

**Strategic Decision Making Under Uncertainty: Innovation and
New Technology Introduction During Volatile Times
CAB CS 08.3**

The agricultural equipment division of Deere and Company faced a number of challenges and opportunities as 2007 approached. The fundamental challenge was to continue to improve its financial performance, with an increased focus on growth, without sacrificing profitability. Although improving profitability was hard to implement, the approach was well understood. The goal was to reduce costs, reduce assets or increase asset utilization, increase sales and improve price realization.

Growing the business was going to be more difficult. The farm machinery and equipment business in the United States was a relatively mature market. Clearly, there were opportunities for significant growth globally. Brazil, Argentina, the countries of the former Soviet Union, and eventually China and India provided significant potential. Furthermore, Deere had been quite successful in growing its non-traditional agriculture business. Its consumer products segment focused on small tractors and related equipment, lawn mowers and other consumer products. It also included tools, as well as a golf and turf equipment business.

However, Deere's agriculture division was also responsible for the company's U.S. growth strategy. This included a farm machinery and equipment business, which was a much tougher market to expand. Cultivated acreage was not growing, and cyclical sales were highly dependent on farmer's incomes.

Nevertheless, CEO Robert Lane had not let the division off the hook. Growing the

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U.S. agriculture business was important and required continued commitment to innovation and new product introductions. Lane challenged the team to bring new products and services to market that would meet Operating Return on Assets (OROA) and Shareholder Value Added (SVA) goals. He also wanted to grow the division at almost twice the industry growth rate of the past 20 years.

The farm equipment industry viewed Deere as an innovator with a constant stream of new products in power, implement, planting and harvesting equipment. Many of the most successful innovations of the past few decades were product enhancements introduced during a period of reduced labor use and rapid mechanization in the farming sector. The future challenge was how to grow the farm machinery and equipment business in a period of increasingly competitive pressure, a relatively mature U.S. agriculture market, high market uncertainty (ethanol, farm bill, gas prices), high technological uncertainty (GPS) and shortened cycle time in the innovation process.

Despite the challenges, the agriculture division management team had a number of alternatives it could pursue. However, the research and development budget could not support them all. Consequently, the team developed and implemented a systematic process for assessing the potential of the innovations. It used that process to allocate financial and personnel resources to what it considered the highest payoff innovations. These strategies would meet corporate growth-rate goals and mitigate or manage the aforementioned uncertainty.

Deere's History: A Commitment to Quality and Innovation

The legendary agribusiness Deere and Company was founded in 1837 by John Deere, a Vermont blacksmith. A year earlier, he created an innovative design for self-scouring plows for Midwest prairie soil. More than a century later, Deere's "leaping deer" logo is universally trusted in the marketplace and continues to symbolize innovative engineering and rugged construction in agriculture equipment and tractors.

Continuous innovation and new product introductions result from a major commitment of resources to research and development and new product commercialization. Deere's resource commitment to R&D is summarized in Table 1; commitments to R&D have consistently been strong compared to competitors. Appendix A summarizes some of the major innovations and new product introductions during the past 50

Table 1. Sales and R&D Expenditures for Deere and Its Competitors

<i>\$ (in million)</i>	Net Sales	R&D Expenses	R&D as a percent of net sales			
	Deere	Deere	Deere	AGCO	CNH	CAT
2006	19,884	725.8	3.70%	2.40%	3.00%	3.50%
2005	19,401	677.3	3.50%	2.20%	2.60%	3.20%
2004	17,673	611.6	3.50%	2.00%	2.30%	3.30%
2003	13,349	577.3	4.30%	2.00%	2.60%	3.20%
2002	11,702	527.8	4.50%	2.00%	3.00%	3.50%
2001	11,077	590.1	5.30%	2.00%	3.40%	3.70%
2000	11,168	542.1	4.90%	2.00%	3.60%	3.40%

Source: Deere and Company and other companies' annual reports

years. Innovations have involved improvements in tractor, combine, implement and sprayer machinery and equipment (sustaining innovations.) More recent innovations feature new information and electronic-based technology, such as global positioning systems (GPS) guidance products.

The Lane Challenge

The 170-year history of Deere and Company is characterized by innovation and quality. Even during the agricultural recession of the 1980s, Deere maintained its focus on delivering quality products that customers valued. Consequently, Deere gained market share as other major agricultural equipment companies stumbled or failed. However, financial performance was cyclical. Deere typically earned a competitive return on capital for only a few years in a row before it encountered a significant downturn in performance (Table 2). When Robert Lane became CEO and chairman in 2000, his goal was “building and growing a business as great as our products.”

Lane’s basic strategy was relatively straightforward — to achieve exceptional operating performance and disciplined growth through high, performance-aligned team work. Operational performance has been improving through the classic approaches of cost reductions, improved asset utilization and margin enhancing or value pricing. Deere also implemented metrics and reward systems that enable the organization to reach new levels.

Table 2. Deere's Performance

\$ (in million)	Deere and Company		Revenues by segment				Total # of employees
	Net sales of Equipment	R&D	Ag Equipment	Commercial & Consumer Equipment	Construction & Forestry	Credit/Financial services	
2006	19,884	725.8	10,232	3,877	5,775		46,500
2005	19,401	677.3	10,567	3,605	5,229		47,400
2004	17,673	611.6	9,717	3,742	4,214	1,276	46,500
2003	13,349	577.3	7,390	3,231	2,728	1,347	43,200
2002	11,702	527.8	6,792	2,712	2,199	1,426	43,100
2001	11,077	590.1	6,269	2,667	2,086	1,439	45,100
2000	11,168	542.1	5,934	2,966	-	1,323	43,700
1999	9,701	458.4	5,138	2,648	-	1,136	38,700
1998	11,925	444.4	7,217	2,124	-	971	37,000
1997	11,081	412.3	7,048	1,772	-	818	34,400
1996	9,640	370.3	-	-	-	-	33,900
1995	8,830	327.4	-	-	-	-	33,400
1994	7,663	275.7	-	-	-	-	34,300
1993	6,479	269.8	-	-	-	-	33,100

Source: Deere and Company's annual reports

Growth continues to be a more difficult challenge since Deere already enjoys a strong market share position in the United States and Canada farm machinery and equipment market. That market has been growing only at the modest rate of three to five percent per year. Growing, therefore, required a continued commitment to innovation and new product introductions.

