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## **Large Commercial Producer Market Segments for Agricultural Capital Equipment**

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### **Abstract**

Using cluster analysis, this research identifies four buying behavior segments of commercial producers who purchase capital items: Convenience, Price, Performance, and a group of Balance buyers who consider all of these factors as well as customer service and support services in roughly equal allotments. The Balance segment is the largest of the four. Price and Performance buyers tend to be younger, larger, and better educated than the Convenience or Balance buyers. We discuss the implications of these customer market segments for capital equipment marketers and salespeople.

**Keywords:** Cluster Analysis, Capital Equipment, Market Segmentation, Commercial Producers

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## **Introduction**

A review of the current literature reveals that not much has been written about the buying behavior of farmers as they make decisions about the purchase of capital items. Yet this information is critical for firms to deploy marketing budgets effectively. Consolidation among farming operations today means that there are fewer potential customers for capital equipment dealers and manufacturers. One implication of consolidation, first noted by Kohls (1959), is that the remaining, larger customers have seen an expansion in purchasing power. This translates to tremendous market opportunities for suppliers of capital items. Understanding how producers buy is valuable to those sellers who hope to develop strategies for attracting and retaining customers in an evolving agricultural marketplace. This information is also valuable to researchers who are concerned about the factors that drive economic decisions on the farm.

This paper presents the results of a market segmentation of U.S. commercial producers using cluster analysis that will help practitioners and researchers better understand buying preferences for capital items in the agricultural sector. U.S. commercial agricultural producers are defined as farming operations with annual sales of \$100,000 or greater<sup>1</sup>. This group represented 16% of operations in 2007 but accounted for 58% of the estimated value of machinery and equipment in the United States (USDA, 2007; p104). Therefore, understanding and successfully serving these commercial producers who represent such a large portion of machinery and equipment expenditures is critical to the success of dealers and manufacturers as they look for ways to retain customers, increase repeat customer transactions, and capture and increase customer lifetime expenditures.

This research aims to identify today's distinct market segments for capital items for U.S. commercial agricultural producers. This cluster analysis is used to segment the commercial producer market based on survey data describing their buying behavior for capital items (such as equipment, machinery, etc). We find four buying segments for capital items: Balance, Convenience, Price, and Performance. Finally, we discuss the implications of our results for suppliers of capital equipment serving these market segments.

## **Previous Research**

To the best of our knowledge, there has been very little research on buying behavior and customer segmentation of agricultural capital markets. The literature that specifically focuses on agricultural capital equipment market segments is a subset of the broader literature on market segmentation and of the industrial market segmentation focuses on segmenting business customers. Kotler and Keller (2011) define market segmentation as a three-step process that starts by identifying distinct groups of consumers who have different needs and wants, then selecting one or more market segments to target, and lastly communicating the benefits of the company's offering to each target market. Much of the industrial market segmentation literature focuses on the first step of identifying the distinct groups of buyers and the bases (for example, demographics, purchasing approaches, etc.) for segmenting them, rather than the strategic problem of allocating

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<sup>1</sup> When the Large Commercial Producer Survey was first conducted, the USDA definition of a commercial farm was a farm with at least \$100,000 in gross sales (USDA, 1998). In the 2008 survey, we still use \$100,000 in gross sales as a benchmark definition of a commercial farm.

marketing resources (Plank, 1985; Freytag and Clarke, 2001). In one seminal study on how firms use market segmentation, Wind and Cardozo (1974) found that it is most often used as a marketing tool *ex post* to explain the outcome of a marketing effort but they argue it would be best used *ex ante* in the planning and implementation of marketing efforts. Freytag and Clarke (2001) argue the segmentation approach depends on whether the market situation can be characterized as a simple market transaction or a complex relationship management. In the case of complex relationship management, which is most relevant to our study of agricultural producers, the firm needs to understand the customers' needs and wants and the choice of which segments to serve will depend on how well the firm's strengths match the customers' needs and wants. Overall, the industrial market segmentation literature focuses on the analytical tools of how to segment the markets and on how firms utilize segmentation in their marketing efforts.

