

FROM BURDEN TO BENEFIT

Sustainability Data in the
Agricultural Supply Chain



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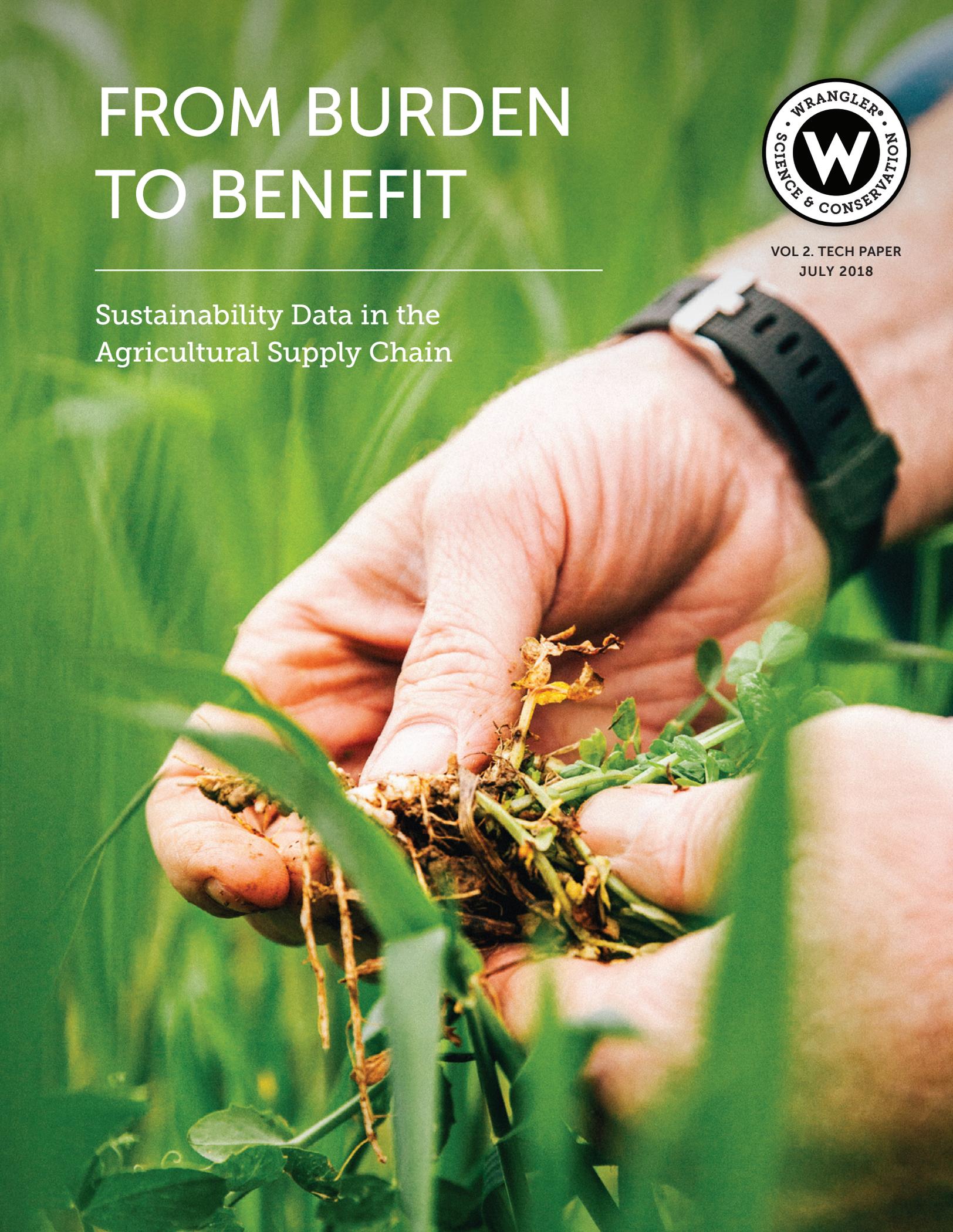




PHOTO: Cotton bale ledger from Pugh family farm in Halls, Tennessee



PHOTO: Modern tractor cab with computerized data management systems

Introduction

The opportunity to achieve positive environmental outcomes on farmland is tremendous and urgent. Sustainable farming practices have the potential to reverse topsoil loss, reduce greenhouse gas emissions, preserve biodiversity and protect groundwater—all while feeding and clothing a growing global population. However, in the past, growers came under attack by environmental activists, resulting in an air of mistrust that continues to affect the formation of supply chain partnerships today.

