exemplifies efficient use of resources. Anuvia represents a tangible example of a circular economy in which resources are reclaimed, converted and reused.



becomes fertilizer is handled on farms on a daily basis. We're trying to enhance our transparency in these areas, as well as in the preparation and packaging of the food we make."

Meeting the needs of the food retailers

"Sustainability is ingrained in Smithfield Foods culture. Our sustainability initiatives differentiate our company from competitors while making our business more efficient and competitive," says Leeth.

For example, in 2013 one of Smithfield's largest food retailers began looking at grain supply chain sustainability. "Along with the Environmental Defense Fund, they came to us and other food companies, asking if we could develop a programme which would have meaningful improvements, a sustainable impact," says Leeth.

In response, Smithfield set a goal to have 75% of its directly sourced grain supply, or 450,000 acres engaged in conservation practices aimed at reducing loss of nitrogen into the environment. The company exceeded this goal by engaging 80% of its grain supply chain, used to feed the company's hogs, in farming practices that are both more sustainable and reduce production costs for grain farmers.

Grain production is the first step in the vertically integrated company's supply chain, making this accomplishment one of the key ways Smithfield developed and is now working toward its ambitious goal to reduce greenhouse gas (GHG) emissions 25% by 2025 throughout its entire supply chain – the first commitment of its kind from a protein company.

Kraig Westerbeek, Senior Director of Smithfield Renewables and Hog

Production Environmental Affairs, explains, “We’re leveraging a wide range of projects to help reach that goal, including grain supply chain fertilizer optimization and ‘manure-to-energy’ projects that convert manure into renewable natural gas. Last Autumn, we announced the nationwide expansion of our ‘manure-to-energy’ projects, with a goal to implement projects on 90% of Smithfield’s hog finishing spaces in North Carolina, Utah and Virginia and nearly all of its hog finishing spaces in Missouri over the next 10 years.”

Technology aligned with food companies

To further reduce its carbon footprint, Smithfield is working with Anuvia Plant Nutrients to optimize fertilizer usage. “We were intrigued by Anuvia’s patented process to reuse organic matter found in hog manure, a by-product of our hog operations, to create a commercial-grade fertilizer,” says Westerbeek.

A stark contrast from other fertilizer companies, Anuvia is producing a sustainable, efficient, and economically viable alternative to synthetic fertilizer using organic matter that offers the potential to create a revolutionary change in the fertilizer business.

“Smithfield recognized Anuvia’s bio-based fertilizer as an opportunity to enhance fertilizer efficiency within our grain supply chain and the efficiency of the farmers who grow grain we may purchase in the future. In turn, this



Ben Hushon (front right), The Mill, in a wheat field collecting data supporting sustainable farming practices.

effort is communicated to our food retailers and others to show steps being taken to ensure sustainable production of food products,” says Westerbeek.

“We hope to increase use of this fertilizer technology, which is an effective substitute for synthetic fertilizers and meets the sustainability goals of our Smithfield Agronomics programme, known as SmithfieldGro. It also fits with our food retailers desire to purchase from companies with sustainably-sourced ingredients.”

From the field to consumer perspectives

As an ag retailer with The Mill in the Chesapeake Bay area of Maryland and Pennsylvania, Ben Hushon is often

both consumer-facing and farmer-facing with his diverse customer base. The Mill encompasses seven locations, with three designated crop agronomy centres and five agronomists.

“We sell consumer customers their animal feed, bird seed and lawn care items,” says Hushon. “We see consumers come to the counter and ask about what we do with our farmer customers. They say things like ‘I can’t believe you’re just spreading fertilizer everywhere and it ends up in the Bay.’ There are a lot of misconceptions.”

Hushon explains that the consumer-centred retailer locations help set up the values used in the three crop agronomy centres. Hence, The Mill seeks to explain, at the counter and on social media, how farmers responsibly use fertilizer through soil sampling,

variable rates, split applications and other fertilizer technology.

