

# Responding To A Changing Market

As precision agriculture moves into another year, the challenges and opportunities continue to shift.

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THE verdict is in — more corn in 2007 was good for everybody in the ag retail business. In particular, precision agriculture recorded some truly impressive numbers. As a result, there was nothing unlucky about the 13th annual Precision Ag Survey.

The impact of more corn acreage and higher fertilizer prices can be seen in this year's adoption of precision technology in dealerships. Service offerings of both single-nutrient and multi-nutrient controller-driven application is up. Not surprisingly, more dealers report they are earning a profit on these two services relative to all other precision offerings.

This spring, *CropLife*® magazine and Purdue University's Center for Food and Agricultural Business conducted a survey of retail crop input dealers for the 13th consecutive year to see which precision technologies were being used by dealers, what type of precision services they were expecting to offer in the future, and how precision programs continue to evolve. As in previous years, a questionnaire was sent to 2,500 *CropLife* dealership readers to "take the pulse of the industry" with respect to precision technologies (see "About The Survey, p. 14, for details).

## How Are Dealers Using Precision Technology?

This year showed continued growth in the use of precision

with support from

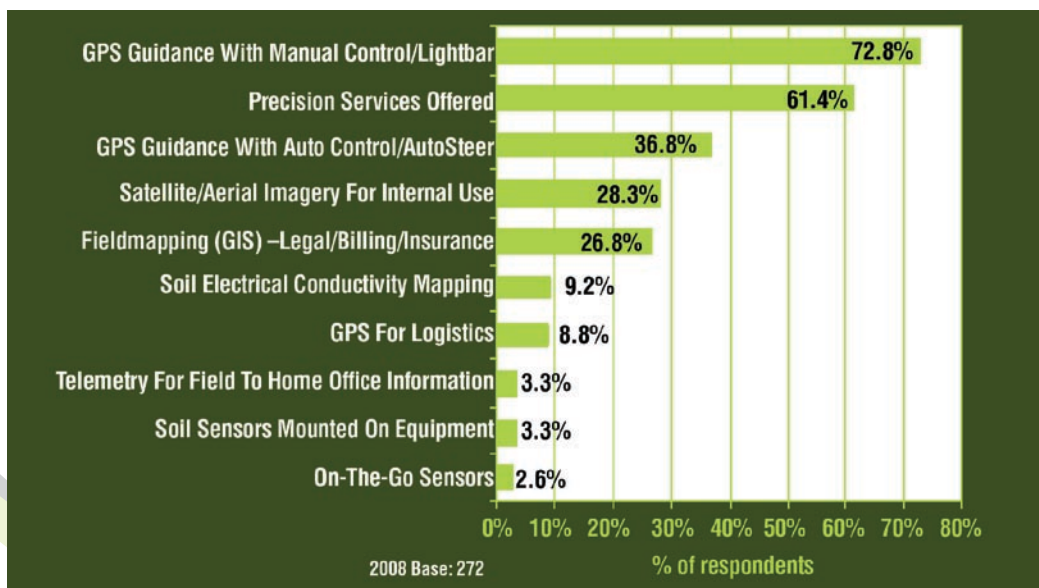


technologies within the dealership. The most commonly used precision technology were GPS guidance systems with manual control/lightbar at 73% of respondents (see Figure 1), followed by precision technologies being used to provide services to growers (61%). Similar to last year, the third most-common use of precision technology within the dealership was the use of GPS guidance systems with automatic control/automatic steering for fertilizer/chemical application, used by 37% of the responding

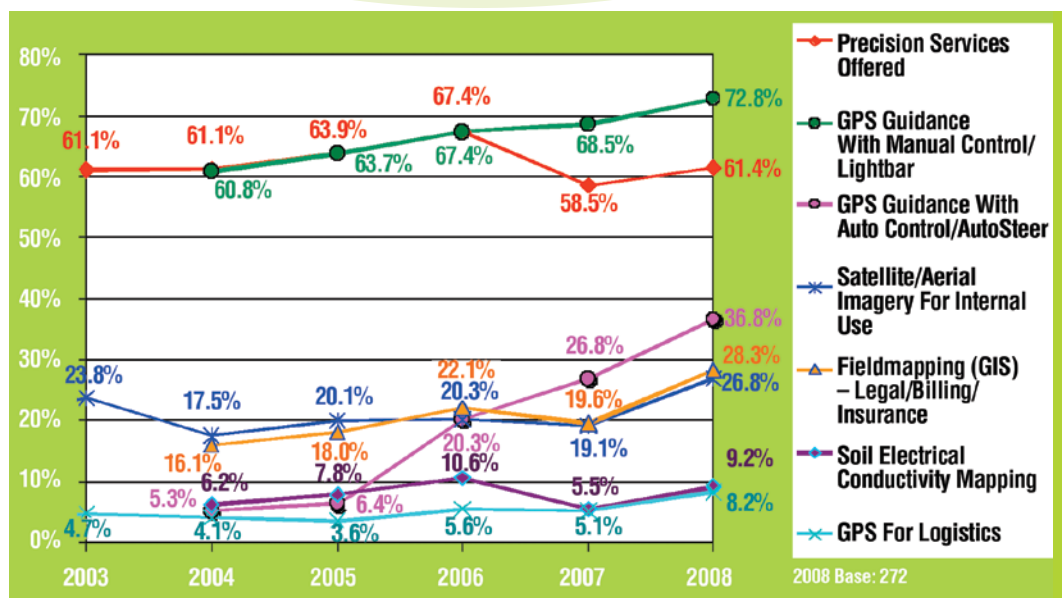
dealerships. Almost one-third (31%) used both types of GPS guidance systems (manual and autosteer) while 22% of the dealerships didn't use either type of guidance system.