As a new generation of sustainability practitioners and advocates identifies the possibilities for systemic change through agriculture, this paper is intended to help build bridges and suggest how diverse actors in the agricultural supply chain might be motivated to serve common goals:

1. **To minimize negative impacts and maximize the regenerative potential of agricultural systems**
2. **To increase consumer confidence in agricultural producers committed to continuous improvement**
3. **To create greater financial benefit and farm resiliency**

Sustainability data can fuel the pursuit of common goals in agriculture. From the seed manufacturer to the retailer, each link in the supply chain has unique business needs and opportunities that can be recognized and served through better sustainability data and analysis.

If we design supply chain engagements to gather and share data purposefully and with integrity, we can achieve the economic interests of each link in the supply chain while enabling better environmental outcomes.

Because on-farm data is the primary currency of this strategy, this paper focuses largely on understanding the decision-making processes of growers in order to better align their interests with those of manufacturers, retailers and others in the supply chain. The examples here are from cotton, but the learnings shared are relevant to many food and fiber supply chains.

Converting Data into Value for Growers

Two converging trends have focused the attention of the sustainability community on agriculture:

1. **Market pressure for better, more-granular corporate social responsibility (CSR) reporting**
2. **Growing awareness that increasing the health of agricultural soils could ensure millions of acres of farmland globally act as assets—not liabilities—for addressing problems like water quality, climate change and more**

Before asking growers to participate in any new sustainability initiative by investing significant time in sharing detailed information about their practices—and potentially changing those practices—it's important to consider what can be offered in exchange. To succeed, a supply chain initiative must create value for each link in the chain, beginning with the farmer.

Unless we create value, sustainability engagements may be perceived as a burden, likely to lose momentum or even damage relationships.

The first paper in the Wrangler Science & Conservation series, **“Seeding Soil’s Potential,”** illustrated how farmland can serve as an ecological asset. It summarized how a combination of soil health practices in cotton production results in three times more carbon sequestered in the soil, which generates a host of environmental *and* economic benefits.



The good news is sustainability data can be converted into new, valuable farm-management insight. While sustainability practitioners need field-level data to feed environmental models and provide better transparency to customers, farmers require field-level data to make better crop management decisions. On the sustainability side, the data can project soil-health outcomes like reducing erosion rates, increasing soil organic carbon and improving water-use efficiency, or help retailers and brands understand the environmental impact associated with a pair of jeans, a box of cereal, or a liter of soda. On the grower side, similar data can help compare seed performance, optimize application timing, calculate input purchases, evaluate energy efficiency, and much more.

