

**2007 PRECISION AGRICULTURAL SERVICES
DEALERSHIP SURVEY RESULTS**

by

Dr. Linda D. Whipker* and Dr. Jay T. Akridge

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**Dept. of Agricultural Economics
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* Linda D. Whipker is a marketing consultant in Raleigh, NC. Jay T. Akridge is Interim Vice Provost for Engagement and the James and Lois Ackerman Professor of Agricultural Economics at Purdue University. The financial support of Trimble for this project is gratefully acknowledged.

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2007 Precision Agricultural Services Dealership Survey Results

by

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Introduction

In the spring of 2007, *Crop Life* magazine and Purdue University's Center for Food and Agricultural Business conducted a survey of crop input dealers for the 12th 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 customers were impacting their businesses. As in previous years, the survey takes a broad look at the status of precision agriculture adoption with retail agronomy dealerships across the U.S.

The survey was conducted in late January to early March 2007. In January, a questionnaire was sent to 2500 *Crop Life* retail agronomy dealership readers across the US. A second questionnaire was mailed to participants approximately two weeks after the first one as a reminder to complete and return it. (See Appendix I to this report for a copy of the questionnaire.) A total of 415 questionnaires were returned, with 388 being usable. This provided an effective response rate of 15.1 percent, a bit higher than last year's response rate of 13.7 percent but similar to the response rate in 2005. (Response rates have ranged from a high of 38 percent in 1996 to a low of 11 percent in 2001.)

Consistent with previous surveys, dealerships were asked questions about the types of precision services they offer and/or use in their businesses, the fees they are charging for precision services, how fast their customers are adopting precision agriculture practices, and how profitable they are finding precision services to be in their businesses. This year additional questions were asked about the impact of increased biofuel processing capacity on their businesses and the volatility of fertilizer prices.

Questionnaire and Data Analysis Notes

As in other years, questionnaires were deemed "unusable" for several reasons. Some questionnaires were not filled out completely; others were from wholesalers who did not sell directly to farmers; some respondents sold only seed, while a few were from farmers. This year there were 38 unusable questionnaires among the 415 returned.

In 2000 and 2001, the data were statistically weighted to have the same demographics as the 1999 data in order to make year-to-year comparisons more meaningful. These demographics included the region, organizational type and outlet size in terms of sales. Several procedural changes in the survey process in those two years made this necessary (timing of the survey, survey length, etc.).

This year, the data was once again statistically different from other years' data in terms of these demographics, though the survey process was similar in timing and questionnaire length

compared to previous years. Though no procedural differences could be identified to explain the difference in samples, there were also no dramatic shifts in the agricultural industry’s structure. Because of these sample differences, the data was statistically weighted to reflect the 2004 to 2006 average proportions of the four regions of the U.S. and the three organizational types within each region.

The weighted data were analyzed to identify statistical differences by region (Midwest versus other states) and differences between organizational types within the Midwest (cooperative, local independent, regional/national). Where charts or data are provided for these breakouts, differences are statistically different at $p < .05$ unless specifically stated otherwise.

The Respondents

The 377 survey respondents came from 28 states with the highest state representation from Iowa, accounting for 14.3 percent of the respondents, and Illinois with 12.5 percent of the respondents (Figure 1). By region, the Midwest was heavily represented in the sample, with 81 percent of the respondents being from the Midwest states of Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North and South Dakota, Ohio and Wisconsin. Ten percent of the respondents were from the West, 7 percent were from the South, and 2 percent were from the Northeast. Compared to other years, this was weighted more heavily toward the Midwest (up from 70 percent of the 2006 sample) and less toward the West and Northeast (down from 15 percent and 5 percent, respectively). Figure 2 shows the sample after it was weighted by average regional proportions for 2004 to 2006.

Figure 1. States Represented in Original Sample

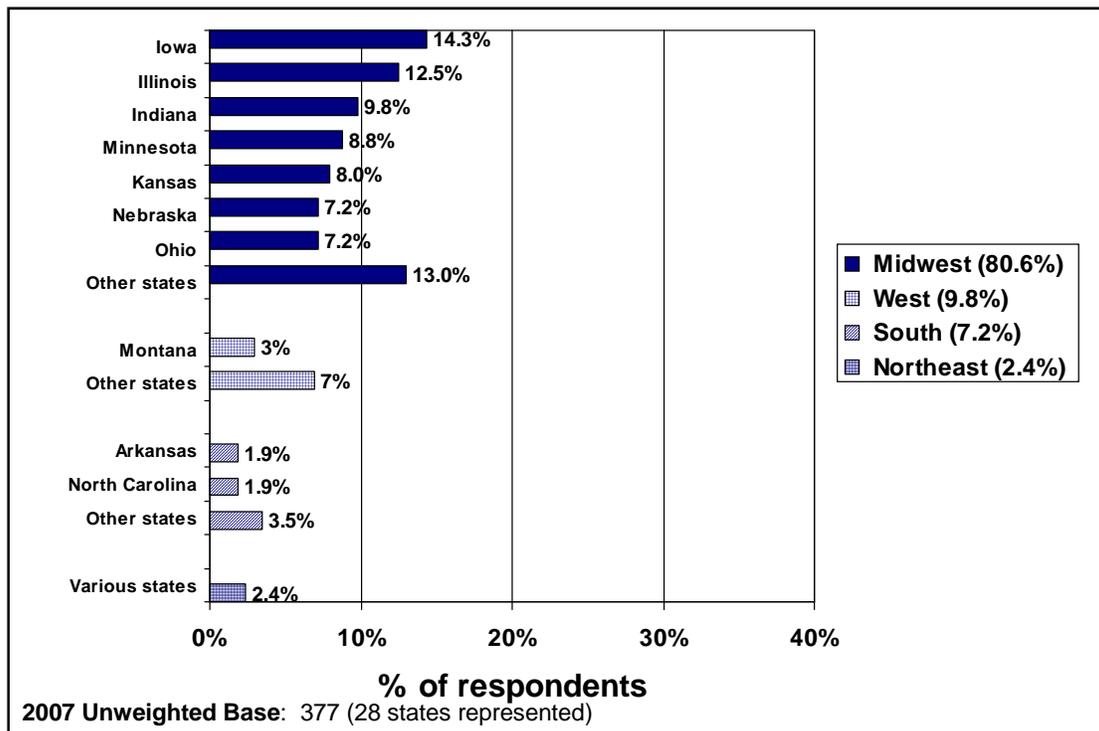
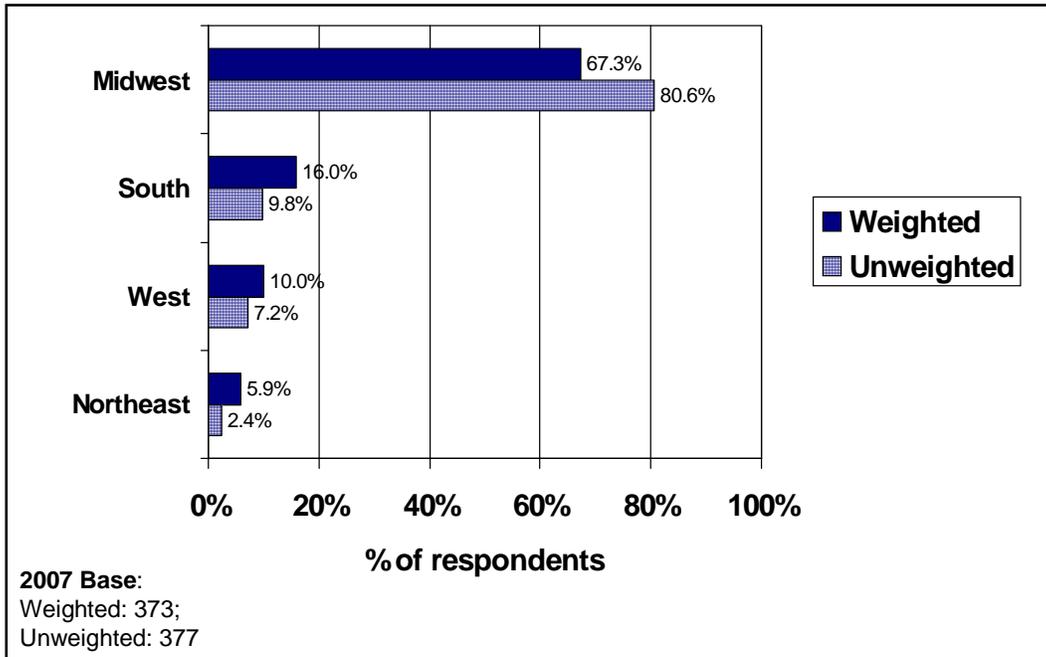


Figure 2. Regions Represented in the Weighted and Unweighted Samples



Responding dealerships represented a variety of organizational types with four out of 10 of the original sample respondents being cooperatives (40 percent), 48 percent representing local independents and 12 percent being part of a national or regional chain of dealerships (Figure 3). Local independents were represented in greater numbers than in previous years while fewer cooperatives were represented than in previous years. This is particularly evident when broken out by regions.

Figure 3. Organization Types Represented in the Weighted and Unweighted Samples

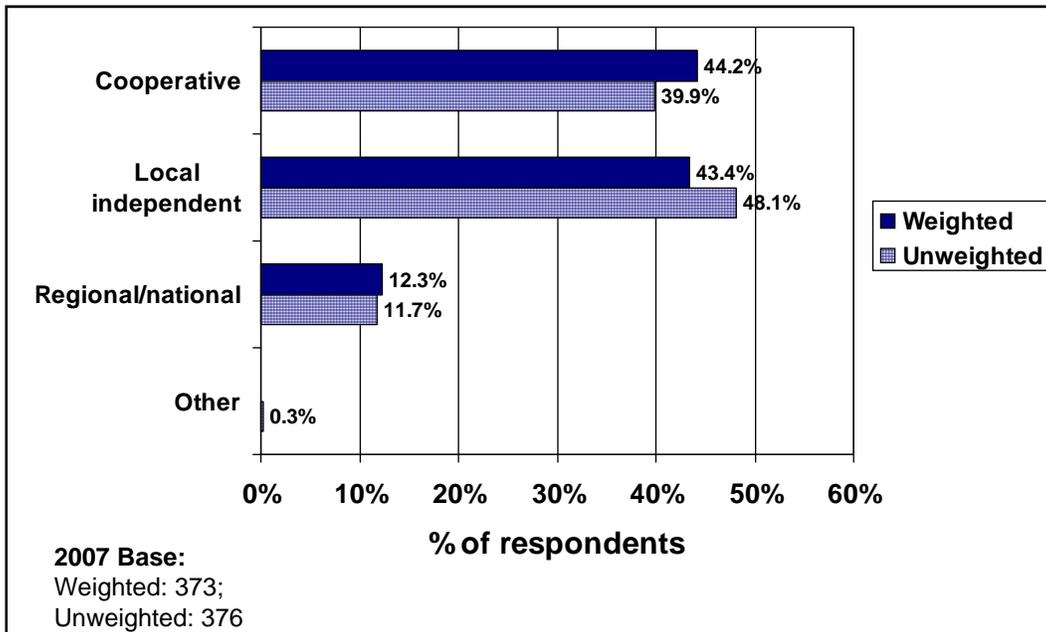
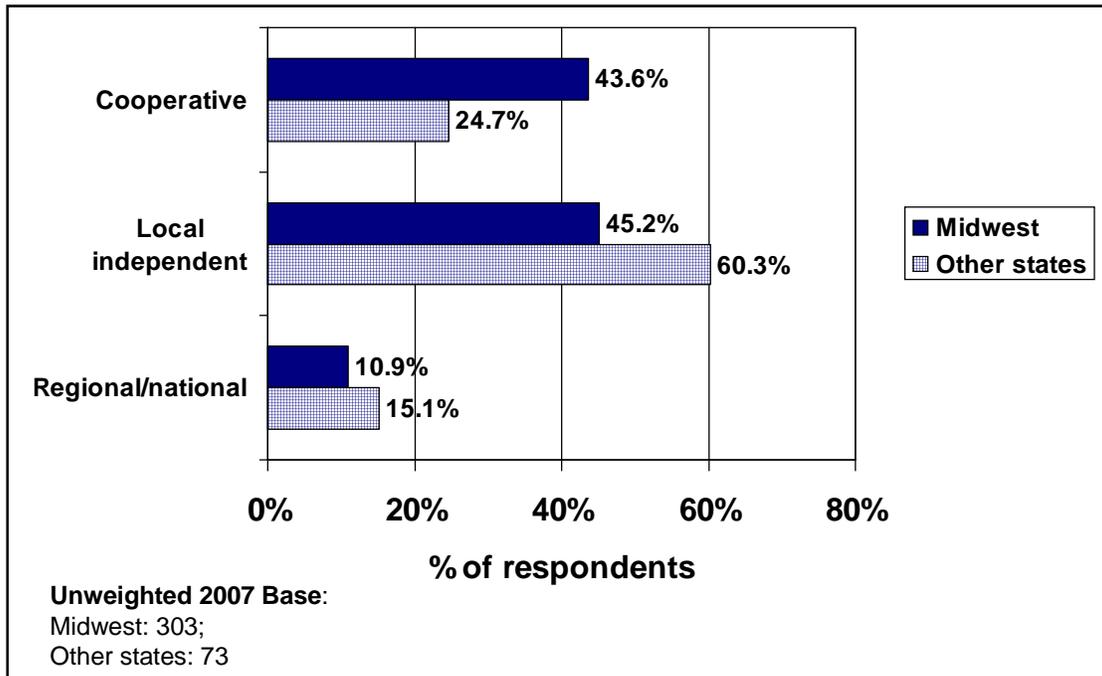


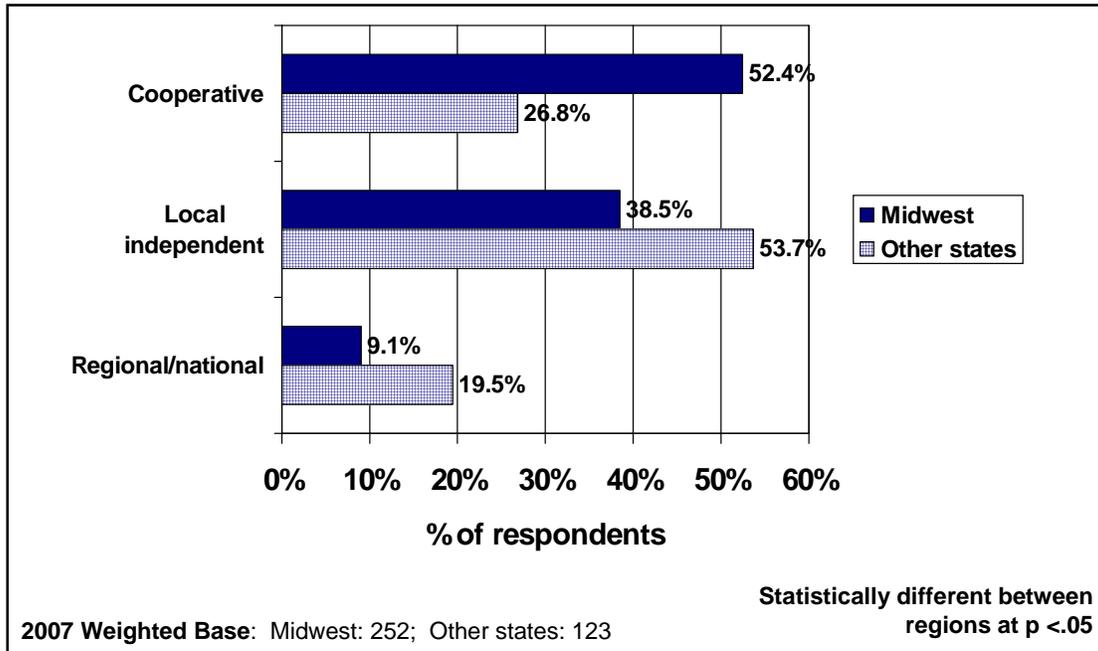
Figure 4 and Figure 5 show the unweighted and weighted samples for organizational types for the Midwest and non-Midwestern states. Unlike previous years, this year's sample consisted of fewer cooperatives and more local independents. In previous years, cooperatives accounted for approximately half of the Midwest sample while local independents accounted for approximately 40 percent of the Midwest sample. In 2007, local independents in the Midwest accounted for 45 percent of the sample and cooperatives accounted for 44 percent of the sample. In non-Midwestern states, local independents accounted for 60 percent of the sample this year, compared to a more typical 50 percent.

Figure 4. Organization Types by Region in the Original Sample



After weighting this year's sample by the typical weighting found in 2004 to 2006 samples for region and organizational types within each region, the sample is more reflective of previous years as seen in Figure 5.

Figure 5. Organization Types by Region in the Weighted Sample



Important note: The remaining charts, analysis and discussion in this report utilize only the weighted data in order to make consistent comparisons between 2007 results and previous years' results.

The size of the responding dealerships ranged from one outlet (37 percent of the respondents) to more than 25 outlets (13 percent of the respondents) (Figure 6). When the number of retail outlets was broken out by region (Figure 7), respondents with only one retail outlet were the most common in both regions (34 percent of the Midwestern respondents and 43 percent of the respondents from other states). In both regions, respondents from firms with 2 to 15 outlets were next most common (32 percent in the Midwest and 21 percent of the respondents from non-Midwestern states). There were significantly more respondents from non-Midwestern states representing firms with more than 25 outlets than respondents from the Midwest. In the Midwest, local independents were significantly more likely to have only one retail outlet (68 percent) while the most common size for cooperatives was 2 to 15 outlets (42 percent) and the majority of the regional/national organizations had over 25 outlets (67 percent of these respondents).

Figure 6. Number of Retail Outlets Owned or Managed

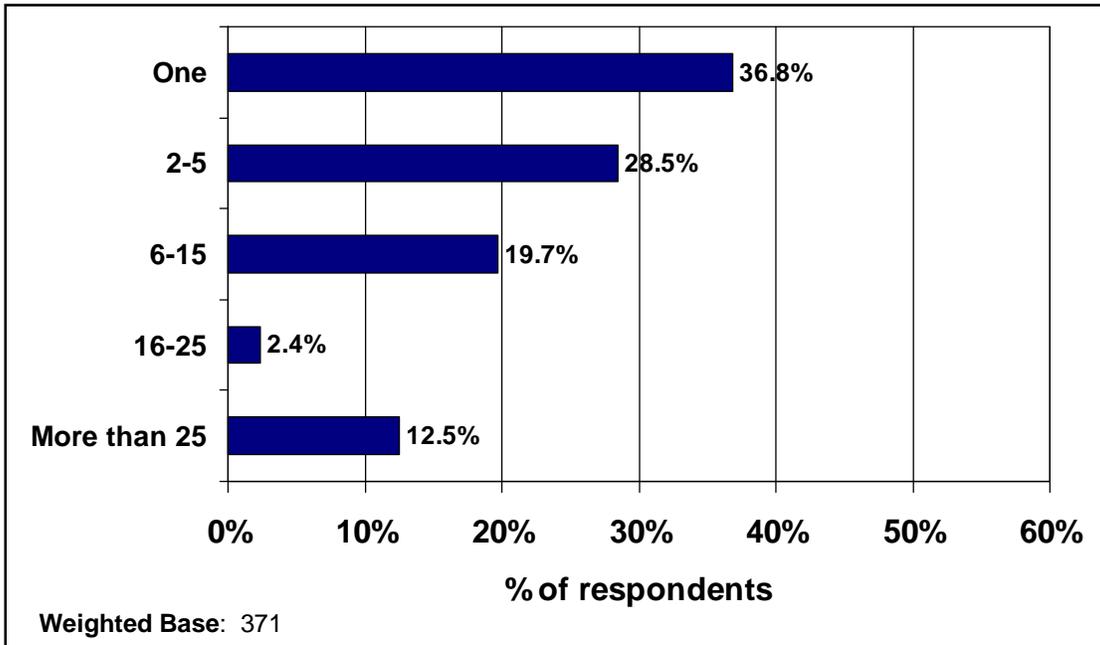
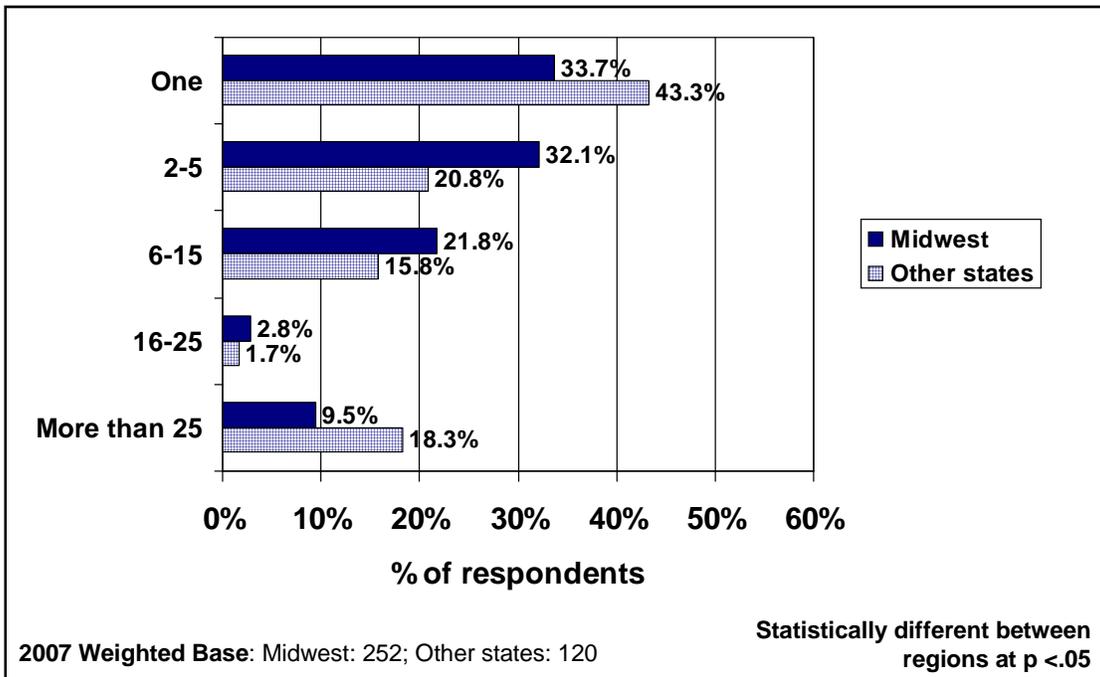


Figure 7. Number of Retail Outlets Owned or Managed by Region



Respondents also represented a range of outlet sizes. Fifteen percent of this year's respondents had annual agronomy sales of less than \$1 million at their location, similar to last year, while 33 percent had \$5 million or more in annual agronomy sales (Figure 8). Unlike previous years, there were significant differences in outlet size across regions. Non-Midwestern respondents were significantly more likely to represent large outlets with over \$5 million in annual retail agronomy sales than were firms from the Midwest (Figure 9).

Within the Midwest, there were significant differences in annual agronomy sales by organizational type. Local independents were not only smaller in terms of the number of outlets in their businesses, but their outlets were also significantly smaller in terms of agronomy sales dollars per outlet (Figure 10). This is similar to previous years.

Figure 8. 2006 Annual Agronomy Sales at Location

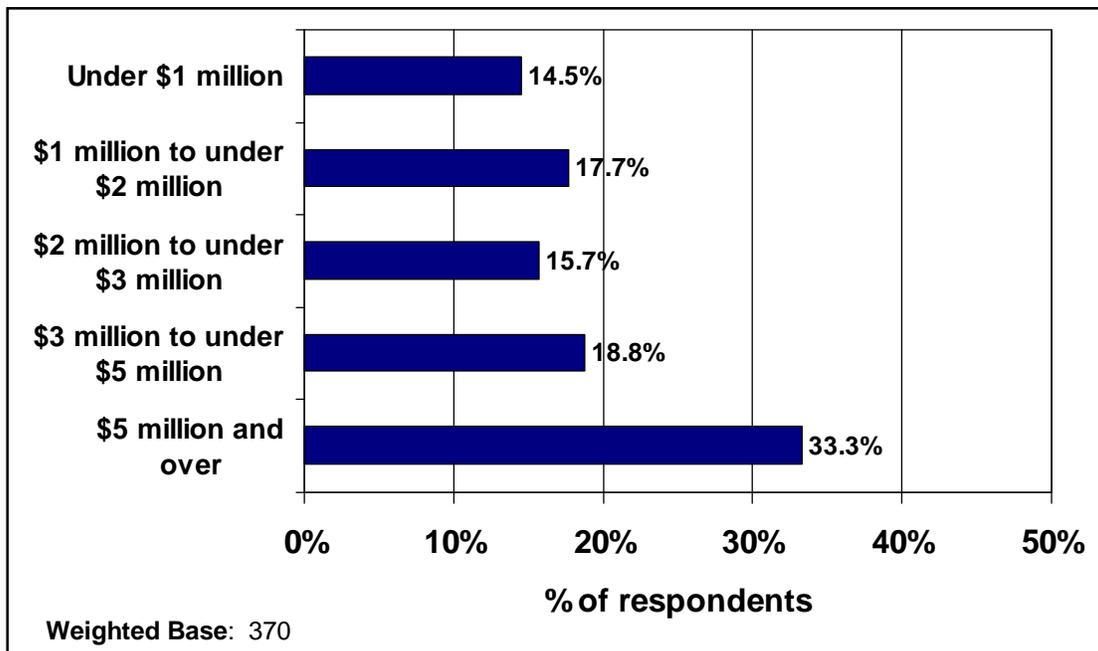


Figure 9. 2006 Annual Agronomy Sales at Location by Region

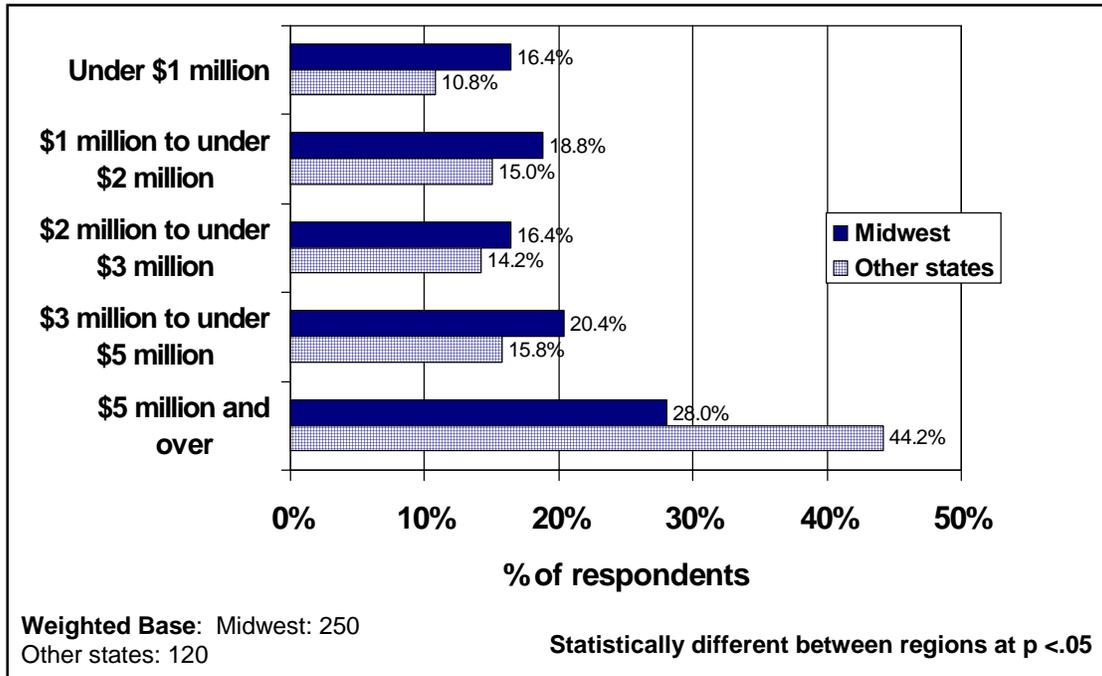
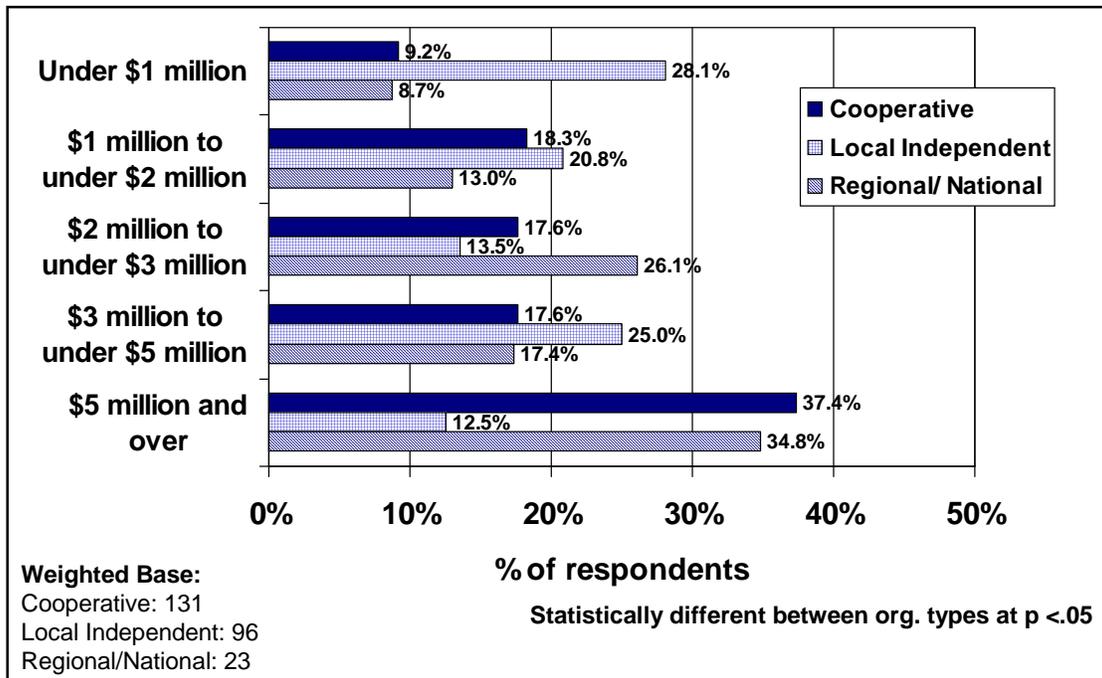
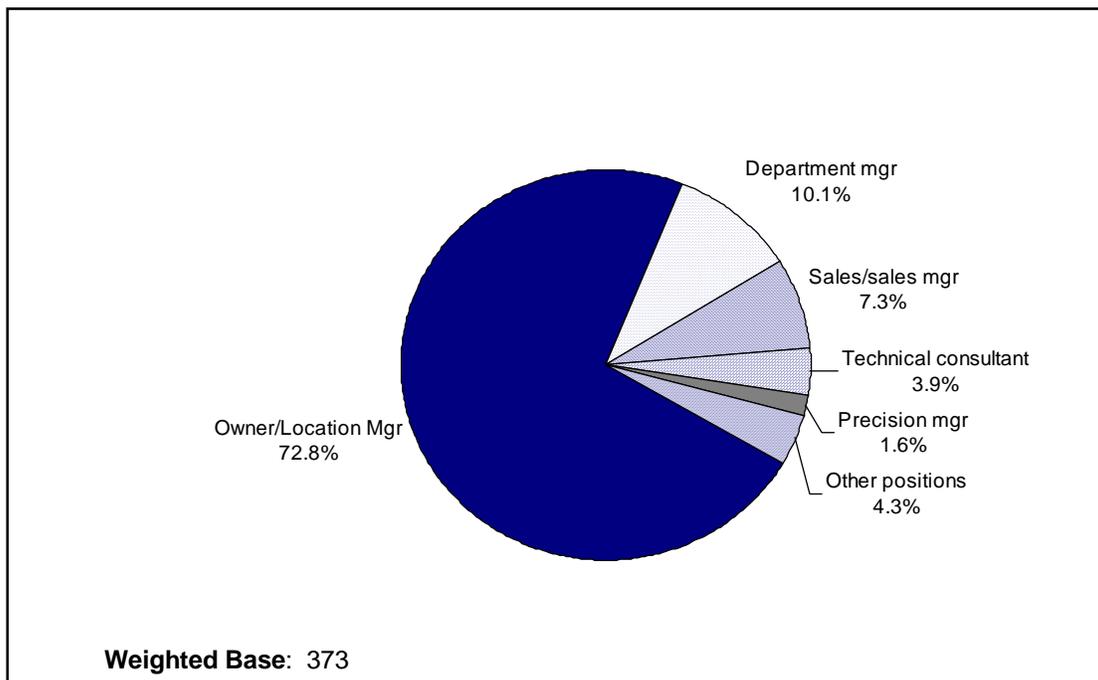


Figure 10. 2006 Annual Agronomy Sales at Location by Organizational Type in the Midwest



Three-quarters of the questionnaires were completed by the owner or manager of the outlet (73 percent), while 10 percent of the respondents were departmental managers (Figure 11). Technical consultants and precision managers together accounted for 6 percent of the respondents. By region, respondents in non-Midwest states were more likely to be the owner/manager of the dealership (83 percent compared to 68 percent in the Midwest). In the Midwest, the owner/manager was again the most common position for respondents from all three types of organizations. Eight out of 10 (85 percent) of the respondents representing local independents owned or managed the location, while 74 percent of those representing regional/national organizations were owners/managers and 55 percent of the respondents representing cooperatives were the owners or managers.

