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The Data Revolution in Grain Trading: Navigating Complexity and Unlocking Opportunities

In an era of rapid technological advancement, the grain industry is experiencing a profound transformation. For grain traders, grain merchandisers and others engaged in commodity commerce, particularly those operating mid-level elevators and smaller agricultural trading businesses, the pace can feel unsettling. This paper explores how data and analytics are reshaping the grain industry, with a focus on how building robust and agile supply chains can now more accurately account for market conditions and local information when trading with farmers and ranchers.

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The changing face of grain trading and the evolution of analytics-based grain management

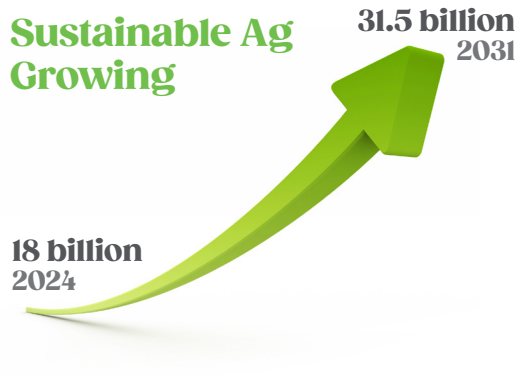
The grain industry has become increasingly complex and opaque in recent years. This shift is driven by several factors:

1. **Growing farmer sophistication:** Today's farmers are more technologically savvy and business-oriented than ever before. They utilize advanced tools and techniques to optimize their operations, including the use of multiple data sources across the various stages of planting, growing and harvesting.. This extends to how they engage in the grain commodity markets, leading to more responsive and streamlined grain market engagement. This clarity, when combined with more sophisticated and connected grain markets means the days of managing grain marketing via simple phone calls is over.

2. **Expansion of on-farm storage and grain marketing flexibility:** The growth in on-farm storage capacity has given farmers more control over when they sell their grain. From 2000 to 2022, on-farm storage capacity in the U.S. grew from ~10 billion bushels to ~13.6 billion bushels, outpacing off-farm capacity, which stands at 11.8 billion bushels (per Farm Bureau Economist Daniel Munch in October, 2023 article "Grain Storage Capacity Can Buffer Impact of Transportation Disruptions" on www.fb.org)) . On-farm storage growth has made it more challenging for traders to predict and manage grain supply, as it puts power into the hands of producers who have more flexibility on when and how they market their grain. While these changes vary across states, most continue to see a steady increase in storage capacity.

3. **Lack of hyper-local, real-time data:** Despite advancements in technology, there remains a gap in access to field-level, near-time data at the local level. This information void can vary by grain type and geography. It can also vary by farmer, as producers are known to keep yield information close to the vest. This can lead to missed opportunities and increased risk for grain traders. Indeed, while regional yields and opportunities can be determined through larger datasets, individual farm operations and their status continue to be controlled by the farmers. However, there are tools and models in use and in development that help answer some of those questions.

4. **Introduction of sustainable grain markets:** Sustainably grown grain is forming as a new marketplace for farmers with a promise of increased value and income. This new attribute of select grain is still in the initial stages but is based on using low-carbon impact practices and inputs. Financial support from the USDA, in the form of grants, and an increased demand from consumers and food companies show is leading to greater willingness among farmers to engage in structured sustainable grain trading practice. Although recent actions by the Trump Administration are putting some of these grant efforts in question. A report by the Food and Agriculture Organization



sustainably grown grains is rising, with a 25% increase in consumer demand for sustainably produced food products over the past three years. The USDA's Sustainable Agriculture Research and Education (SARE) program has allocated significant funding towards promoting sustainable practices, including a $46 million grant initiative to support low-carbon impact farming practices called Farmers for Soil Health (per USDA press release on April 19, 2023 at www.USDA.gov). Despite these advances, measuring sustainability characteristics remains complex, as it requires detailed data on farming practices that go beyond traditional quality tests. This complexity requires greater transparency and willingness from farmers to share detailed operational information because sustainability goes beyond the typical grain quality tests focused more on moisture, grain damage or foreign materials.