As noted earlier, Deere's financial commitment to innovation has been unwavering. This commitment to R&D and innovation was the key to avoiding what Robert Lane described as "commodity hell," through which tired products and services result in "me too" products that may satisfy current customer needs but do little to anticipate future needs or opportunities. This strategy precludes earning above-average profits.

However, a financial commitment to innovation is unlikely to be successful without a disciplined approach to new project selection. Deere implemented an Accelerated Innovation Process (AIP) to evaluate new product or service initiatives more

systematically and quickly. This process was initiated with the identification of areas of opportunity for innovation in which it was perceived that Deere had the capacity and ability to participate. This step was followed by opportunity identification, through which internal capability was matched with current and future customer needs. This process requires intense and sometimes contentious dialogue between the marketing or sales staff, who represent the perspective of the customer, and the engineering and technology personnel who focus on the capabilities or capacity of current and future technology. It is also driven by a set of financial performance metrics that maintain consistency and indicate the expected contribution of an innovation to Deere financial performance.

An additional dimension of Deere's approach to innovation had been to broaden the focus beyond the traditional emphasis on mechanization. Much of Deere's history had been built on sustaining innovations, which generally involve improving the performance and/or lowering the cost of current product or service offerings. In contrast, breakthroughs or disruptive innovations feature new product or service offerings to new or underserved customers. These innovations frequently require capabilities that may be beyond the current skill set of the organization. They also may require a more intimate knowledge of potential new customers, which may not be the focal point of the current sales and marketing organization.

One of the potential breakthroughs or disruptive areas of innovation was in the realm of information management, precision and traceability. This area is increasingly evolving because of the increased demand for quality and food safety across the food production and distribution value chain. It also increases the capability of information technology and telemetry to measure, analyze and deliver critical data and information in real time for improved management decision-making.

Robert Lane, for example, pointed to the shift to intelligent machinery.

“The technology is becoming available to us to bring to the customer intelligent, mobile machinery,” Lane said. “And these machines will be doubly smart because every day out in the field has different weather and growing conditions. To send a smart machine into an environment that is changing every day, it has to be intelligent enough to be adaptive.”

Deere was well aware of the traditional approach to thinking about growth in terms of both customers and products as reflected in Exhibit 1. Its perspective was that more focus should be placed on new products. Yet, these opportunities were characterized by high technical and market uncertainty. The Deere agriculture division found the current discussion about precision agriculture and traceability across the food production/distribution value chain interesting. However, were its customers, as well as the other participants in the food production/distribution value chain, ready to adopt these new disruptive innovations? Also, was the information technology available and adaptable to the agricultural production and food distribution industry? Those were some foremost questions as the team contemplated the critical decisions it had to make.

Although Deere had been a leader in commercializing new products and services in the farm machinery and equipment industry, it had also been focused on maintaining high-quality products that provided reliable and consistent services/experiences for its customers. So, in some cases, Deere's historical approach to innovation might be best described as a "fast follower" or "close second" rather than a "first mover."

A key component of Deere's commitment to quality had been the Enterprise Product Development Process (EPDP), which was a well-defined stage gate process that products go through to assure reliable performance before a commitment to commercialization is made. On the one hand, this process assures quality in products. Yet, as an integrated process, it can take more time than the marketplace may accept. The concern then became that in the information/electronics domains, the rapid rate of technical change meant that the cycle time for successful innovation had to be accelerated. Consequently, some processes Deere had historically used to assess innovations might need to be revamped.

Customer Segmentation

Deere had historically maintained a strong market position in power, implement and combine equipment with traditional commercial producers in Midwest corn and soybean agriculture. This historical dominance had reinforced the perception that the U.S. market was mature and growth potential was limited. However, by reassessing the market with a customer segmentation focus, a different story and conclusion began to emerge.

Deere's segmentation analysis suggested eight customer segments in the farm machinery and equipment market (Exhibit 2) with different attitudes, goals, behaviors and needs. Deere's focus on the traditional segment, which had historically been the most important segment in the industry, had been the source of its success. Yet, the industry was rapidly changing, and the other segments were becoming increasingly more important (Exhibit 3).

Some of these new growing segments, particularly the large/mega farm, the agricultural service provider or custom contractor, and some of the not-for-profit sectors (state and federal government, etc.), needed machinery and equipment with different features. Larger-scale growers and specialty-crop producers were increasingly concerned about precision and process control systems. They were more willing to adopt electronic technology, as long as it was reliable and simple to use.

These segments were currently underserved by Deere, both in terms of market share and features, thus providing significant growth opportunities. Deere sought to prove that information-based technology was reliable, easy to use and valuable to these segments. When considered with the continuous cost reductions and technological advances of electronic-based technology, Deere had the opportunity to scale to traditional and smaller producers in the future. The market segmentation work suggested that the U.S. farm machinery and equipment market may have substantially more growth potential than might have been perceived. It also suggested that new information or precision/electronic-based technology, such as that used in precision farming, could be the entry point and the key to capturing this growth potential.