Figure 11. Responsibility of Survey Respondent



To better understand the size of growers in the dealerships' markets, respondents were asked for the average size (in acres) of their customers. Almost three-quarters of the respondents (70 percent) said their average customer farmed more than 500 acres with 29 percent of the respondents indicating their average customer farmed more than 1000 acres (Figure 12). As expected, the average customer size varied greatly across geographic regions. Half of the respondents in the Midwest (50 percent) said their average customer farmed between 501 and 1000 acres and another 29 percent of the Midwestern respondents said their average customer farmed over 1000 acres. The average customer size for dealerships in other (non-Midwestern) states was almost evenly divided among the four size categories (Figure 13). There were no statistical differences in average customer size across organizational types in the Midwest.

Figure 12. Average Customer Size

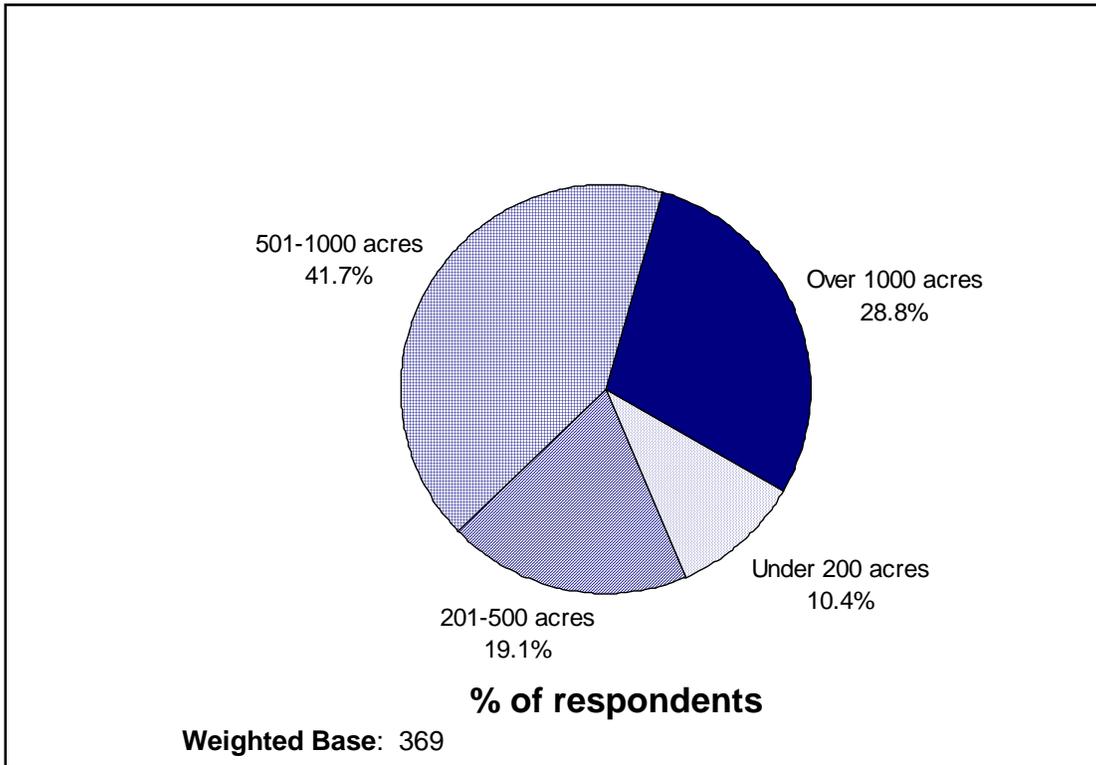
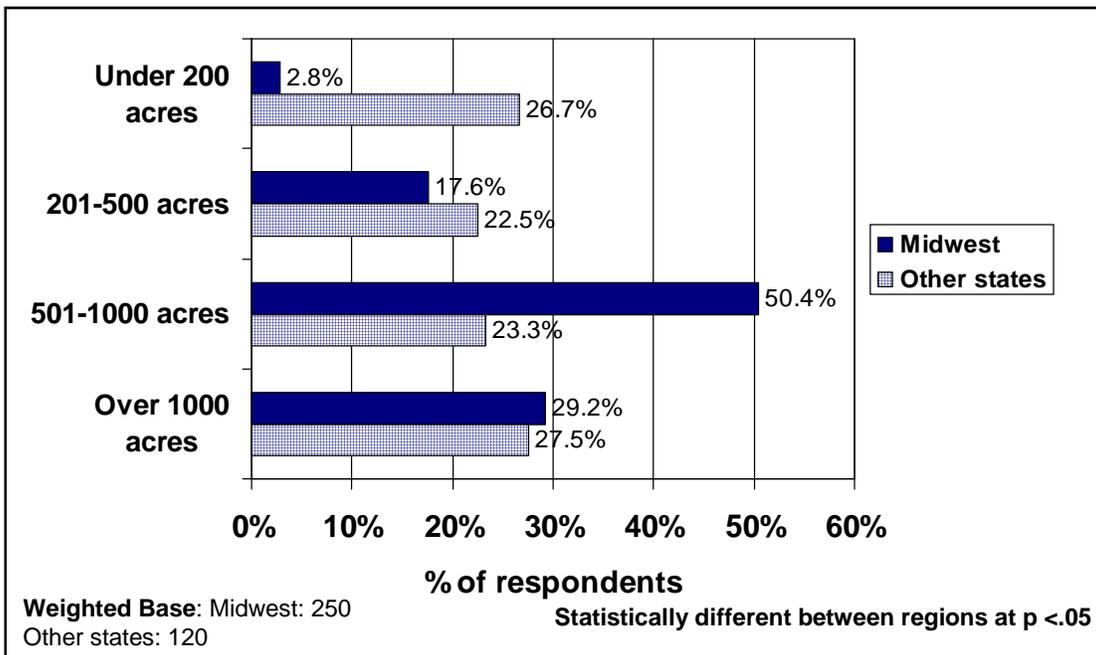


Figure 13. Average Customer Size by Region



Custom Application

Custom application was offered by 85 percent of the respondents. (Custom application here is defined as dealership application of fertilizer, pesticides, and/or custom seeding.) Over half of the respondents custom applied more than 25,000 acres per year (58 percent) (Figure 14). Across the U.S., however, custom application was most common in the Midwest where 90 percent of the respondents offered custom application services compared to 76 percent of the respondents from other states (Figure 15).

Figure 14. Acres Custom Applied

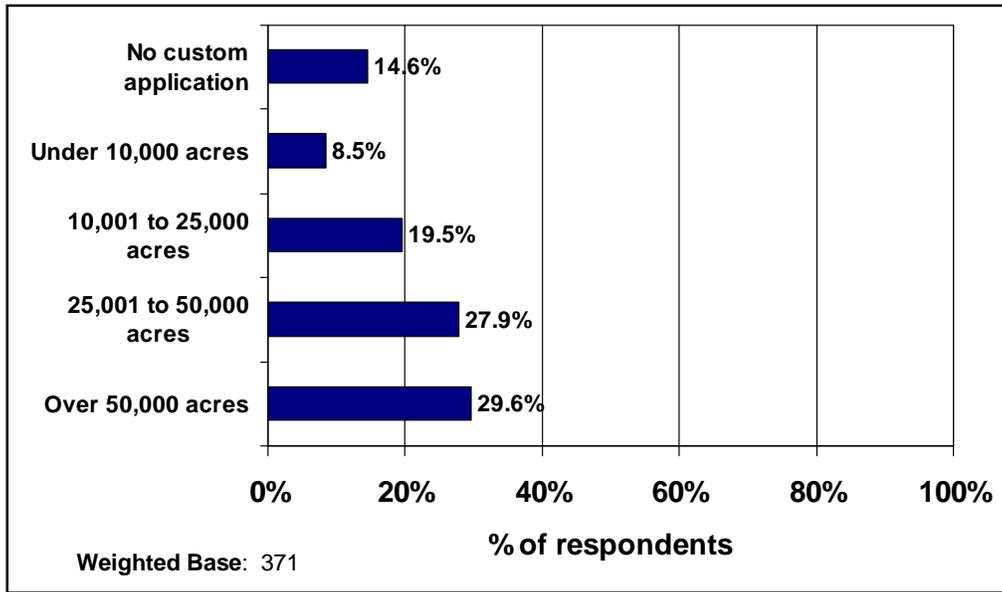
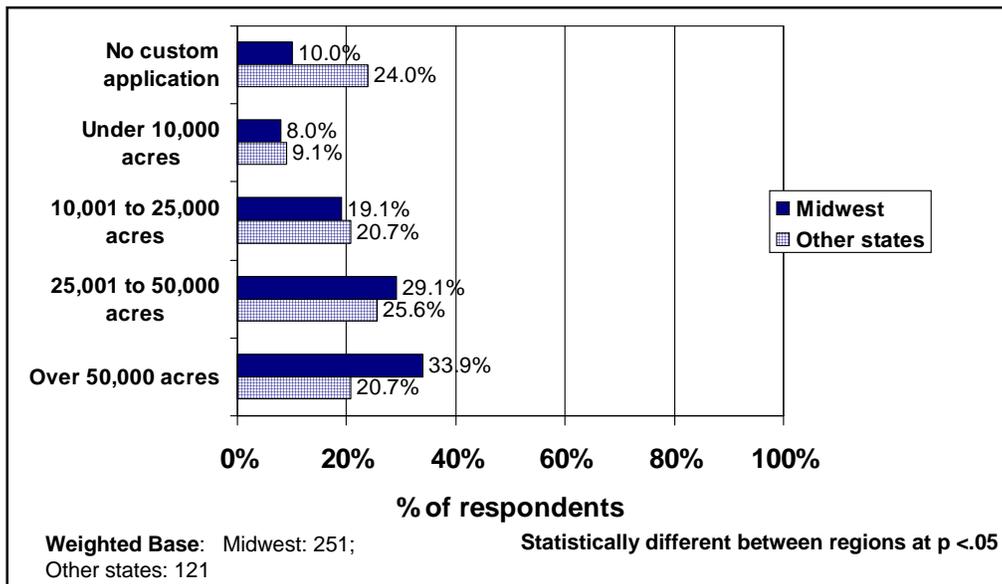
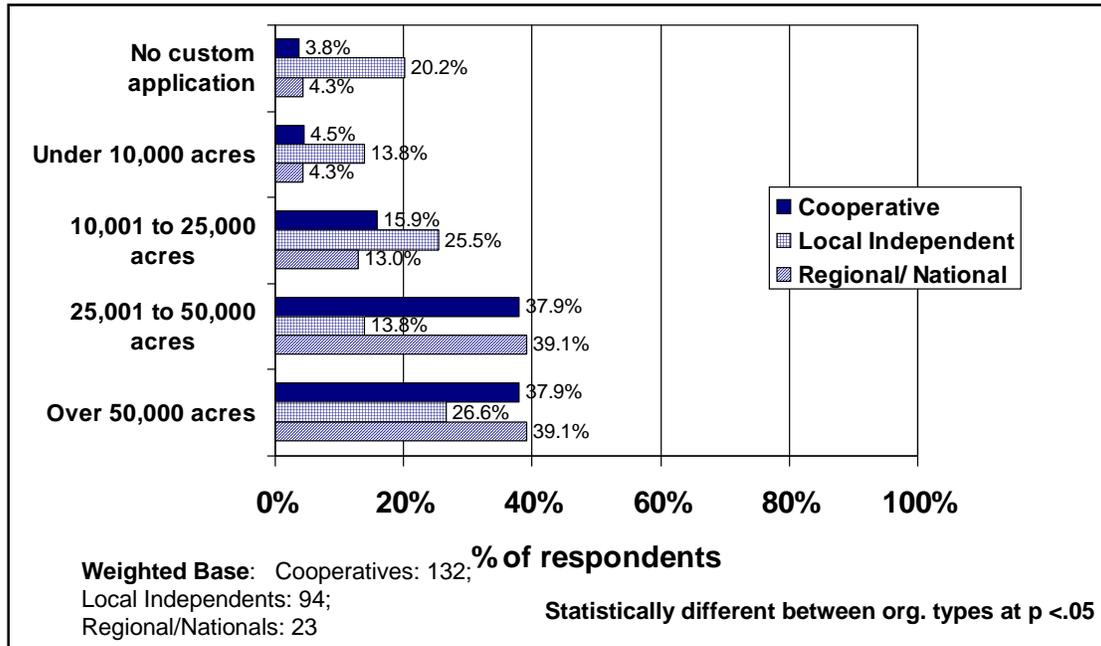


Figure 15. Acres Custom Applied by Region



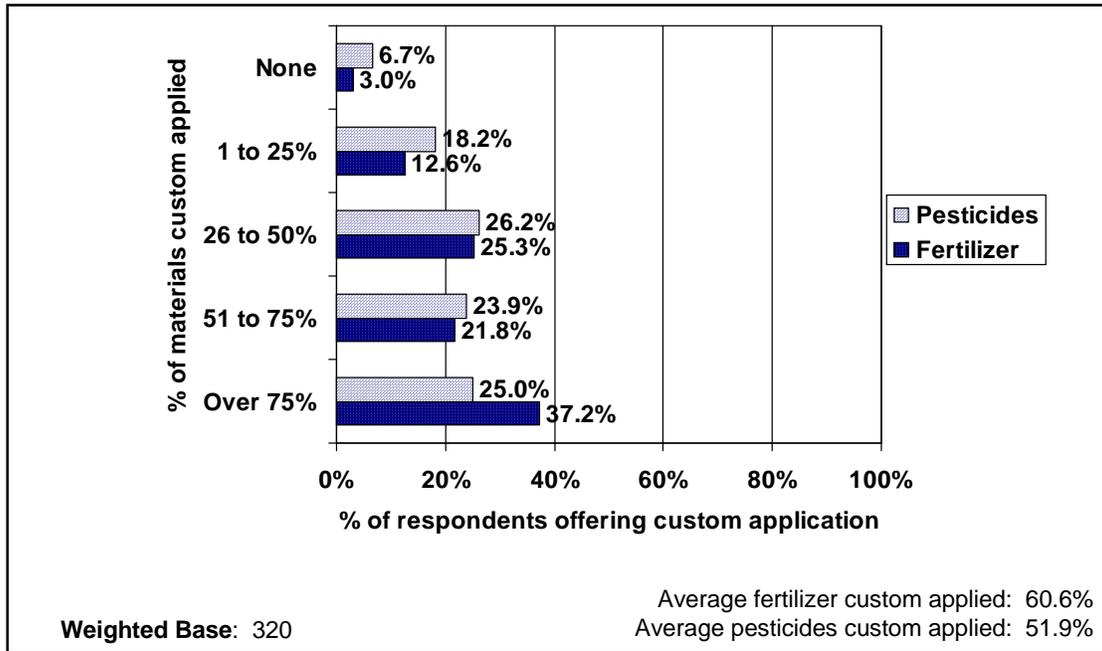
Similar to most other years, local independents in the Midwest were less likely to offer custom application than were other organizations, with one in five local independents offering no custom application compared to less than 5 percent of cooperatives and regional/nationals (Figure 16).

Figure 16. Acres Custom Applied by Organizational Type in the Midwest



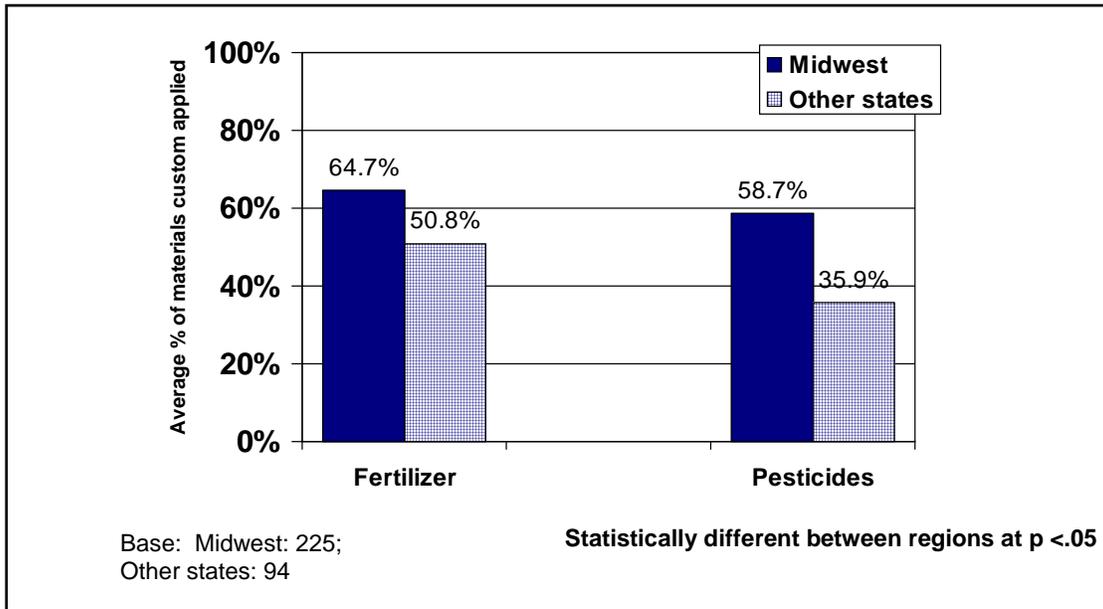
When asked specifically about custom application of fertilizer versus pesticides, respondents custom applied a slightly greater proportion of the fertilizer they sold relative to pesticides. On average, respondents who indicated their outlet offered custom application applied 61 percent of the fertilizer they sold and 52 percent of the pesticides they sold (Figure 17). A quarter of the respondents (25 percent) said their dealership custom applied over 75 percent of the pesticides sold. Over a third of the respondents (37 percent) said they custom applied over 75 percent of the fertilizer they sold.

Figure 17. Custom Application of Fertilizer and Pesticides



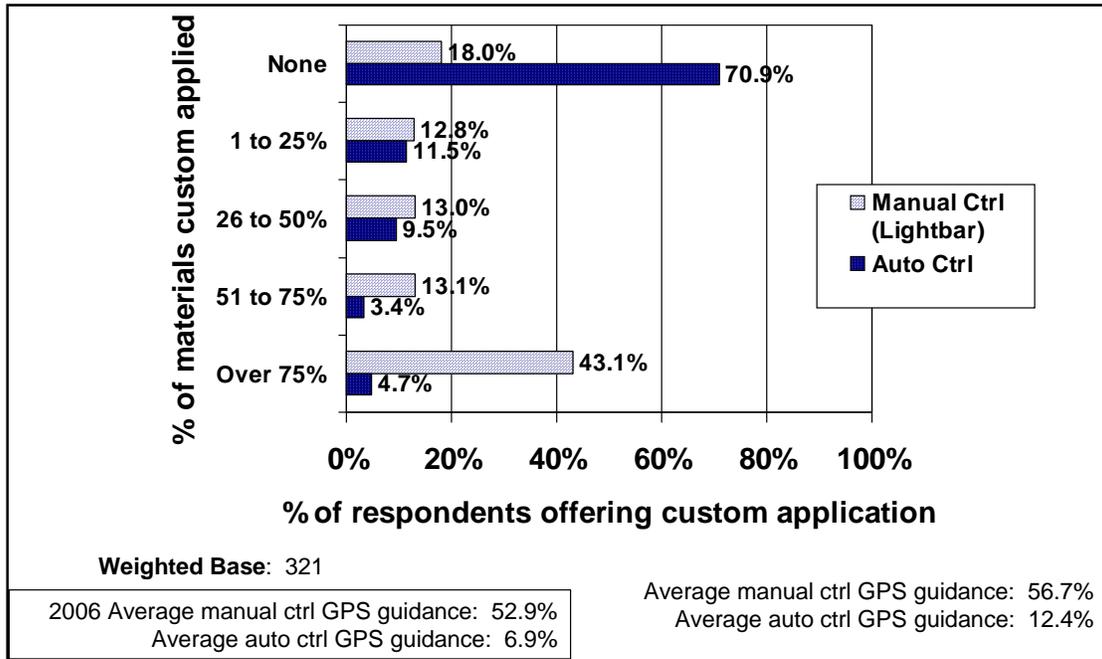
Those dealerships from the Midwest who offered custom application typically applied a greater proportion of the fertilizer and pesticides they sold. Midwestern respondents said they custom applied an average of 65 percent of the fertilizer they sold and 59 percent of the pesticides they sold while those from non-Midwestern states applied an average of 51 percent of the fertilizer sold and 36 percent of the pesticides sold (Figure 18). In the Midwest, there were no differences in the average amount of fertilizer or pesticides custom applied by organizational type.

Figure 18. Custom Application of Fertilizer and Pesticides by Region



For the third year, we asked respondents what percentage of their custom application was carried out using GPS guidance systems. Of those who offered custom application, 82 percent said they were custom applying at least some of the fertilizer/chemicals using a GPS guidance system with manual control/light bar (Figure 19). Twenty-nine percent said they used a GPS guidance system with auto control/auto steer for at least some of their custom application, up from 20 percent last year. Overall, an average of 57 percent of the materials custom applied were applied with GPS with manual control/light bar and 12 percent of the materials custom applied were applied with auto control GPS.

Figure 19. Use of GPS Guidance Systems for Custom Application



The use of GPS guidance systems with manual control/lightbars varied by region (Figure 20), with heavier use in the Midwest than in non-Midwestern states. Over 85 percent of the respondents from the Midwest used some form of GPS guidance system with manual control, compared to only 73 percent of the respondents from non-Midwestern states. On average, 60 percent of the materials being custom applied in the Midwest were applied with manual control GPS guidance systems, compared to 50 of the material in non-Midwestern states. Both were up over last year's averages of 57 and 43 percent, respectively.

There was no statistical difference in the use of auto control/autosteer GPS guidance systems between respondents from the Midwest states and respondents from non-Midwestern states (Figure 21).

Figure 20. Use of GPS Guidance Systems for Custom Application by Region: Manual Control

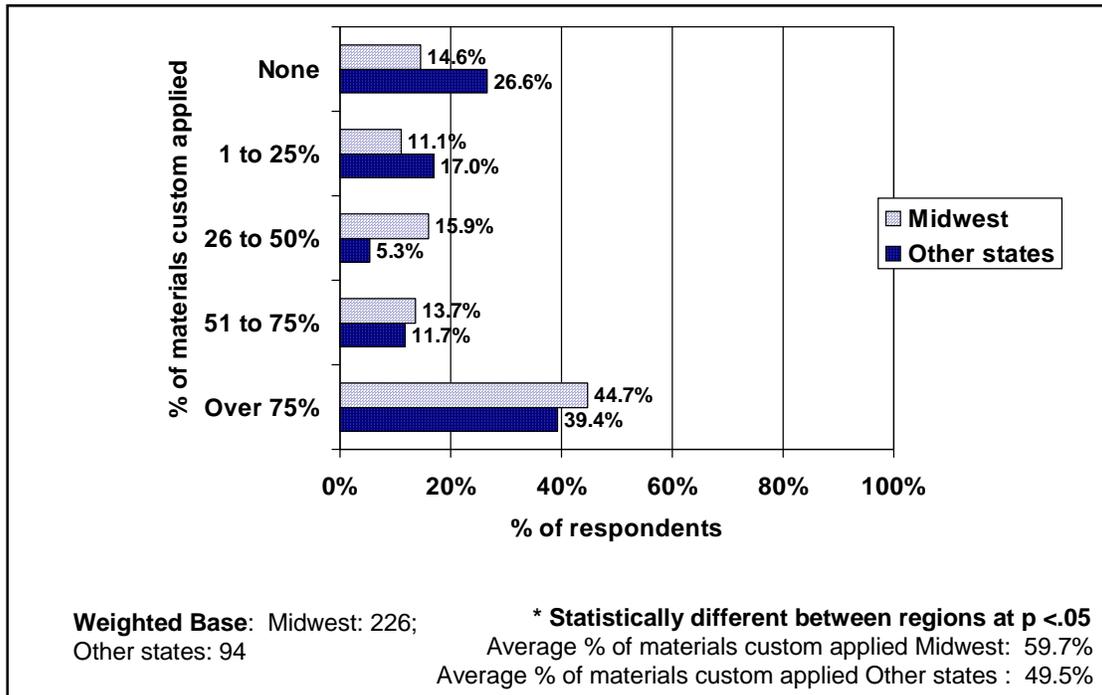
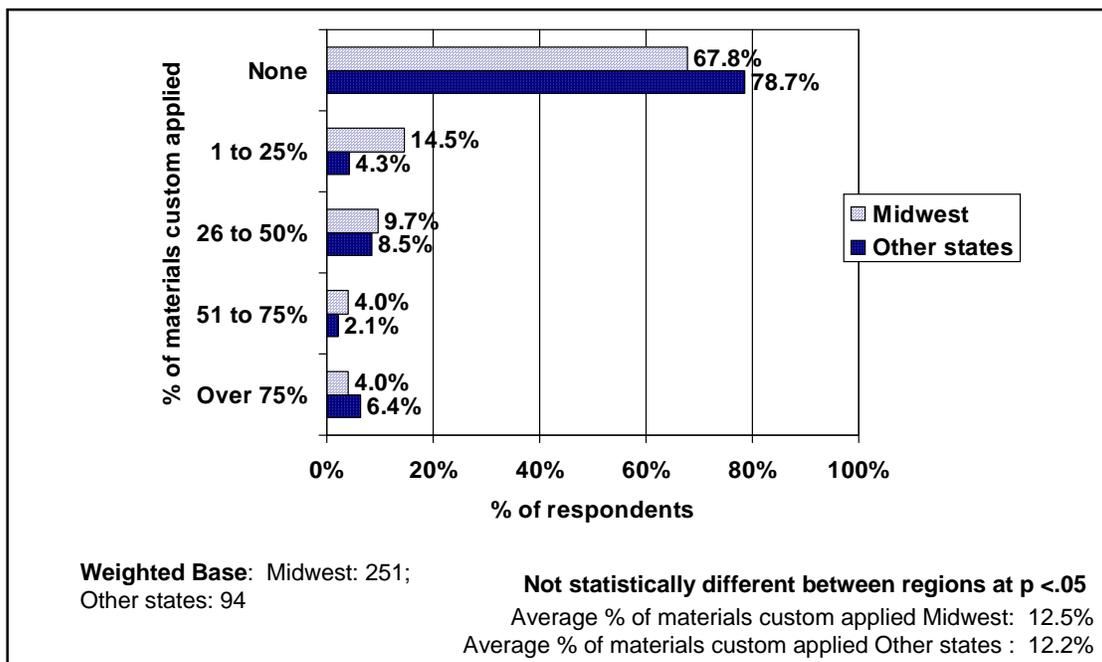


Figure 21. Use of GPS Guidance Systems for Custom Application by Region: Auto Control



In the Midwest, use of GPS guidance systems with manual control did not vary significantly by organizational type (Figure 22), with only cooperatives showing any growth in the use of manual guidance systems over last year (growing from 53 to 59 percent of the materials applied). This year, there were statistical differences in the use of auto-control GPS guidance systems between organizational types in the Midwest (Figure 23), with regional/nationals showing the lowest use of the technology. This was also the smallest group represented, though and the finding may be due to the limited sample instead of a meaningful difference.