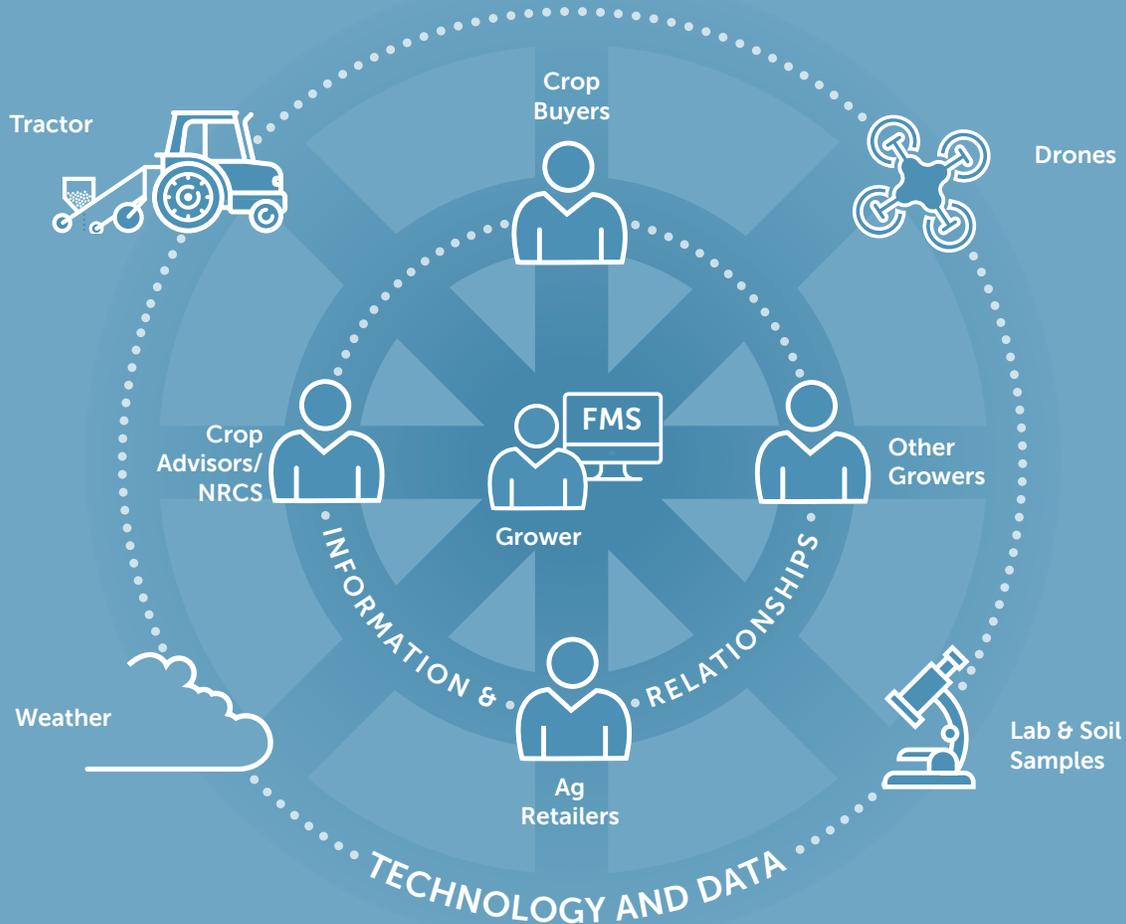
A data-intensive approach to sustainability and farm management is in line with changes in the agricultural industry as a whole that are making it more reliant on information technology (IT). In fact, modern tractors

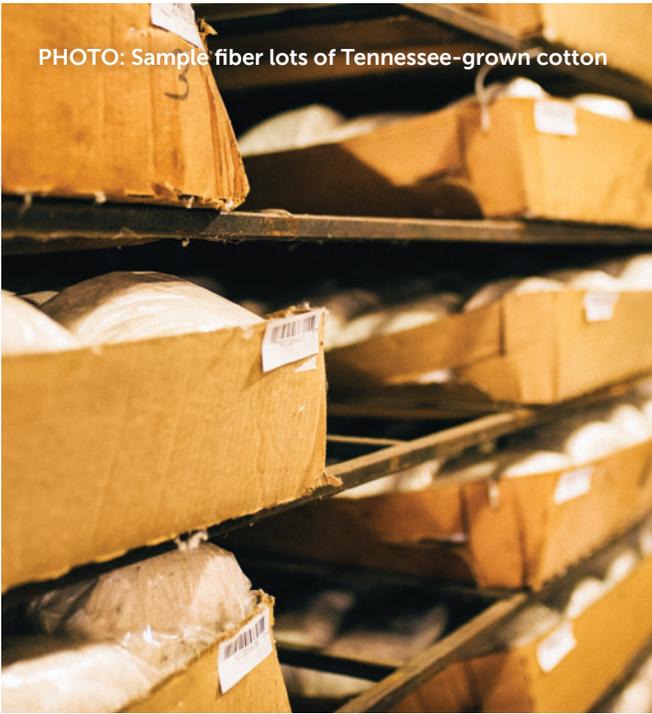
are often described as “computers on wheels”. With digital field mapping tied to GPS location and remote field sensors, crop-management decisions can be analyzed and implemented on a field-by-field basis, allowing for precision fertilizer or seed application rates that shift from one acre to the next. A state-of-the-art cotton picker, for example, can record crop yield and moisture, along with the GPS coordinates of the picker, every few seconds and then mark the round bale with a unique identifier using barcode and/or RFID technology. Although it’s still an emerging technology, this capability demonstrates the progress and potential of digital farming practices.