Q&A with Former DTN Lead Analyst Todd Hultman

Former DTN Lead Analyst Todd Hultman and long time commodity markets expert has been immersed in the commodity futures industry since 1985. He started as a broker and later chose to focus on futures market research and trader education. Those strong interests brought him to DTN where he provided unbiased, targeted insights and grain market commentary. During an interview with Todd , he spoke about the changes that data has brought to the grain trading business.

QUESTIONS	ANSWERS
Why is a data revolution happening now in grain trading, and how is it impacting the industry overall?	"A snowball of progress that started with the computer evolved into the Internet and then has gone on steroids with increased computing power over the past decades, and now we have a society where there is so much electronic data information available. This revolution provides a greater understanding of crop conditions and the environment that crops grow in from the very beginning. Additionally, it has led to the ability to have a better understanding not only of where the grain's coming from, how much grain is coming from each area, but also then where the grain is flowing to."
How do grain traders and farmers view this data revolution differently?	"For the farmer, there's a strong reluctance to share their information with just anybody knowing that there's a possibility that people are using that information to make money off of their crops or the fluctuation of prices in their crops. From a trader's perspective, it can feel a little vulnerable to think that maybe your competitors know as much about the availability of grain in your region as you do, and so maybe you feel a little bit like there's a loss of a competitive edge in your local knowledge of the situation."
How has data specifically helped traders?	"Having better information and data at our fingertips and in our grasp helps us to have better confidence of the situation that we're presently in and working from. However, no matter how hard we work, we can never get rid of that uncertain X Factor."
What are some specifics that grain traders and grain merchandisers face with this data revolution?	"We can be overwhelmed with the tidal wave of information, but we still have to have a good understanding and comprehension of what's really important out of all that that we need to know and focus on. This leads to the challenge of understanding markets, with most traders inundated with news and data. I mean, we get bombarded. We can read as much news every day as we want and still not cover it all."
Has the data revolution leveled the playing field in grain trading?	"While the agriculture and grain trading industry are making the type of information they have much more available to all of us, there is still an imbalance. So far to date, it is still the big commercial players, the Cargills, the Bungies, the Louis Dreyfus, that are involved in the flow of grain internationally. We still have a long way to go to say that the commercials still do not have the advantage. But availability of data and the technology to help manage it continues to advance in ways that are slowly leveling trading activities."

The use of analytics in grain trading has come a long way from simple spreadsheets and basic market reports or tickers. Today, advanced analytics and, to a growing extent, artificial intelligence (AI) are revolutionizing how grain traders operate. This evolution can be broken down into several categories:

1. **Descriptive analytics:** The first step is the ability to analyze historical data to understand past trends and patterns. This included basic reporting on prices, volumes, and market movements. But it also includes data around grain type, inputs, soil health and other factors that drive yield results. This ability to view and see results from past actions helps farmers better understand what works, and what does not. Descriptive analytics also aids in understanding market movements, with a 2024 report from the USDA highlighting that historical market data analysis helps traders make more informed decisions, improving forecasting accuracy by as much as 20%.

Descriptive analytics can improve forcasting accuracy by as much as 20%

2. **Predictive analytics:** The next logical topic is how the development of models, and use of more comprehensive and available data points can help forecast future yields and trends based on the combination of historical data and current field and market conditions. This allows grain buyers to make more informed decisions about how a specific ag season may be playing out.

Predictive analytics can improve forecast accuracy by up to 25%

3. **Prescriptive analytics:** The latest advancement is the use of AI and machine learning to not only predict outcomes but also suggest optimal courses of action. These systems can analyze vast amounts of data from multiple sources to provide actionable insights.