The New Product/Service Choices

The agriculture division identified five basic precision farming innovation domains that could be offered to the market:

1. Advanced autotrack/guidance/headland management
2. Variable rate seed/fertilizer/chemical application
3. Telematics
4. Information/data management along the value chain
5. Synchronized and autonomous equipment

Precision farming dates back to the first yield mapping system presented by Ag Leader in 1992. The system was introduced soon after GPS technology became available to the public. Precision farming refers to the concept of in-field variability. It results in performing the right task, in the right place and at the right time. Most precision farming systems consist of a GPS receiver, display unit and desktop software.

John Deere's history in precision farming dates back to 1994 with the introduction of a yield mapping system. It has evolved into five distinct categories:

Guidance: The ability to pilot farm machinery through a field via GPS satellite signals. It reduces overlap and improves efficiency by increasing the speed of operation, allowing more work at night or in low visibility conditions and lessens fatigue.

Machine control: Systems that automate tractors, sprayers and planting. They also implement functions such as speed, hydraulic control, on/off control and rate control to reduce inputs, decrease costs and be more environmentally responsive.

Telematics: A wireless communication system between a vehicle and a remote site that transmits information about the vehicle and its environment. Maintenance information can be recorded and location of the equipment can be known at all times. Productivity, idle and transportation times of the equipment can also be calculated. To summarize, the systems can be used for efficiency and equipment management.

Information management: Collecting data about fields, including field location, the seed variety planted, seeding depth or planting height, tillage depth, application depth or height, the amount of products applied, crop yield, harvest moisture level and weather conditions to make maps and informed decisions. The information can be transferred along the value chain to improve efficiency and quality control.

Synchronized and autonomous/robotic multi-unit operations: Wireless operation and control of multiple machine units, such as tractors, swathers and harvesters, by one operator.

The agriculture division faced several challenges in these five domains. Customer adoption behavior has propelled the direction of precision farming solutions in several ways. The rapid adoption of guidance and machine control products is the result of customers reaping the direct benefits of increased productivity, ease of operation and reduced input costs. Documentation and information management solutions have struggled due to the inability for customers to see a direct benefit. Overall, precision farming products have met complexity and price resistance adoption challenges.

Having products that are compatible with older John Deere equipment, as well as competitive equipment, was a top priority. John Deere battled enabling compatibility with their first systems and the rest of the industry. Full integration of precision farming products into John Deere equipment continues to be challenging due to different product lifecycles and the variance between precision solutions and equipment vehicles.

Competition is, of course, also an issue. With high potential for growth in the market, many other companies have tried to capture this emerging global business. Those companies include Trimble, Topcorn, Outback, Leica, AutoFarm, Ag Leader and Raven. Trimble and Topcorn offer guidance, application, water management and information management systems, such as software for planning and documentation. Outback and Leica offer guidance/steering systems. Autofarm and Ag Leader sell guidance/steering systems, as well as data collection products. Ag Leader also produces application control systems. Raven focuses on the application control domain. Furthermore, the major agricultural machinery equipment manufacturers, such as CNH, AGCO and CAT, also offer precision farming technology.

Finally, the agriculture team was concerned about dealer support. They had just begun training the dealers with auto-trac products. This was a necessary, but time-consuming process. How would they find the time to develop the training material for the other domains, justify the time away from the dealership to the dealers and do all of that in a record time?

The Market

Information technology has been adopted by farmers sporadically. Although the use of computers and access to the Internet had expanded in recent years as reflected in Exhibit 4, farmers continued to lag behind other industries in the broad use of elec-

tronic technology for business decisions. Approximately 30 percent of farmers used computers for business purposes in 2003, which made the adoption of precision products by farmers a challenge. Adoption of precision farming technology has paralleled that of computer technology, but with even more uncertainty.

Data from the Agricultural Resource Management Survey (ARMS) show that yield monitors and guidance systems were being adopted at a relatively rapid pace. Yet, other technologies, such as variable rate application of fertilizer, lime, pesticides and seed, as well as yield mapping, geo-referenced soil mapping and remote sensing were lagging in their adoption rates (Table 3). Economic analysis of the payoff of precision farming techniques indicated that guidance systems had the fastest payback, and variable application of lime also had financial benefits. Other precision farming technologies and techniques were not yet seen as highly profitable.

A survey of retail agronomy dealerships concerning precision agriculture services indicated similar uncertainty in adoption. While more than 80 percent of the 340 respondents used some form of precision technologies in their dealerships, the applications were primarily dominated by service offerings to customers and manual control/light bar GPS guidance of application equipment (Exhibit 5). Specific service offerings have grown erratically since the mid-90s and still did not exceed 50 percent of the respondents as of 2006 (Exhibit 6). Midwest dealers were significantly more likely to offer precision services compared to dealers in other regions of the United States (Exhibit 7).

Table 3. Share of U.S. Acreage Using Precision Agriculture Technology

Technology	Sunflower 1999	Potatoes 1999	Sugarbeets 2000	Rice 2000	Barley 2003 ^{2,3}	Sorghum 2003 ^{2,3}
Yield monitor	17.1	10.4	1.0	17.6	17.0	14.4
Yield map	3.8	10.2	*	5.1	4.6	2.0
Geo-referenced soil map	3.8	18.7	28.6	9.5	7.3	7.3
Remote sensing	4.4	20.5	35.2	4.7	2.8	4.4
VRT used for:						
Fertilizer/lime	2.8	13.1	11.9	1.6	12.9	4.7
Seed	*	1.5	2.2	1.2	8.0	3.5
Pesticides	*	3.6	1.3	2.6	10.4	2.7
Guidance	NA	NA	NA	NA	14.7	10.4
*= less than 1 percent. NA = survey not conducted. VRT = variable-rate technology						
¹ These estimates are revised from previous published estimates based on updated weights from the ARMS.						
² Prior to 2002, respondents were asked if the soil characteristics of the field had ever been geo-referenced. Beginning in 2002, respondents were asked						
³ The question was reworded in 2002 to better define the term "remotely sensed.*"						

Source: ARMS

Data from surveys of Ohio farmers in 1999 and 2003 suggested that adoption of precision farming practices was progressing at a slow to moderate pace. As summarized in Table 4, the most frequently adopted precision farming practice was geo-referenced grid soil sampling. Adoption increased from 8 percent of the respondents in 1999 to 15 percent in 2003.