While IT is quickly becoming part of day-to-day farm operations, most farmers have not yet adopted digital systems for tracking and measurement. Although exceptions exist, analyzing data is not what most farmers love to do with their time. For this reason, many already work with professional or personal

THE GROWER’S DATA ECOSYSTEM

Today’s grower can access numerous data streams and analysis with the help of a farm management system (FMS) to inform on-farm decisions.





advisors they trust to interpret data on their behalf. Coordinating with these trusted crop buyers, ag retailers, crop advisors and organizations like Natural Resources Conservation Service (NRCS) and Texas Alliance for Watershed Conservation (TAWC) to achieve sustainability objectives is a wise strategic choice. Similarly, supply chain engagements can create additional value for growers (and their advisors) by providing easy-to-use software and advisory services to help with the transition to digital systems for tracking and measurement.

In short, if sustainability practitioners can help convert field data into business insights, they will be welcomed among farmers (and other segments of the supply chain).

If we can help convert business insight into economic gain, which is shared with the farmer, our initiatives are almost certain to drive change.

SPECTRUM OF SUSTAINABILITY’S VALUE IN THE COTTON SUPPLY CHAIN

From justifying a premium price to risk management, sustainability can create value throughout the agricultural supply chain in unique ways.

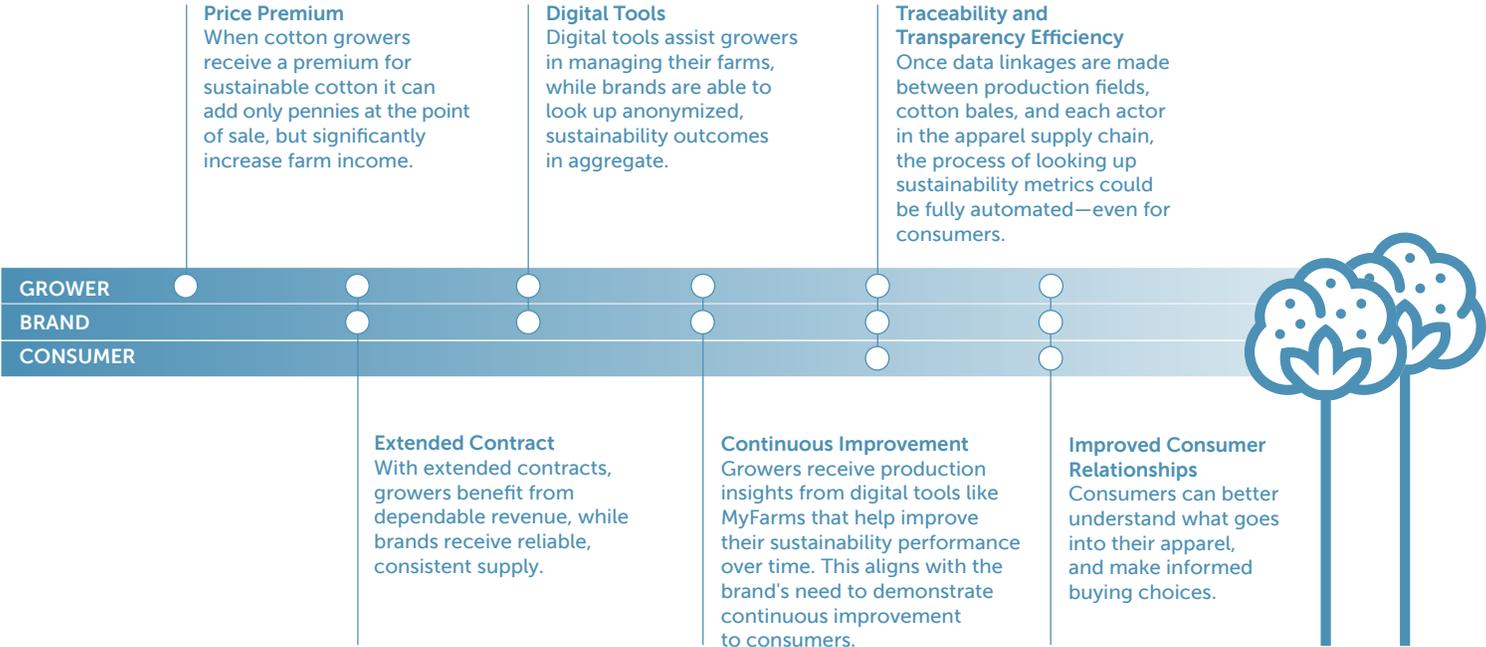


PHOTO: Cotton grown with land-stewardship practices on the Pugh family farm in Halls, Tennessee, will be included in a new line of Wrangler jeans for 2019