Figure 22. Use of GPS Guidance Systems for Custom Application by Organizational Type in the Midwest: Manual Control

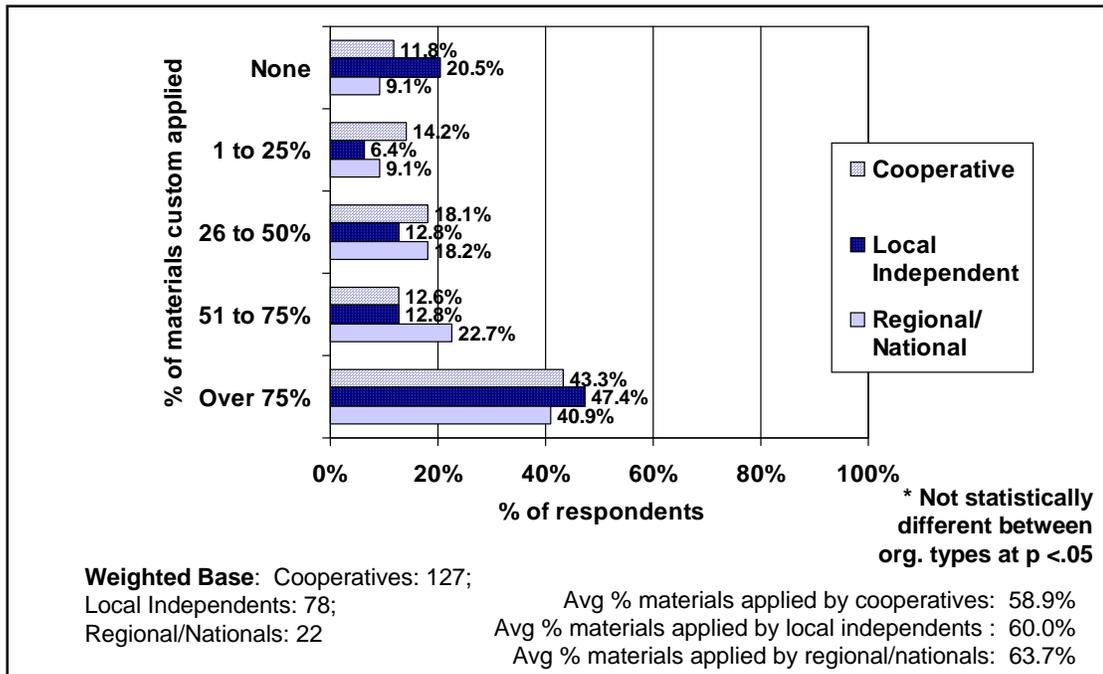
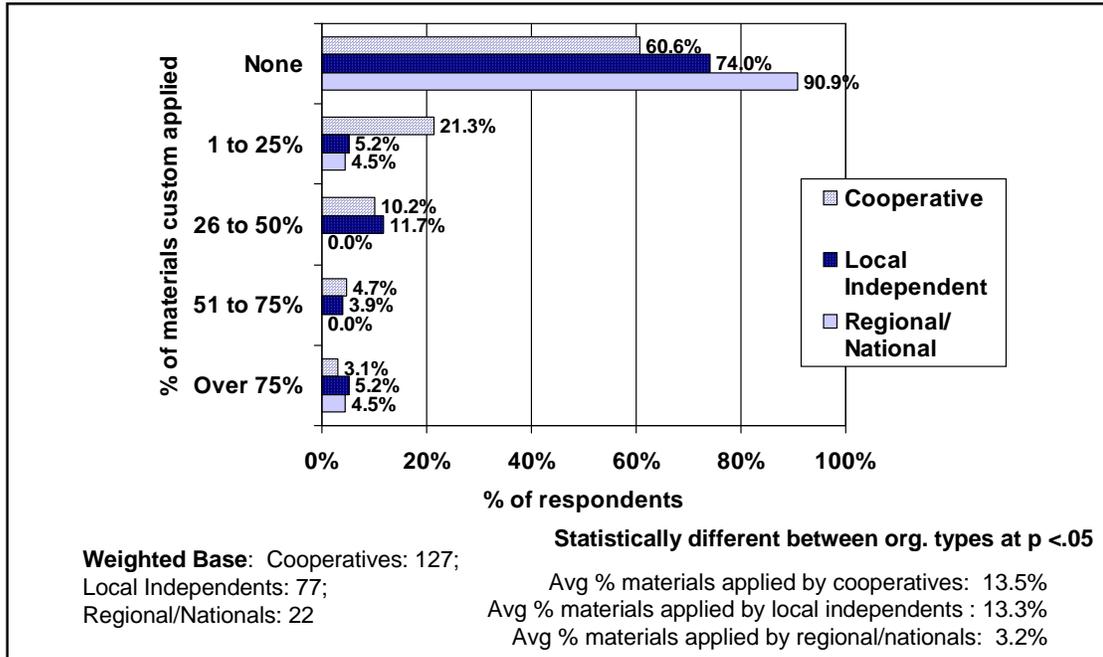


Figure 23. Use of GPS Guidance Systems for Custom Application by Organizational Type in the Midwest: Auto Control



Full-Time Agronomists

To support these services, many dealerships had agronomists available, either full-time on staff or shared with other locations. On average, the respondents had 1.2 full-time agronomists available on staff and shared an average of 0.9 agronomists with other locations. Two-thirds of the responding dealerships had at least one full-time agronomist on staff at their location (58 percent) (Figure 24), however several of those with no full-time agronomist at their location did have one available for their use at another location. A third of the respondents (30 percent) had no full-time agronomist available to them at all.

Though there were no differences between regions in the number of full-time agronomists on staff, there were regional differences in full-time agronomists shared between locations with the Midwest having an average of 1.1 agronomists shared between locations and non-Midwestern outlets sharing an average of 0.4 agronomists per location (Figure 25).

Figure 24. Full-time Agronomists Available

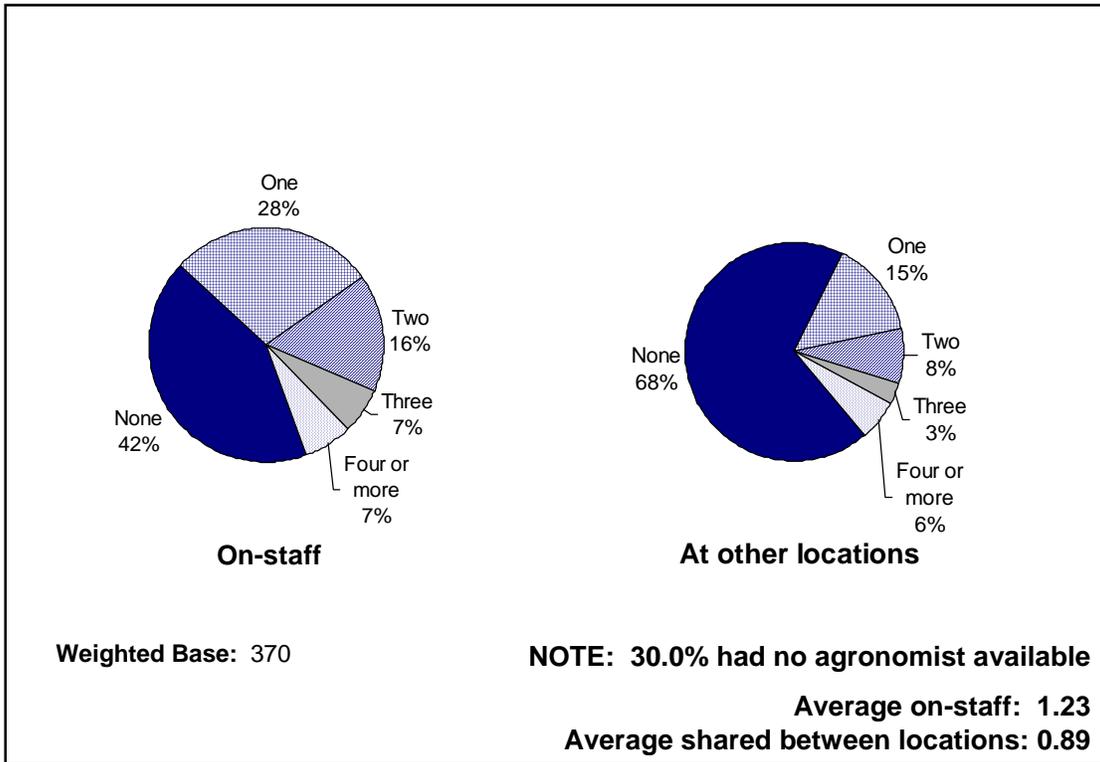
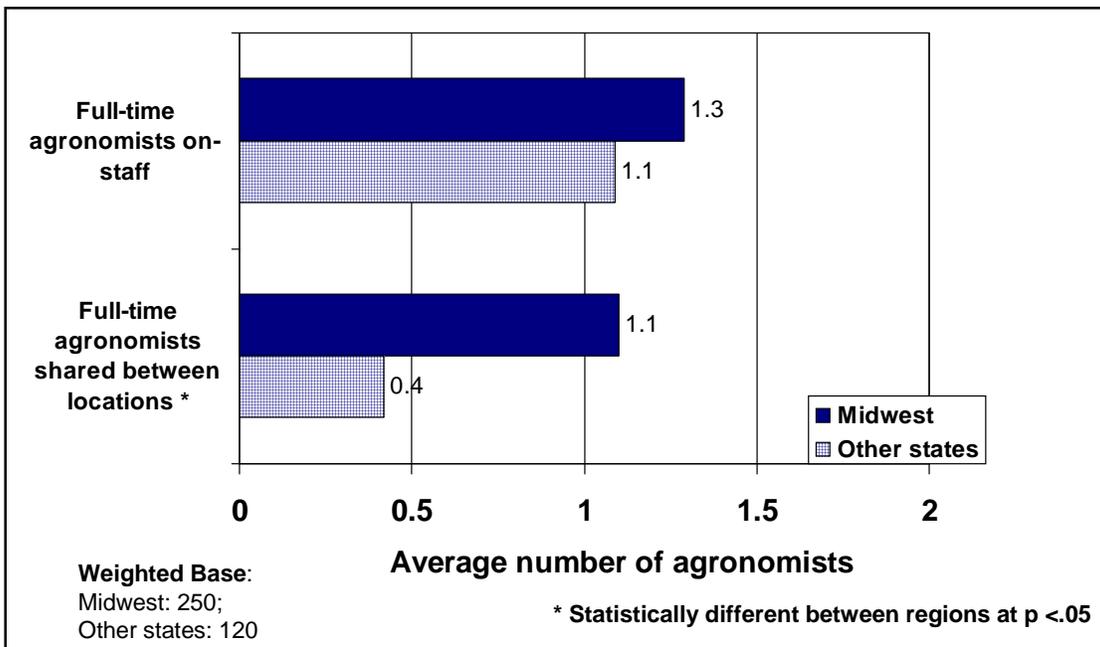
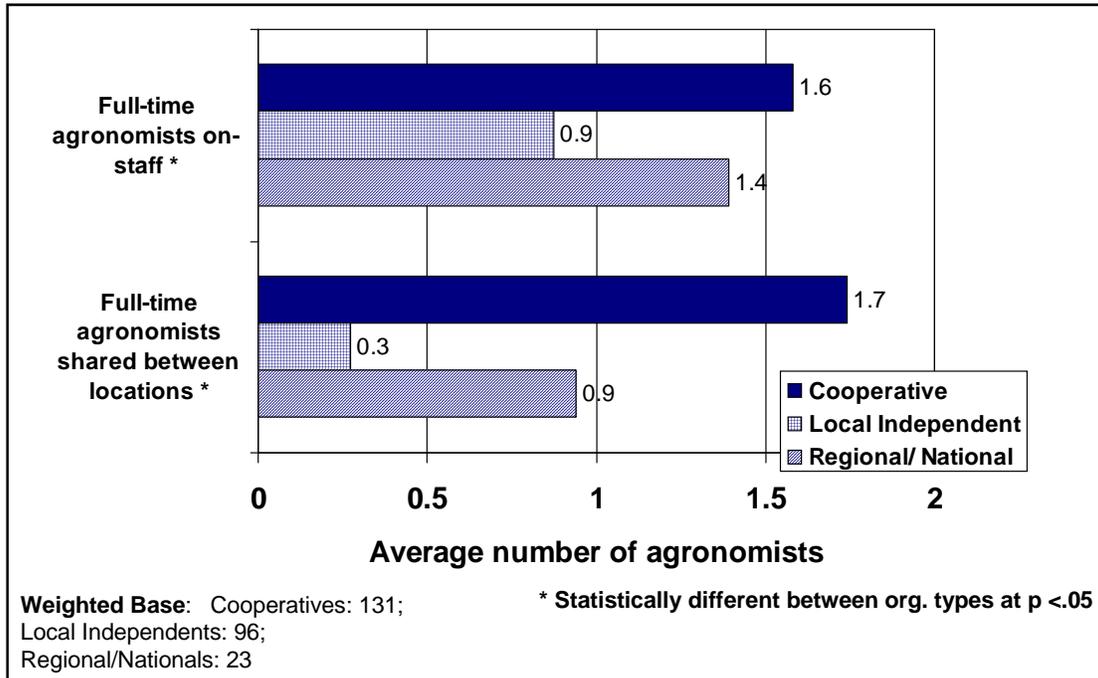


Figure 25. Agronomists Available by Region



The number of agronomists available varied by the type of organization in the Midwest. Local independents had fewer full-time agronomists on staff and fewer agronomists shared between locations. Cooperatives and regional/nationals had a similar number of full-time agronomists on-staff but cooperatives had more available to share between locations (Figure 26).

Figure 26. Average Number of Agronomists Available by Organizational Type in the Midwest



Use of Precision Technologies and Offerings of Site-Specific Services

Respondents were asked several questions about their use of precision technologies and which site-specific services they were currently offering (or would be offering by the fall of 2007).

Use of Precision Technologies

Dealerships were asked how they were using precision technology in their dealerships – from offering their customers precision services to using precision technologies internally for guidance systems, satellite/aerial imagery, billing/insurance/legal activities, logistics, or field-to-home office communications.

Showing some decline over last year, 76 percent of the respondents used precision technologies in some way in their dealership (down from 81 percent last year but at a similar level to 2005) (Figure 27 and Figure 28). The two most common uses of precision technology were using GPS guidance with manual control/light bar (69 percent of respondents) and

precision service offerings for customers (59 percent of respondents). The next three most common uses were GPS guidance with auto control/autosteer, satellite/aerial photography for internal uses and field mapping with GIS (Geographical Information Systems) for legal/billing/insurance purposes (27, 20 and 19 percent of respondents, respectively). Only 6 percent of the respondents said they used soil electrical conductivity mapping (Veris) while 5 percent used GPS for logistics.

Figure 27. Use of Precision Technology Part A

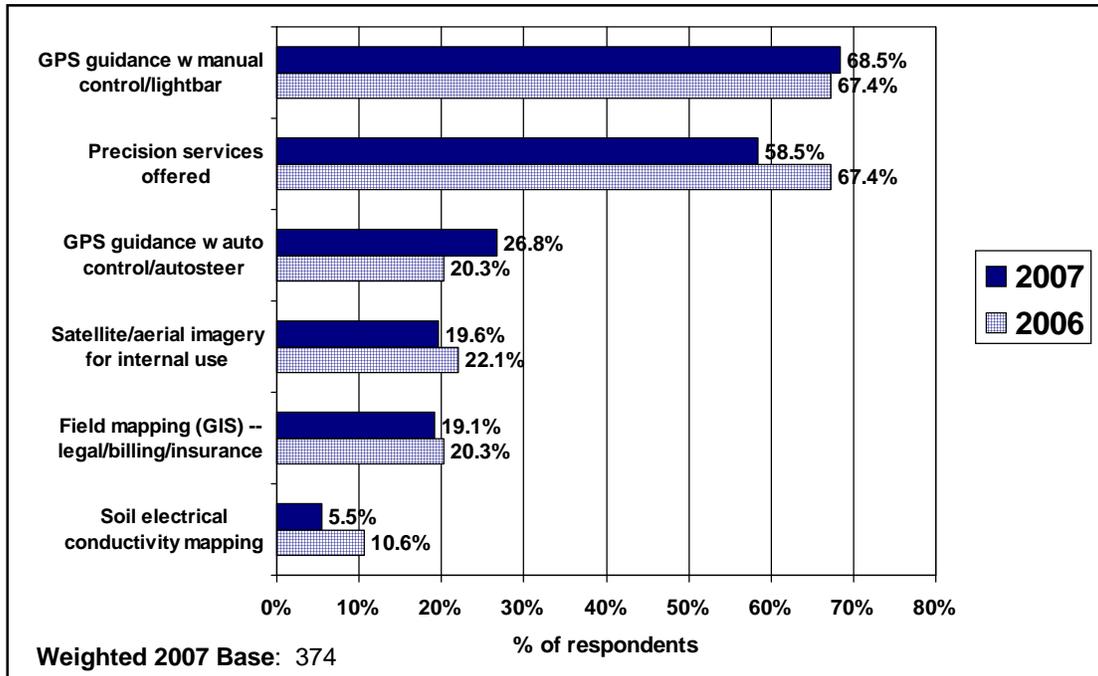
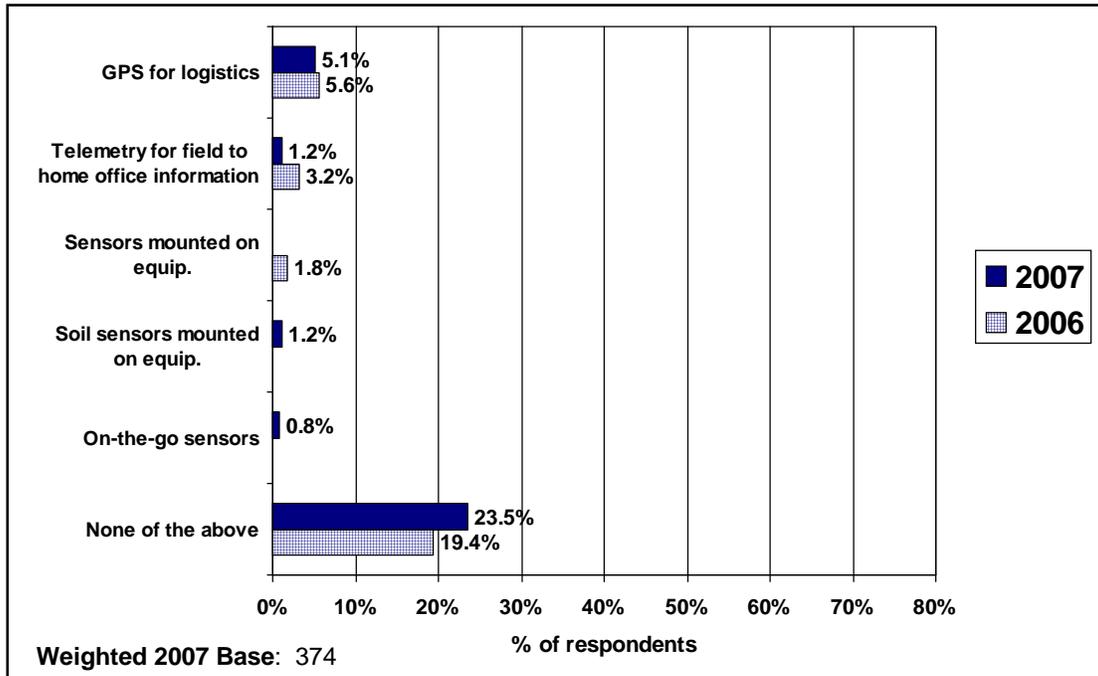
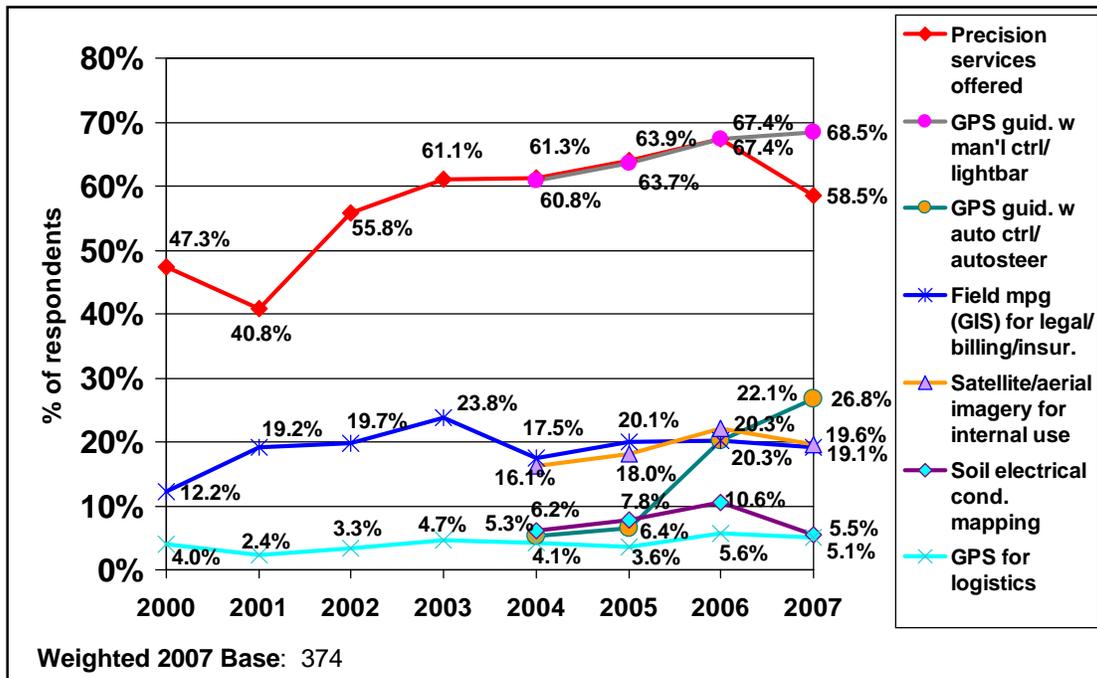


Figure 28. Use of Precision Technology Part B



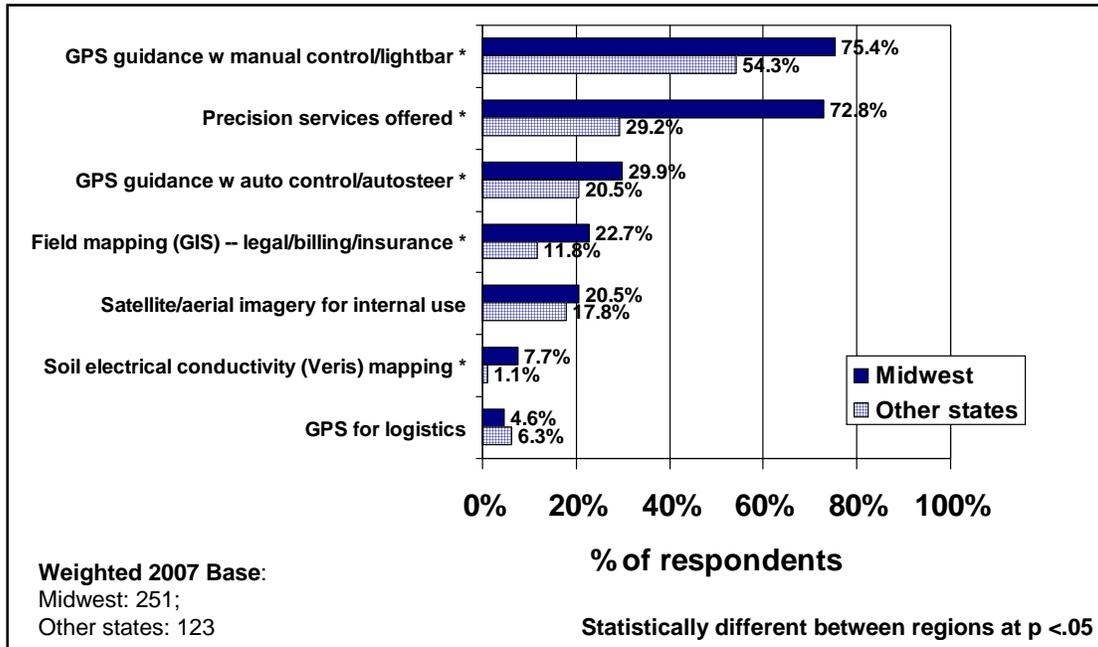
Over time, some uses of precision technology have increased while others have remained fairly stable (Figure 29). The biggest growth has been in precision service offerings, with fairly consistent growth from 2000 to 2006. In 2007, however, precision service offerings showed a significant decline from 67 percent of the respondents to 59 percent of the respondents (less than any year since 2002). It will be important to closely monitor this trend in 2008. Based on further analysis of the data, at least some portion of the drop in 2007 appears to be primarily a difference in the 2007 sample rather than an actual decline in the nationwide offerings of precision technology. The biggest growth seen from 2006 to 2007 was in the use of GPS guidance systems with autocontrol/autosteer, growing from 20 percent of the dealerships in 2006 to 27 percent in 2007.

Figure 29. Use of Precision Technology over Time



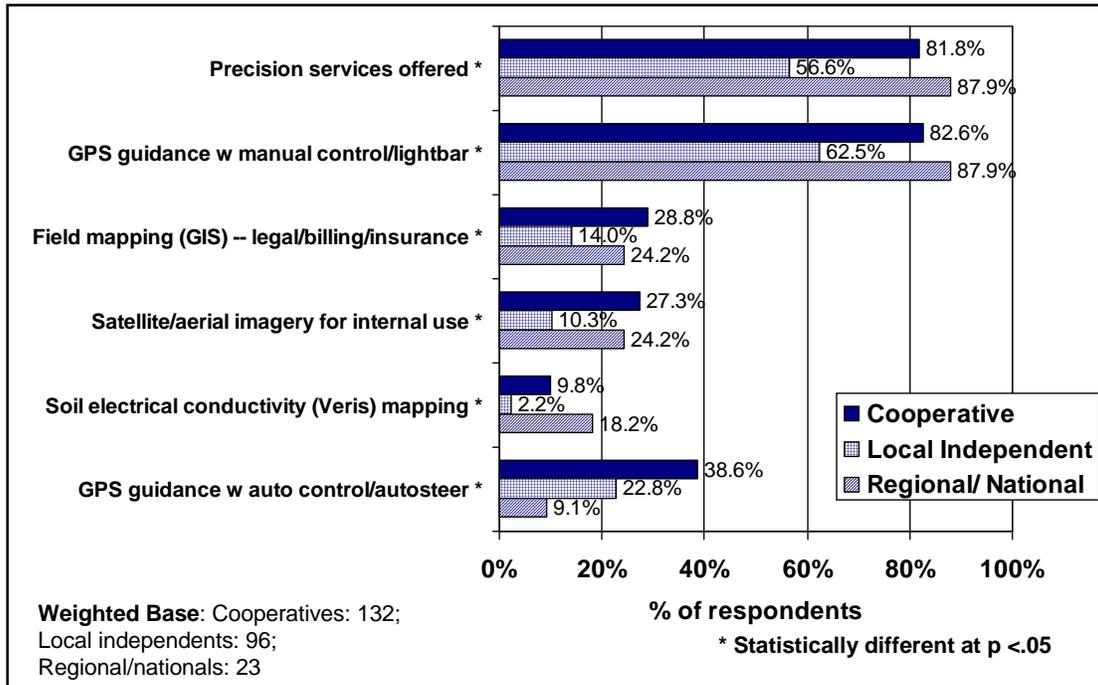
As in other years, precision technologies were being used by significantly more dealerships in the Midwest than in non-Midwestern states (Figure 30). Almost 9 out of 10 of the respondents in the Midwest (85 percent) said their dealership used precision technologies in some way, compared to just over six out of 10 of the respondents from other states (59 percent). Almost three-quarters (73 percent) of the Midwestern respondents said their dealership offered precision services compared to only 29 percent of the non-Midwestern respondents. GPS was used as a guidance system with manual control/lightbar by 75 percent of the Midwestern dealerships compared to 54 percent of the non-Midwestern respondents. GPS guidance systems with auto control/autosteer were used by 30 percent of the Midwestern respondents but only 21 percent of the respondents from other states. Field mapping with GIS for legal/billing/insurance purposes was used by twice as many dealerships in the Midwest compared to non-Midwest states (23 percent in the Midwest compared to 12 percent).

Figure 30. Use of Precision Technology by Region



In the Midwest, adoption of precision technology varied by organizational type. Almost all of the respondents representing regional/nationals used at least one precision technology (97 percent) while 9 out of 10 respondents representing cooperative organizations said they used at least one precision technology (89 percent). Only 77 percent of the local independents used precision technology in at least one way. Almost 90 percent of the respondents representing regional/nationals offered precision services to their customers (88 percent) (Figure 31), while almost as many (82 percent) of the cooperatives offered precision services. This can be contrasted to the local independents where only 57 percent of the respondents offered precision services.

Figure 31. Use of Precision Technology by Organizational Type in the Midwest



Precision Service Offerings

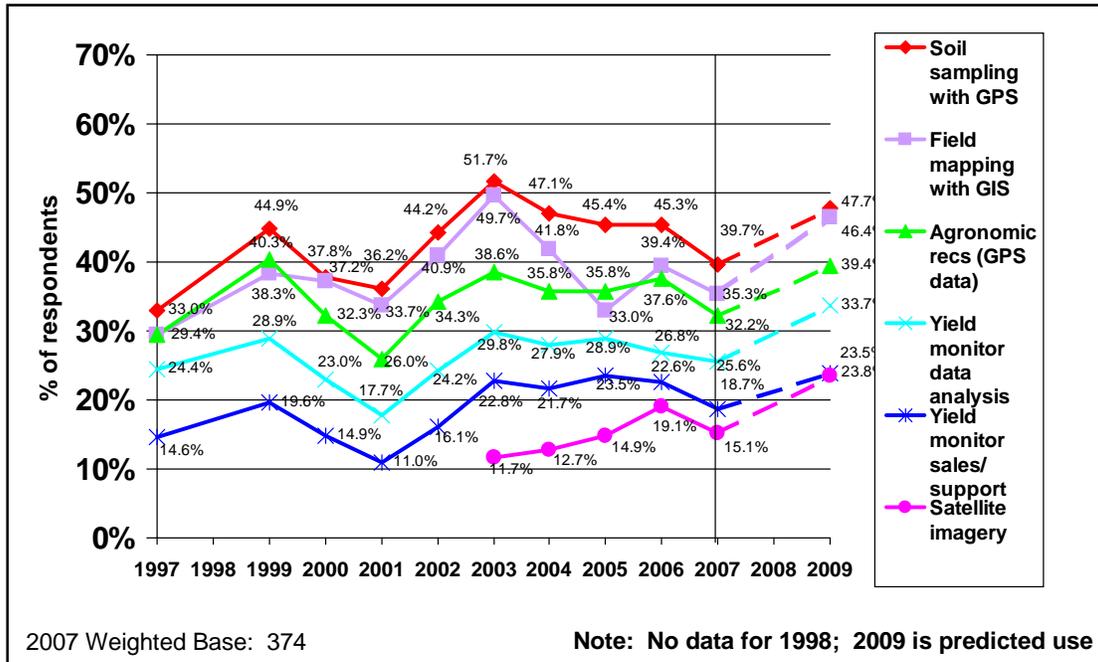
Respondents were asked which specific precision services they would be offering their customers by the fall of 2007. In most cases, current use and projections were down compared to numbers provided in 2006. However it is important to remember that there were some significant differences in the composition of the sample in 2007. And, some of the decline could be due to the sample differences rather than true reductions in precision service offerings. As in previous years, the most common precision service offered by these dealerships was soil sampling with GPS – offered by 40 percent of the respondents (Figure 32). This was down from 45 percent in 2006. By 2009, 48 percent of the respondents expected their dealerships to be offering soil sampling with GPS.