Variable rate application of plant nutrients showed similar rates of adoption and growth in adoption since 1999. Yield monitor adoption almost doubled from 6 to almost 12 percent from 1999 to 2003. Precision guidance was not generally commercially available in 1999 and had been adopted by five percent of the survey respondents by 2003. Approximately one-third of the surveyed farmers had adopted one or more of the precision farming practices in 2003, compared to less than 25 percent in 1999. As expected, larger farmers adopted precision farming techniques more rapidly and were using a larger number of techniques compared to smaller farmers.

From a global perspective, the data are only available on yield monitor use. They

Table 4. Percent of Ohio farmers who had adopted various precision farming components in March 1999 and 2003.

	Percent Adopting	
	2003	1999
Georeferenced (i.e., map-based or location specific) grid soil sampling	15.3	8.1
Variable Rate Application of Phosphorus	14.1	7.3
Variable Rate (i.e., rate varied across field) Application of Lime	14.0	6.7
Variable Rate Application of Potassium	13.4	7.3
Yield Monitor	11.6	6.0
Boundary Mapping	9.8	4.3
Variable Rate Application of Nitrogen	7.7	6.3
Satellite GPS receiver	7.6	2.2
Georeferenced field scouting for weeds	6.0	2.3
Variable Rate Application of Herbicides	5.3	5.7
Precision Guidance (light-bar navigation or auto pilot system)	5.2	
Aerial or Satellite Field Photography	5.2	2.7
Georeferenced field scouting for insects, pests, or disease	4.9	2.0
Variable Rate Seeding	4.2	3.4
Variable Rate Application of Other Nutrients	4.1	3.9
GPS or Sensor-Directed Spot Spraying of Herbicides	3.0	1.3
Variable Rate Application of Pesticides	2.8	2.9
GPS or Sensor-Directed Spot Spraying of Pesticides	0.9	
Percent who have adopted one or more of above	31.8	23.6

Source: Adoption and Use of Precision Farming Technologies: Results of a 2003 Survey of Ohio Farmers The Ohio State University Report Series: AEDE-RP-0039-03, December 15, 2003.

indicate that the United States and Germany appear to have the highest use with lower utilization in Denmark, Sweden and Argentina (Exhibit 8). Success in expanding the precision farming technology footprint in the United States would allow Deere to better understand customers' needs, which could then be leveraged to other countries.

Key Questions

The challenge was clear. How might the agriculture division deliver on this challenge? There were numerous opportunities for new product and service introduction in the traditional areas of enhancing the performance and productivity of Deere's power, implement and harvesting equipment. Yet, the division felt that the most potential and uncertainty might be in the five new domains of precision farming previously identified. The top questions that the division management team decided to focus on were:

1. What strategies might be used to manage the market acceptance or adoption and the technical/technological uncertainties of bringing these new information-based products and services to market?
2. What framework could be used to determine the appropriate portfolio of innovation projects to fund, support and manage this portfolio over time?
3. Should Deere collaborate with specialty electronics companies, such as Raven and Ag Leader? Which characteristics should Deere look for in the partners involved in the development of new technology and what organizational structure might be used to benefit both Deere and the collaborators?
4. What customer characteristics, such as age, size or crops produced, provide the most potential for adopting the products and services in these domains?
5. Given the rapid rate of change in technology, what can Deere do to modify its processes of evaluating and bringing new technology to the market that will accelerate market entry and yet maintain quality?
6. What challenges will the dealer distribution channel encounter in bringing these information-based products and services to market? Will they be able to sell and support them while generating a profit?