As with the industrial market segmentation literature, most of the literature on market segments for agricultural capital equipment focuses on both how to segment farmers and on describing the market segments. Kohls (1956, 1959) was one of the first to study how farmers purchase capital equipment and he interviewed 201 farmers in Central Indiana in June 1955. He found that although capital purchases tend to be relatively large, farmers do not shop around much and most of their purchasing activity is done within five miles of their home (Kohls, 1956). Before making their purchase decision, farmers discuss it with the dealers, consult neighbors, relatives, and friends, have read some form of literature about the product, and have usually seen a similar item in operation on friends' or neighbors farms (Kohls, 1956). Kohls (1956) also indicated that a favorable price and having the desired item are the two main reasons that explain the farmer's decision to choose a specific dealer. Kohls (1956) also studied dealer and brand loyalty and found that no socioeconomic characteristics significantly explained dealer loyalty. Although only significant at the 20 percent level, brand preference tended to be negatively related with income, age, and farm experience; and positively related with farmer's exposure to radio, television, and printed publications. Farmers who believed there were greater differences among available dealers tended to have higher brand preferences as well.

Kool et al. (1997) studied Dutch farmers' purchasing decision processes for inputs. They found that the more familiar the farmer was with the product and the smaller the purchase, the quicker the farmer makes a purchase decision. In this case, farmers mainly focus on prices, the availability of alternatives, and special bargains. Thus, suppliers should emphasize price level, distribution (availability), and brand knowledge. In contrast, for infrequent decisions, farmers spend a considerable amount of time on the decision and suppliers in those cases should focus on product performance, price in relation to product performance, and personal selling. The authors also found that a personal relationship between the farmer and the vendor decreased the evaluation of other alternatives by the farmers, which suggests that suppliers should spend time investing in their relationship with the farmer. The Kool et al.'s (1997) study highlights that both price and relationship appear to play a role in farm buyer preferences for equipment.

Pratik (2008) presented a case study of an Indian company manufacturing small-scale tractors. The company was trying to select the most appropriate market segment for its product given the advantages of their product, tractorization in India, the industry, and the available market segments. The company's major dilemma was determining whether the small and marginal farmers were the most appropriate target market, whether they would represent enough sales, and wheth-

er these farmers could be convinced to buy a small tractor instead of a large one given the saying “the bigger, the better”.

Gloy and Akridge (1999) used cluster analysis to segment the commercial producer market for agricultural inputs (expendable items, such as feed, seed, and fertilizer, relative to capital items, such as equipment). Their work was based on data from the 1998 Purdue Large Commercial Producer Survey and they identified four market segments: Balance, Price, Performance, and Convenience. Their four market segments refine the traditional three segments of Business, Economic, and Price (Downey, Holschuh, and Jackson, 1999) where members of the Balance and Performance segments are Business buyers, members of the Price segment are Economic buyers and members of the Convenience segment are Relationship buyers.

Walley et al. (2007) used data from a survey of farmers and farm contractors to examine the importance of brand in the industrial purchase decision, and more specifically in the United Kingdom (UK) tractor market. They found that brand name was the most important purchase decision factor with a 38.95% weight in the decision and ranked above price, dealer proximity, and quality of dealer service. The dealer is also an influential part of the decision through their location and their quality of service. Since the respondents award the highest brand utility scores to the brands they own, with the exception of one tractor brand, the authors concluded that tractor owners are very brand loyal.

Harbor, Martin and Akridge (2008) used data from the 2003 Purdue Large Commercial Producer Survey to assess the nature of brand loyalty for capital items among commercial agricultural producers in the United States. They found that over half of the respondents consider themselves loyal to brands of capital items. The data show that attending but not completing high school and producing corn or soybeans increased the likelihood of being brand loyal to capital items. Other variables that positively influenced capital brand loyalty included the reported use of media to obtain information useful for making input decisions, and the perception that substantial differences in performance exist across branded capital items.

Boehlje and Roucan-Kane (2009) presented a case study of Deere’s market segmentation. Deere had historically focused on and had a strong market position in power, implement and combine equipment with traditional commercial producers in Midwest corn/soybean agriculture. However, a customer segmentation analysis indicated that there are eight different and important customer segments in the farm machinery and equipment market (not-for-profit public companies, not-for-profit property owner, part-time producers, traditional producers, large producers, extra-large producers, agricultural service providers, and commercial companies) with different attitudes, goals, behaviors, and needs. By starting from the customer’s standpoint, Deere realized that some of these segments were growing exponentially — particularly the large/mega farm, the agricultural service provider/custom contractor, and some of the not-for-profit (state and federal government, etc.) segments – and could be Deere’s future source of growth. However, these “new” customers needed machinery and equipment with different features convincing Deere to invest in electronic technology as long as it was simple to use and reliable.