“The Mill is a family-owned business, and we need to do the right thing for our customers – consumers and farmers. We think selling sustainable products is the way to go,” says Hushon. This philosophy led The Mill to partner with two prominent food companies looking to collect data about on-farm sustainable practices – including Anuvia’s sustainable fertilizer technology. The Mill purchases Anuvia fertilizers through Southern States Cooperative.

Joining forces for improvement

In 2018, Campbell’s Soup Co. company partnered with the Land O’Lakes SUSTAIN programme and The Mill to educate consumers on sustainability and how farmers are doing their part.

“The goal behind this whole thing is to optimize nutrient use efficiency to increase yields,” says Hushon. “We believe that being sustainable is right, and we know it will work. Using the SUSTAIN digital data collection tool – Truterra – farmers can advance ROI and stewardship in real time, acre-by-acre, plus help food companies measure sustainability progress.”

Campbell’s partnered with Land O’Lakes and The Mill because of their long-standing relationships with farmers. Campbell’s operates two Pepperidge Farm bakeries in Pennsylvania and sources wheat from the area.

“We have five full-time agronomists who go from farm to farm and work with farmers in five counties where they are growing wheat. If we can educate farmers about the economics of sustainable products, they’ll see what they want to use on their farms, while at the same time meeting food retailers’ needs,” says Hushon.

Technology designed for sustainable food production

“We’ve got a great story for food retailers to tell their consumers. Our technology is aimed at creating an

abundant tomorrow for farmers, the food industry and the planet,” says Hugh MacGillivray, chief commercial officer, Anuvia Plant Nutrients.

“We manufacture bio-based enhanced efficiency fertilizers to drive sustainability at the farm level through the food supply chain. Our bio-based technology delivers a positive yield benefit, feeds the soil and contributes to reducing agriculture’s carbon footprint – all factors that meet the need for sustainably-sourced food ingredients.

“An added bonus is this fertilizer technology is plug and play. With little to no financial or operational barriers to adoption, Anuvia can make an overnight impact on the agriculture industry and food sustainability.”

MacGillivray explains that the company’s sustainable fertilizer technology supports a circular economy.

“Nutrients in the soil nourish plants that begin the food chain. The end of the food chain, which has been largely ignored, creates waste and crowds landfills. Anuvia completes the food chain cycle by returning those organic materials to the soil to feed the next cycle, leading to a sustainable supply



Stewart Leeth (left) and Craig Westerbeek, Smithfield Foods, work to apply sustainable food production practices throughout the food supply chain.

of food ingredients for food retailers and consumers.

“By partnering with food companies like Smithfield Foods, we can use recycled organic materials to create bio-based fertilizers that close the loop in a circular economy and make sense for farmers, food companies and consumers.” ■



The trend for sustainably grown food is growing among food retailers. Improving soil health is a key component of sustainability.



To protect the land for future generations and to feed a growing population, farming must move to even more sustainable practices.

Research confirms benefits of sustainable Fertilizer

Dr. Gerald Henry, University of Georgia, recently completed work in which he studied nutrient efficiency and soil health of Anuvia’s bio-based fertilizer technology compared with conventional fertilizer products. Here are the results:

- Nitrogen leaching: 50.2% reduction Vs urea and 39.9% reduction versus ammonium sulfate
- Soil health assessment: 248.6% increase in soil microbial activity for more rapid microbial recolonization compared to ammonium sulphate
- Root mass increase: 27% compared to ammonium sulphate

A leading global environmental research firm, Environmental Resources Management (ERM), recently conducted a study which verified the sustainability impact of Anuvia’s technology on corn, rice and cotton. Findings include:

- 10% reduction of greenhouse gases on corn
- 32% reduction of greenhouse gases on cotton and rice
- 4x to 13x lower carbon footprint (compared to traditional inorganic fertilizers) from manufacturing process
- For every million acres of crops that use Anuvia, the reduction of greenhouse gases is the equivalent of removing 20,000 to 30,000 cars from the roads. With 90 mn acres of corn in the US alone, this would conservatively translate to 1.8 mn cars removed in perpetuity. Anuvia is already in use on more than 500,000 acres, with production capacity planned to dramatically increase by 2020.

Complete study results can be requested at <https://www.anuviaplantnutrients.com/erm>