Consistent with most previous years, field mapping with GIS was the second most common precision technology service to be offered, with 35 percent of the respondents offering the service by the fall of 2007. By 2009, over 46 percent of respondents expected to be offering this service.

Similar to field mapping with GIS, agronomic recommendations based on GPS data was offered by 32 percent by the fall of 2006, with expectations of it rising to 40 percent by 2009. This service has remained fairly stable since 2003.

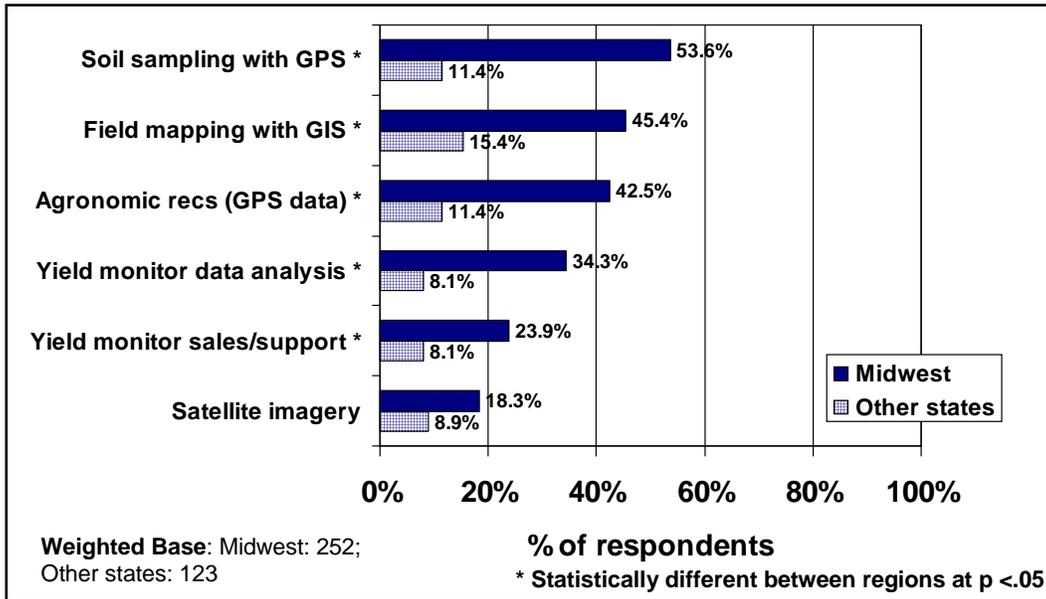
Yield monitor data analysis, yield monitor sales support and satellite imagery were all offered by slightly fewer respondents in 2007 relative to those offering the services in 2006.

Figure 32. Precision Ag Services Offered Over Time



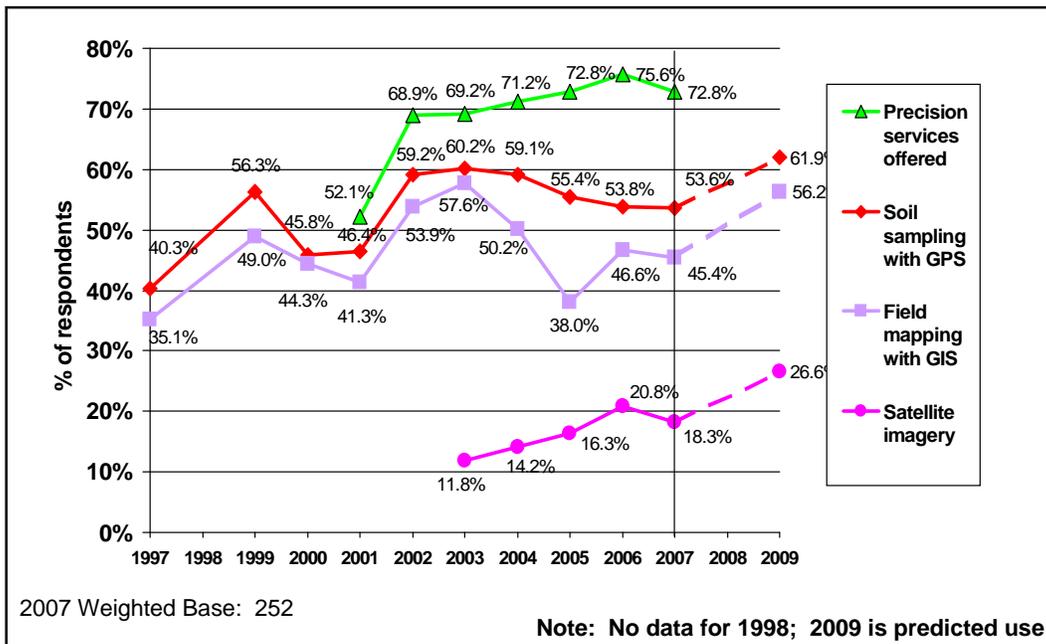
With the exception of satellite/aerial imagery, all of these precision service offerings were significantly more common in the Midwest than in other states (Figure 33). For example, 54 percent of the responding dealerships from the Midwest indicated they would be offering soil sampling with GPS by the fall of 2007. In non-Midwestern states, soil sampling with GPS was expected to be offered by only 11 percent of the respondents. Similar differences were apparent for field mapping with GIS, agronomic recommendations based on GPS data, and yield monitor sales/support and data analysis. Most of the precision ag services in non-Midwestern states declined from last year (but the differences in sample composition must be considered).

Figure 33. Precision Ag Services Offered by Region



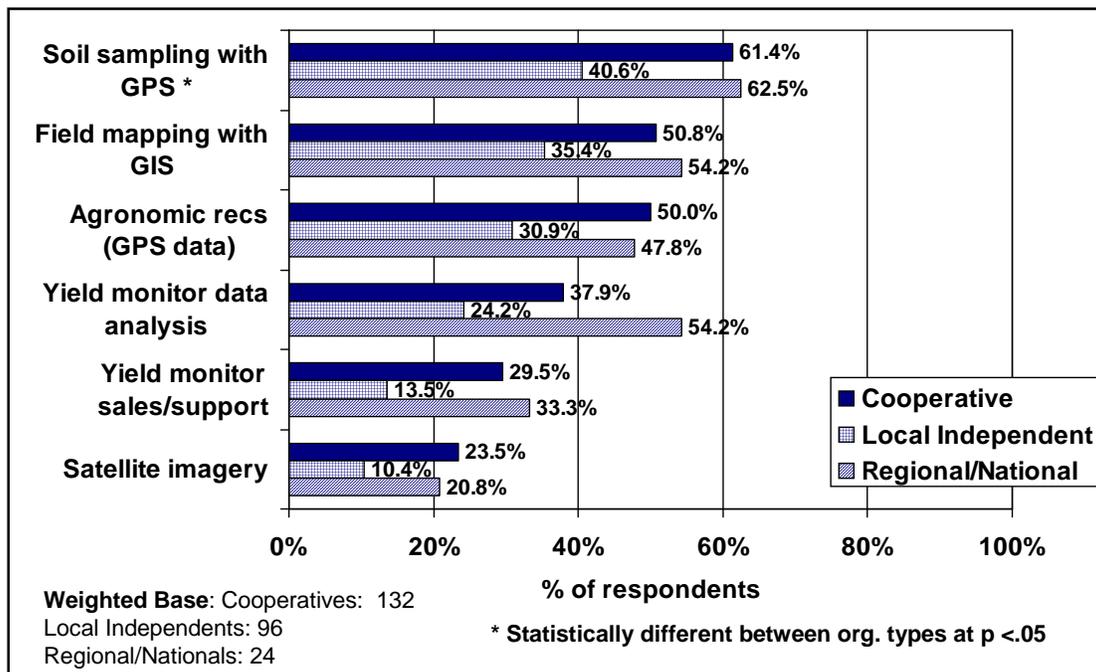
To get a better understanding of precision technology growth in the Midwest, Figure 34 shows the trends in key precision service offerings in the Midwest over the past 11 years. Overall, dealers offering any type of precision service have shown a slow but steady increase since 2002, growing from 69 percent to 73 percent in 2007. There was not a lot of change from 2006 to 2007.

Figure 34. Precision Ag Services Offered Over Time in the Midwest



As in previous years, precision service offerings were more extensive in national/regional organizations and cooperatives in the Midwest compared to local independents (Figure 35). In the Midwest, local independents were generally not as likely to offer these services relative to the other organizational types. However, this year, the only specific service where this difference was statistically significant was soil sampling with GPS.

Figure 35. Precision Ag Services Offered by Organizational Type in the Midwest



A Focus on Soil Sampling

As in previous years, the types of soil sampling dealerships were offering – by grid or by soil type – were explored in more detail. Eighty-nine (89) percent of the respondents offered some type of soil sampling with eight out of ten respondents indicating their dealership offered traditional soil sampling. Just under half of the respondents (42 percent) said they offered soil sampling by grid, while 19 percent offered soil sampling by soil type (Figure 36). Over time, these numbers have remained relatively constant, with a steady decline in soil sampling by soil type since 2004 (Figure 37).

Figure 36. Types of Soil Sampling Offered

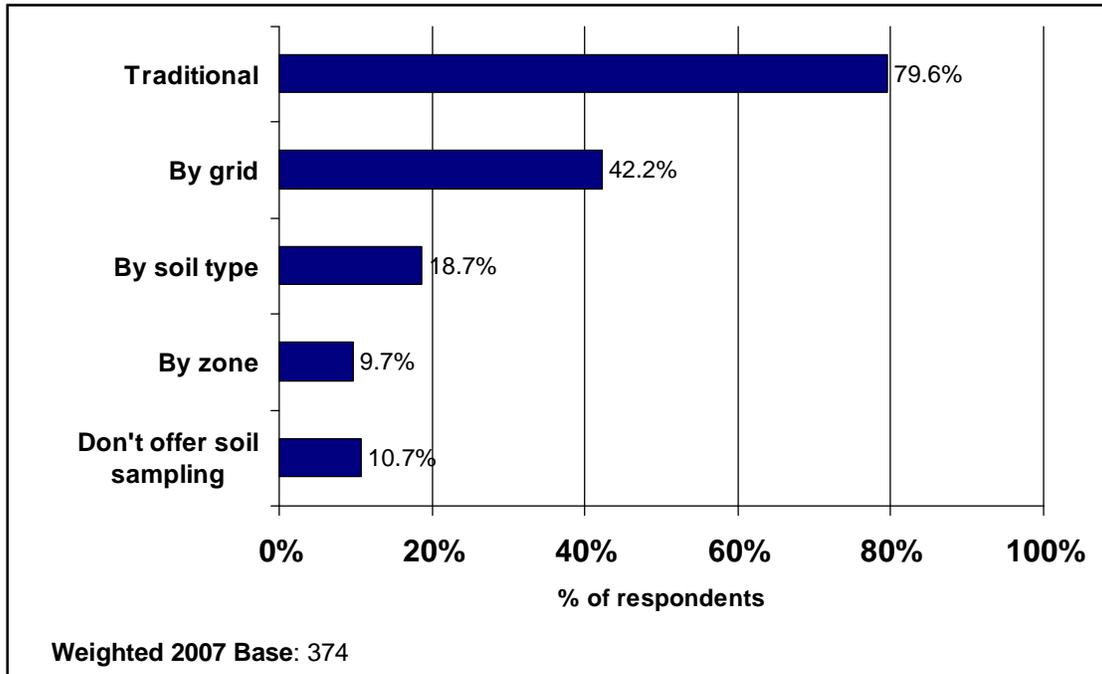
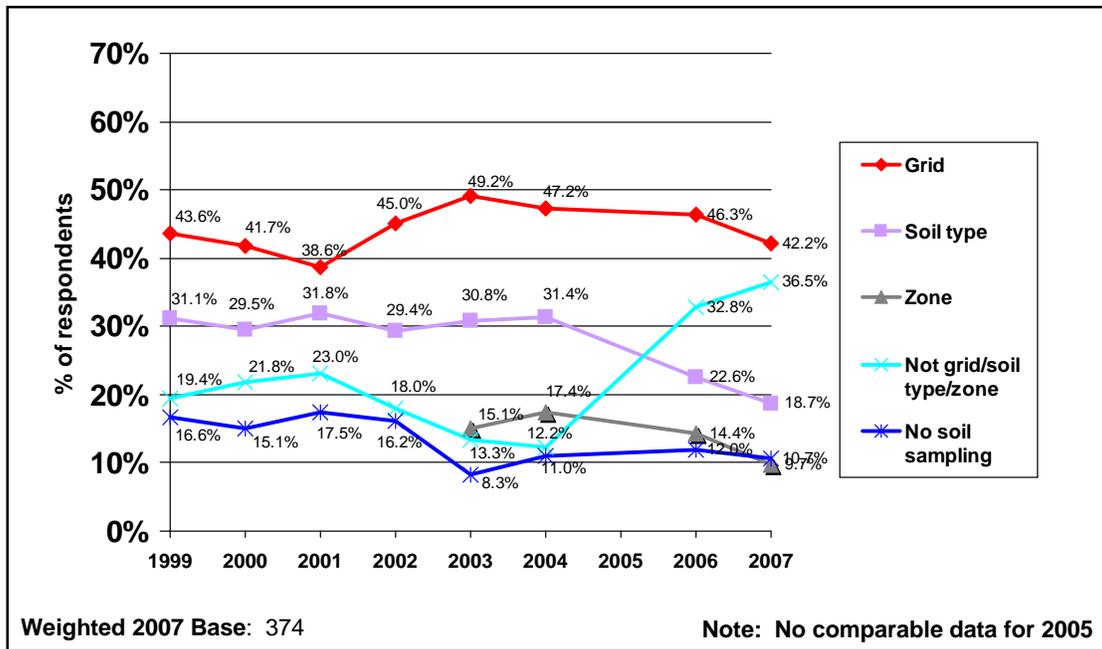
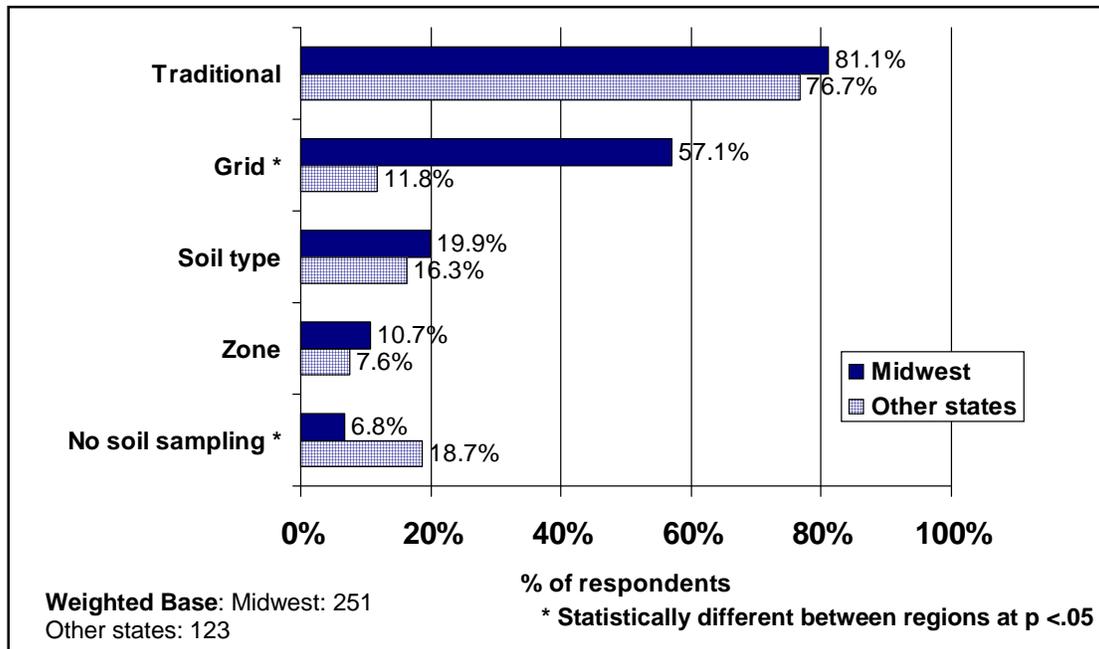


Figure 37. Types of Soil Sampling Offered Over Time



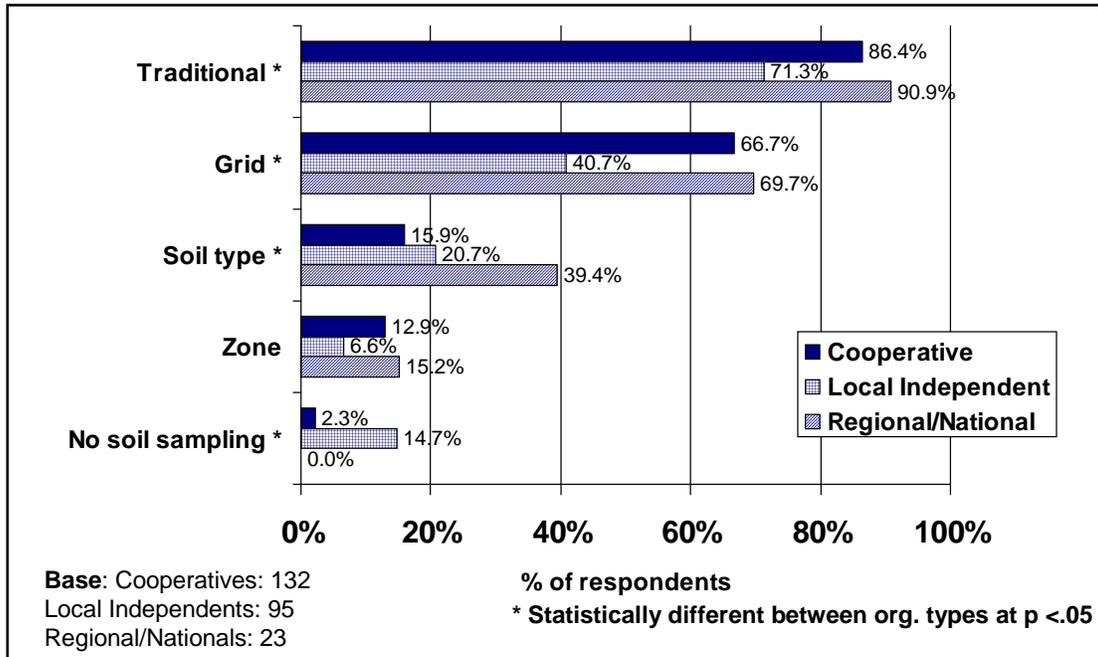
Soil sampling is more common in the Midwest than in other states (Figure 38) with 93 percent of the respondents in the Midwest saying their dealership offered some type of soil sampling, compared to 81 percent of the respondents from non-Midwestern states. The only specific type of soil sampling that varied statistically by region was grid sampling – offered by five times as many dealerships in the Midwest compared to other states (57 percent compared to 12 percent). This is a much lower figure for non-Midwestern states than in previous years and may reflect sample differences rather than actual declines in grid sampling offerings.

Figure 38. Types of Soil Sampling Offered by Region



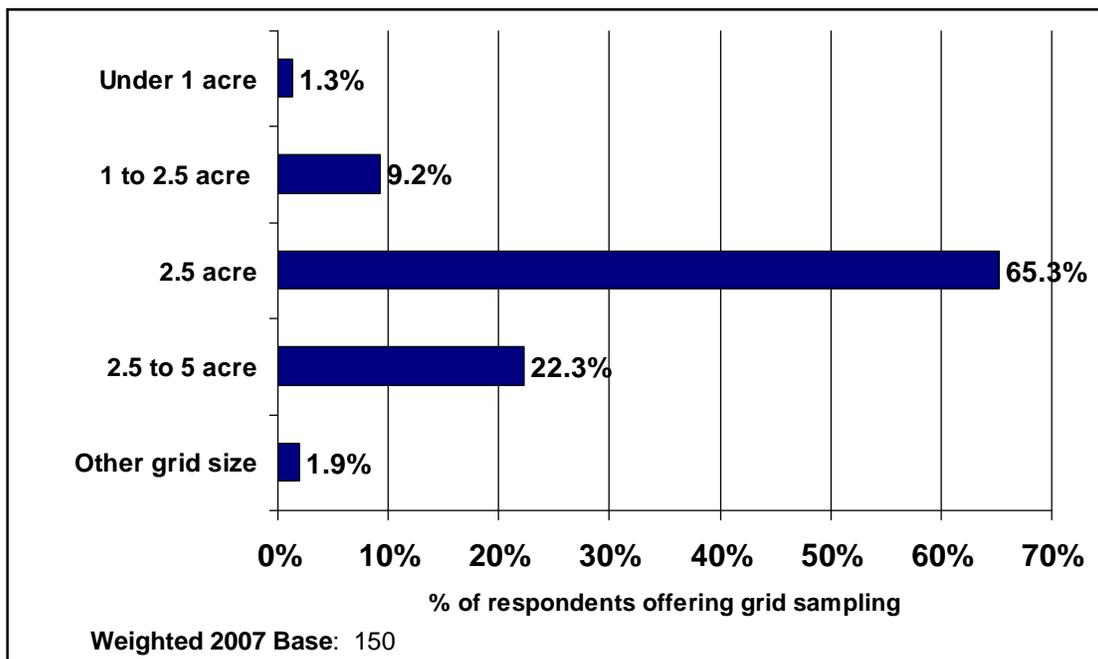
In the Midwest, the type of soil sampling also varied by organizational type. Consistent with precision service offerings, soil sampling was more likely to be offered by cooperatives and national/regional dealerships (Figure 39). This year, every national/regional dealership who participated in the survey and 98 percent of the cooperatives offered some type of soil sampling, compared to 85 percent of the local independents. Traditional soil sampling and grid soil sampling were both more likely to be offered by cooperatives and national/regional dealerships. Soil sampling by soil type was offered by twice as many regional/national dealerships than by cooperatives or local independents.

Figure 39. Types of Soil Sampling Offered by Organizational Type in the Midwest



As the use of grid sampling has leveled out, the distribution of grid sizes has also remained fairly constant with the most common grid size continuing to be 2.5 acres, followed by 2.5 to 5.0 acres (Figure 40). There was no variation in grid size by region or by organizational type within the Midwest.

Figure 40. Grid Sizes Used in Grid Sampling



Variable Rate Seeding

Variable rate seeding continues to be an area where dealerships show less interest relative to other precision services. As in other years, in 2007 fewer than 10 percent of the responding dealerships offered variable seeding, either with or without GPS (Figure 41). Respondents in the Midwest were statistically more likely to be offering variable seeding without GPS than were respondents from non-Midwestern states (Figure 42) though even in the Midwest fewer than 10 percent of the dealerships offered variable rate seeding. There were no statistical differences between organizational types in the Midwest (Figure 43).

Figure 41. Variable Rate Seeding Offered Over Time

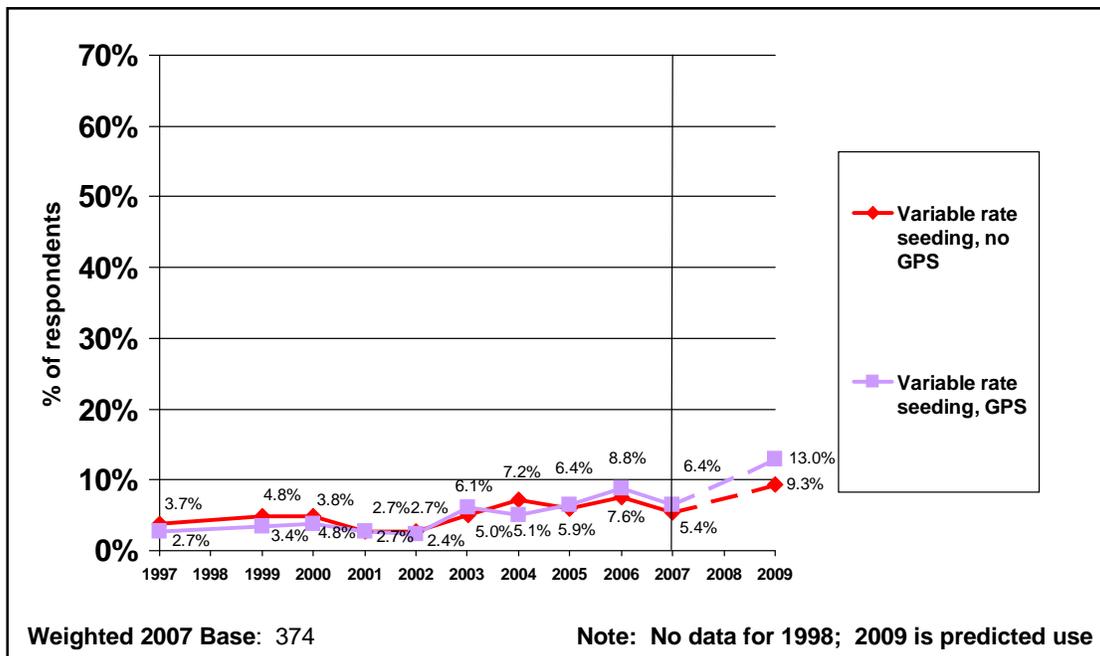


Figure 42. Variable Rate Seeding Offered by Region

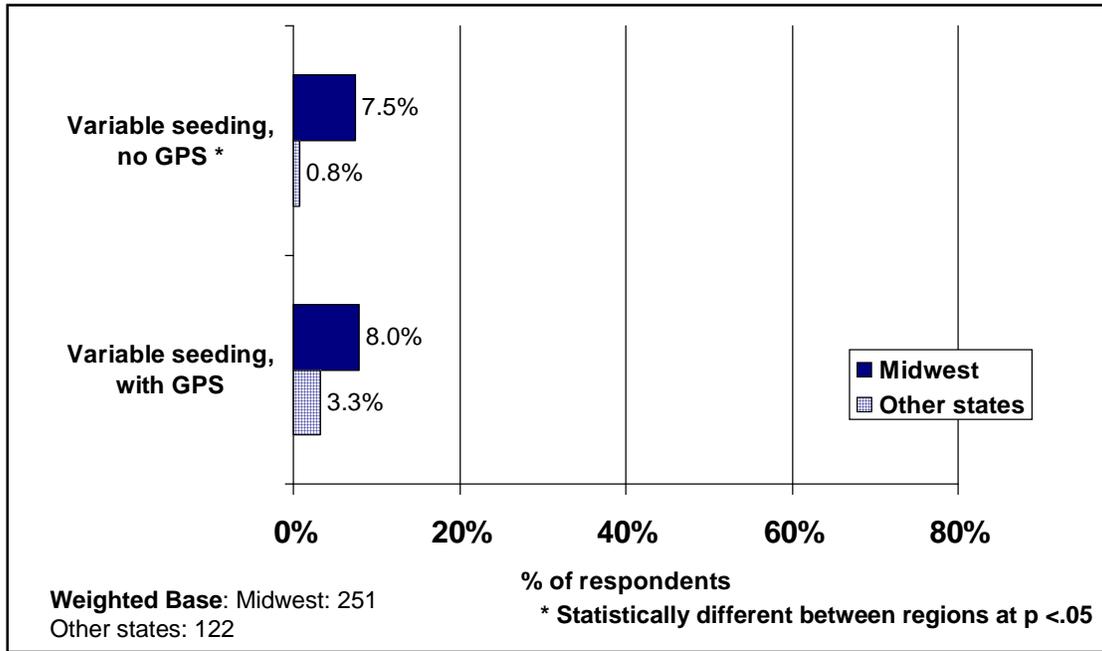
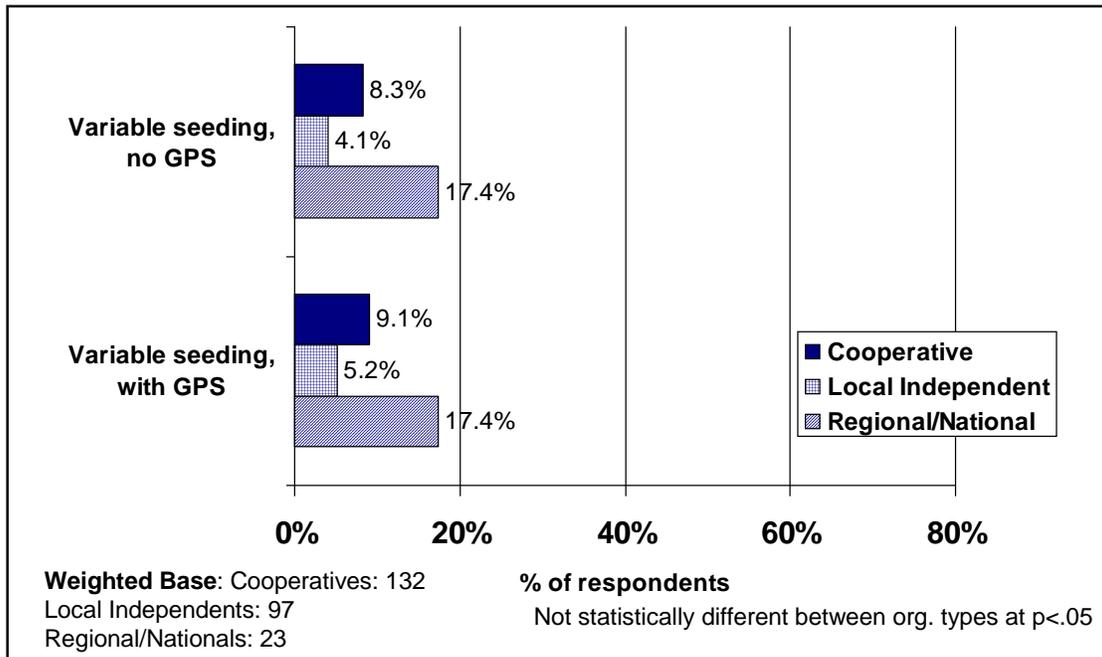


Figure 43. Variable Rate Seeding Offered by Organizational Type in the Midwest



Variable Rate Application

Variable rate custom application services have typically been provided along with traditional custom application services. Of the 85 percent of the dealerships who offered custom application, two-thirds expected to offer some type of variable rate application service by the fall of 2007 (including both controller-driven and manual variable rate application). Figure 44 shows the trends in variable rate application service offerings over time. Overall, there was a decline in manual variable rate application services and controller-driven single nutrient application 2007.