The segmentation literature in general focuses more on grouping customers into market segments than on the implementation of a marketing plan based on these market segments (Dibb and Sim-

kin, 1994). Therefore, after we identify the market segments, we will focus on describing the customers in each segment based on characteristics salespeople can easily observe or elicit by asking key questions (Wind and Cardozo 1974; Gupta and Chintangunta 1994; Wyner 1999; Mudambi 2002). Finally, we will discuss implications of these market segments for salespeople interacting with their customers.

## Data

This research uses phone survey data collected during the 2008 Large Commercial Producer Project conducted by The Center for Food and Agricultural Business at Purdue University. The survey specifically targeted mid-size and large producers of corn/soybeans, wheat/barley/canola, cotton, dairy, swine, and beef farming operations. State quotas were set so that targeted producers were in states that accounted for 75 percent of 2007 U.S. production in each of the six target enterprise classes. The questionnaire was successfully answered by 2,575 producers during January and February 2008, resulting in a response rate of 28 percent (Roucan-Kane et al. 2010).

## Methods

The cluster analysis used in this study follows the same methodology as Gloy and Akridge (1999), Alexander, Wilson and Foley (2005), and Roucan-Kane et al. (2010). First, we select the clustering variables. We used responses to a buying behavior question because behavioral data is more descriptive of the customers' basic reasons for purchase (Dibb and Simkin, 1994; Assael, 1995). In addition, one advantage of using cluster analysis is that it "minimizes research bias by not specifying classes according to pre-specified conceptions (Rosenburg and Turvey, 1991). This key survey question asked the respondents to weigh the influence of five factors they may consider to choose their capital equipment supplier.

We used a two-step clustering algorithm (Gloy and Akridge, 1999; Alexander, Wilson and Foley, 2005; and Roucan-Kane et al., 2010). First, we used Ward's Minimum Variance hierarchical clustering algorithm to identify the appropriate number of clusters and obtain seed values that are being used in the second step. Second, we used the k-means non-hierarchical clustering algorithm to identify the market segments.

## Results

The key survey question used in the segmentation analysis asked the respondents to weigh the influence of five factors they may use to choose their capital equipment supplier. The influence of these factors was measured on a forced sum scale using the following question: *When you choose a supplier for capital equipment, how is your decision influenced by the following factors? Assign a percentage value to each factor based on its importance in the decision. The percentages should add to 100 in each column.* The response categories included convenience/location, customer service/information, price, product performance, and support services. The survey defined customer service/information as responsiveness, follow-up, advice, etc. Product performance referred to characteristics such as durability of the equipment. Support service was related to whether the dealer offered delivery, repair, and application services. We left the definition of convenience/location, customer service/information, and price up to the re-

spondent’s interpretation. Our discussion with some respondents on this topic suggested that producers relate convenience/location to the presence of local suppliers, long operating hours, etc. The same question was asked for financial products, animal health, feed, seed, and crop protection chemicals.<sup>2</sup>

The data cleaning process, prior to the cluster analysis, consisted of deleting 227 observations that represented respondents that had a farm size less than the lower bound of the mid-size farm definition as defined by Alexander et al. (2009). We then deleted 124 observations where the respondent allocated the full 100% to a single factor. These single-factor buying behaviors each represent a distinct, and narrowly defined, market segment. Further, these single-factor market segments each represent about 1% or less of the respondents and are too small for a capital equipment firm to serve with a tailored marketing program. The data cleaning process reduced the number of observations from 2574 to 2223 producers.

Based on the pseudo-t<sup>2</sup> value and the pseudo F-statistic for the cluster analysis, there were four natural clusters for capital equipment buying behavior. Table 1 presents the sample means for the clustering variables and the names of each cluster based on the most influential factor in the choice of a capital equipment provider. Tables 2 and 3 demonstrate that these clusters meet the validation criteria suggested by Gloy and Akridge (1999), i.e. that members of the segments differ in the non-clustering variables such as their demographics, general business characteristics, management practices, and attitudes.

*Segments’ Characteristics*

The Balance segment is the largest segment, with 59% of the farms (Table 1). Buyers in the Balance segment consider all of the capital supplier criteria (convenience/ location, customer service, price, performance, and support service) to be equally important. Members of the Balance segment look for a capital supplier who can provide a wide array of benefits including service and information, convenience, competitive prices, and equipment that performs well.