For the second year in a row, we asked dealers if they were using sensors: soil sensors for mapping mounted on a pick-up truck, applicator, or tractor (examples: pH soil sensor, chlorophyll/greenness sensor) and on-the-go sensors (such as Crop Circle, Greenseeker, Yara N-Sensor). Four percent of the dealerships used at

**Figure 1**  
**Precision Technology Used In Retail Dealerships In 2008**



**Figure 2**  
**Precision Technology Used In Dealerships Over Time**





least one type of sensor this year compared to 1.7% of the respondents last year. Soil sensors mounted on the equipment were used by 3.3% of the respondents and on-the-go sensors were used by 2.6%.

Figure 2 shows the trends in the use of these technologies for the last five years. The biggest growth in technology has been in GPS guidance systems with auto boom control/autosteer. In 2004, only 5% of the dealerships were using autocontrol/autosteer technology. Last year, 27% were using the technology. By 2008, 37% of the dealerships were using autocontrol/autosteer (a seven-fold increase in four years). Other growth areas this year were field mapping with GIS for legal/billing and insurance purposes and satellite/aerial imagery for internal use — both growing from just under 20% last year to over one-quarter of the dealerships this year. The use of other precision technologies has more or less leveled off from 2005 to 2008.

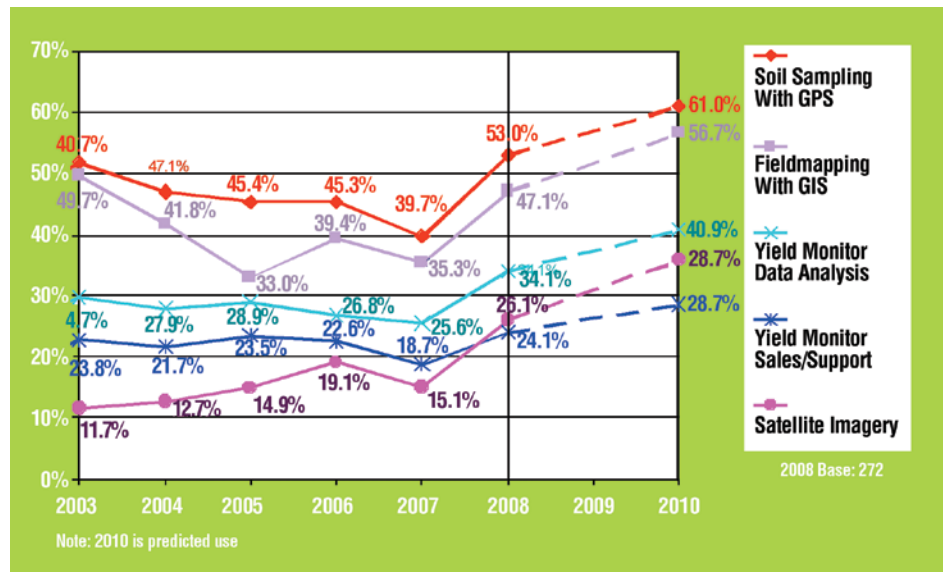
### Precision Ag Service Offerings

The precision services that dealerships offer their customers have remained relatively stable over the past few years with minor fluctuations each year, likely due in part to different annual samples of survey respondents. This year, all precision service offerings — except for field mapping with GIS — were at the highest level, showing slight increases over previous peaks. (Note that the 2007 results showed a reduction in most service offerings, though we expect that this may

have been due to the sample of dealerships reporting instead of a real decline in the U.S.) Dealers are expecting to add more precision services in the next two years, with continued growth expected through 2010 for all precision services. The biggest growth expected is in satellite imagery, with 36% of the dealerships expecting to be offering the service by 2010, up from 26% in 2008.