Figure 44. Precision Application Offered Over Time

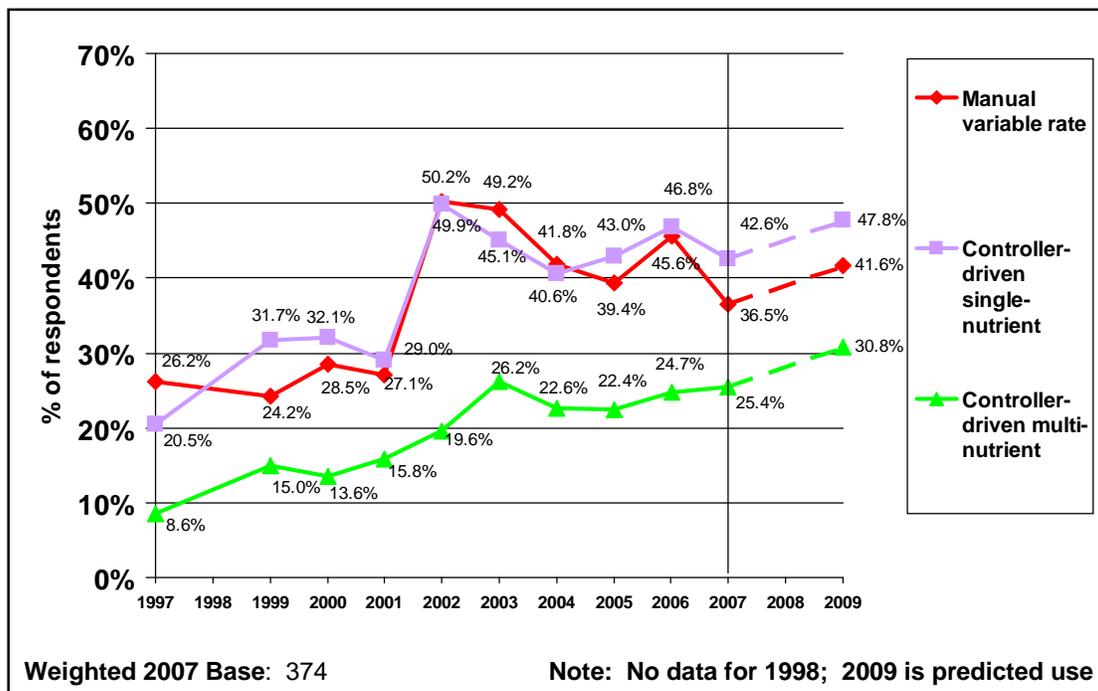
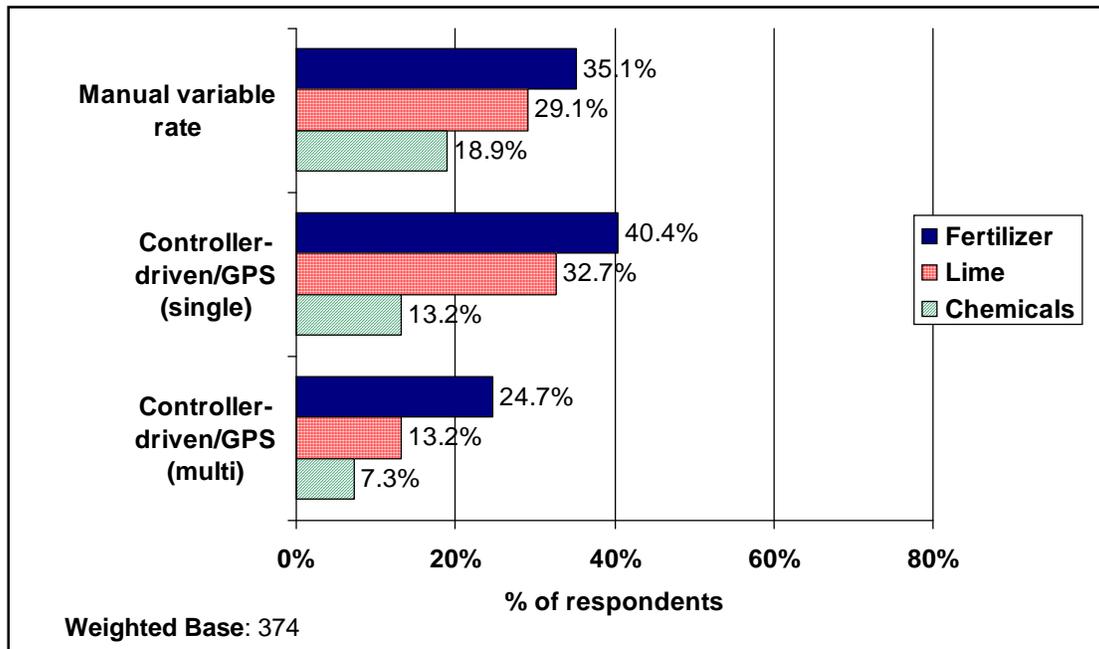


Figure 45 shows the offerings of specific controller-driven variable rate application services in 2007. Almost half of the respondents (46 percent) offered some form of controller-driven application of fertilizer, lime and/or chemicals – either single nutrient or multi-nutrient application. This was down from 51 percent in 2006 but similar to the 45 percent of respondents reporting some form of controller-driven application in 2005. Single nutrient controller-driven application of fertilizer was the most common controller-driven variable rate application service offered, with 40 percent of the respondents expecting to offer the service by the fall of 2007 (down from 44 percent in 2006). Multi-nutrient controller-driven application of fertilizer was virtually unchanged from the last 2 years, with 25 percent of the responding dealerships offering the service in 2007. A third of the respondents offered single-nutrient controller-driven variable rate application of lime and 13 percent offered it in combination with other materials in multi-nutrient controller-driven application.

Figure 45. Precision Application Offered for Each Input Type



Manual and controller-driven variable rate application was more common in the Midwest relative to the other states (Figure 46 to Figure 48). For fertilizer, half of the respondents (53 percent) expected to offer single nutrient controller-driven application in the Midwest by the fall of 2007 compared to only 17 percent of the respondents from other states (Figure 46). This showed no change from 2006 to 2007 in the Midwest but a drop from 26 percent in non-Midwestern states. Multi-nutrient controller-driven application of fertilizer in both Midwestern and non-Midwestern states were almost the same in 2007 as in 2006. In the Midwest, multi-nutrient controller-driven application of fertilizer was offered by 31 percent of the respondents while 11 percent of the respondents from non-Midwestern states offered the service.

Controller-driven application of lime was offered at slightly lower levels than fertilizer in both regions (Figure 47), but like fertilizer, controller-driven application of lime was much more common in the Midwest than in non-Midwestern states. For chemicals, variable rate application was not as common as for fertilizer and lime (Figure 48). However, for the first time in several years, controller-driven application of chemicals was statistically more common in the Midwest than in non-Midwestern states.

Figure 46. Precision Application of *Fertilizer* Offered by Region

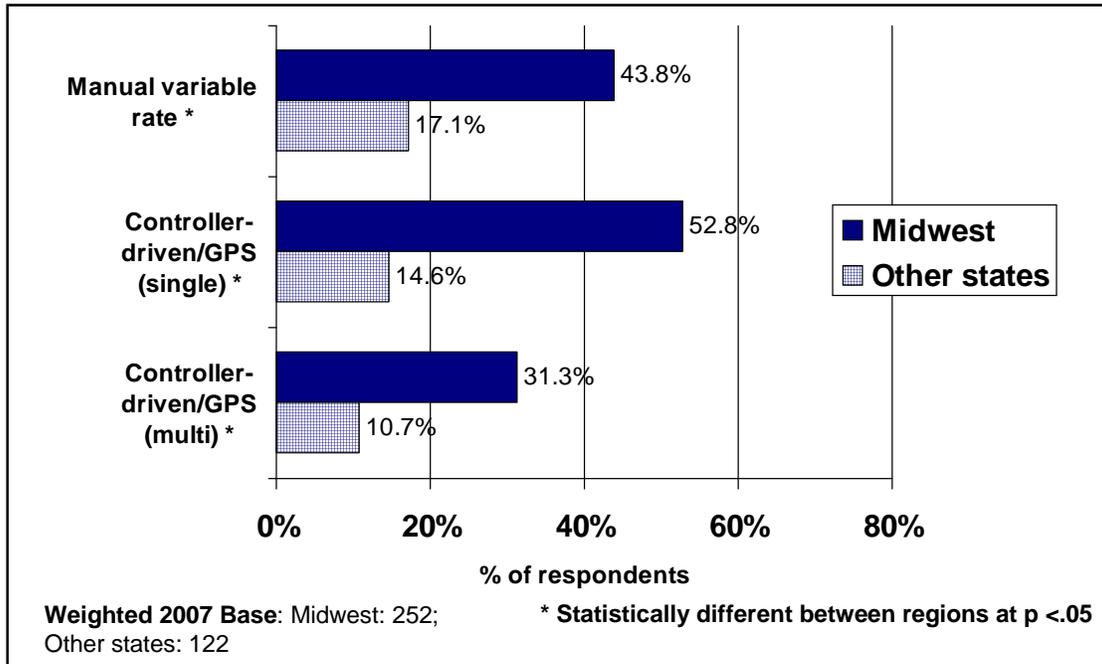


Figure 47. Precision Application of *Lime* Offered by Region

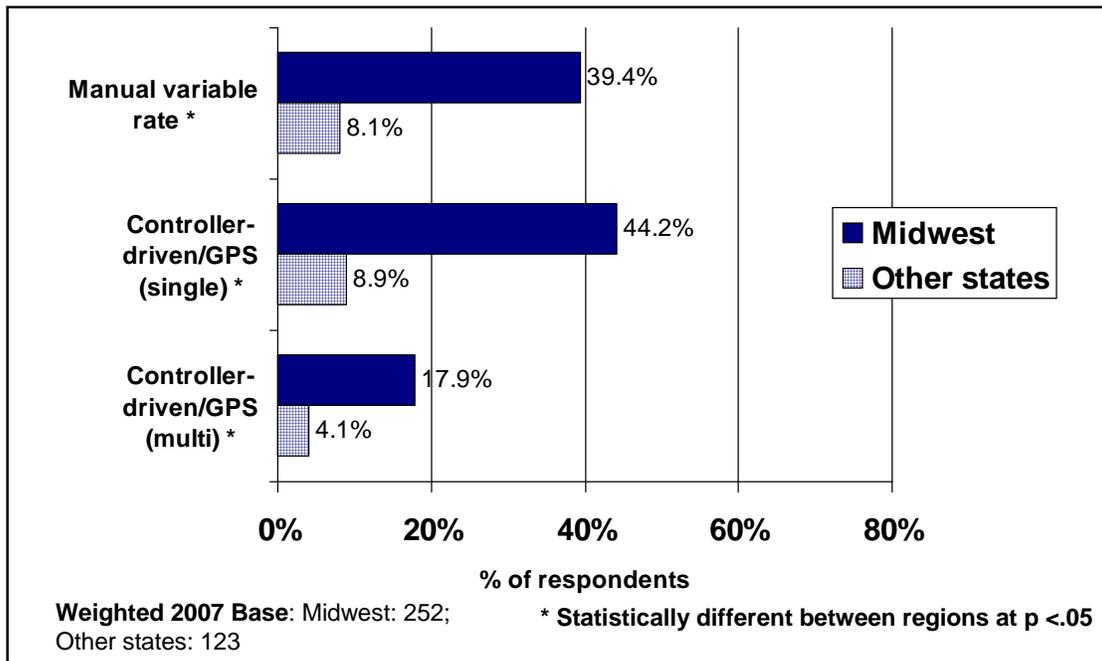
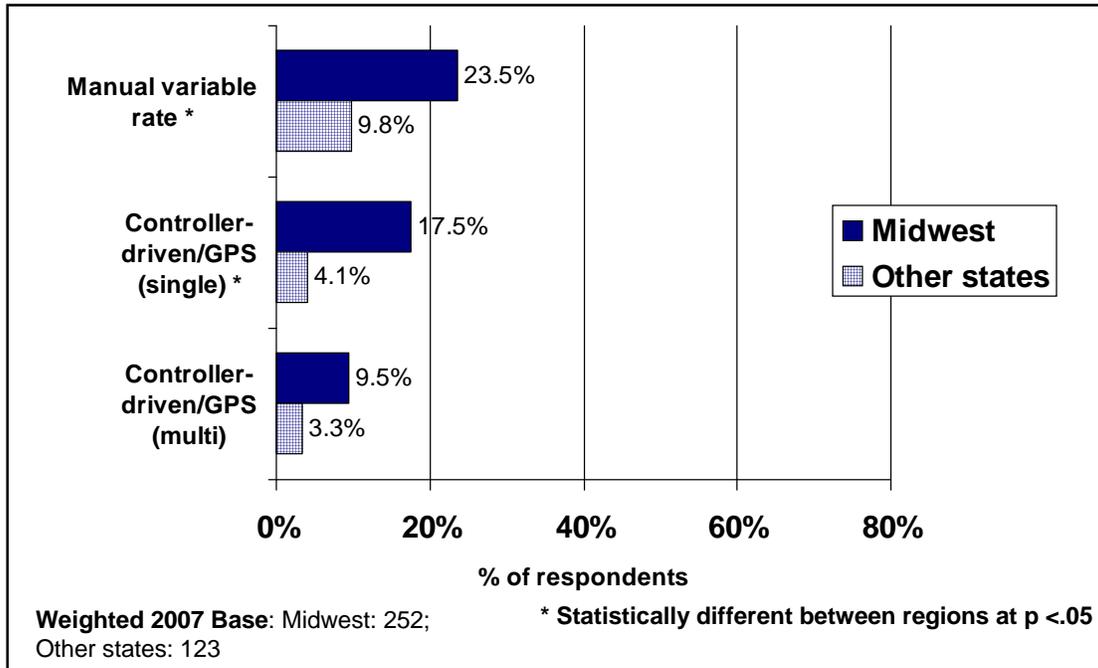


Figure 48. Precision Application of Chemicals Offered by Region



To give a perspective of overall adoption of controller-driven application in the Midwest, Figure 49 shows the levels of controller-driven variable rate application over the past 11 years. Both single-nutrient and multi-nutrient controller-driven application have grown steadily or held level for the past few years.

Figure 49. Precision Application Offered Over Time in the Midwest

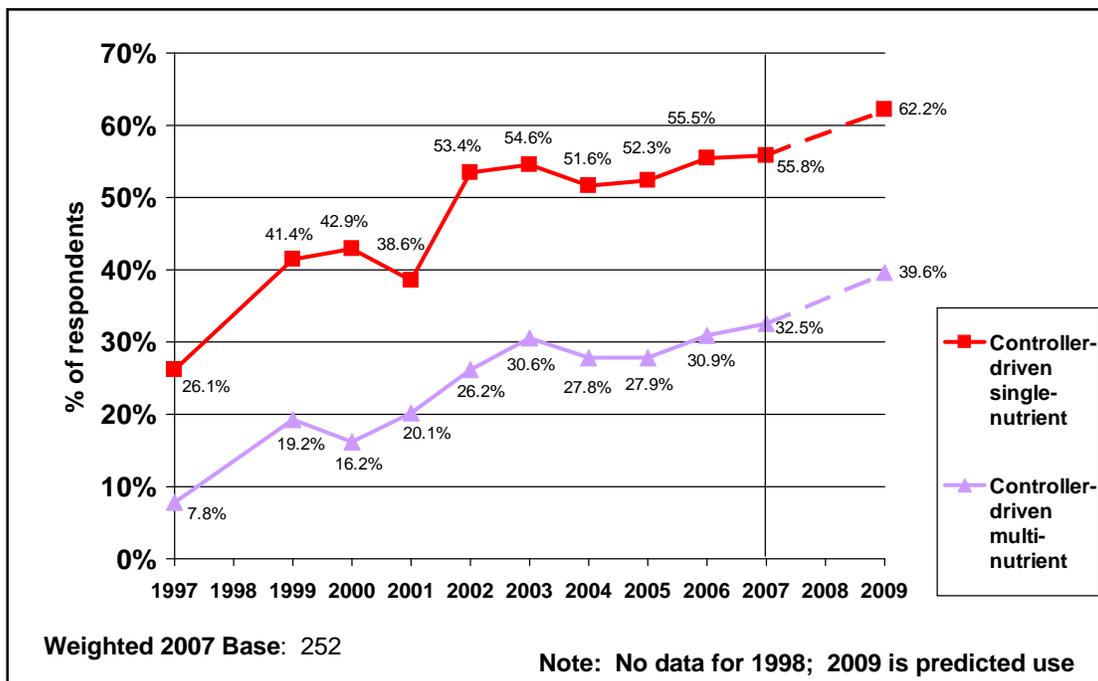


Figure 50 to Figure 52 show the precision application offerings by organizational type in the Midwest. In general, the patterns are similar to those seen for other services, with regional/national outlets and cooperatives being more likely to offer precision application than local independents. For fertilizer, the largest difference between organizational types was seen for controller-driven multi-nutrient application, with 2 to 3 times as many cooperatives and regional/national organizations offering the service compared to the local independents. This may reflect the higher cost of equipment and additional expertise involved and is consistent with previous years' results. For both lime and chemicals, cooperatives were significantly more likely to offer multi-nutrient controller-driven application than were regional/national dealerships or local independents.

Figure 50. Precision Application of *Fertilizer* Offered by Organizational Type in the Midwest

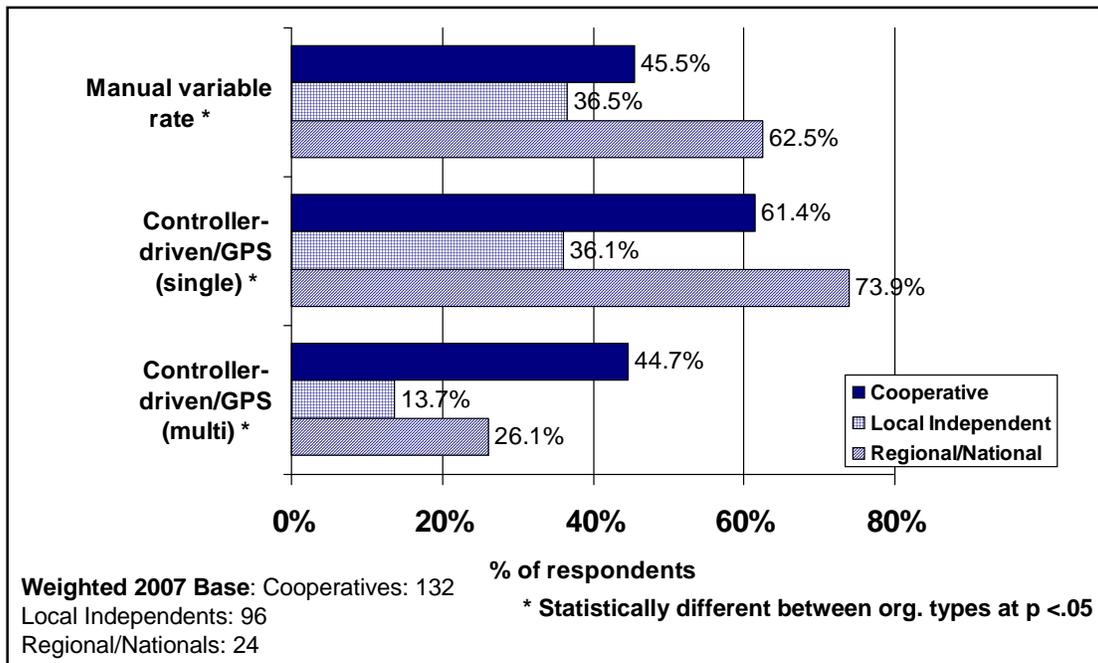


Figure 51. Precision Application of *Lime* Offered by Organizational Type in the Midwest

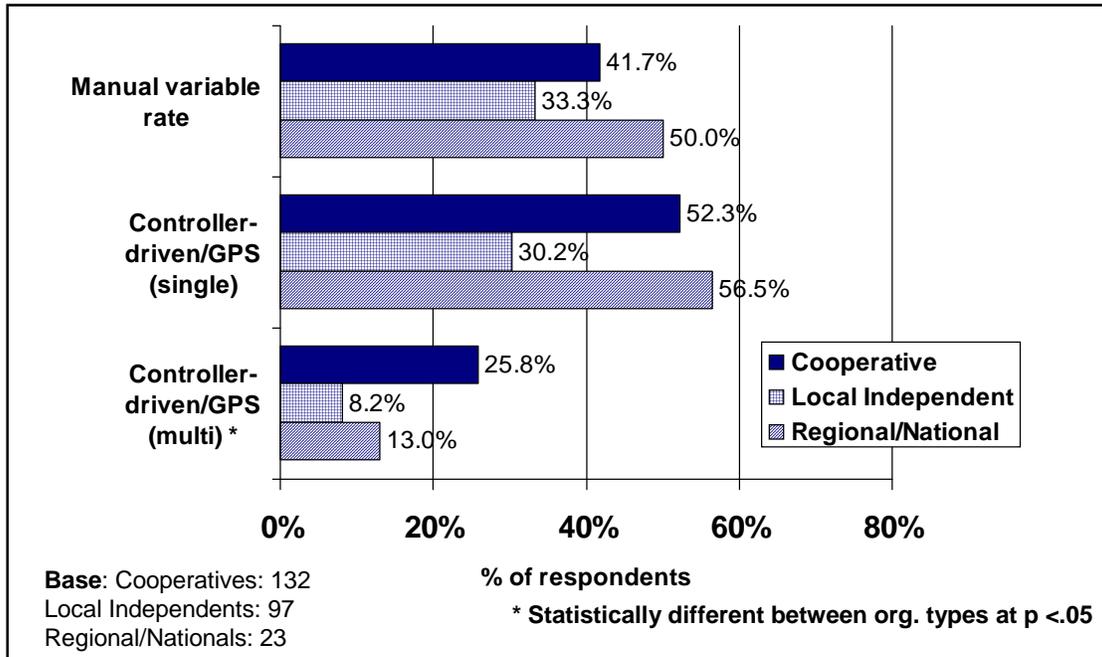
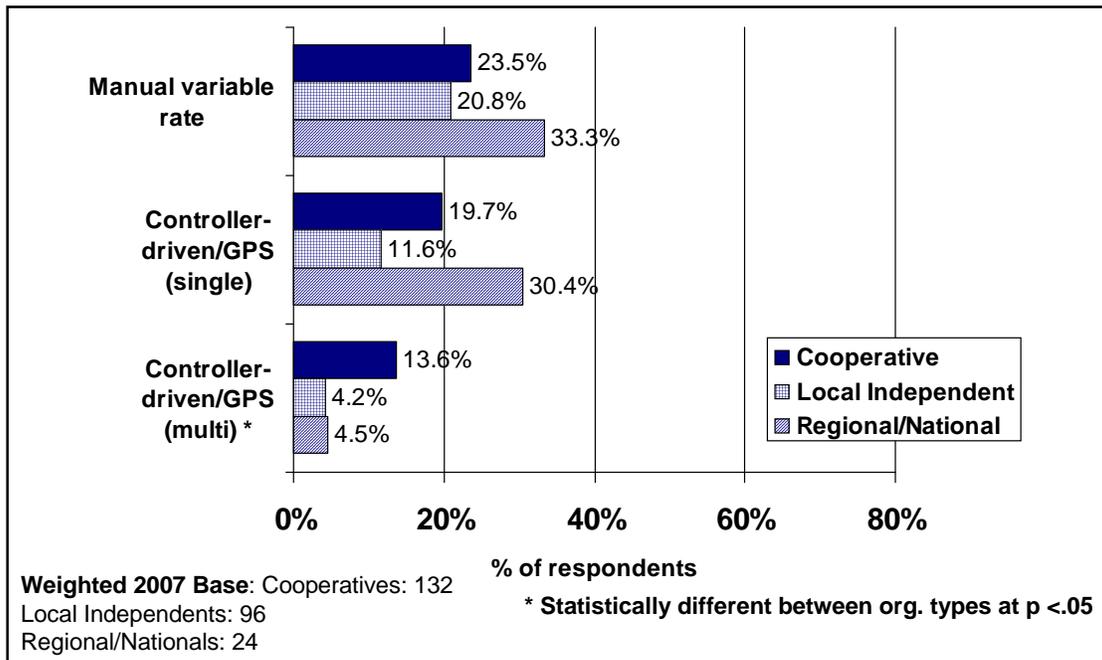


Figure 52. Precision Application of *Chemicals* Offered by Organizational Type in the Midwest



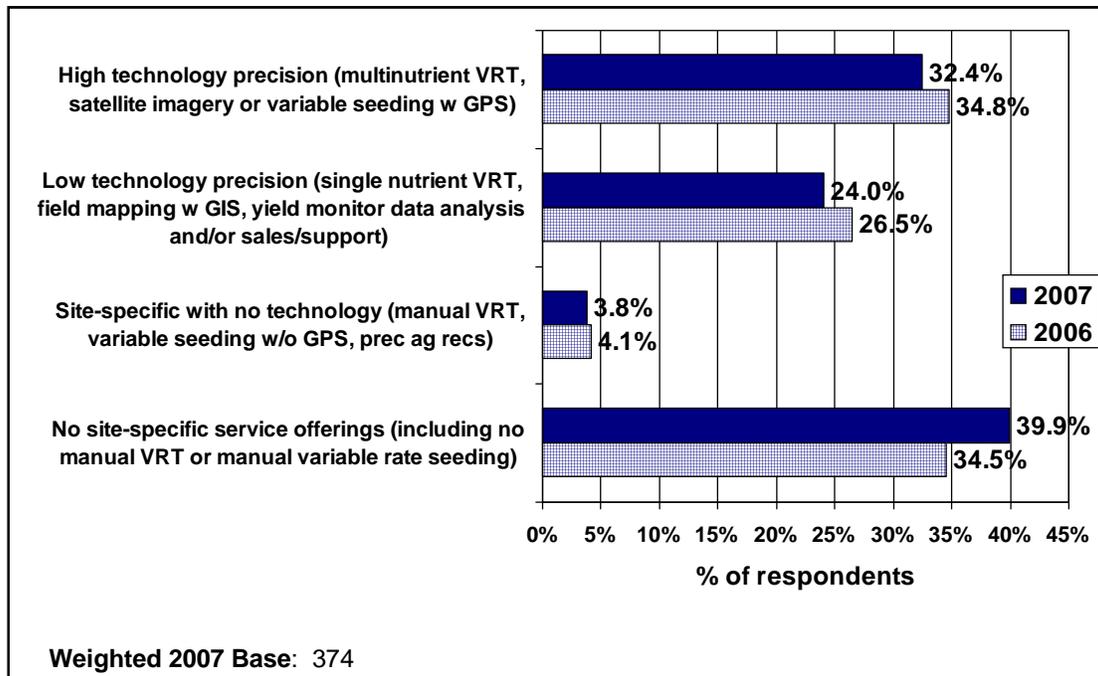
Levels of Precision Adoption

To summarize how extensively dealerships are incorporating precision technology into their service offerings, respondents were grouped into the following categories based on how extensive their precision service offerings were:

1. “High tech”: Multi-nutrient variable rate application, satellite/aerial imagery and/or variable seeding with GPS
2. “Low tech”: Single variable rate application, field mapping with GIS, yield monitor sales/support and/or data analysis, soil sampling with GPS
3. “Site-specific with no technology”: Manual variable rate application, variable rate seeding with no GPS, and/or agronomic recommendations based on precision data gathered elsewhere
4. No site-specific services at all.

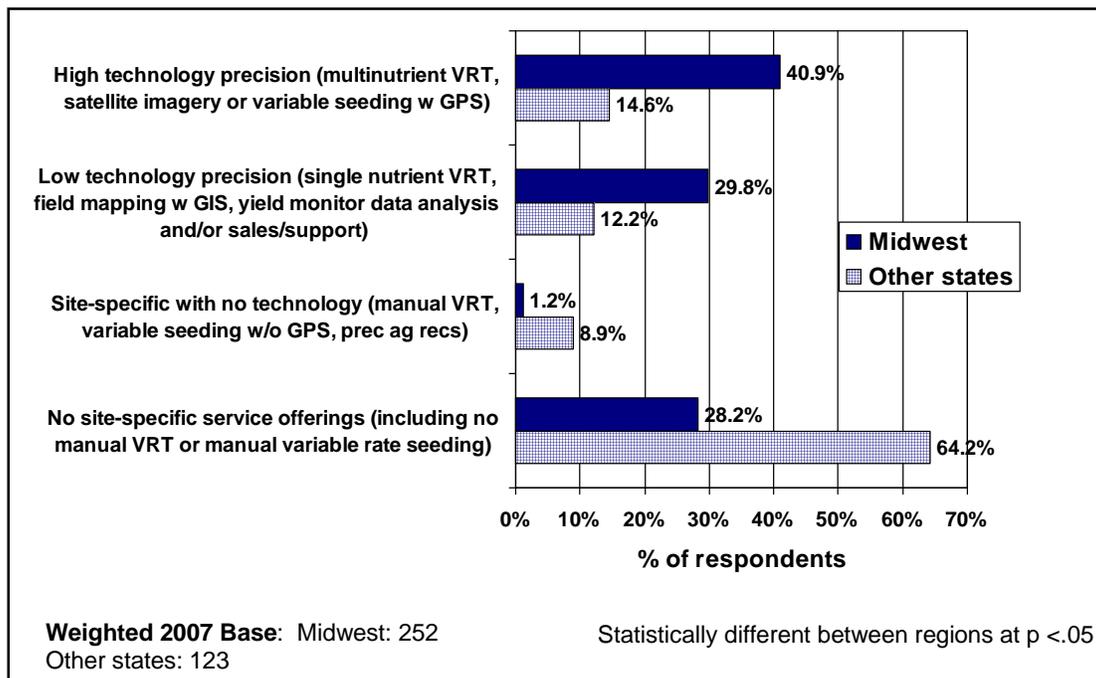
Just under a third of the respondents were in the “high tech” category (Figure 53), just under a quarter were in the “low tech” category and over a third offered no site-specific services at all (including manual variable rate application or making recommendations based on precision data). Very few respondents were offering manually-controlled site-specific services with no technology investment. In 2007, 40 percent of the survey respondents offered no site-specific services at all, compared to 35 percent in the 2006 survey.