**Table 1.** Mean Percent Importance for each Factor in the Capital Supplier Decision by Market Segment

<i>Factor</i>	<b>Market Segment</b>			
	<i>Balance</i>	<i>Convenience</i>	<i>Price</i>	<i>Performance</i>
Convenience/Location	18	<b>48</b>	12	7
Customer Service	22	27	17	12
Price	22	15	<b>47</b>	21
Performance	21	6	16	<b>50</b>
Support Service	17	5	8	10
Percent of Sample	59%	12%	18%	12%

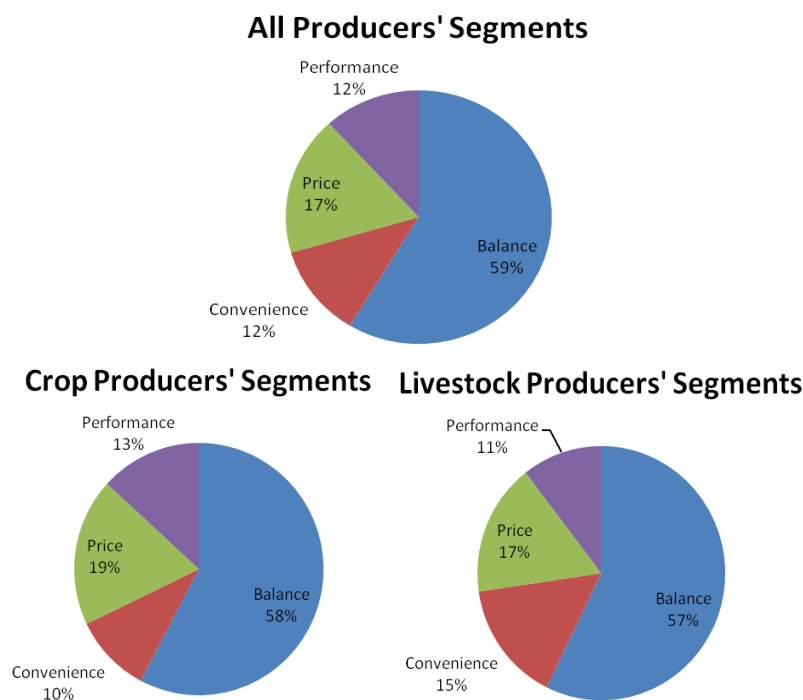
The Price segment was the second largest segment with 18% of the farms. Buyers in the Price segment place a large emphasis of 47% on price when selecting a capital provider. Customer service/information is the second most important factor followed closely by performance.

<sup>2</sup> Roucan-Kane et al. (2010) presents the analysis of this question for financial products.

The Convenience segment accounted for 12% of the farms. This segment placed an average weight of 48% on the convenience and location provided by a capital provider. Customer service/information is the second most important factor to the Convenience segment.

The Performance segment also accounted for 12% of the farms. Approximately one half of the purchase decision of producers in the Performance segment is based on the performance of the products. Price is the second most important factor to the Performance segment.

Figure 1 indicates differences in market segment membership between the crop and livestock producers. Crop producers are slightly more likely to be Performance and Price buyers, while livestock producers are more likely to be Convenience buyers of capital items.



**Figure 1.** Market Segments for Crop and Livestock Producers

### Demographics

Producers in the Balance segment are slightly less educated than the average with 27% having a bachelor's degree or more education (Table 2). They also tend to be slightly older than producers in other segments. In terms of gross sales, 37% of the Balance segment have gross sales over \$1 million, 25% have sales between \$500,000 and \$1 million, and 38% have gross sales less than \$500,000. We cannot draw any inferences about the sales distribution for the population of Balance buyers since we oversampled producers with higher gross sales; that said, we can compare the distribution of gross sales across segments. The majority of the Balance buyers (76%) consider themselves primarily crop operations, while 24% of the Balance buyers consider themselves primarily livestock operations.

**Table 2.** Demographics and General Farm Characteristics

Demographic and Farm Characteristics	Definition of Categories	Balance	Convenience	Price	Performance	Prob of No Assoc. <sup>a</sup>
Percent of College Graduates	Highest level of education is a bachelor or more	26.6%	23.7%	34.6%	37.8%	23.203*** <sup>b</sup>
Average Age		54.05	53.89	52.28	52.79	2.965**
Total gross farm sales	Less than \$500,000	37.9%	48.5%	34.6%	32.8%	20.217***
	\$500,000-1 million	25.4%	21.4%	28.2%	23.7%	
	\$1 million +	36.7%	30.2%	37.2%	43.5%	
Self-stated primary enterprise	Crop	75.20%	66.40%	77.30%	79.20%	7.079*
	Livestock	24.80%	33.60%	22.70%	20.80%	

<sup>a</sup> The numbers in the column “probability of no association” represent the Pearson chi-square in the case of the chi-square test of cross tabulation or the F statistic in the case of the Anova table.