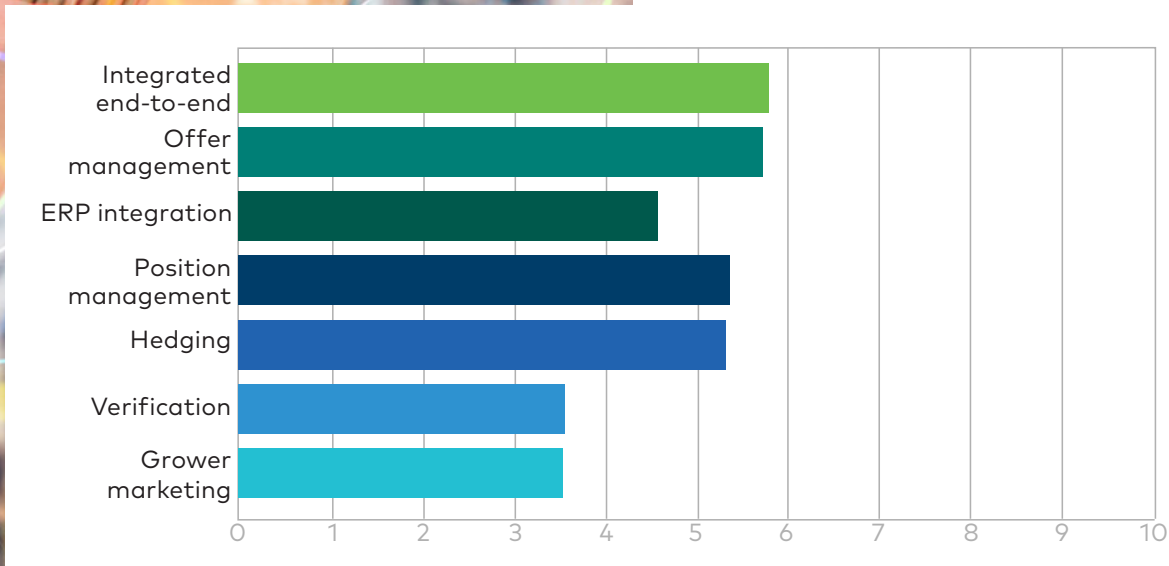
4. **Real-time analytics:** Real-time analytics are now table stakes for successful grain trading, facilitating immediate responses to market fluctuations. Exact improvement in results can vary.

Real-time analytics can enhance trading efficiency and profitability by up to 30%

In a survey conducted in June 2024, DTN asked grain buyers what capabilities are important in innovative technologies and solutions that help them conduct their farmer engagement and grain trading practices. The results show a balanced ranking of a variety of factors that include:

- End-to-end integration of data within trading systems
- Offer management
- ERP integration
- Position management
- Hedging
- Verification
- Grower marketing capabilities

In short, this evolution means a shift from reactive, historical, "gut-based" decision-making to proactive strategy development using data and systems to coordinate across the complexities of grain trading practices. This allows for more informed buying decisions, better risk management, better inventory control, and optimized pricing strategies.



Challenges and opportunities for grain traders

The data revolution in grain trading presents both significant challenges and opportunities for traders. Let us explore some of the key areas:

Challenges

1. **Data integration:** Many traders struggle with integrating data from multiple sources into a cohesive and usable format. A 2023 survey by Deloitte found that 65% of organizations struggle with integrating data from various sources, a challenge exacerbated in industries like agriculture and grain trading where data diversity is high. The complexity of integrating data from weather forecasts, market prices, soil conditions, and logistical systems can lead to inefficiency.
2. **Technology adoption:** Implementing modern technologies can be costly and may require significant changes to existing processes and systems. McKinsey & Company reports that 70% of digital transformation initiatives fail (Per "Perspectives on transformation" on www.mckinsey.com), primarily due to the prohibitive costs and disruptions associated with implementing modern technologies. For agriculture and grain trading, adopting innovative technologies like precision agriculture tools or blockchain for supply chain transparency can be particularly costly.
3. **Skill gap:** There is often a shortage of personnel with the necessary skills to effectively utilize advanced analytics and AI tools. The World Economic Forum's 2024 Future of Jobs Report reveals that 23% of jobs are expected to change in the next five years, with AI being a core driver of those changes. In specialized fields such as agriculture, the shortage is even more acute.
4. **Data quality and consistency:** Ensuring the accuracy and reliability of data from various sources remains a significant challenge. A 2023 report from Gartner highlights that data quality affects overall labor productivity by as much as 20%. Leaders consider data quality a top challenge, with poor data quality impacting decision-making. In agriculture and grain trading, data inaccuracies can lead to misinformed decisions affecting crop yields and market prices.
5. **Regulatory compliance:** As data becomes more central to operations, traders must navigate complex regulations around data privacy and security. For the agriculture and grain trading sectors, compliance with regulations such as the General Data Protection Regulation (GDPR) and the California Consumer Privacy Act (CCPA) is crucial. Non-compliance can result in significant fines—GDPR penalties can reach up to €20 million or 4% of annual global turnover, whichever is greater—making it essential for traders to stay abreast of evolving regulations.