Exhibit 1. Growth Options Matrix

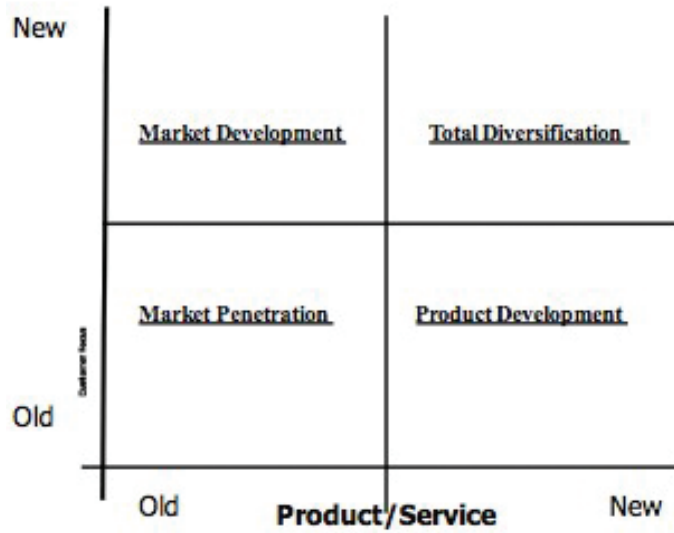
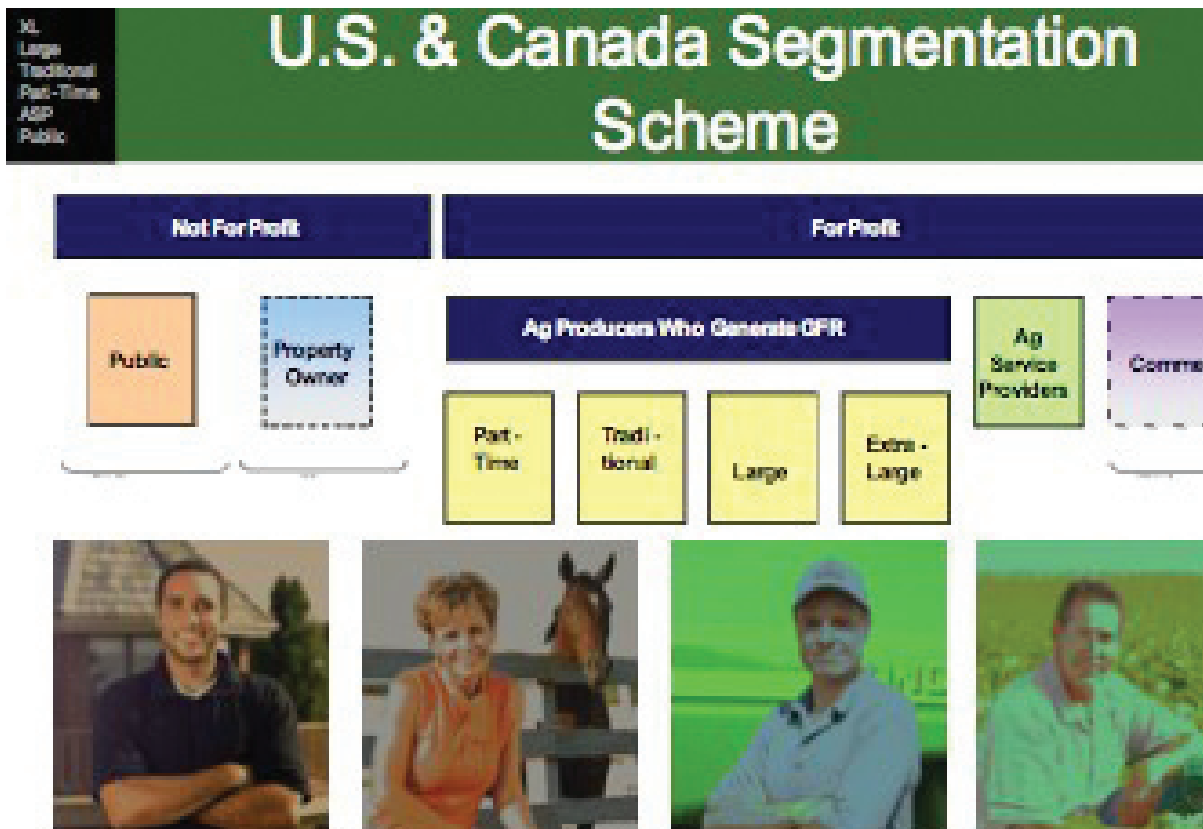
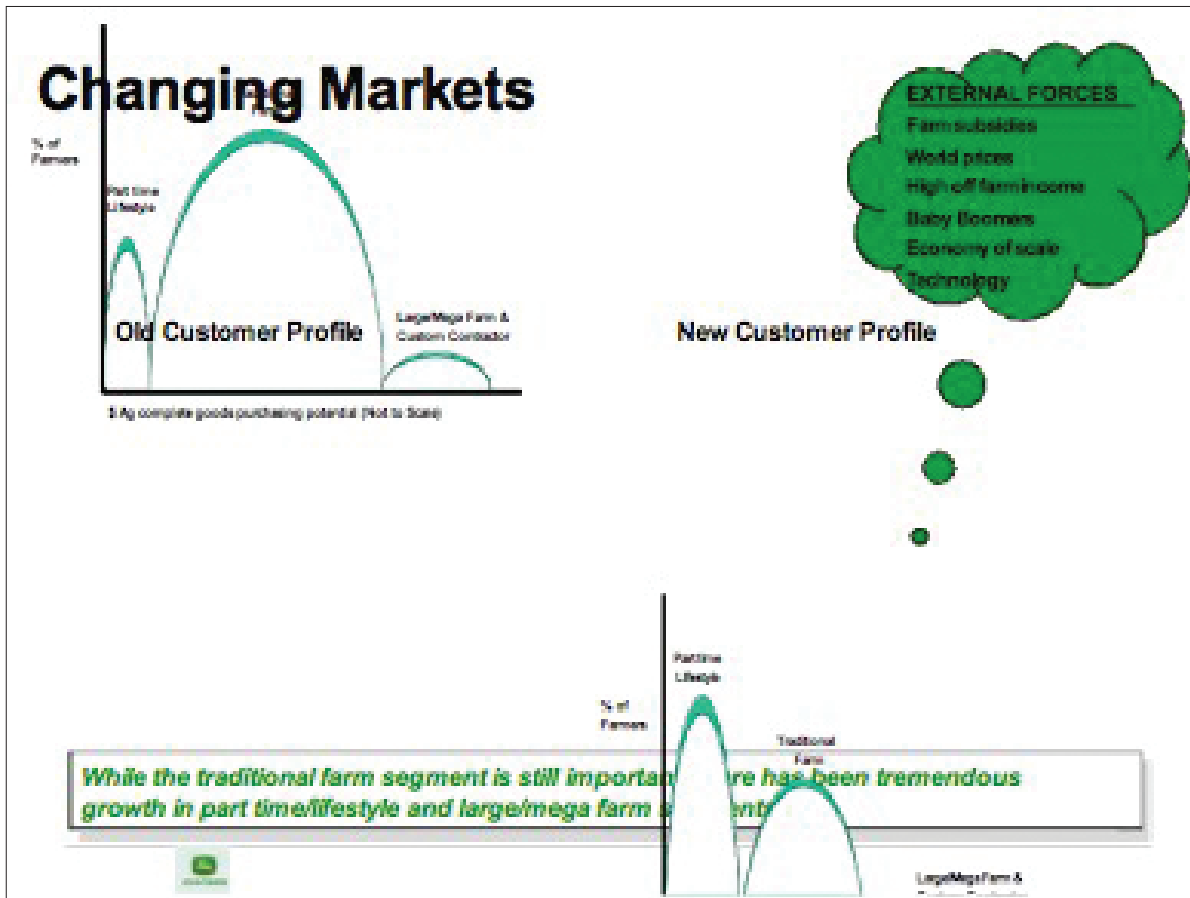