<sup>b</sup> \*, \*\*, and \*\*\* represent 0.10, 0.05, and 0.01 levels of statistical significance, respectively.

Producers in the Convenience segment have the least amount of education relative to the other segments, with only 24% of them having a bachelor’s degree or more. After the Balance segment, they are the oldest segment with an average age of 54. Farms in the Convenience segment are the smallest as measured by gross sales with the largest proportion, with sales less than \$500,000 at 49%. Convenience buyers are also the most likely to have livestock operations, with the largest proportion of farms that consider themselves primarily livestock farms.

Producers in the Price segment have the second most years of education with 35% having a bachelor’s degree or more education. This segment is the youngest with an average age of 52 years. Looking at gross sales, the Price segment represents relatively large farms with 37% having gross sales over \$1 million, and 28% having gross sales between \$500,000 and 1 million. The Price segment has the second lowest proportion of livestock farms after the Performance segment, with only 23% of the farms in this segment considering themselves primarily livestock farms.

Producers in the Performance segment have the most education with 38% having a bachelor’s degree or more. They are the second youngest segment after the Price segment with an average age of 53 years old. Looking at gross sales, the Performance segment is more likely than other segments to be in the \$1 million plus category. The Performance segment is the least likely of all segments to have an operation that is primarily livestock oriented.

Additional analyses were performed on other farm characteristics to determine demographic differences across segments, but no clear differences could be found on factors such as expected change in farming over the next five years, outsourcing and contract production, growth expectations, management challenges, and risk management approaches. A closer analysis comparing crop producers and livestock producers indicates that the four segments for crop producers do not vary much in terms of education, but education varies significantly within the livestock pro-



ducers. Specifically, 50% of livestock producers in the performance segment had a bachelor's degree or more. This proportion declines to 31% for the Price segment, 22% for the Balance segment, and 9% for the Convenience segment. This means livestock producers in the Balance and Convenience segments have significantly fewer years of education than their crop counterparts. As for age, livestock producers in the Convenience segment are slightly younger (50.6 years old versus 53.7 years old) than crop producers.

For marketing managers, demographic information about the four segments has several implications. First, the Balance segment is quite large for both the crop and livestock sectors. This implies that there are significant opportunities for marketers who want to consider targeting this segment. Yet, the preferences of this segment are complex because these buyers are motivated similarly by all value bundle characteristics – price, performance, convenience, customer service, and support services. The support services aspect of the value bundle may offer marketers the most opportunity for developing a differentiated offering that targets this segment. The Balance segment cares about support services more than any other segment. Along with their older age, this group wants to have confidence that the company they buy from will maintain and service the equipment they sell. This is a revenue opportunity for capital equipment sellers.

Beyond the Balance segment, it is worth noting the role that customer service plays. This factor was ranked first or second for all but the Performance segment. Customer service activities support the relationship with the customer, in contrast to support services which focus on products and implementation. Marketers and sales people would do well to recognize that interaction with customers before and after the sale may influence the buying decision. For marketing strategies that do not clearly indicate a price or performance dimension, customer service and the role of local sales and technical staff may be an area worth considering as a key point of differentiation.

### *Information Characteristics*

Respondents were asked to rate the usefulness of information sources and communication medias (Table 3). Respondents rated local dealer sales/technical people to be the most useful information sources on average, followed by other farmers, manufacturer salespeople, extension service, and lenders. Manufacturer technical specialists and independent paid consultants were rated the least useful. This finding suggests that manufacturers of capital items should consider increasing the training they offer local dealers representatives, rather than sending their own representatives to producers. The high rating of other farmers confirms the results of Kool et al. (1997) who stated that “presence [of the product] in the evoked set of farmers is vital to the market success of a product”. Capital items are a major investment for producers, and producers gather information about an item before purchase to reduce the risk that they make a poor investment. Buying a product that they have observed another producer use or that is recommended by other producers lowers the risk associated with the investment. Therefore, if a manufacturer wishes to succeed in a new market, promoting at trade shows with current customers who can provide testimonials either in person or through videos, and offering leasing opportunities where producers can test the capital item before purchase may lower producers' perception of the risk associated with a major investment.