Building Trust with Growers

In addition to creating value, successful supply chain initiatives must overcome other barriers to building trust with growers. Some farmers express apprehension about sharing field data out of concern for how it could be used against them in the future by customers, regulators or farming input manufacturers. Legally binding terms can ease these fears by expressly prohibiting the sharing of sustainability data tied to an individual farmer. Furthermore, sustainability tracking platforms should be sure to highlight that they do not store on-farm data after calculating environmental projections.

In general, the sustainability community understands the need to respect grower data-privacy concerns, and farmers need to know this so they can be transparent without fear of unanticipated consequences.

Another key element for building trust is respect. Most farmers have been dutifully tending to the land for generations. Thus, it can be offensive if someone suggests farmers need to *start* caring about the environment.

Instead of emotional pleas, sustainability practitioners would do better to focus on providing growers with new insight into the environmental impacts of their farming decisions that can only flow from track-and-measure activities.

If we're going to ask probing questions about each farmer's planting, fertility, tillage, and crop-protection decisions we can earn his or her respect by making the time investment intrinsically valuable to the operation of the farm.

For example, we can help a grower see how the environmental outcomes of his or her management decisions anonymously compares with peers in aggregate using sustainability metrics embedded from the Fieldprint® Platform—a pioneering sustainability assessment developed by Field to Market: The Alliance for Sustainable Agriculture. If a grower is losing 6.5 tons per acre of topsoil each year, while a neighbor is only



An example of benchmarked data provided to growers by MyFarms for comparing performance against peers on embedded Field to Market sustainability metrics like soil erosion and energy use efficiency.

losing 0.5 tons per acre, that will naturally raise some important questions about what he or she could do differently. A sustainability partner could then share new scientific insights without presuming to understand or judge the many nuances that go into a farmer's unique production system.

Growers know the importance of science in agriculture, making it common ground for approaching sustainability discussions.

Numerous multi-stakeholder initiatives including The Sustainability Consortium (TSC) and Field to Market: The Alliance for Sustainable Agriculture have defined how to track and measure sustainability outcomes. These organizations engage the scientific community to build consensus around data-driven sustainability metrics.

Data- and science-based approaches to supply chain engagement convey respect for farmers' inherent roles as conservationists, while equipping them with additional information on which to base farm-management decisions. Promoting and managing sustainability in this manner is a paradigm shift that will fundamentally build stronger grower relationships while enabling meaningful change.

WRANGLER AND MYFARMS TECHNOLOGY INFRASTRUCTURE

Wrangler and MyFarms have partnered on a technology solution for sharing sustainability data securely and anonymously throughout the cotton value chain.



SIX EXAMPLES OF SUSTAINABILITY ALIGNMENT IN THE COTTON SUPPLY CHAIN

The surest way to achieve supply chain transformation is to consider the economics of downstream customers AND upstream vendors. Here are examples from the cotton industry of how track-and-measure activities for sustainability can be converted into business value.



Cotton Seed Manufacturer

Cotton seed companies invest millions of dollars each year to understand the relationships between seed genetics and yield environments by managing replicated test plots across their sales territories. With a shared goal of creating and using seed varieties that yield the most with the fewest inputs, a two-way data exchange would be valuable to both farmers and seed companies.



Ag Retailers

Growers often have long-standing relationships with one or more ag retailers providing seed, fertilizer and crop-protection products. Some retailers also provide digital-agronomy services ranging from site-specific soil testing to variable-rate seed and fertilizer recommendations. Ag retailers have an opportunity to build on these services by analyzing growers' field-level data to advise on both long-term sustainability questions and near-term opportunities for improvement.