Precision application services continued to grow in 2008, with both controller-driven multiple-nutrient application and single-nutrient application growing quickly this year, reflecting last year's prediction by respondents that higher fertilizer prices and corn acreage would result in more demand for precision application (Figure 4). For the first

**Figure 3**  
**Precision Ag Services Offered Over Time**



## ABOUT THE SURVEY

The Precision Agriculture Survey was sent to 2,500 retail agronomy dealerships across the U.S. earlier this spring. To get a better distribution of respondents, 500 of the questionnaires were sent specifically to the West. Dealerships were asked questions about the types of precision services they offer and/or use in their businesses, how many of their customers are adopting precision agriculture practices, how profitable they are finding precision services to be in their businesses, and some additional questions about the current barriers to adoption in terms of customers, dealers, and technology.

The 275 survey respondents (an 11% overall response rate) came from 38 states and one from Puerto Rico, with the highest representation — as usual — from the Midwest (69% of the respondents). Dealerships from Indiana accounted for 14% of the

respondents, followed by Illinois with 13% and Iowa with 11% of the respondents. Minnesota, Wisconsin, Kansas, Nebraska, Ohio, Missouri, Michigan, North Dakota, and South Dakota rounded out the Midwestern states.

Two-thirds of the surveys (68%) were completed by the owner or manager of the outlet, while 12% were completed by departmental managers and 10% of the respondents were involved in sales. Technical consultants, agronomists, and precision managers accounted for the remaining 10%.

The responding dealerships represented a wide range of organizational types and sizes, with over four out of 10 representing local independents (43%), one-third representing cooperatives (39%), and the remaining 18% belonging to a regional or national organization.

time, over half of the dealerships (56%) said they offered controller-driven single-nutrient application, with almost two-thirds (64%) expecting to offer it by 2010. One-third of the respondents said their dealership offered controller-driven multi-nutrient application.

Unexpectedly, variable-rate seeding with GPS more than doubled this year from 6% of dealerships offering the service in 2007 to 15% in 2008. One-quarter of the respondents expected to be offering the service by 2010.

### Profitability Of Precision Ag Service Offerings

Figure 5 shows the different types of variable-rate application services dealerships expect to offer by the fall of 2008. Over half of the respondents (52%) indicated they were currently offering controller-driven single-nutrient application of fertilizer, up from 40% in 2007. Almost as many were offering controller-driven application of lime (45%, up from 33% in 2007). Controller-driven multiple-nutrient application of fertilizer is also increasing, with almost one-third indicating they were offering that service in 2008, up from 24% in 2007.

We also asked dealerships how profitable they felt their precision service offerings were. For each precision component, Figure 6 shows the percentage of respondents who said the service was generating a profit (covering both fixed and variable costs) from 2003-08. This year, 43% of the respondents felt that their total precision package was profitable, similar to last year's 44%. The most profitable precision service continued to be controller-driven multi-nutrient application, with 49% of the respondents saying that it generated a profit for them. But 47% said that con-