Exhibit 2. Deere's U.S. and Canada Segmentation Scheme



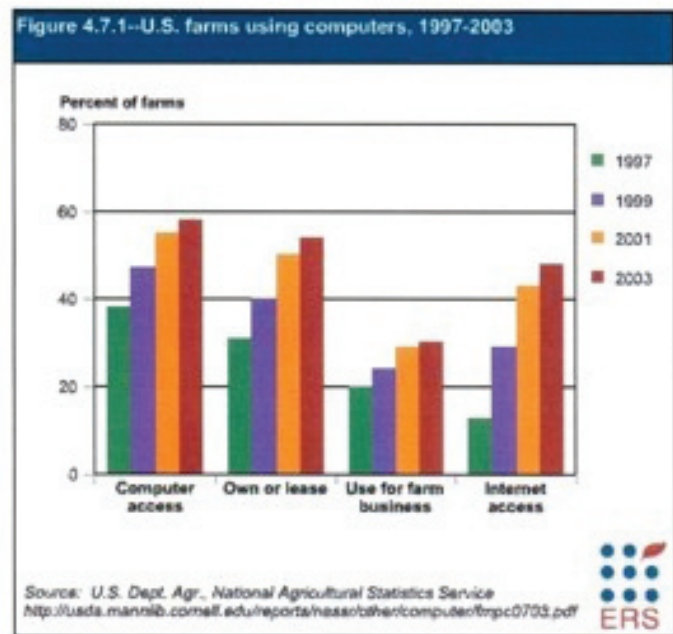
Source: Deere and Company

Exhibit 3. Evolution of Deere Customers' Segments



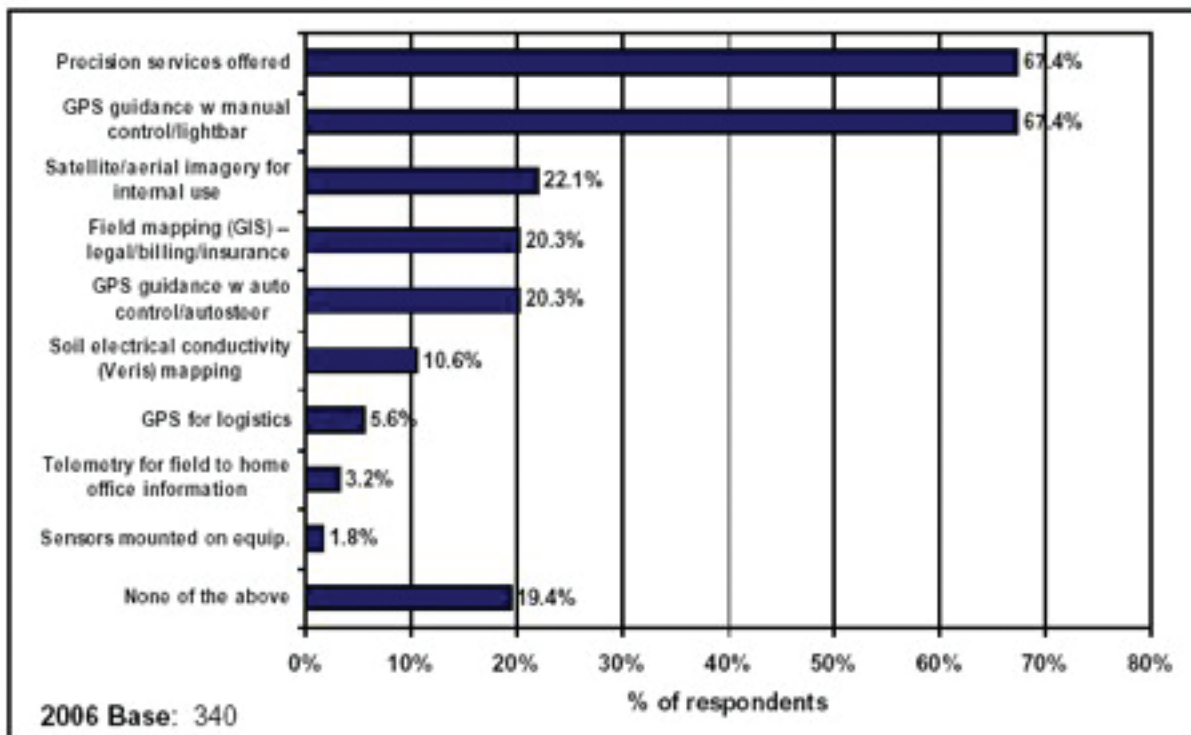
Source: Deere and Company

Exhibit 4. U.S. farms using computers, 1997–2003



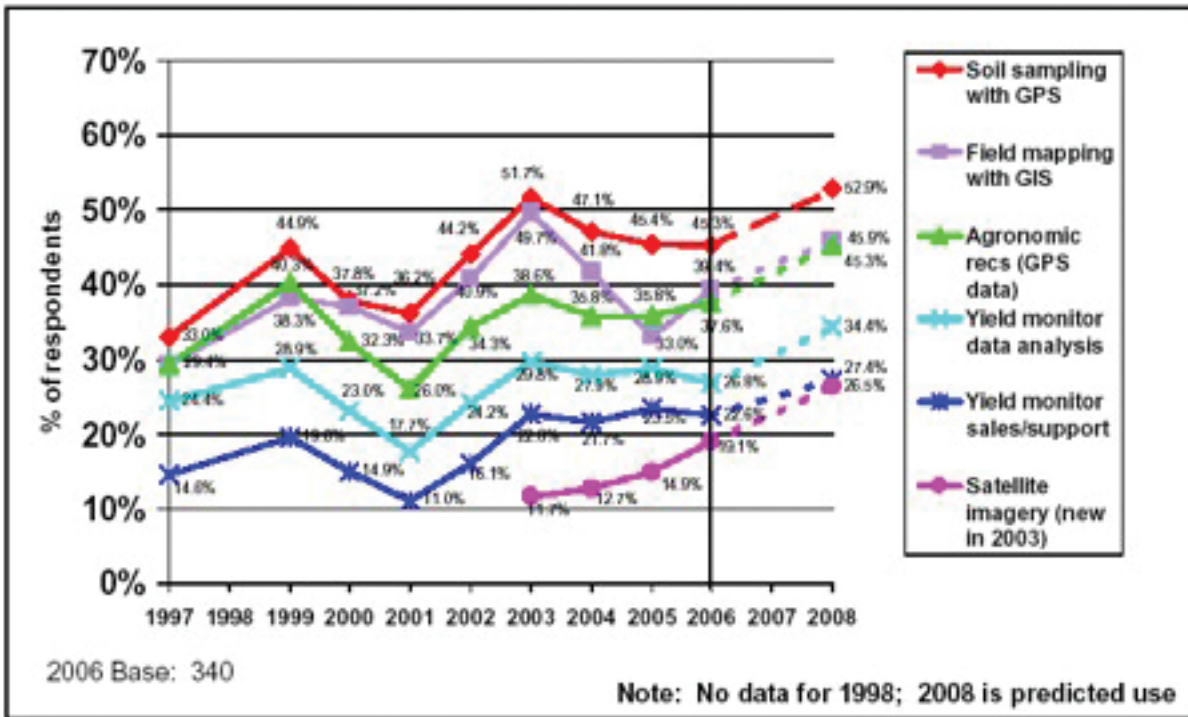