**Table 3.** Information Characteristics

Information Characteristics	Definition/Categories	Balance	Convenience	Price	Performance	Prob of No Assoc.
Mean Usefulness of information sources (1=never useful, 5=always useful)	Extension service	2.63	2.61	2.70	2.68	0.51
	Manufacturer salespeople	2.80	2.66	2.84	2.87	2.44*
	Manufacturer technical specialists	2.34	2.14	2.34	2.51	5.52***
	Independent, paid consultants <sup>3</sup>	2.44	2.27	2.43	2.47	0.71
	Local dealer sales/technical people	3.21	3.14	3.09	3.19	1.62
	Lenders	2.55	2.50	2.45	2.37	1.86
	Other farmers	3.05	2.97	3.09	3.10	0.97
Mean Usefulness of communication media (1=never useful, 5=always useful)	General farm publications	3.33	3.25	3.33	3.33	0.56
	Crop/livestock specific publications	3.10	2.95	3.08	3.15	1.82
	Agricultural newspapers	3.01	2.90	3.04	3.02	0.91
	Agricultural newsletters	2.87	2.76	2.90	2.93	1.33
	Farm shows	2.82	2.66	2.73	2.77	2.56*
	Direct mail	2.62	2.48	2.63	2.63	1.39
	Supplier's meetings	2.69	2.57	2.76	2.71	1.99
	Agricultural websites	2.44	2.14	2.51	2.51	6.20***
	Field days	2.74	2.60	2.75	2.75	1.55
	Agricultural radio programs	2.46	2.40	2.41	2.54	0.95
	Agricultural TV programs	2.29	2.30	2.37	2.33	0.65
Telephone contact	2.16	2.15	2.26	2.23	1.26	

There are only a few statistically significant differences in how segments rate the usefulness of information sources. The Performance segment is significantly more likely to consider manufacturer salespeople and technical specialists to be useful than the other segments, while the Convenience segment rates them less useful. Performance buyers who are seeking optimum performance of the product value the more detailed information that can be provided by the manufacturer technical specialists. In contrast, Convenience buyers tend to place a low value on detailed information and would rather rely on the recommendation of the local dealer.

Producers were also asked to rate the usefulness of communication media, and on average they rated general farm publications the most useful, followed by crop/livestock specific publications,

<sup>3</sup> Usefulness of consultants was calculated only for the respondents who use environmental, crop, management consultants or nutritionists.

agricultural newspapers, agricultural newsletters, farm shows, field days, supplier’s meetings, direct mail, agricultural websites, agricultural radio programs, agricultural TV programs, and telephone contact. Capital suppliers may wish to target their advertisements to these general farm publications and crop/livestock-specific publications when the target market of the publication matches the target market for their product. There are only a few statistically significant differences in how segments rate the usefulness of communication media. The Balance segments finds farm shows more useful than the other segments, while the Convenience segment finds them the least useful. For agricultural websites, Price and Performance buyers rate them as more useful than the other segments, and Convenience buyers rate them the least useful.

*Decision-making Process*

To sell effectively to producers, it is important for manufacturers and dealers to understand how their customers make decisions (Table 4). Although there are no significant differences across segments, slightly over half of the respondents make decisions without input from others. For these producers, it is important for technical representatives and salespeople to directly approach the primary decision-maker. The second largest set of respondents make decisions after extensive discussions with other family members and/or employees. For these producers, it is important for technical representatives and salespeople to engage more members of the operation. As sales representatives think about their strategy, they first need to determine how each of their customers make their purchasing decisions and respond accordingly.