Opportunities

1. **Enhanced market intelligence:** Advanced analytics can provide deeper insights into market trends, allowing traders to make more informed decisions. According to a 2023 report by McKinsey & Company, organizations leveraging advanced analytics and big data have seen up to a 20% improvement in decision-making speed and accuracy. Advanced analytics tools enable traders to gain deeper insights into market trends by analyzing vast amounts of data.
2. **Improved supply chain management:** Near-time data and predictive analytics can help optimize inventory levels and logistics, reducing costs and improving efficiency. According to the association for Supply Chain Management, by 2026 the global supply chain management application market is expected to reach $31billion, showing the importance and need for supply chain technology. Real-time data allows for better inventory management and coordination optimization.
3. **Better risk management:** AI-powered models can help identify and mitigate risks more effectively, from price volatility to weather-related supply disruptions. AI models can forecast risks related to price volatility and weather disruptions more accurately.
4. **Personalized farmer engagement:** Data analytics can help traders understand individual farmers' needs and preferences, allowing for more targeted and effective relationship-building strategies. In a recent McKinsey study of 800 row and specialty crop farmers, 50% are willing to buy and sell ag products online. But only 12% do execute business through digital channels, complaining that the ecommerce solutions in ag are not intuitive.
5. **Margin optimization:** By analyzing multiple data points, traders can identify opportunities to maximize margins while remaining competitive. Businesses using data analytics to optimize margins can increase profit margins and improvecompetitive positioning. Analyzing data from various sources helps traders identify opportunities for margin improvement.

The need for fewer data platforms

One of the most pressing challenges facing grain traders is the proliferation of data platforms and tools. Many traders find themselves juggling multiple systems, each providing different pieces of the puzzle. This fragmentation can lead to inefficiencies, data inconsistencies, and increased complexity in decision-making processes.

The industry is increasingly recognizing the need for more integrated solutions that can:

1. Consolidate data from multiple sources into a single, user-friendly platform
2. Provide a comprehensive view of market conditions, supply chain status, and trading opportunities
3. Offer advanced analytics and AI capabilities without requiring extensive technical expertise
4. Scale to accommodate the needs of both smaller local cooperatives and larger trading operations

By moving toward more unified data platforms, grain traders can streamline their operations, reduce costs, and make more informed decisions based on a holistic view of their business and the market. A unified data approach allows traders to integrate market data with internal metrics, providing a comprehensive view of business performance.

Conclusion

The grain trading industry is at a pivotal point, with data and analytics offering unprecedented opportunities for growth and efficiency. While challenges remain, particularly in terms of data integration and platform consolidation, the potential benefits are immense. Grain traders who embrace these technologies and develop strategies to leverage them effectively will be well-positioned to thrive in an increasingly complex and competitive landscape.

As the industry continues to evolve, partnerships with trusted, independent data providers will become increasingly valuable. Companies like DTN are at the forefront of this transformation, offering unparalleled, proprietary agriculture insights that can truly improve operations and deliver meaningful, measurable value across the agricultural value chain. With deep industry expertise and a commitment to leveraging advanced analytics and AI, such partners are helping to unlock new value for grain traders and stakeholders throughout the agricultural ecosystem.

By focusing on data-driven decision-making, streamlined operations, and strengthened farmer relationships, grain traders can navigate the complexities of the modern market and position themselves for long-term success in this data-rich era.

Learn more

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