Figure 4  
Variable-Rate Application Offered Over Time

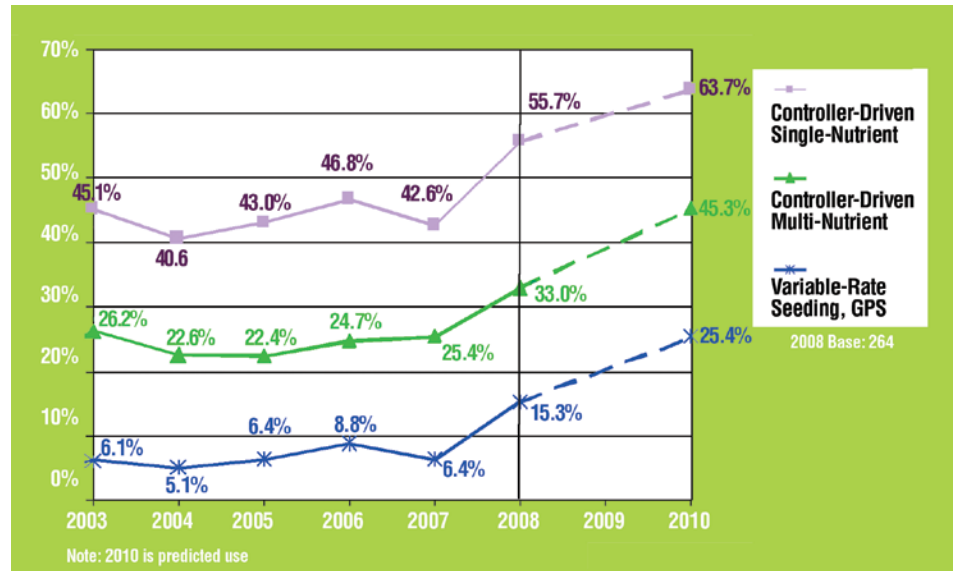
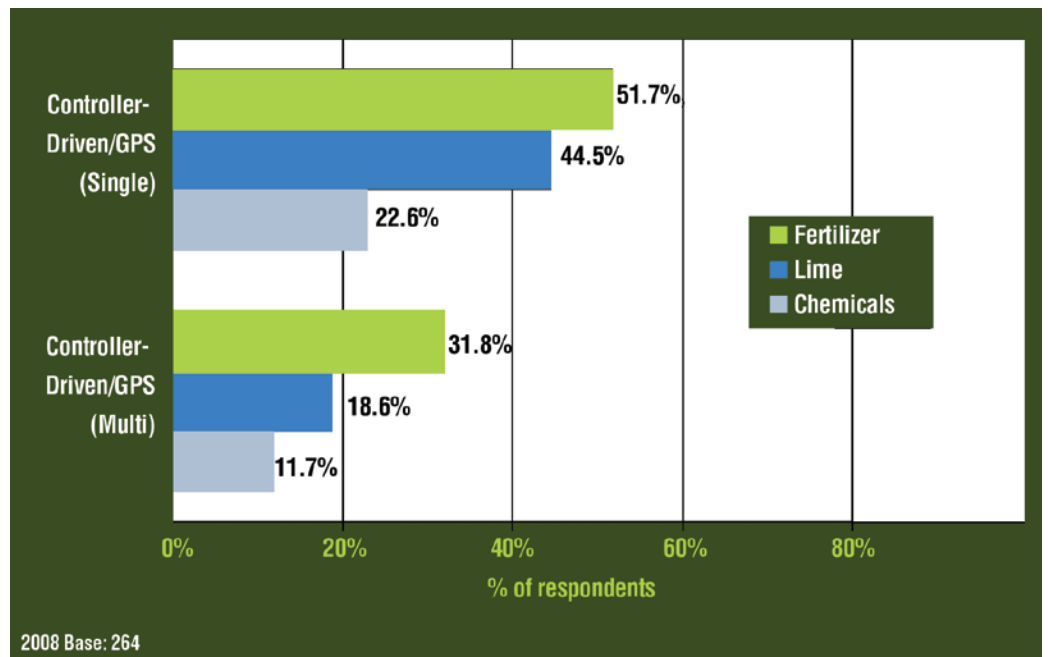


Figure 5  
Variable-Rate Application Offered By Type Of Input In 2008



troller-driven single-nutrient variable-rate application was generating a profit this year as well, up from 36% last year.

one-quarter of the respondents (24%) said they wouldn't be investing anything in 2008.

### Expected Investment In Precision Technologies In 2008

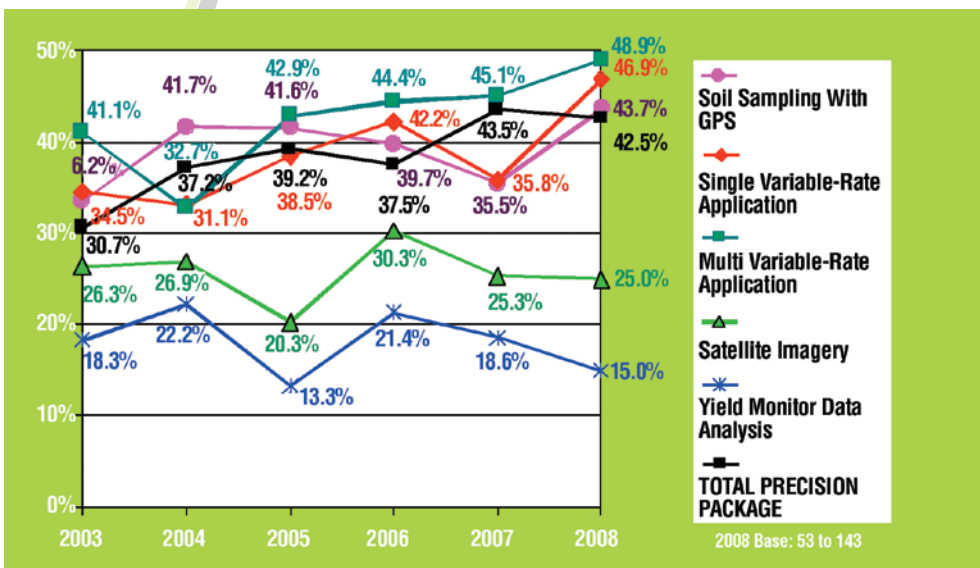
Given the current market conditions, one question we had for dealers was how much they would be investing in precision technology this year. Almost one-quarter of the respondents (23%) said their dealerships would be investing more than \$25,000 in precision/site-specific technology in 2008 (Figure 7). More than half (53%) said their dealership would be investing under \$25,000. Only

### Summary

With another big corn crop expected and continued pressure on fertilizer prices, use of precision technology will likely increase again in 2009. Growers — and dealerships — continue to look for strategies to successfully manage through this unprecedented time.