**Table 4.** Decision-making Process for the Purchase of Capital Items

Percentage of respondents	Balance	Convenience	Price	Performance	Prob of No Assoc.
Made by me with very little input from family members and/or employees	48.60%	58.40%	49.60%	51.50%	
Made by me after extensive discussions with other family members and/or employees	34.70%	24.80%	36.40%	31.30%	
Made by the person responsible for using the item after extensive discussion with others on the farm.	9.60%	8.80%	8.10%	7.60%	17.655
Made by the person responsible for the item with little input from anyone else.	5.20%	6.50%	4.10%	6.90%	
Made by a purchasing agent hired by our farm.	1.80%	1.50%	1.80%	2.70%	

When it comes to attitude towards price, producers tend to somewhat disagree with the statement “when buying capital items, I usually purchase the lowest priced products” (Table 5). The Performance segment is the most likely to disagree that they purchased the lowest priced products, which is consistent with their focus on product performance and not on price. Interestingly, the Convenience segment, and not the Price segment, is the least likely to disagree, i.e. more Convenience buyers agree with this statement than Price buyers. It is possible that the Convenience segment trusts their local dealer to consistently provide the best prices, or this segment simply

sees the travel and shopping requirements to work with non-local dealers as adding to the costs. This area warrants more study.

Even with these differences, producers overall do not emphasize price when purchasing capital items, which suggests that salespeople need to focus primarily on attributes other than price when communicating with potential customers. Producers tend to agree with the statement “for capital items, there are often significant price differences for similar products from one supplier to another” (Table 5). While there are no significant differences across segments regarding this statement, Price buyers are slightly more likely to notice price differences.

**Table 5.** Producers’ Opinions about Price

Price Characteristics	Balance	Convenience	Price	Performance	Prob of No Assoc.
<i>Mean of Attitudinal Questions</i> 1 being “strongly disagree” to 5 being “strongly agree”					
When buying capital items such as equipment, I usually purchase the lowest priced products	2.40	2.53	2.47	2.27	2.588*
For capital items such as machinery, there are often significant price differences for similar products from one supplier to another	3.41	3.41	3.49	3.39	0.55
<i>Attitudinal Questions</i> Percentage of respondents selecting with a 4 (“agree”) or a 5 (“strongly agree”)					
When buying capital items such as equipment, I usually purchase the lowest priced products	17.00%	21.00%	20.40%	13.40%	7.7*
For capital items such as machinery, there are often significant price differences for similar products from one supplier to another	47.00%	46.20%	50.60%	47.30%	1.851

*Brand Loyalty*

Consistent with Walley et al. (2007) and Harbor, Martin and Akridge (2008) producers on average consider themselves to be loyal to brands of capital items. However, there are significant differences between market segments (Table 6). Balance buyers are the most likely to report that they are brand loyal. Price buyers are the least likely to report they are brand loyal which is consistent with Harbor, Martin and Akridge (2008) who find that price sensitive buyers are less brand loyal. We also tested whether respondent’s brand loyalty was correlated with their socioeconomic characteristics such as gross sales, respondent’s age, and level of education. We found that there was no significant correlation with these socioeconomic characteristics, which provides support for defining market segments based on buying behaviors rather than socioeconomic characteristics. Brand loyalty was weakly and positively correlated with dealer loyalty (correlation of 0.2 to 0.3).

**Table 6.** Producers’ Brand Loyalty

Distribution Characteristics	Balance	Convenience	Price	Performance	Prob of No Assoc.
<i>Mean of Attitudinal questions</i> 1 being “strongly disagree” to 5 being “strongly agree”					
I consider myself loyal to the brands of capital items (equipment, etc) I buy	3.49	3.32	3.25	3.32	4.597***
<i>Attitudinal questions</i> Percentage of respondents responding with a 4 (“agree”) or a 5 (“strongly agree”)					
I consider myself loyal to the brands of capital items (equipment, etc) I buy	54.00%	49.20%	45.30%	47.30%	11.50***

*Dealer Loyalty and Distribution Channels*

Producers tend to be loyal to their primary local supplier of capital items, with Balance and Convenience buyers being significantly more loyal than Price and Performance buyers (Table 7). Balance and Convenience buyers also prefer to buy their capital items from one supplier, which means that local dealers who win the business of Balance and Convenience buyers have the opportunity to win lifetime customers.

One way capital item suppliers can differentiate themselves is through the quality of services they provide. Performance buyers are the most likely to notice differences in the quality of services provided by local suppliers, followed by Balance buyers. While Performance buyers notice this difference, recall from Table 1 that these issues do not weigh heavily in purchase decisions for this segment.