Figure 53. Levels of Precision Adoption



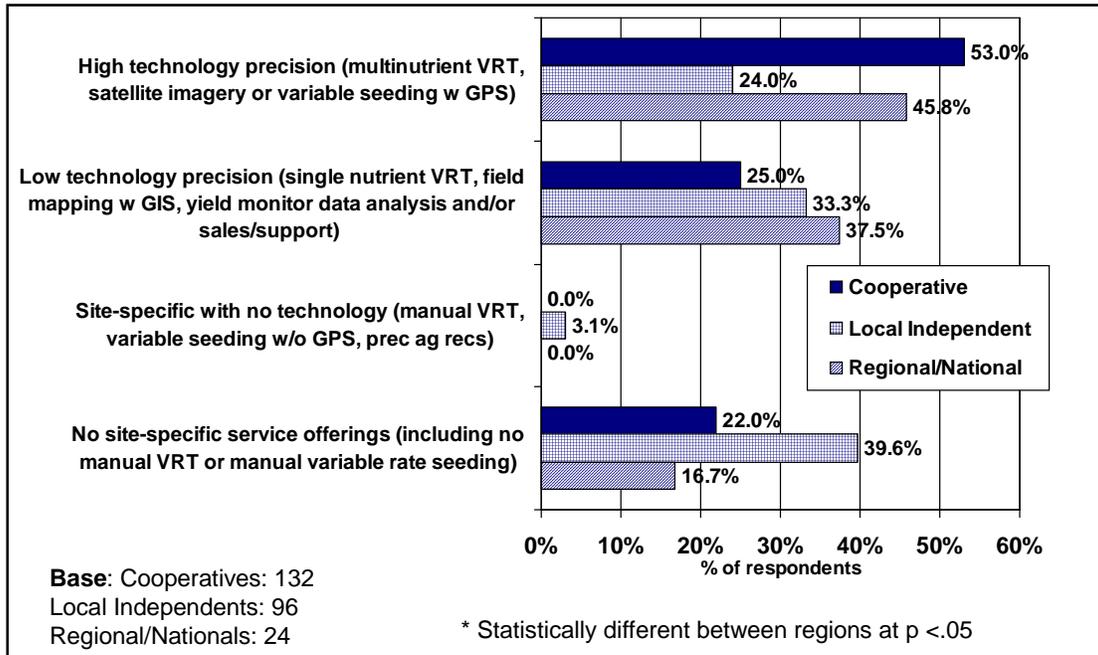
Precision technology varied greatly by region with four in ten (41 percent) of the respondents from the Midwest being classified as “high tech” precision users compared to only 15 percent in the non-Midwestern states (Figure 54). Almost two-thirds of the respondents from the non-Midwestern states offered no site-specific services at all, compared to only 28 percent of the respondents from the Midwest.

Figure 54. Levels of Precision Adoption by Region



In the Midwest, there were significant differences in levels of precision technology between the different types of organizations (Figure 55). Over half of those representing cooperatives (53 percent) were classified as “high tech” precision users, as were 46 percent of the respondents from regional/national organizations. In contrast, only 24 percent of the respondents from local independents were classified as being “high tech.”

Figure 55. Levels of Precision Adoption by Organizational Type in the Midwest



Pricing Precision Service Offerings

Dealerships were asked to report the typical price they charge per acre for their precision services where they could. For those offering only packages or bundled pricing, it often wasn't possible to price out the components individually. Hence, far fewer respondents completed this question relative to some of the other questions in the survey.

Figure 56 and Figure 57 show the average prices charged per acre for each of the precision services. The bars indicate what the middle 80 percent of the dealers were charging (as with other years, the top 10 percent and bottom 10 percent were dropped to make the ranges more consistent) while the squares show the average prices. Overall, the average prices charged were similar to those seen in previous years. There were no overall differences between prices charged in the Midwest and prices charged in other states.

Figure 56. Prices Charged for Precision Ag Services

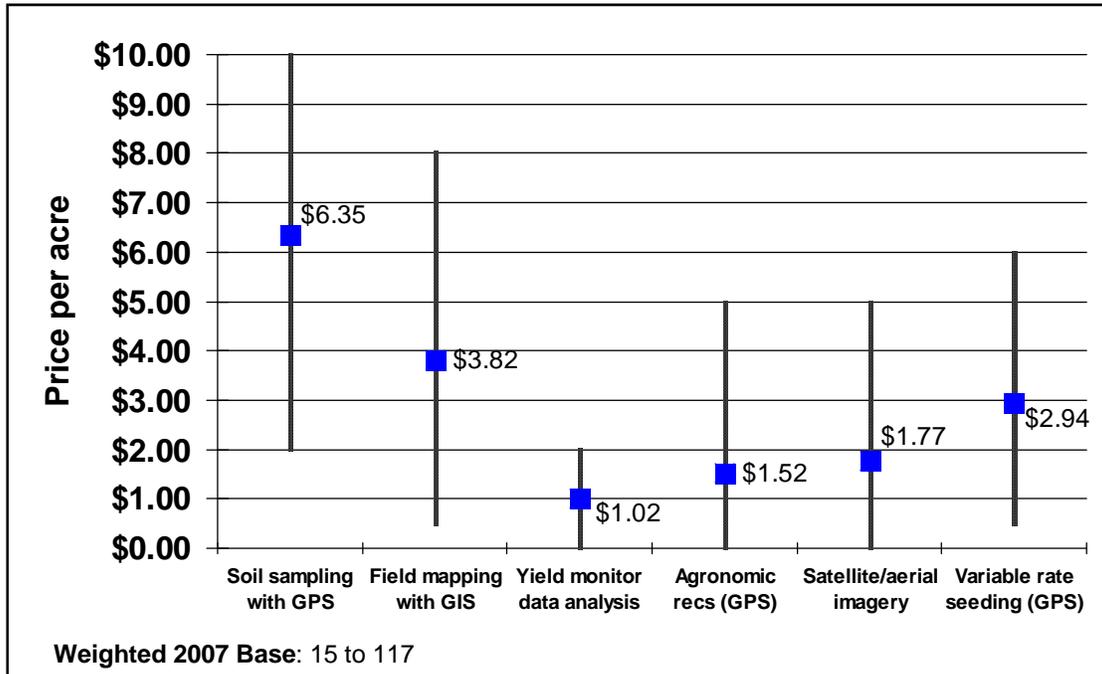
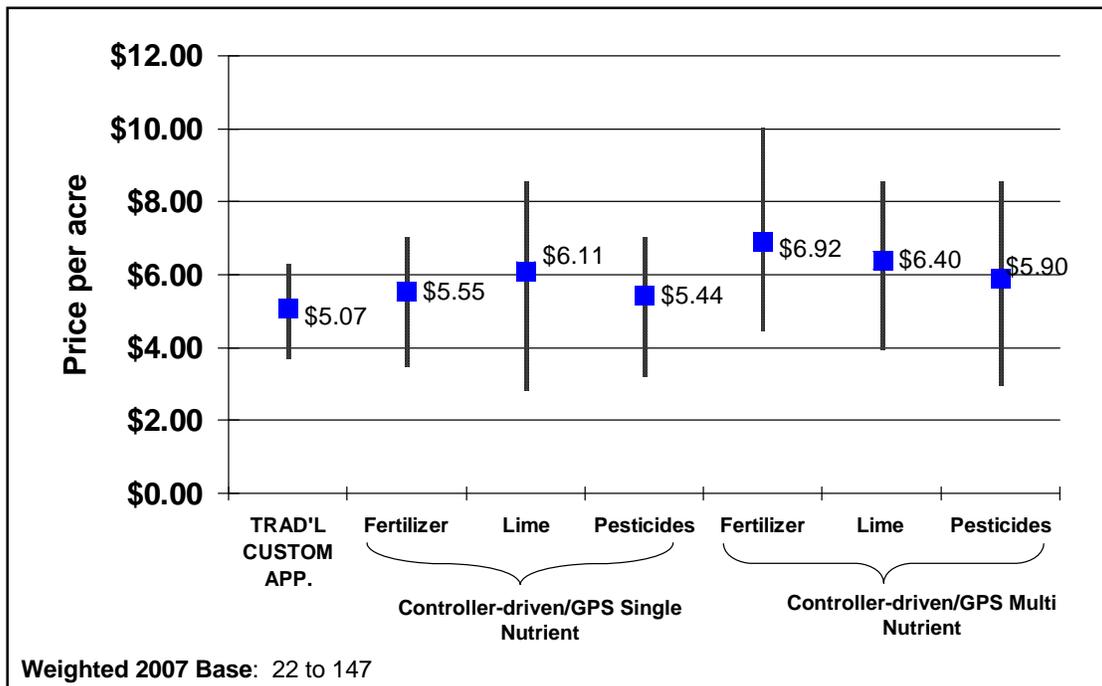


Figure 57. Prices Charged for Precision Application Services



Profitability of Precision Service Offerings

Dealerships were asked how profitable they felt their precision offerings were. Overall, results were similar to those of last year.

Each bar in Figure 58 and Figure 59 shows the proportion of respondents who indicated that a particular service was:

- not covering fixed or variable costs;
- covering variable costs;
- covering both variable and fixed costs; or
- generating a profit.

Using soil sampling with GPS in Figure 58 as an example, four out of ten of the respondents said the service generated a profit for their dealership (35.5 percent). Over a quarter (29.7 percent) said that it just covered fixed and variable costs. One in six respondents (16.0 percent) felt that they were covering variable costs but not fixed costs for soil sampling with GPS and 9.9 percent said they were covering neither variable nor fixed costs. Only 8.9 percent of the respondents did not know how profitable soil sampling with GPS was for their dealership.

In looking at the precision services in both charts, the most profitable service appeared to be multi-nutrient controller-driven application, with 45 percent of the respondents reporting that the service was generating a profit. Traditional, non-precision custom application was also profitable; with 44 percent of the respondents indicating they were making a profit on custom application. Both were similar to last year's results. Profitability of single-nutrient controller-driven application seemed to decline this year, with only 36 percent of the respondents indicating it was generating a profit compared with 42 percent of the respondents in 2006 (though broken out by region, 40 percent of the Midwestern dealerships said it was profitable compared to 12 percent of the dealerships in non-Midwestern dealerships). Soil sampling with GPS generated a profit for 36 percent of the respondents.

Similar to last year, the least profitable of the precision services were variable seeding with GPS and yield monitor data analysis, with fewer than one in five respondents saying they made a profit on those services. For yield monitor data analysis, fewer than half of the respondents thought it did more than cover variable costs. Respondents were most uncertain about the profitability of variable seeding with GPS, with 19 percent indicating they didn't know whether or not they were covering costs, though these results were based on fewer responses.

Overall, respondents were confident about the profitability of their total precision service offerings. Four out of ten of the respondents (44 percent) indicated their precision package generated a profit while another 25 percent said they were covering both the fixed and variable costs of providing the services.

Other than single-nutrient controller-driven application, there were no regional differences in profitability and there were no significant differences across organizational types in the Midwest.

Figure 58. Profitability of Precision Service Offerings

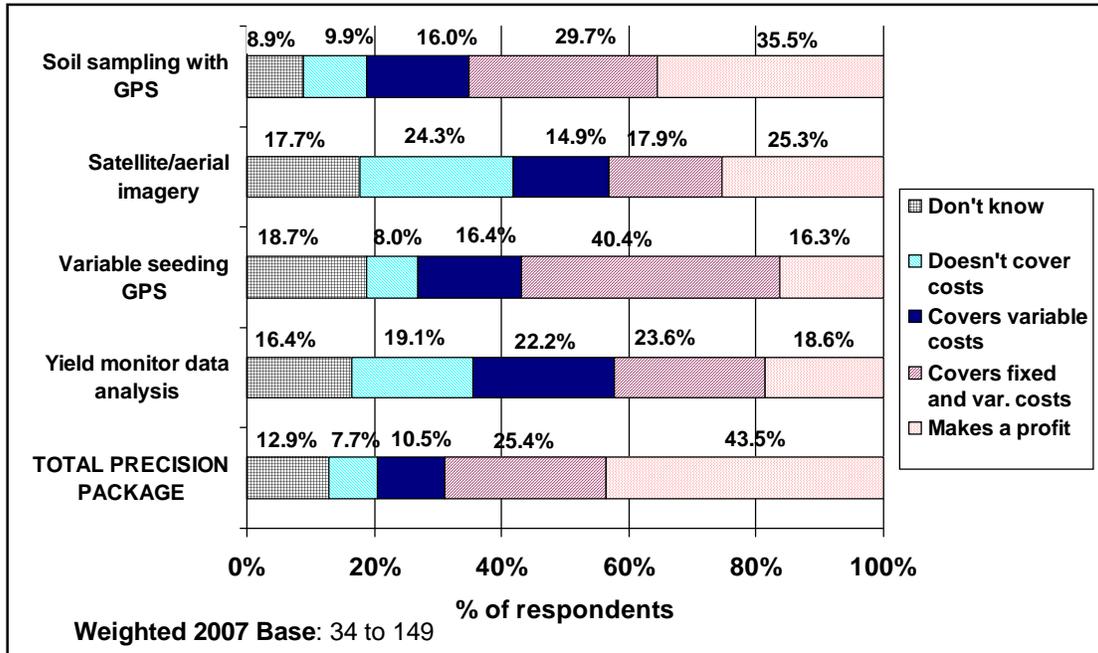


Figure 59. Profitability of Precision Application Offerings

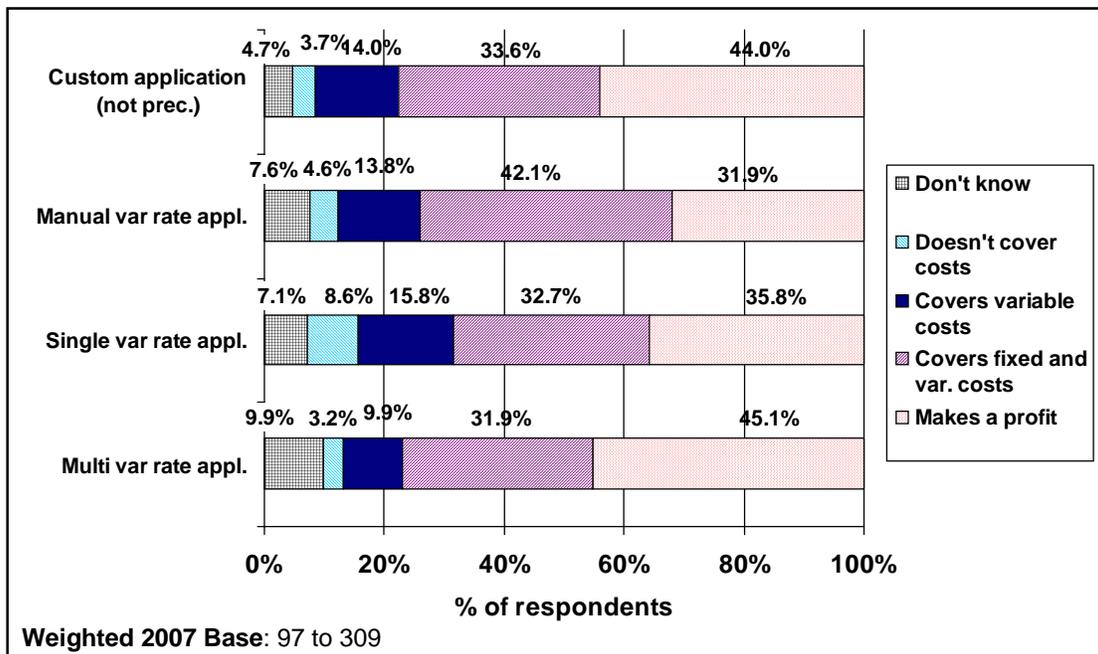
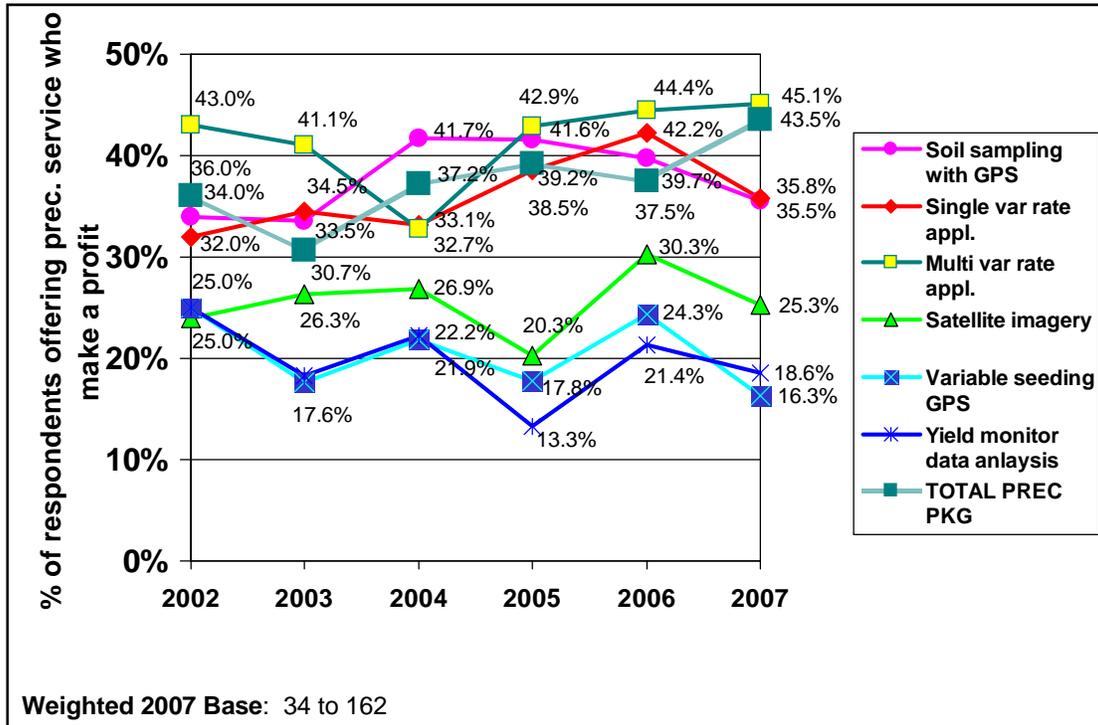


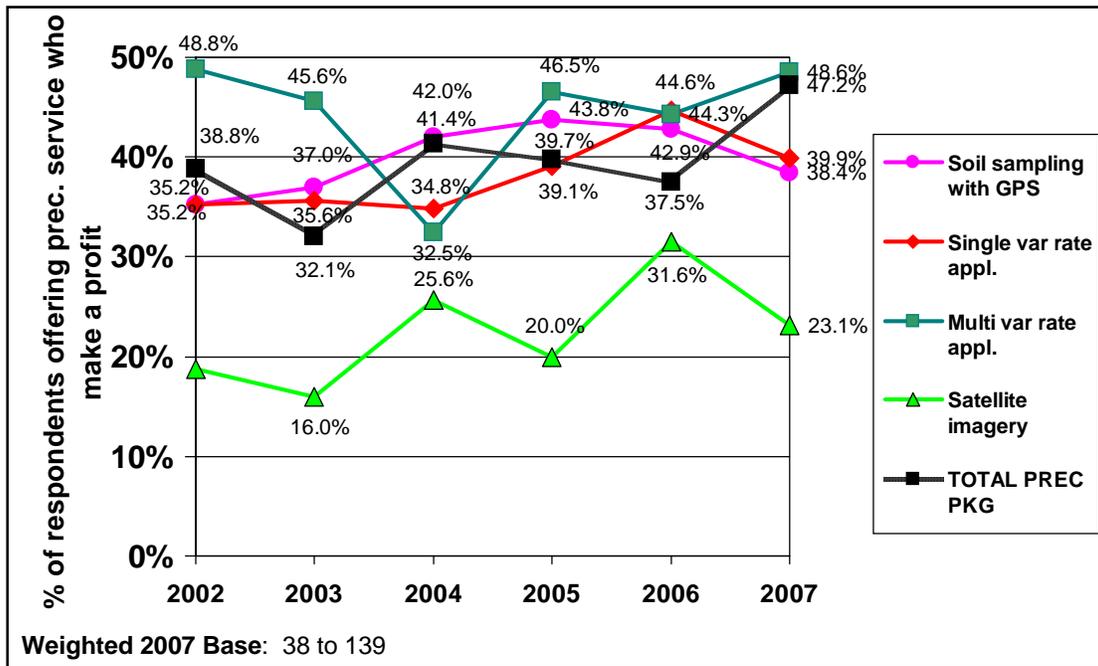
Figure 60 shows the profitability of the services across time, indicating the percentage of respondents generating a profit on the service. This year showed slight declines in profitability in individual service offerings but an increase in profitability of the total precision package.

Figure 60. Respondents Generating a Profit from Precision Services



To get a better perspective of the profitability trends in the Midwest, Figure 61 shows the same trends broken out just for the respondents from the Midwest. After a dip in 2004, multi-nutrient controller-driven application once again was the most profitable precision service, with 49 percent of the respondents saying they were generating a profit with that service. The other services showed a similar profit pattern to that of the entire sample shown in Figure 60, with most of the services showing a slight decline in profitability this year while the total precision package was felt to be more profitable than in the past.

Figure 61. Respondents Generating a Profit from Precision Services in the Midwest



Customer Use of Precision Services

To get a better understanding of how quickly growers are adopting precision services, survey participants were asked what percentage of the total acreage in their market area (all growers, not just current customers) was currently using various site-specific management services; and, in their opinion, what proportion of the local market acres would be using these services in 3 years. Figure 62 to Figure 65 show the trends over time in the estimated market use of specific precision agriculture management services.

Overall there was not much growth seen in average market acreage using the specific precision technologies. Most services were used more intensely than in previous years but nothing showed substantial growth. Expectations continue to be optimistic for growth over the next 3 years.

Figure 62. Estimated Market Area Using Precision Services

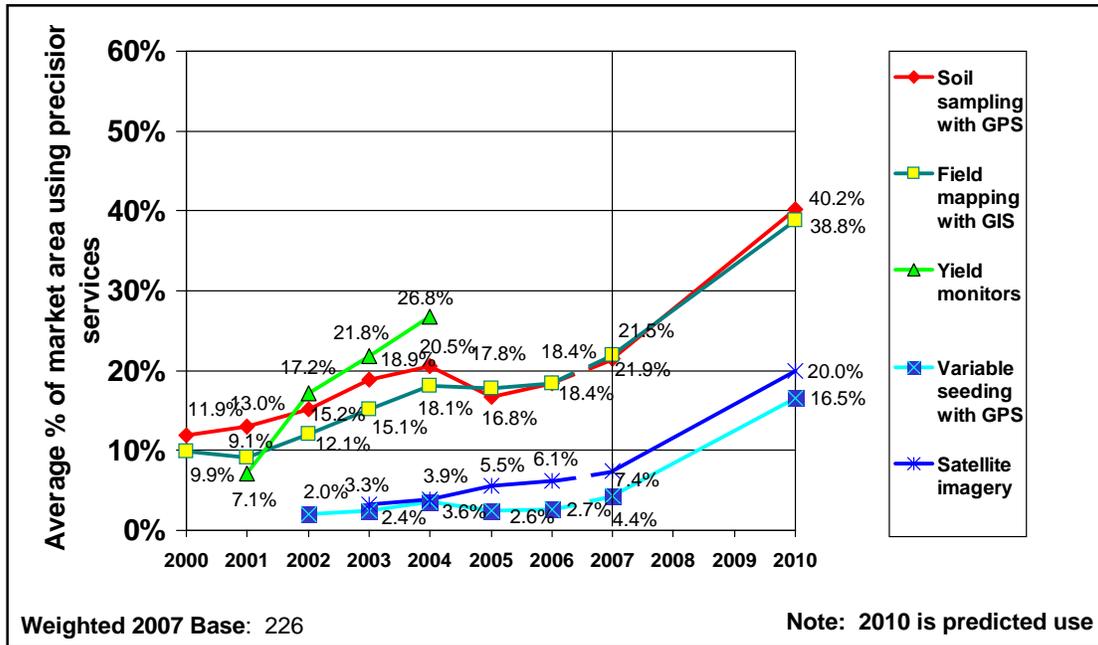
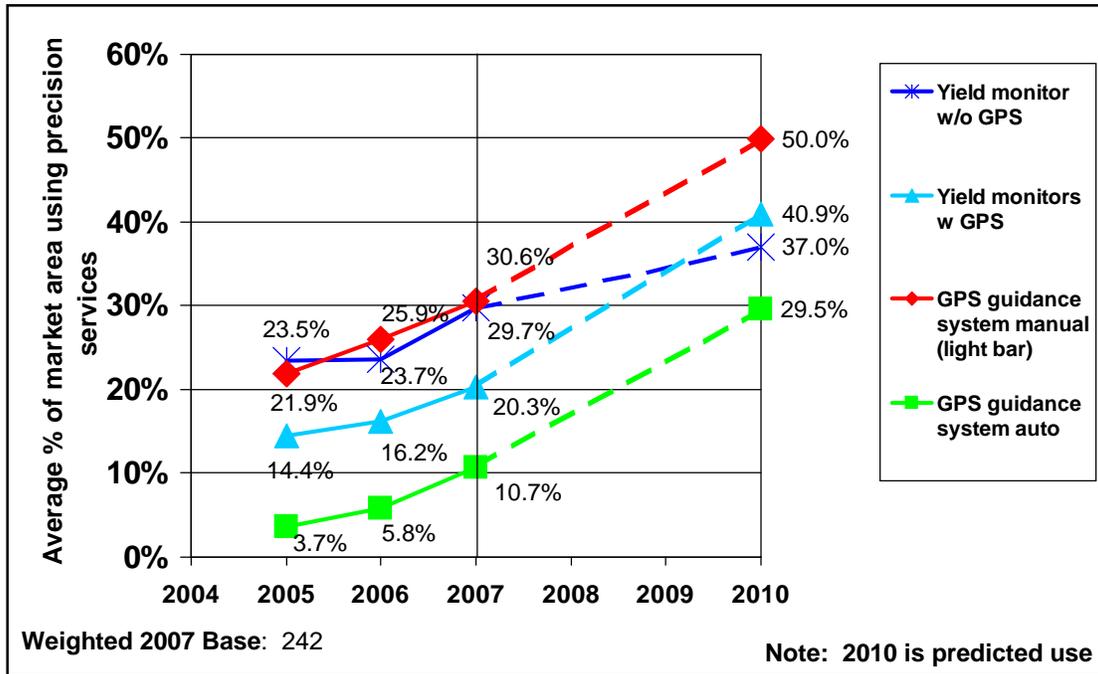


Figure 63 shows the use of yield monitors with and without GPS as well as use of the different types of guidance systems. On average, 30 percent each respondent's market area was using yield monitors without GPS while 20 percent was using yield monitors with GPS, both increasing approximately 5 percentage points over 2006 estimates. The use of GPS guidance systems with light bars grew from an average of 26 percent to 31 percent of the local market while autosteer GPS guidance systems grew from an average of 6 percent to 11 percent of the market acres.

Figure 63. Estimated Market Area Using Yield Monitors and Guidance Systems



The use of variable rate application showed slight increases from 2006 to 2007 (Figure 64 and Figure 65), with continued growth expected into 2010. By 2010, respondents estimated that, on average, approximately a third of their market acreages would be having fertilizer and/or lime applied in a single-nutrient controller-driven application (35 and 31 percent of the markets, respectively), both growing consistently from an estimated 15 percent of market acres in 2006. Expected growth rates in the use of multi-nutrient controller-driven application were greater, with all types of multi-nutrient controller-driven application expecting to at least double in use in the next 3 years.

Figure 64. Estimated Market Area Using Single Nutrient Controller-Driven Application

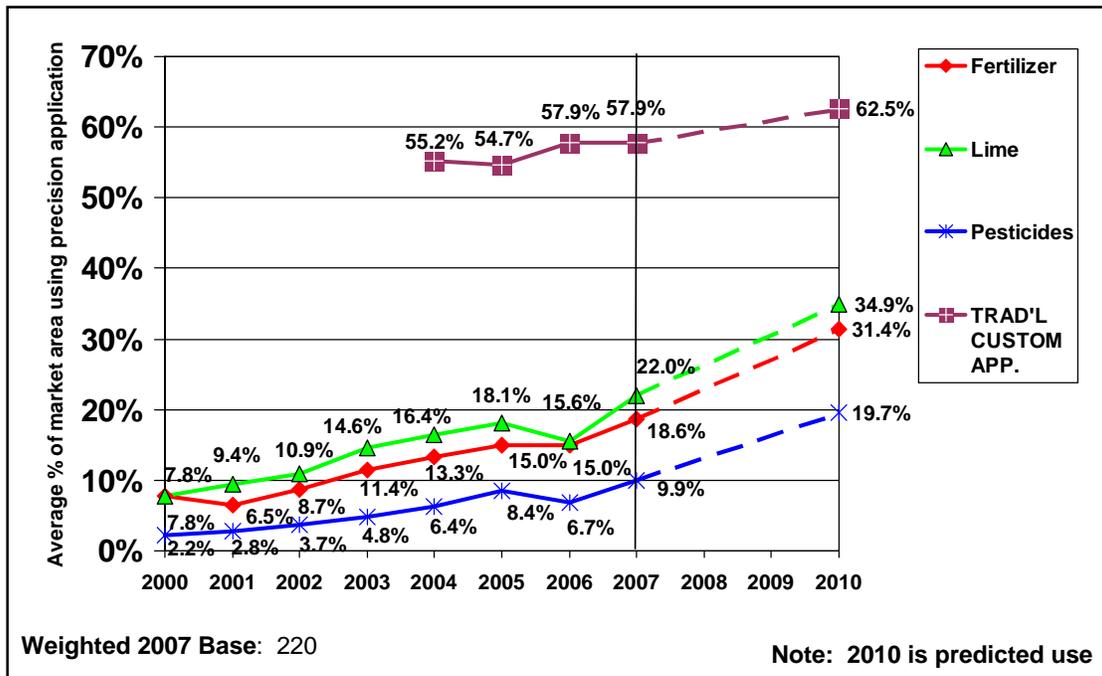


Figure 65. Estimated Market Area Using Multi-Nutrient Controller-Driven Application

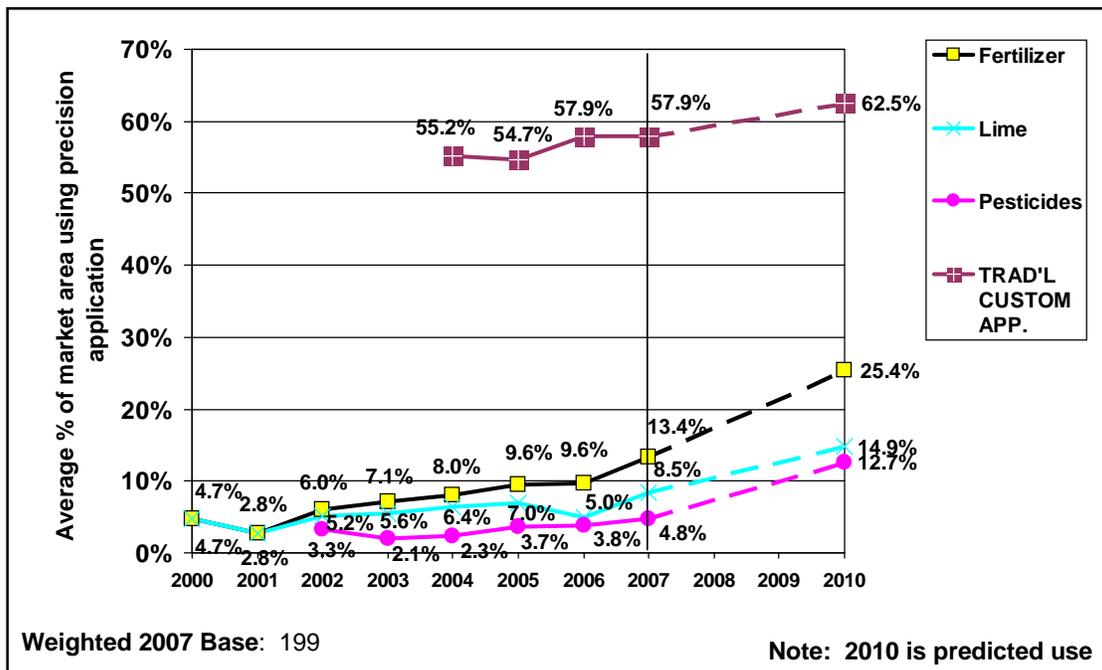


Figure 66 to Figure 73 break out estimated market usage of precision services by region. Some market use estimates were significantly higher in the Midwest than in other states. Current usage was significantly higher in the Midwest for soil sampling with GPS, field mapping with GIS, yield monitors both with and without GPS, manual GPS guidance systems (lightbars), and single and multi-nutrient controller-driven application of fertilizer and lime.