Source: <http://www.ers.usda.gov/publications/arei/eib16/Chapter4/4.7/>

Exhibit 5. Use of Precision Technology in 2006



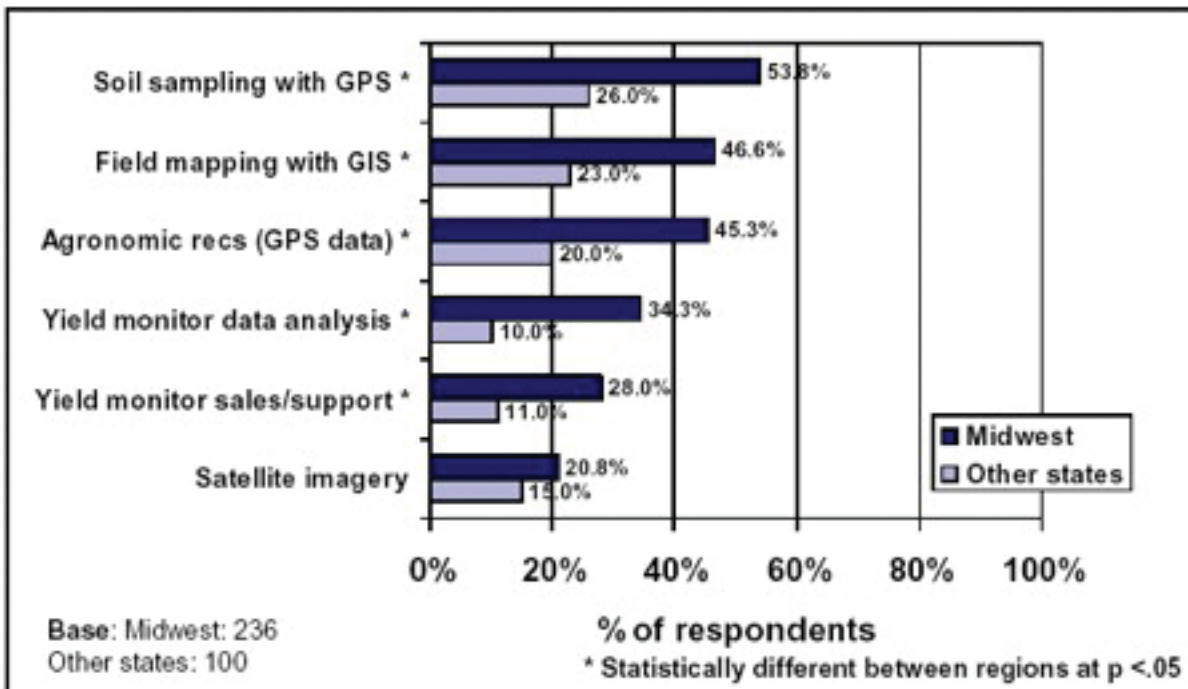
Source: Whipker and Akridge, 2006 Precision Agricultural Services Dealership Survey Results

Exhibit 6. Precision Ag Services Offered Over Time in 2006



Source: Whipker and Akridge, 2006 Precision Agricultural Services Dealership Survey Results