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Figure 6  
Profitability Of Precision Service Offerings Over Time



Precision 2.0 begins on p. 18

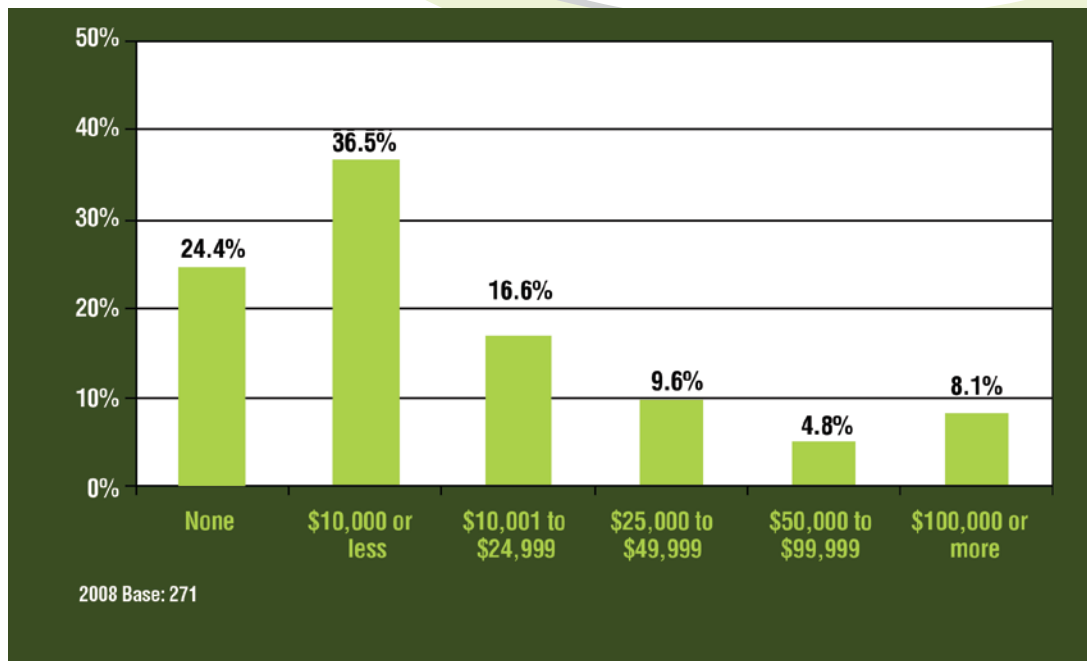


Figure 7  
Expected Investment In Precision Technology In 2008

## PRECISION 2.0

# Where Is Site-Specific Agriculture Headed?

Figure 8  
What Will Precision 2.0 Look Like?