Figure 66. Estimated Market Area Using Precision Services in the Midwest

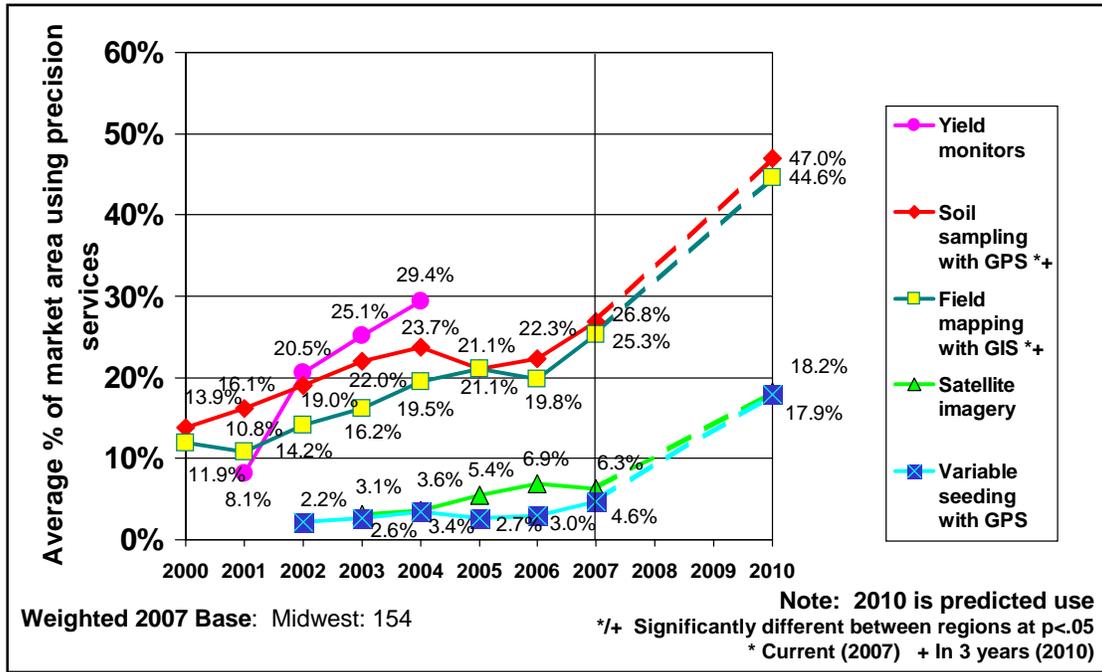


Figure 67. Estimated Market Area Using Precision Services in the Other States

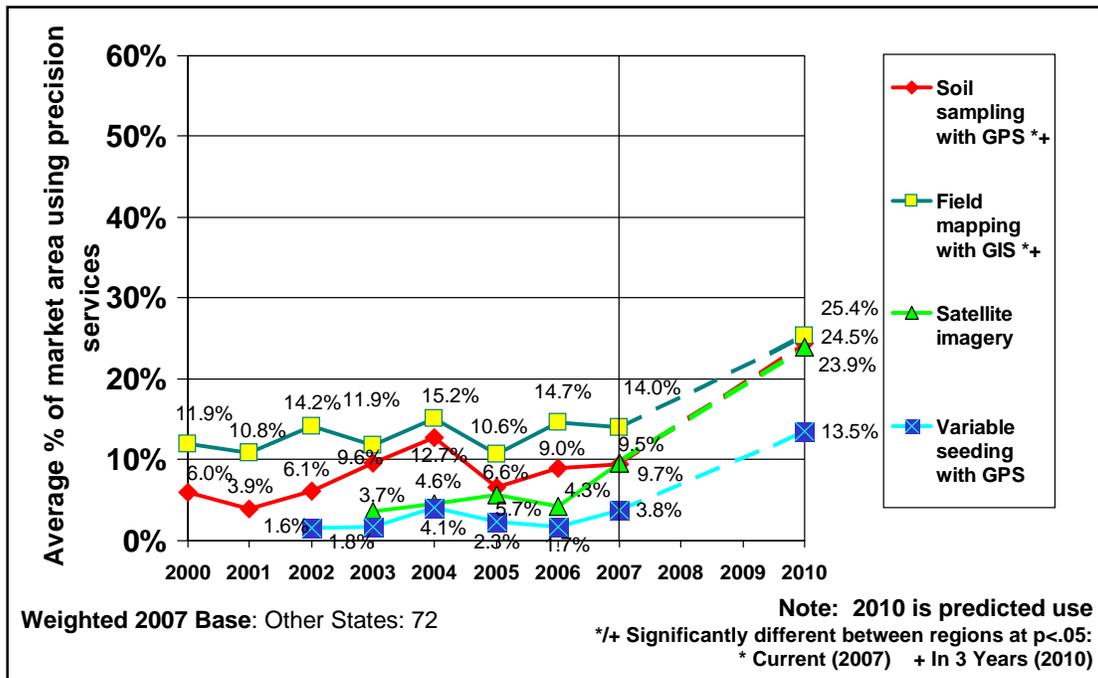


Figure 68. Estimated Market Area Using Yield Monitors and Guidance Systems in the Midwest

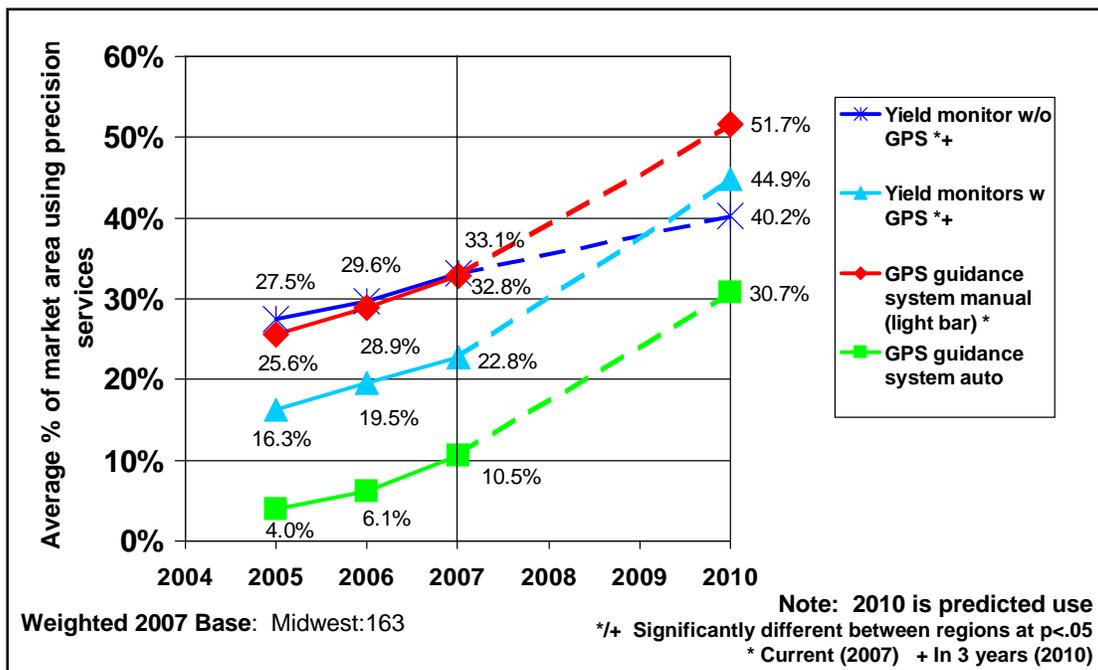


Figure 69. Estimated Market Area Using Yield Monitors and Guidance Systems in Other States

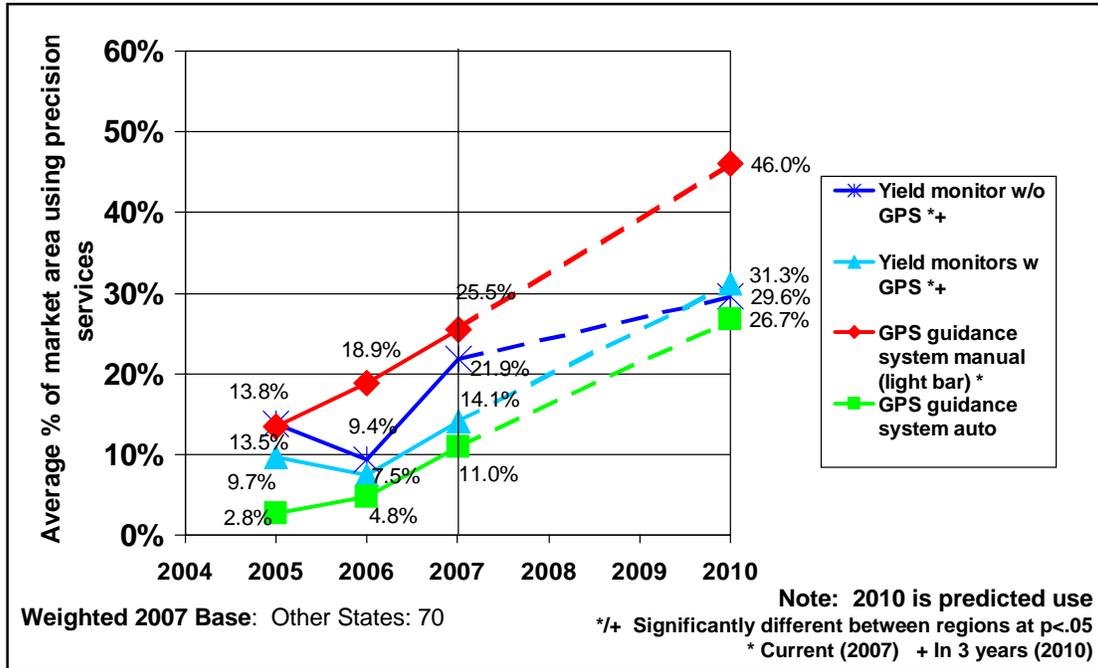


Figure 70. Estimated Market Area Using Single Nutrient Controller-Driven Application in the Midwest

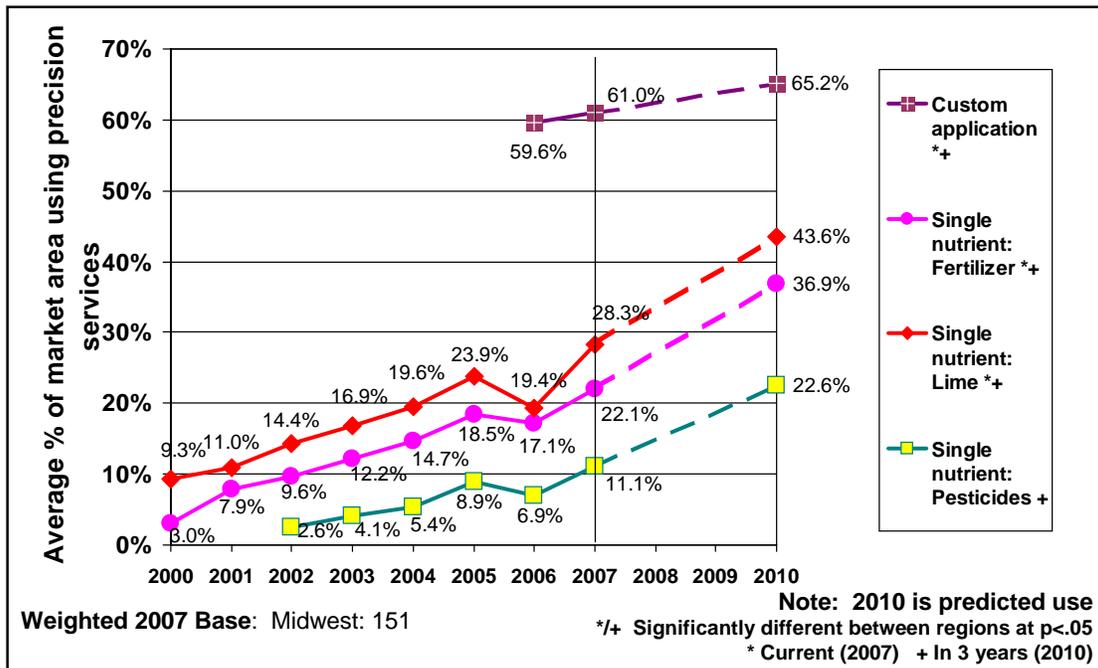


Figure 71. Estimated Market Area Using Single Nutrient Controller-Driven Application in Other States

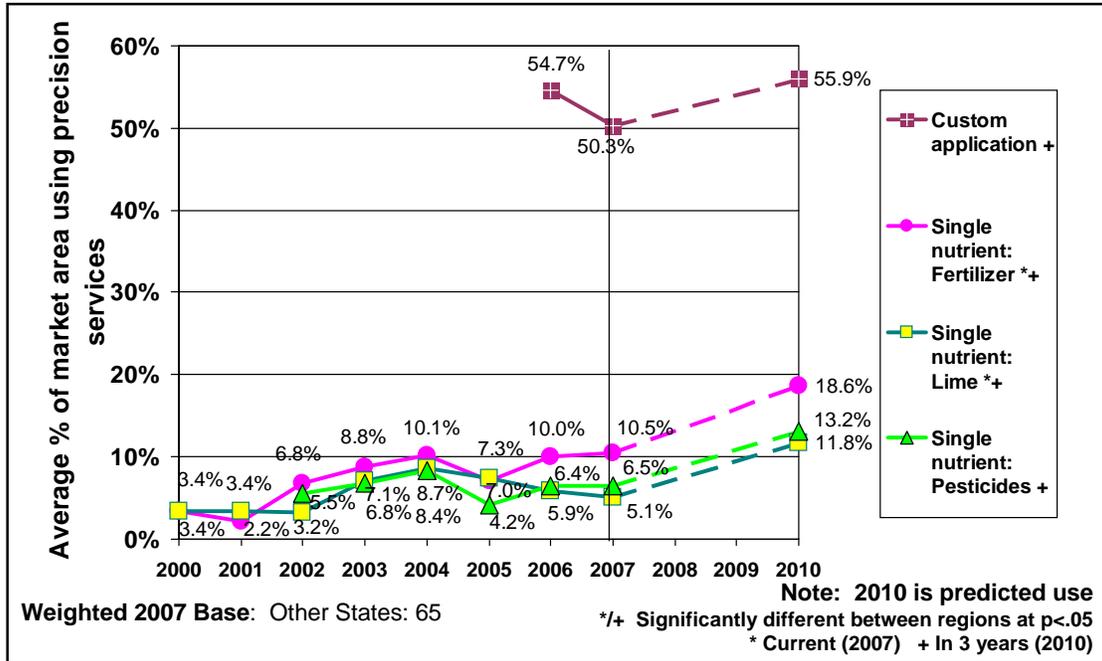


Figure 72. Estimated Market Area Using Multi Nutrient Controller-Driven Application in the Midwest

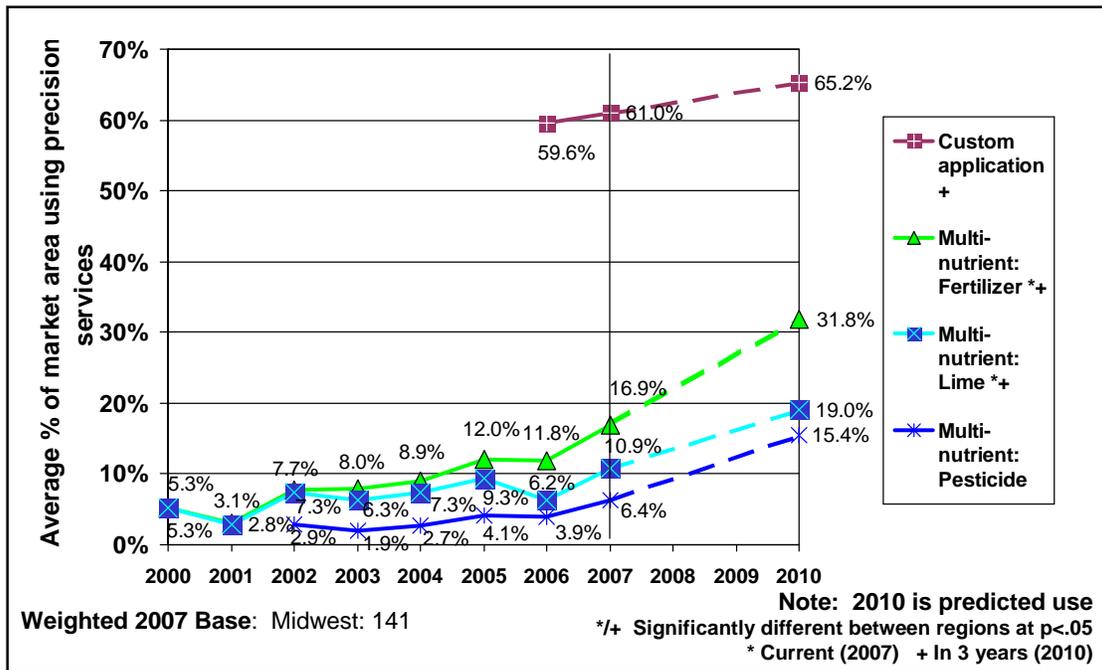
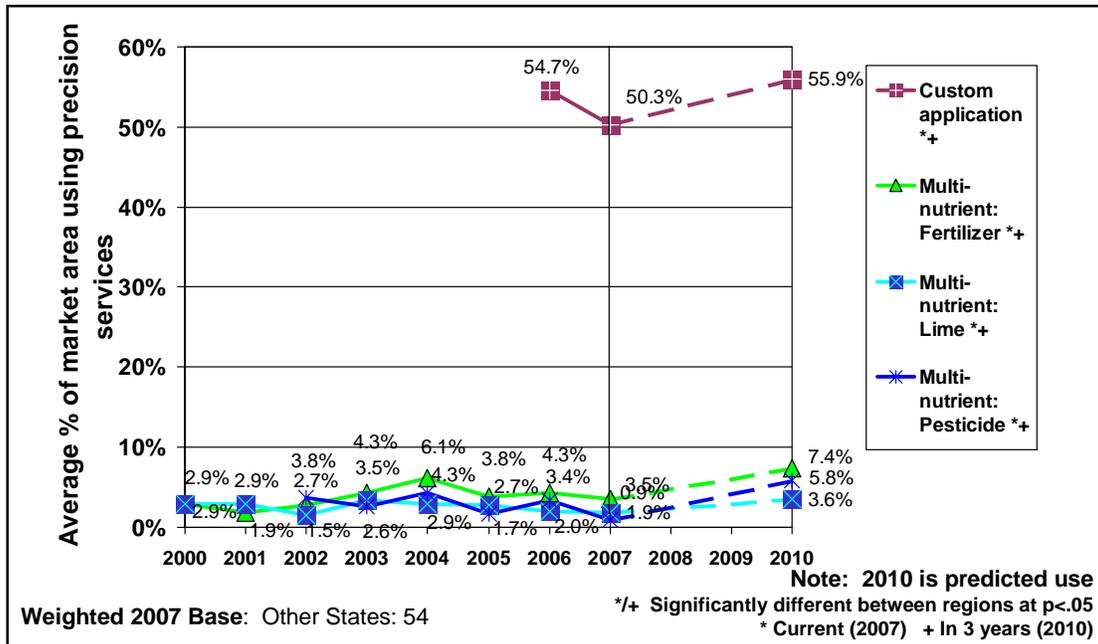


Figure 73. Estimated Market Area Using Multi Nutrient Controller-Driven Application in Other States

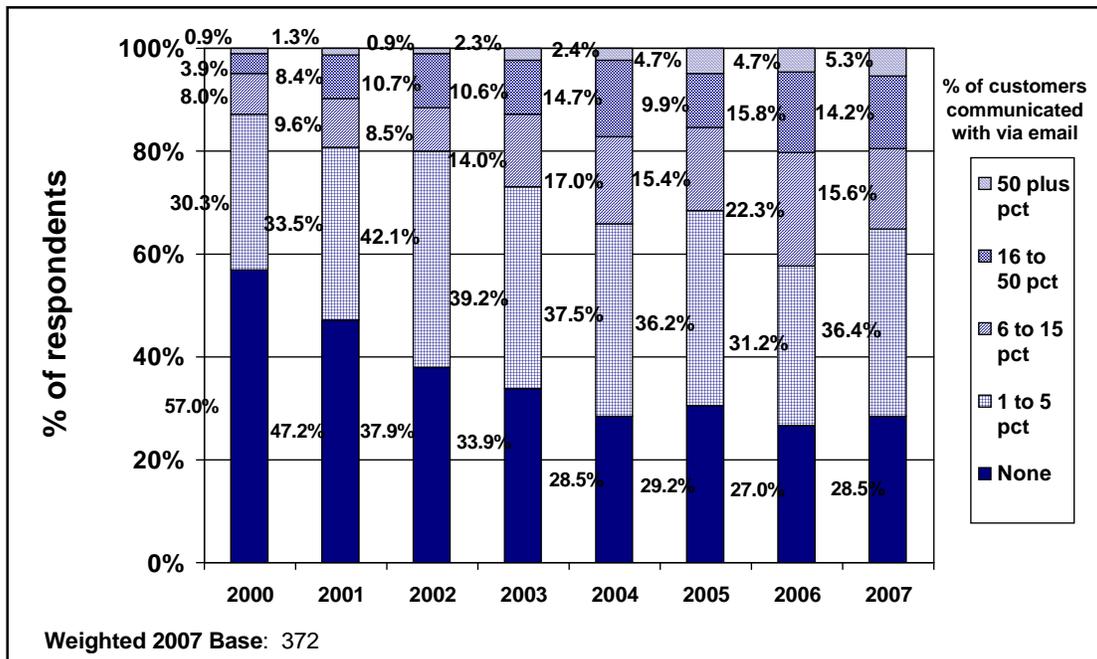


Use of Email

The survey also looked at email as another type of technology that is changing how business is conducted in today’s market. Dealerships were asked how many of their customers they were communicating with via email. There were very few changes from 2006 to 2007 (Figure 74). Similar to last year, 29 percent of the respondents used no email to communicate with customers. Over a third (36 percent) used email to communicate with fewer than 5 percent of their customers. Only 5 percent were using email to communicate with over half of their customers, showing little change for the past 3 years.

There was more use of email for dealerships in the Midwest, with 74 percent of Midwestern dealerships using some email options with customers compared to only 67 percent of non-Midwestern dealerships. Within the Midwest, there were no significant differences in the use of email among types of organizations.

Figure 74. Customers Communicated With Via Email



Impact of Increased Biofuel Processing Plants

New (and proposed) biofuel processing plants are affecting the demand for corn and soybeans in many parts of the U.S. Survey participants were asked their opinions on a series of statements about the impact these changes could have on their markets and their businesses.

For the following statements, participants were asked to indicate their agreement or disagreement by rating them on a 1 to 5 scale, where 1 was *strongly disagree* and 5 was *strongly agree*:

- Investments in processing capacity for biofuels are currently having a major impact on grower input purchase decisions in my market.
- As a result of investments in biofuel processing capacity, growers in my area are far more interested in maximizing yield than they were one year ago.
- As a result of investments in biofuel processing capacity, growers in my area are purchasing more precision services than they were one year ago.
- The interest in biofuels is a short run phenomenon and I expect it to run its course in the next 3 years.
- As a result of grower decisions resulting from investments in biofuels, I will be purchasing/leasing additional application equipment this year.

- I expect fertilizer supplies to be tight and some shortages to occur in my market this year as a result of grower decisions resulting from investments in biofuels.

Figure 75 shows the average ratings for each statement. The most agreement was with the statements that the increased biofuels processing capacity would result in fertilizer shortages, it would have a major impact on grower input purchase decisions, and that growers were more interested in maximizing yield. Overall, they did not agree that it would cause their dealership to invest in more application equipment.

Figure 75. Average Impact of Increased Biofuels Processing Capacity on Local Markets

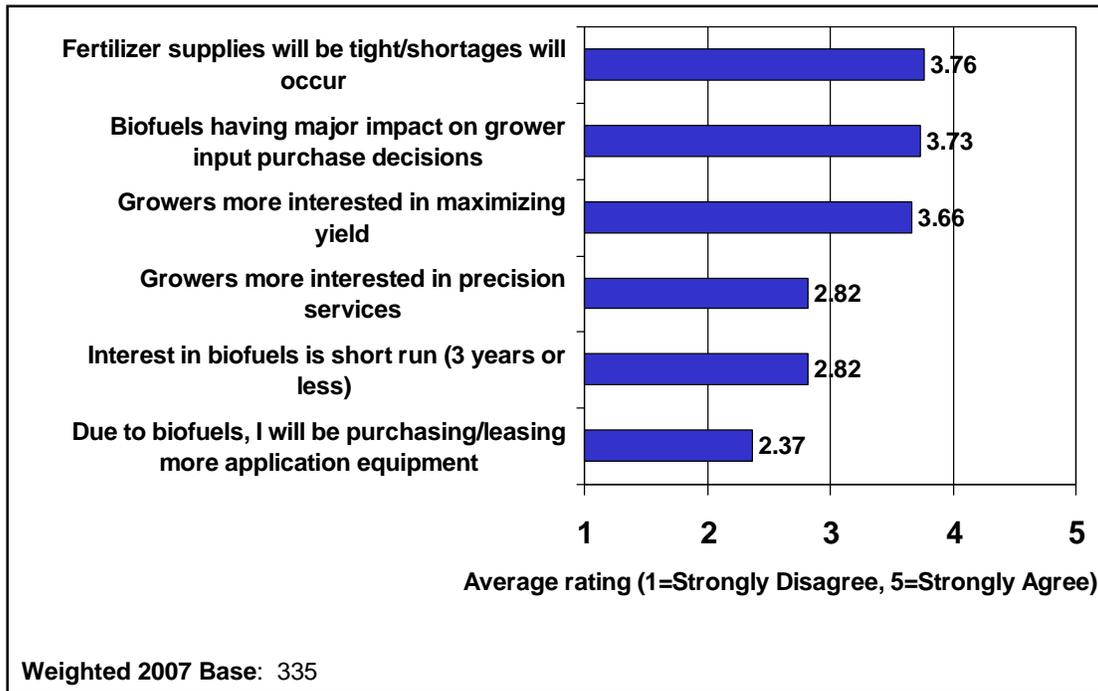
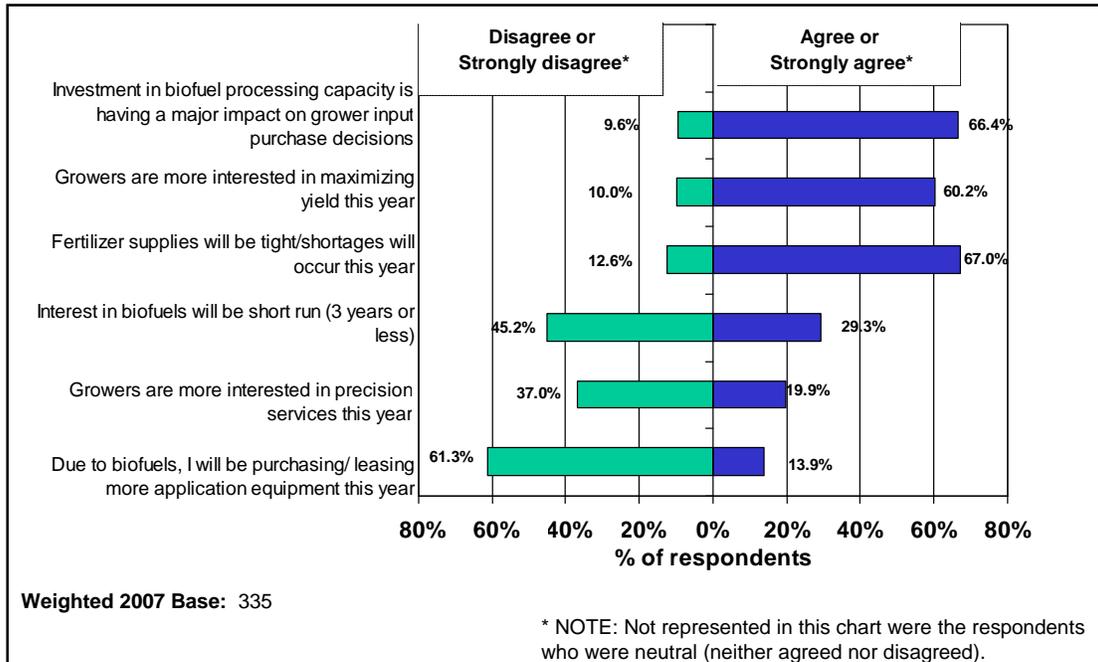


Figure 76 looks at the agreement/disagreement with these statements in more detail. The chart shows the percentage of participants who disagreed with the statement (rating it a 1 or a 2 out of 5) and those who agreed with it (rating it a 4 or 5 out of 5). Those who were neutral (rating it 3 out of 5) are not included in the chart. Two-thirds of the participants agreed that the increased biofuel processing would impact grower input decisions while 6 percent disagreed. The statement that generated the greatest diversity in opinions was whether or not the interest in biofuels would be short run (3 years or less). Almost half of the survey participants disagreed (45 percent) while almost a third agreed (29 percent).

Figure 76. Opinion of Impact of Increased Biofuels Processing Capacity on Local Markets



Regionally, the impact of biofuels was expected to have more of an impact on growers in the Midwest than in non-Midwestern states, however there was no regional difference in participants' overall view of biofuels' impact on fertilizer shortages and on how long there will be an interest in biofuels (Figure 77 to Figure 79).