Exhibit 7. Precision Ag Services Offered by Region in 2006

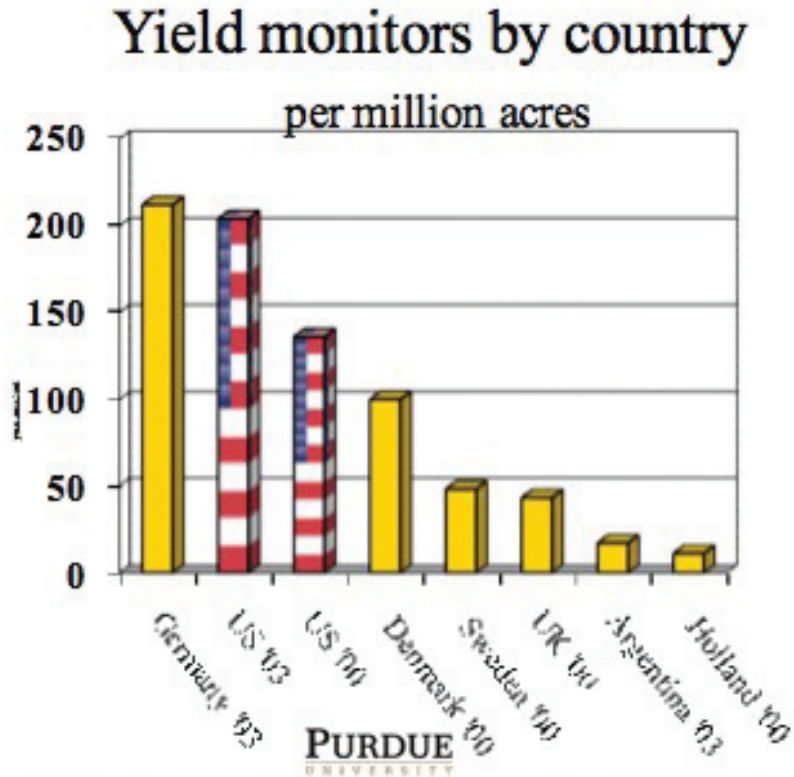


Source: Whipker and Akridge, 2006 Precision Agricultural Services Dealership Survey Results

Exhibit 8. Yield Monitors Use by Country



AGRICULTURAL ECONOMICS



Source: August 2003 SSMC newsletter, http://www.agriculture.purdue.edu/SSMC/Frames/Aug03How%20many%20yield%20monitors_gregedits1.htm

Appendix A: Innovation Chronology

2006: Deere introduces a high-capacity 4930 self-propelled sprayer; the 120-foot boom makes it the most productive sprayer ever built by John Deere.

Innovations such as iGuide, for perfectly straight rows; iTEC Pro for automated end of row turns and GS2 Rate Controller to expand the capabilities of the GS2 system by acting as a controller for sprayers; reach the market.

John Deere 8430 tractor, powered by company's clean-burning engine technology, sets fuel-efficiency record for its size class. Advanced products appear in the 6030 premium series and 7030 full-frame tractors.

A new line of productive round balers is launched.

2005: Major new-product introduction for model-year 2006 with John Deere 8530 tractor; the most powerful row crop tractor ever (275-hp) that allows operators to get more done in less time. Equipped with new 9.0-liter engine, this tractor is more fuel-efficient than the previous model.

Advanced precision-guidance product introduced, which can direct equipment in the field with sub-inch accuracy.

2004: Further advances in new products include recently introduced self-propelled sprayers: the 4720 and 4920 models are the Deere's largest and most-productive sprayers ever.

Expansion of the GreenStar AutoTrac Assisted Steering System on more vehicles.

Development of StarFire RTK system with the repeatable guidance that only Real-Time Kinematic (RTK) GPS systems can deliver.

2003: John Deere Introduces GreenStar™ AutoTrac Assisted-Steering for Wheeled Tractors.

Introduction of several product enhancements for Parallel Tracking (a manual guidance system) and expansion of the GreenStar AutoTrac Assisted Steering line-up with the introduction of Auto-Trac for 8020 series tractors with MFWD or ILS.

Development of JDLink™ Machine Messenger, a wireless communications system for the new John Deere twenty series tractors which allows owners to monitor tractor performance and usage from a secure Internet website.

2002: Development of JD Office, an extended version of JDmap.

Creation of a new JDLink Machine Messenger, a wireless communication and information system for John Deere agricultural tractors that makes automated fleet management a reality.

2001: Two mapping softwares: JDmap & JDmap Deluxe.

Development of parallel tracking to reduce overlap.

Creation of a new service CropTracer that provides the necessary components of a full service traceability program.

Launch of Field Doc, an electronic notebook that makes collecting and recording information about operations exceptionally easy.

Introduction of the GreenStar AutoTrac assisted steering system to reduce the amount of time an operator needs to spend steering the tractor.

1992: A program is launched to encourage installation of rollover protective structures and seat belts on older tractors. In 1966, John Deere introduced the first commercially available rollover protective devices for farm tractors, later releasing the patent to the industry without charge.

1991: Lawn-and-grounds-care equipment operations in the US and Canada become a separate division. Since 1970 they had been part of the farm-equipment operations. The company acquires SABO, a European maker of lawn mowers.

1963: John Deere surpasses IH to become the world's largest producer and seller of farm and industrial tractors and equipment. The company ventures into the consumer market, deciding to produce and sell lawn and garden tractors plus some attachments such as mowers and snow blowers.

1958: The John Deere Credit Company, financier of domestic purchases of John Deere equipment, begins operations.

1957: Six-row planters and cultivators, John Deere innovations, reach the market. They provide 50 percent more planting and cultivating capacity for row-crop farmers in corn- and cotton-producing areas.

Source: Deere and Company