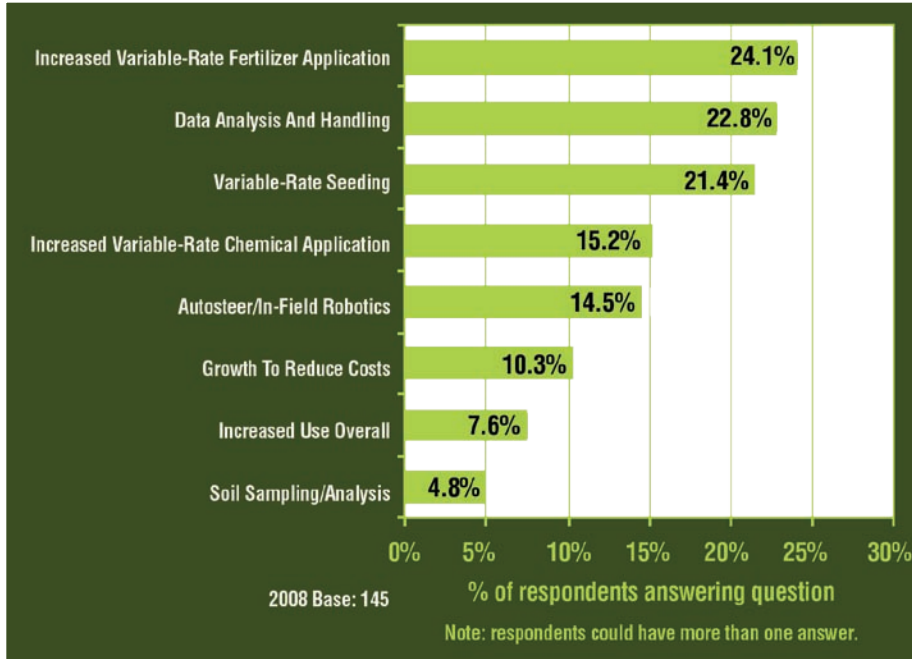
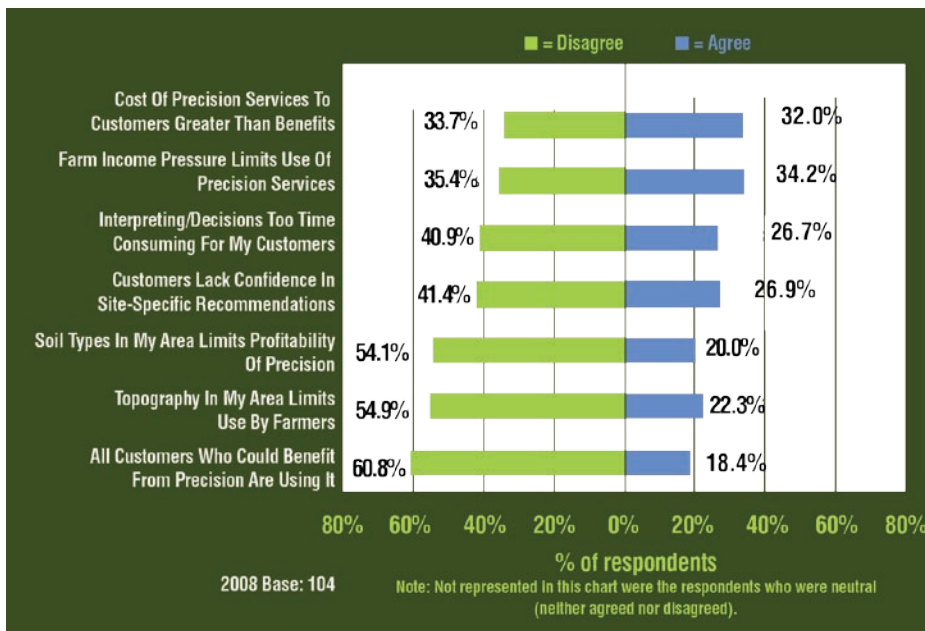


Figure 9  
Customer Issues



**P**RECISION agriculture and site-specific technologies have been around for well over a decade now. Over that time, new technologies and services have been introduced — including new types of sensors, autosteer GPS guidance systems, and soil electroconductivity mapping. At this point, GPS and the concept of variable-rate application are fairly well understood by both growers and retail dealers. The question now is where the technology and associated services will go next.

As part of the 13th Annual Precision Agriculture Survey sponsored by *CropLife*® magazine and Purdue University's Center for Food and Agricultural Business, retail dealers were asked what they thought Precision 2.0 would look like. They were also asked to rate several barriers to the further expansion of precision agriculture — customer issues, dealer issues, and issues with the technology (these issues were also explored in 2004). The following results are based on responses from the 275 dealers who responded to the 2008 survey.

Many dealers did see changes coming. Some focused on changes at the grower level and mentioned the need to make technology more user-friendly to support more on-farm growth in use of precision services.

■ Grower purchase and use of GPS technology for planting/harvesting purposes is where this area is going. (AL)

■ Compatibility and reliability of precision equipment continues to be a challenge. The complexity is a major drawback for many growers — they don't want to

take the time to learn. (OH)

■ Data interpretation. My customers have data overload. They need help to make the data they are getting usable. (KS)

Several technology changes were mentioned by responding dealers as part of the changes needed to move precision agriculture to the next level:

■ More autosteering. Sprayer that recognizes weeds and applies herbicides only to the weed; seed that carries multiple traits to overcome insect and herbicide issues; multiple-use application equipment. (MN)

■ I see the future becoming more technical from the office's standpoint — everything being implemented on the computer in the office before being put into the machine. (IL)

■ Right now the industry is doing a good job of helping the producer manage his inputs. Next step is on-the-go sensing and data pooling for analysis. (MO)

■ RTK sub-inch technology on everything. (IN)

The responses to the open-ended question about Precision 2.0 are summarized in Figure 8. Increased use of variable-rate fertilizer application, often driven by increased input prices, was the most common change, mentioned by a quarter of the respondents answering this question (24%). Changes in data analysis and handling were mentioned by 23% of the dealers — often with the idea that more efficient and quicker data analysis was going to be required to get to the next level. Variable-rate seeding was seen to be an important growth area in the future (21%), followed by increased variable-rate application of chemicals (15%). The other two areas where more than 10% of the respondents mentioned changes were increases in autosteer/in-field robotics and overall growth in precision application (not specifically for fer-

tilizer or chemicals) due to increased input costs/lower product prices (15% and 10%, respectively).