Figure 77. Average Impact of Increased Biofuels Processing Capacity on Local Markets

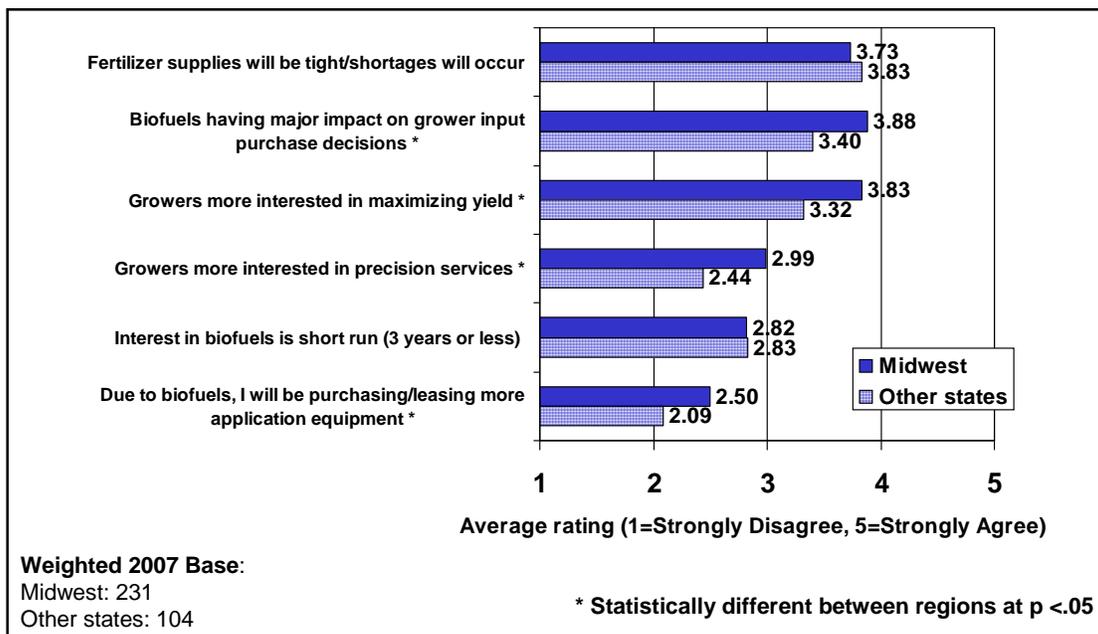


Figure 78. Opinion of Impact of Increased Biofuels Processing Capacity on Local Markets in the Midwest

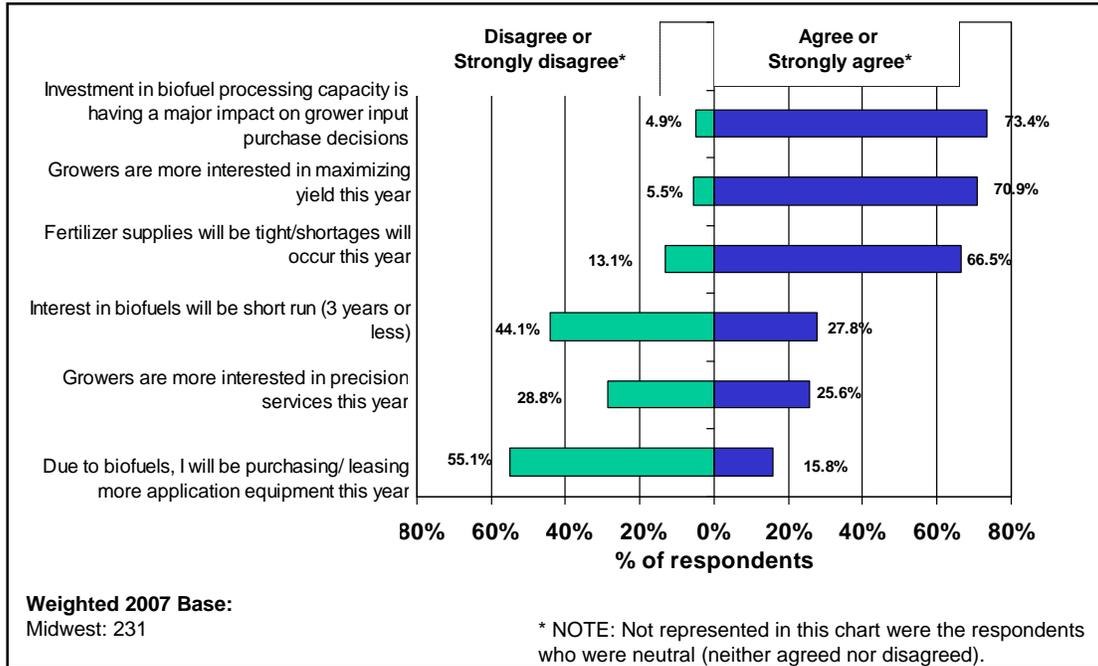
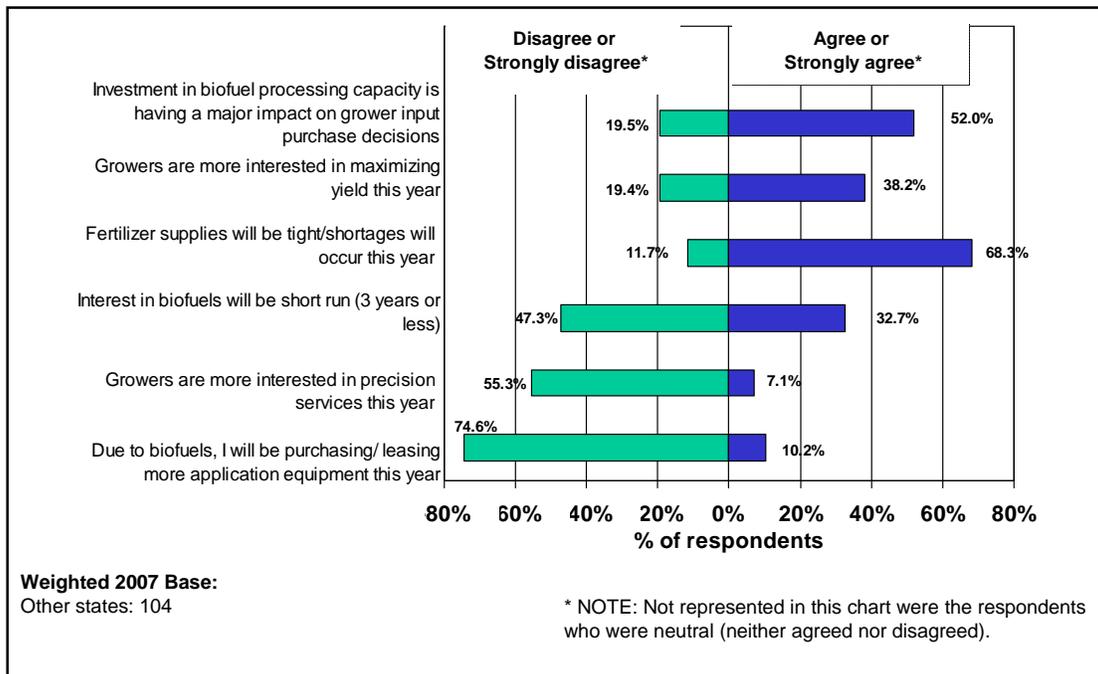
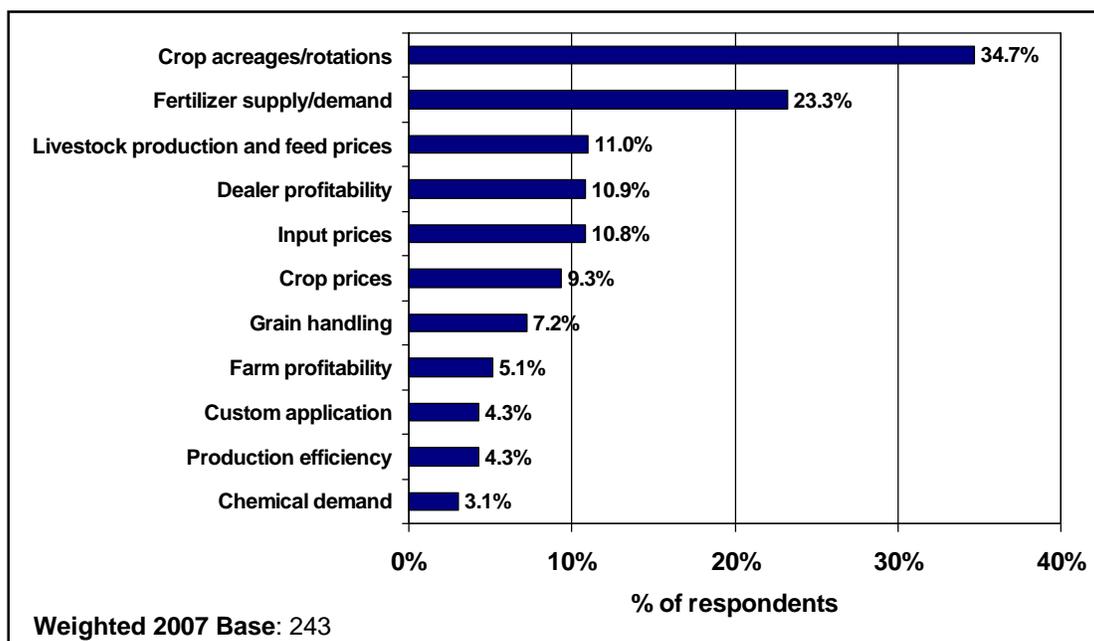


Figure 79. Opinion of Impact of Increased Biofuels Processing Capacity on Local Markets in Other States



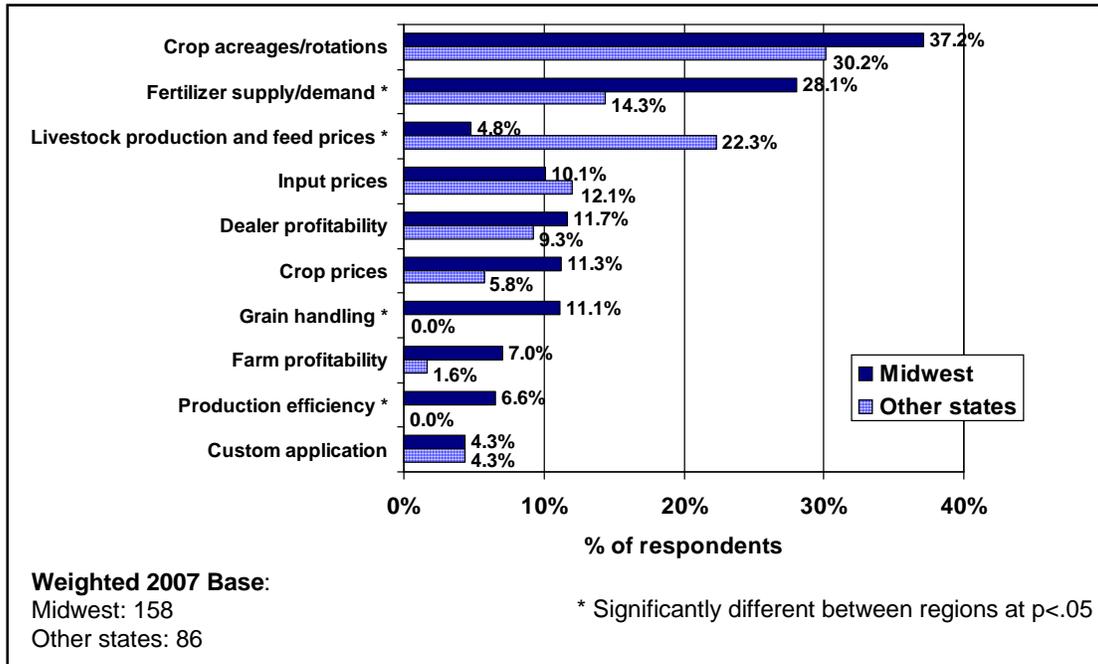
Another question participants were asked was what they thought the biggest impact investments in biofuels processing capacity would have on their business over the longer run (three to five years). This was an open-ended question which participants could answer with as many responses as they liked (Figure 80). The biggest impact they saw was that it would impact crop acreages and rotations in their area, resulting in different input requirements (35 percent of respondents). The effect on the supply and demand for fertilizer was mentioned by 23 percent of the dealers. The impact on livestock production and feed prices was mentioned by 11 percent of the participants, and a similar number mentioned dealer profitability and input prices.

Figure 80. Biggest Challenges Ahead Due to Increased Biofuels Processing



Regional differences were somewhat predictable, in that more Midwestern respondents mentioned crop acreages/rotations than non-Midwestern respondents, along with fertilizer supply and demand (Figure 81). Livestock production and feed prices were more likely to be mentioned by non-Midwestern dealerships.

Figure 81. Biggest Challenges Ahead Due to Increased Biofuels Processing by Region



Fertilizer Price Volatility

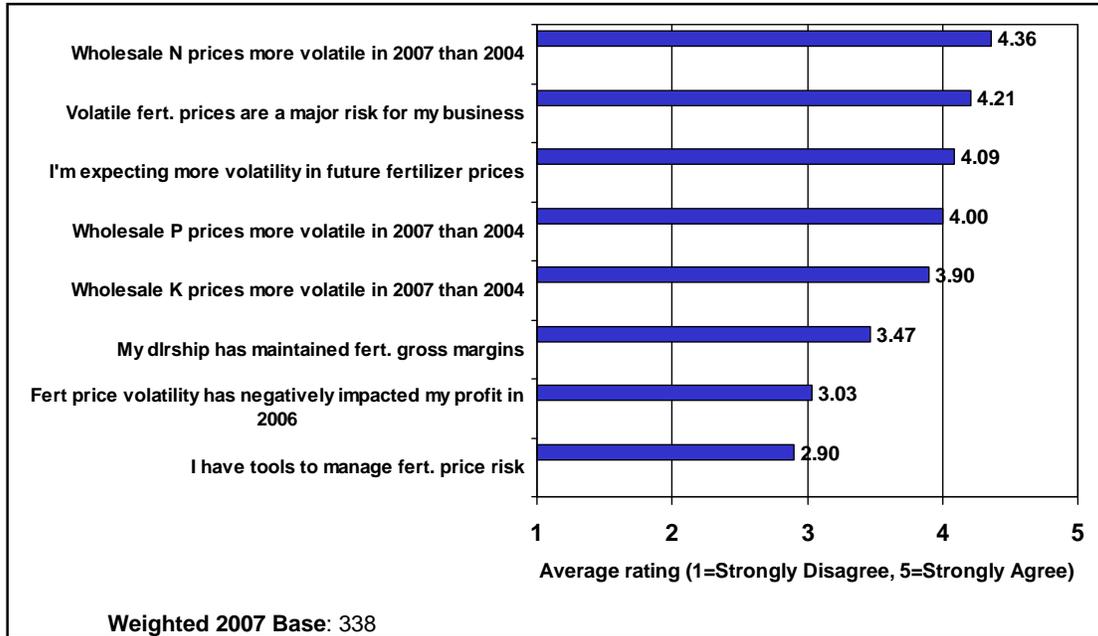
Another question explored in more detail this year was how important pricing risk was to survey participants when their operation is purchased fertilizer products. Participants were asked to rate their agreement or disagreement with the following statements:

- Wholesale nitrogen prices are far more volatile than they were three years ago
- Wholesale potash prices are far more volatile than they were three years ago
- Wholesale phosphate prices are far more volatile than they were three years ago
- I expect volatility in wholesale fertilizer prices to increase in the future
- Volatile fertilizer prices are a major risk for my business
- I have effective tools to manage price risk in the wholesale fertilizer market
- My dealership has been able to maintain gross margins on fertilizer in spite of wholesale fertilizer price volatility
- Wholesale fertilizer price volatility had a significant, negative impact on the profitability of my dealership in fiscal 2006

Most respondents agreed that wholesale nitrogen prices were more volatile in 2007 than in 2004, with an average rating of 4.36 out of 5.0 where 5 was *strongly agree* and 1 was *strongly disagree*. Respondents also felt that volatile fertilizer prices were a major risk for their businesses (4.21) and that fertilizer prices would undergo more volatility in the future (4.09). In facing this volatility, many felt that they did not have the tools available to deal with the price

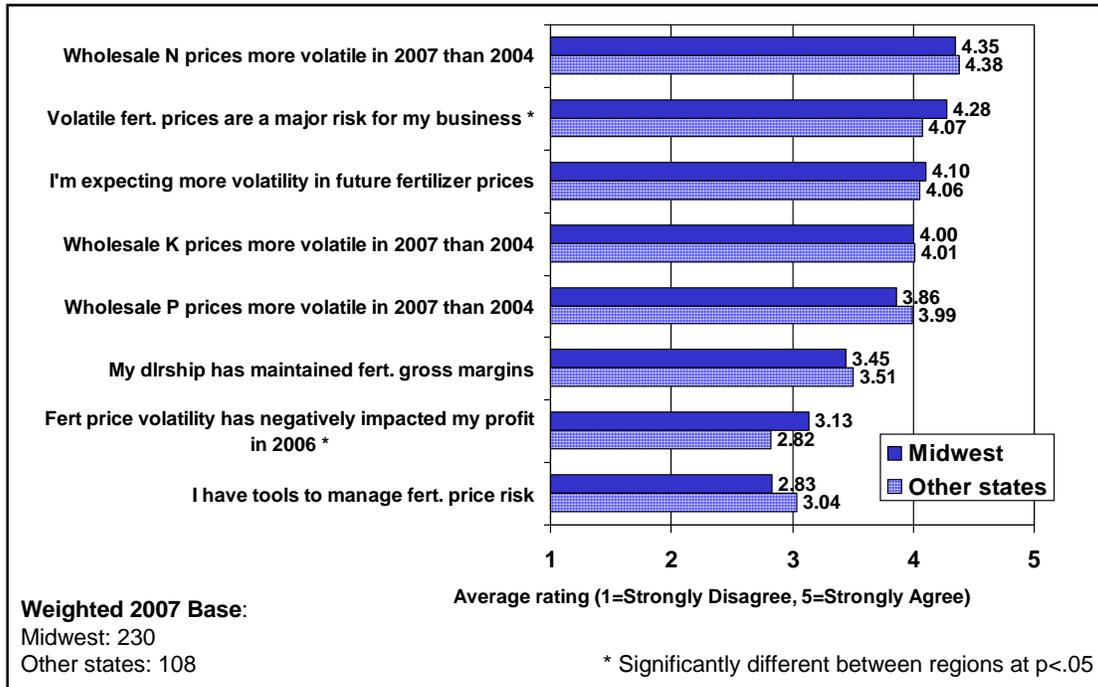
risk (rated 2.90) and they were split on whether or not their business had been impacted negatively by fertilizer price volatility in 2006.

Figure 82. Fertilizer Pricing Risks



Volatile fertilizer prices were seen to be more of a risk for Midwestern dealerships than for non-Midwestern dealerships (an average rating of 4.28 for Midwestern respondents compared to 4.07 for non-Midwestern respondents) (Figure 83). Midwestern dealerships were also more likely to agree that fertilizer price volatility negatively impacted their profit in 2006 than did non-Midwestern dealerships. Respondents from the two regions were mostly in agreement on their ratings of the other statements about fertilizer price volatility.

Figure 83. Fertilizer Pricing Risks by Region



Summary

Precision technology appears to be here to stay in over three-quarters of the retail dealerships in the Midwest and over half of the retail dealerships in non-Midwestern states. The biggest growth currently is in use of the technology within the dealership instead of in services offered to customers. GPS guidance systems with autocontrol/auto-steer continue to show the most rapid growth, though sensors (both on-the-go and mounted sensors) may be starting their growth in adoption as well. With the boom in biofuels production, two key strategic questions are the impact of more corn acres on precision agricultural services (and vice versa) and what the impact of fertilizer price volatility will have throughout the agricultural industry.

APPENDIX I: Questionnaire

12th ANNUAL PRECISION AG SURVEY

CropLife • PURDUE CENTER FOR FOOD AND AGRICULTURAL BUSINESS • **PURDUE**
UNIVERSITY

*Play a part in agricultural history! Please fill out and return this brief survey in the enclosed pre-addressed, postage-paid envelope, and send to: **CropLife**, 37733 Euclid Ave., Willoughby, OH 44094; Fax: 440-942-0662. **PLEASE RETURN BY FEBRUARY 16, 2007.***

1. Your primary responsibility: *[check one]*
 - Owner/general manager/location manager
 - Precision manager
 - Technical consultant/agronomist
 - Other: _____ (Please specify)
 - Departmental manager
 - Application manager
 - Sales/sales management
2. Please indicate the number of full-time staff agronomists you have access to at your location or you share with other locations:
Full-time agronomists **at your location**: _____ "0" if None
Full-time agronomists shared **with other locations**: _____ "0" if None
3. Are you a: *[check one]*
 - Cooperative
 - Part of a national or regional (multi-state) chain of retail dealerships (not a cooperative)
 - Other: _____ (Please specify)
 - Independent dealership
4. What were the **total annual retail sales** (in dollars) of agronomic products and services (fertilizer, chemicals, seed, services) **at this location** in 2006?
 - Under \$1,000,000
 - \$1,000,000 - under \$2,000,000
 - \$2,000,000 - under \$3,000,000
 - \$3,000,000 - under \$5,000,000
 - \$5,000,000 or more
5. How many total retail outlets does **your company** own or manage? *[check one]*
 - None
 - 1
 - 2-5
 - 6-15
 - 16-25
 - More than 25
6. What is the average size (in acres) of your customers? *[check one]*
 - Under 200 acres
 - 201 to 500
 - 501 to 1000
 - Over 1000
7. Do you provide custom application? No > go to Question 12 Yes > continue with Question 8
8. In a typical year how many total acres do you custom apply **at your location** (fertilizer, chemicals, seeding – total acres including multiple applications)? *[check one]*
 - None > go to Question 12
 - Under 10,000 acres
 - 10,001 to 25,000 acres
 - 25,001 to 50,000 acres
 - over 50,000 acres
9. In 2006, approximately what proportion of your total fertilizer sales were custom applied? _____%
10. In 2006, approximately what proportion of your total herbicide/pesticide sales were custom applied? _____%
11. In 2006, approximately what proportion of your total custom application (total acres, all products) used:
 - GPS guidance systems with manual control (light bar)? _____% "0" if None
 - GPS guidance systems with automatic control (autosteer)? _____% "0" if None

- 12.** Do you offer soil sampling — traditional, following a grid pattern and/or by soil type? (check all that apply)
- Traditional
 - Grid pattern — Grid size most commonly used?
 - < 1 acre 1 ac. - 2.49 ac. 2.5 ac. 2.51 ac. - 5 ac. Other: _____
 - Soil type
 - By zone other than soil type Other: _____
 - Don't offer soil sampling

- 13.** In which of the following ways does your dealership use precision technology? (check all that apply)
- Precision agronomic services for customers (such as soil sampling with GPS, GIS field mapping, etc.)
 - GPS guidance systems with manual control (**light bar**) for fertilizer/chemical application
 - GPS guidance systems with automatic control (**autosteer**) for fertilizer/chemical application
 - Satellite/aerial imagery for internal dealership purposes
 - Soil electrical conductivity mapping
 - Field mapping with GIS to document work for billing/insurance/legal purposes
 - Telemetry to send field information to home office from field
 - GPS to manage vehicle logistics, tracking location of vehicles, and guiding vehicles to next site
 - Soil sensors for mapping, mounted on a pick-up, applicator, or tractor (example: pH soil sensor, chlorophyll/greenness sensor)
 - On-the-go sensors (Crop Circle, Greenseeker, Yara N-Sensor, etc.)
 - Don't use precision technology**

14. Which “site-specific” (“precision”) services/products will you offer in the following time periods?

Service	By Fall 2007	Offer by 2009	Never/ Don't Know	Don't offer now but did
Field mapping (with GIS)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Manual variable rate application				
<i>Fertilizer</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Lime</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Chemicals</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Controller-driven (GPS), single nutrient variable rate application				
<i>Fertilizer</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Lime</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Chemicals</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Controller-driven (GPS), multiple nutrient variable rate application				
<i>Fertilizer</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Lime</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Chemicals</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Yield monitor sales/support/rental	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Yield monitor data analysis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Variable seeding rates without GPS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Variable seeding rates with GPS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Satellite/aerial imagery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Agronomic recommendations based on GPS/GIS data	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Soil sampling with GPS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

15. If you currently offer any of these services/products, what is the average per acre/per unit price you charge for individual services? (*do not include bundled pricing*)

Service	Price \$/acre	Price \$/other units (\$/map, \$/hour, etc.)
Custom application (not precision)	\$ _____/acre	\$ _____/(specify units) _____
Field mapping (with GIS)	\$ _____/acre	\$ _____/(specify units) _____
Manual variable rate application		
<i>Fertilizer</i>	\$ _____/acre	\$ _____/(specify units) _____
<i>Lime</i>	\$ _____/acre	\$ _____/(specify units) _____
<i>Chemicals</i>	\$ _____/acre	\$ _____/(specify units) _____

12th ANNUAL PRECISION AG SURVEY

<u>Service</u>	<u>Price \$/acre</u>	<u>Price \$/other units (\$/map, \$/hour, etc.)</u>
Controller-driven (GPS), single nutrient variable rate application		
<i>Fertilizer</i>	\$ _____/acre	\$ _____/(specify units)_____
<i>Lime</i>	\$ _____/acre	\$ _____/(specify units)_____
<i>Chemicals</i>	\$ _____/acre	\$ _____/(specify units)_____
Controller-driven (GPS), multiple nutrient variable rate application		
<i>Fertilizer</i>	\$ _____/acre	\$ _____/(specify units)_____
<i>Lime</i>	\$ _____/acre	\$ _____/(specify units)_____
<i>Chemicals</i>	\$ _____/acre	\$ _____/(specify units)_____
Yield monitor data analysis	\$ _____/acre	\$ _____/(specify units)_____
Variable seeding rates without GPS	\$ _____/acre	\$ _____/(specify units)_____
Variable seeding rates with GPS	\$ _____/acre	\$ _____/(specify units)_____
Satellite/aerial imagery	\$ _____/acre	\$ _____/(specify units)_____
Agronomic recommendations based on GPS/GIS data	\$ _____/acre	\$ _____/(specify units)_____
Soil sampling with GPS	\$ _____/acre	\$ _____/(specify units)_____

16. For the following services **that you offer**, currently how profitable is each specific service for your dealership?

	<u>I am not close to breaking even</u>	<u>I am just covering variable costs (See NOTE)</u>	<u>I am covering both variable and fixed costs</u>	<u>I am generating a profit</u>	<u>Don't know</u>	<u>Don't offer</u>
Custom application (Not-precision)	1	2	3	4	5	6
Manual variable rate application	1	2	3	4	5	6
Controller-driven (GPS) single nutrient variable rate application	1	2	3	4	5	6
Controller-driven (GPS), multiple nutrient variable rate application	1	2	3	4	5	6
Data analysis for yield monitors	1	2	3	4	5	6
Variable seeding rates with GPS	1	2	3	4	5	6
Satellite/aerial imagery	1	2	3	4	5	6
Soil sampling with GPS	1	2	3	4	5	6
Total precision program, all components	1	2	3	4	5	6

NOTE: Variable Costs are the costs of actually performing the service — costs increase or decrease with how much business you do (fuel, supplies, etc.) **Fixed Costs** are the costs of making the service available (depreciation on equipment, computers, labor, training, etc.)

17. New (and proposed) biofuel processing plants are affecting the demand for corn and soybeans in many parts of the U.S. What impact has this push to produce fuel from corn and soybeans had on your growers and your market and what impact do you expect it to have? Please rate the following statements on a scale where

1=Strongly disagree 2=Disagree 3=Neither agree nor disagree 4=Agree 5=Strongly agree D/K=Don't know

Investments in processing capacity for biofuels are currently having a major impact on grower input purchase decisions in my market **1 2 3 4 5 D/K**

As a result of investments in biofuel processing capacity, growers in my area are far more interested in maximizing yield than they were one year ago **1 2 3 4 5 D/K**

As a result of investments in biofuel processing capacity, growers in my area are purchasing more precision services than they were one year ago **1 2 3 4 5 D/K**

The interest in biofuels is a short run phenomenon and I expect it to run its course in the next three years **1 2 3 4 5 D/K**

As a result of grower decisions resulting from investments in biofuels, I will be purchasing/leasing additional application equipment this year **1 2 3 4 5 D/K**

I expect fertilizer supplies to be tight and some shortages to occur in my market this year as a result of grower decisions resulting from investments in biofuels **1 2 3 4 5 D/K**

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18. What do you think the biggest impact investments in biofuels processing capacity will have on your business over the longer run (three to five years)?

19. How important is pricing risk when your operation is purchasing fertilizer products? Please rate the following statements on a scale where **1=Strongly disagree 2=Disagree 3=Neither agree nor disagree 4=Agree 5=Strongly agree D/K= Don't Know**

Wholesale nitrogen prices are far more volatile than they were three years ago	1	2	3	4	5	D/K
Wholesale potash prices are far more volatile than they were three years ago	1	2	3	4	5	D/K
Wholesale phosphate prices are far more volatile than they were three years ago	1	2	3	4	5	D/K
I expect volatility in wholesale fertilizer prices to increase in the future	1	2	3	4	5	D/K
Volatile fertilizer prices are a major risk for my business	1	2	3	4	5	D/K
I have effective tools to manage price risk in the wholesale fertilizer market	1	2	3	4	5	D/K
My dealership has been able to maintain gross margins on fertilizer in spite of wholesale fertilizer price volatility	1	2	3	4	5	D/K
Wholesale fertilizer price volatility had a significant, negative impact on the profitability of my dealership in fiscal 2006	1	2	3	4	5	D/K

20. Please answer the following question *whether or not* you offer any precision services.

Approximately what percentage of the total acreage in your market area (all growers, not just your current customers) is currently using the following site-specific agricultural practices? Approximately what percentage of the total acreage will be using these practices in three years (the year 2010)?

% of market acres (fill in blank with a percentage; indicate 0 if none)

Practice	Currently	3 years from now (2010)
Custom application of any type	_____ %	_____ %
Field mapping (with GIS)	_____ %	_____ %
Controller-driven (GPS), single nutrient variable rate application		
<i>Fertilizer</i>	_____ %	_____ %
<i>Lime</i>	_____ %	_____ %
<i>Chemicals</i>	_____ %	_____ %
Controller-driven (GPS), multiple nutrient variable rate application		
<i>Fertilizer</i>	_____ %	_____ %
<i>Lime</i>	_____ %	_____ %
<i>Chemicals</i>	_____ %	_____ %
GPS guidance systems with manual control (light bar) for field operations (tillage, planting, etc.)	_____ %	_____ %
GPS guidance systems with automatic control (autosteer) for field operations (tillage, planting, etc.)	_____ %	_____ %
Yield monitor without GPS	_____ %	_____ %
Yield monitor with GPS	_____ %	_____ %
Variable seeding rates with GPS	_____ %	_____ %
Satellite/aerial imagery	_____ %	_____ %
Soil sampling with GPS	_____ %	_____ %

21. What proportion of your customers has your location communicated with via e-mail during the last 12 months?

None 1%-5% 6%-15% 16%-25% 26%-50% Over 50%

22. What is the two-letter abbreviation for the state your location is situated in? _____

23. What is your ZIP code? _____

Thank you for your cooperation! PLEASE SEND YOUR COMPLETED SURVEY TO:

CropLife, 37733 Euclid Ave., Willoughby, OH 44094, Fax: 440-942-0662.