Cotton Producer

Cotton farmers operate on thin margins in a highly competitive marketplace and invest hundreds of dollars per acre in each crop. Track-and-measure data can be used to help producers understand how much energy, for example, they invest per acre and per pound. It can also be used to project how much soil they lose as a consequence of their management decisions. By turning sustainability data into benchmark reports that anonymously compare growers to their peers, data becomes both insightful and motivational.



Apparel Brand

In addition to meeting demand for sustainably produced cotton products, Wrangler also needs to meet the reporting demands of retail customers and stakeholders on certain key performance indicators (KPI). A comprehensive system to manage impact data from the field to the product would streamline this process and provide valuable insight on the supply chain as a whole. Neither Wrangler nor its retail partners would have the ability to view the field-specific data entered by producers. This data is only reported to them anonymously and in large collections for the purpose of tracking progress at a large scale.



Spinning/Fabric Mill

Spinning mills need to be able to find and procure sustainably produced cotton bales. These mills are vertically integrated because they spin yarn from raw cotton, and also weave it into a roll of denim, under the same roof. These companies are in a unique position to serve brands seeking sustainability solutions, since they can more easily build the data connection between raw cotton bales and finished denim fabric.



Cotton Gin

Cotton bales produced with sustainable, soil-health practices need to be tracked accordingly, so they can be found and purchased by downstream partners. Building a connection between a farm-management information system, like MyFarms, and a cotton gin's existing IT infrastructure would efficiently convey this value to downstream trading partners.

Closing Thoughts

The work of a sustainability director in the agricultural supply chain is to enable, track and communicate environmental improvements for consumers while engaging growers on the metrics that matter most on the farm. Some consumers, for example, express concern over greenhouse gas emissions and water quality, while farmers are generally more focused on related operational values. They intuitively understand the value associated with improving energy efficiency (a greenhouse gas emissions driver) and retaining life-producing topsoil (a water-quality driver). Thus, the role of the sustainability director is to understand the needs of each, and translate the data requirements accordingly.

By thinking strategically about how sustainability engagements can benefit farmers, we're choosing an approach that has proven successful for other supply chain initiatives. In addition, most farmers have been nurturing farm land for generations, and if we fail to recognize this when introducing new sustainability metrics, we might drive a wedge between our priorities and their decision-making processes.

Instead, we can drive progress by equipping farmers with the tools and data they need to understand the environmental impact of their decisions. In doing so, we can trust the environmental and economic benefits will become clear and lead to the transformation we seek.

LEADING FARM MANAGEMENT SOFTWARES

Numerous organizations are working towards more robust software integrations for capturing sustainability data, including:

- MyFarms
- Fieldprint Platform
- Land 'O Lakes SUSTAIN
- Syngenta/AgConnections
- Cool Farm Tool
- Agrible
- Precision Conservation Management

PARTNERING FROM OPPOSITE ENDS OF THE SUPPLY CHAIN

Wrangler identified the first five growers for its U.S. sustainable cotton program through the e3 program. e3 is an example of a supply chain engagement by a seed manufacturer creating financial value for growers through data linkages with downstream gins and fabric mills willing to pay more for demonstrable claims.

Traceability – e3 is the only conventional, domestic cotton supply that can deliver item-level sustainability claims.

Sustainability – Brands will soon be able to generate sustainability reports for e3 cotton, which can be used in consumer-facing communication.

Transparency – e3 lays the groundwork for tracking a pair of jeans back to the fields used to produce the cotton they contain.





ABOUT THE AUTHORS

Roian Atwood

Roian Atwood is the director of sustainability for Wrangler. He's responsible for engaging global suppliers to drive greater social and environmental performance, and he works with product development and marketing to create more sustainable products and share brand-relevant stories. Roian has worked in footwear and apparel sustainability for 15 years. Atwood studied complex systems at Naropa University and earned a master's of environmental management from the Nicholas School of the Environment at Duke University.

Chris Fennig

Chris's unusual background in farming, physics, and supply chain integration inform his no-nonsense approach to delivering sustainability solutions. As the founder of MyFarms, a cloud-based software company, Chris is passionate about developing market-leading strategies that combine field data with the IT infrastructure of global brands. Today, the MyFarms data exchange is used by thousands of farmers and dozens of enterprises across the US and Australia. Chris studied physics and engineering at Taylor University and earned a master's of science in physics and entrepreneurship from Case Western Reserve University.

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