### Barriers To Growth

Survey respondents were asked to rate a series of issues as to how much of a barrier they were to the growth and expansion of precision agriculture. Figures 9 through 11 show the percentage of respondents who agreed or disagreed with each customer, dealer, and technology issue listed. A similar list of issues was explored in the 2004 *CropLife*/Purdue Precision Survey.

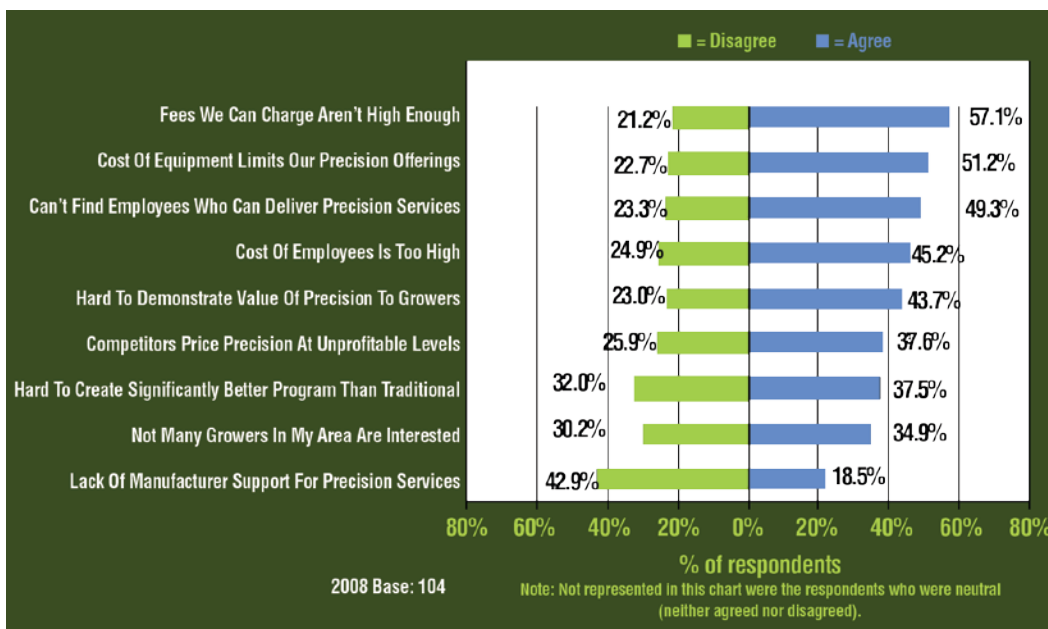
Dealers were almost evenly split on whether they agreed, disagreed, or were neutral that the cost of precision services to their customers was greater than the benefits they received, and that farm income pressure limits the use of precision services (Figure 9), with 33% of the dealers agreeing that the cost was greater than the benefits and 34% agreeing that farm income was a limiting factor.

Though these two factors were also the top two customer barriers in 2004, the impact seems to have decreased dramatically. At that time, 72% of the dealers responding to the survey said that farm income limits the use of precision technologies and 53% said that the grower costs were greater than the benefits.

Compared to farm income and costs vs. benefits, there was less agreement about the other barriers to growth in precision technology adoption. For approximately one-quarter of the dealers, interpreting data/making decisions was believed to be too time-consuming for customers and they felt customers lack confidence in site-specific recommendations. However, 41% of the responding dealers disagreed with each statement.

Over half of the respondents did not believe that soil

Figure 10  
Dealer Issues

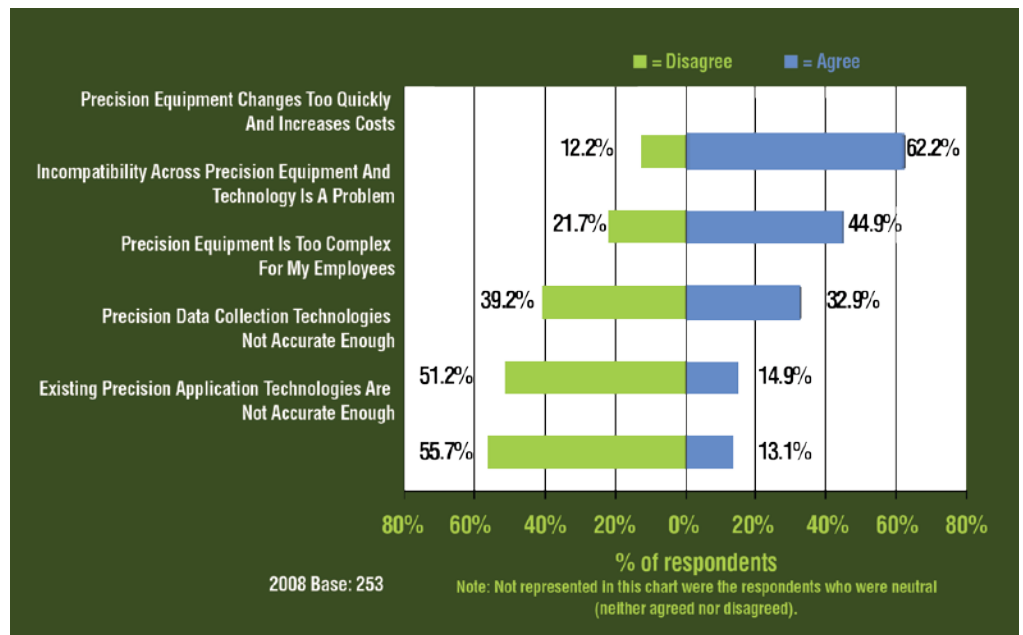




types limited precision profitability or that local topography limited the profitability and use of precision technologies. But, both soil types and topography seemed to be a problem for 20% of the responding dealerships. The least agreement about barriers was that all customers who benefit from using precision are already using it (61% disagreed, only 18% agreed), suggesting that there are still many growers who could benefit from precision technologies that are not currently using them.

When looking at issues that are creating barriers for dealers, almost six out of 10 (57%) (see Figure 10) said that they just weren't able to charge fees high enough to make precision services

**Figure 11**  
**Technology Issues That Create A Barrier To Expansion/Growth**



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profitable. Over half agreed that the cost of the equipment limits their precision offerings (51%). Almost half said they had a challenge finding employees who could deliver precision services (49%) and almost as many (45%) agreed that the cost of employees was high enough to limit the growth of precision services. Another concern that 44% of the dealers had was that it was hard to demonstrate the value of precision technologies to growers. And, for almost four out of 10 of the respondents (38%), another barrier was that competitors priced precision services at unprofitable levels. For all of these issues, there were 20% to 25% of the respondents who disagreed that the issue was a barrier to expansion.

The respondents were more evenly split (approximately one-third disagreed, one-third agreed, and one-third were neutral) on the issues of it being hard to create a precision program that adds significantly more value for the grower than a traditional program, and that not many growers in their area were interested in precision agriculture services.

The most disagreement occurred



with the issue that a lack of manufacturer support for precision services limits their ability to provide such services (disagreed with by 42% while only 19% agreed).

Compared to 2004, several of these issues have declined in perceived importance. In 2004, almost three-quarters of the dealers (72%) believed that the cost of equipment to the dealer was a limitation in growth of precision technology (compared to only half of the dealers in 2008). Almost two-thirds (65%) of the dealers in 2004 said that growers were just not interested in precision services — and this has dropped by almost half to 34% in 2008. Demonstrating value to the customer was a challenge to 63% of the dealers in 2004 compared to only 44% in 2008. Opinions on most of the other issues were similar both years.

The biggest technology issue that is felt to be preventing expansion of precision agriculture is a common characteristic of technology overall. Over six out of 10 respondents agreed that precision equipment changes too quickly and increases the costs of offering precision services (Figure 4). Four out of 10 respondents (45%) said that incompatibility across precision equipment and technology was a problem. Respondents were fairly split about the complexity of the equipment with 39% who did not believe that precision equipment was too complex for employees, 33% believing that it was too complex, and the remaining 28% neutral on the issue. Overall, there was not a lot of agreement that accuracy was a problem (in either the data collection technologies or the precision application technologies).


Overall, most of the technology issues were rated about the same in 2004 and 2008. In both years, over six out of 10 dealers agreed that the equipment changed too quickly, one-third agreed the incompatibilities between equipment and technologies were a challenge, and just under one-third of the dealers said the equipment was too complex for their employees.

### Summary


Overall, precision agriculture has become much more accepted as part


of a grower's way of farming as well as in the retail dealer's business. The cost of the equipment, proving the value of precision technology, and farm income are no longer the barriers they were four years ago. Many dealers see more streamlined technology and data collection/analysis in the future of precision agriculture. However, hand in hand with this continues to be one of the biggest barriers — that of rapidly

evolving equipment and technologies that may or may not be compatible. Most dealers feel that there are many growers who are not using precision services, but who could be. This upside is balanced against pricing pressures and the cost of investing in new equipment and technology. In this new era of crop agriculture, the Precision 2.0 story will be one worth watching closely as it unfolds. ▀



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