Respondents were asked whether they finance their purchases of capital items through their dealer/supplier or a traditional lender (Table 7). Slightly over half of the respondents indicated that they use their dealer/supplier’s financing options, i.e., at least some of their financing comes from their dealer/supplier. About a quarter of respondents use their dealer/supplier financing options for less than a quarter of their total financing, while roughly 15% of respondents use their dealer/supplier financing options for over half of their total financing. This was true for all segments without significant differences among segments. Given the high dollar expenditures for capital items, financing options are important to producers and may provide an alternative source of revenue for manufacturers or dealers who offer them. Dealer or manufacturer financing may be particularly appealing to Convenience buyers, as it saves them time, although this buying behavior may carry over to the purchase of financing from convenient local banks as well. To the extent that dealers or manufacturers can bundle attractive financing with the product, financing through the capital equipment supplier may be appealing to the Price segment as well.

Most producers are not opposed to buying their capital items from different suppliers. This suggests that providing financing, high quality services and a variety of equipment to match producers’ needs in one stop may be a good strategy. Not surprisingly, the Convenience segment and to some extent, the Balance segment are less willing to purchase from multiple dealers.

**Table 7.** Producer Preferences for Distribution Channels

Distribution Characteristics	Balance	Convenience	Price	Performance	Prob of No Assoc.
<i>Mean of Attitudinal questions</i> <i>1 being "strongly disagree" to 5 being "strongly agree"</i>					
I consider myself loyal to my primary local supplier of capital items	3.6	3.69	3.31	3.37	9.656***
I prefer to buy most of the capital items (equipment, etc) I need from one supplier	2.98	3.18	2.76	2.78	7.912***
There are often significant differences in the quality of services from one local supplier to another	3.67	3.49	3.59	3.74	2.852**
There are often significant differences in the quality of information from one local supplier to another	3.40	3.29	3.31	3.40	1.2500
In the next five years I want a more direct relationship with manufacturers of capital items	2.95	2.99	2.92	2.90	0.3050
<i>On average, what percentage of your total financing needs are met through the financing options provided by your dealer/supplier versus a traditional lender (Bank, Farm Credit, Others)?</i>					
	0%	41%	44%	46%	44%
	1-25%	27%	22%	26%	26%
Percentage of respondents	26-50%	17%	17%	17%	16%
	51-75%	6%	7%	5%	6%
	76-100%	9%	10%	7%	8%

## Conclusion

For managers who are seeking to develop more effective approaches to reaching capital item purchasers, understanding their customers' preferences and behaviors is crucial to success. This information is useful in developing strategies for attracting customers in an evolving agricultural marketplace.

Our research shows that buying decisions are based on a variety of influences. We identified four distinct market segments for capital purchases among U.S. crop and livestock commercial producers: Balance, Price, Convenience, and Performance. We described each of the four segments' attitudes toward information, their decision making processes and influences, factors that affect their loyalty and their perspectives about local dealers and manufacturers. Dividing the marketplace based on the four segments will help marketers use their resources to reinforce aspects of the value bundle that are most meaningful to the segments they choose to target. Recognizing that the Balance segment represents the majority of farms and that this group has a high affinity for customer service relative to other segments allows marketers to tailor offerings that may be uniquely appealing to this segment. Training salespeople to discover nuances of individual preferences among producers in this category so that they can tailor their offering to them may be advisable as well. Livestock producers who buy capital items in the Convenience segment tend to be less educated, which reinforces the value local dealers play in providing valuable infor-

mation to those customers. Understanding that Price and Performance segments tend to be larger, younger and more educated allows salespeople to know where to begin their discovery of individual producer preferences. These two groups tend to value manufacturer's resources. Local dealers who want to serve these segments should manage access to manufacturers or work to enhance the expertise of their staff who serve these demanding groups of buyers.

Capital item marketers should be aware of several behaviors of the commercial producers they serve. Farm shows seem to be good venues for reaching Balance buyers, but websites are somewhat more useful to the Price and Performance segments. However, none of the traditional means of providing information are valuable to any segments. Given the complexity of technology being used in many capital items, particularly equipment, marketers must do a better job of crafting information that will be useful to customers. At the same time, price does not weigh heavily in purchase decisions for any segments. Perhaps marketers should consider whether attractive pricing or useful information provides better marketing outcomes. There is some brand loyalty, most among Balance buyers, and loyalty to local dealers is a little higher, but most producers buy from more than one dealer. This represents an opportunity for marketers to focus on customer retention by providing differentiated services and information that discourage buyers from shopping for undifferentiated products elsewhere and researchers to consider which dealer activities are most likely to lead to loyalty. Buyers in all segments see differences between dealers in terms of service quality, which reinforces the opportunity for differentiation where service is a strength.

There are several questions raised in this study that warrant further inquiry as to the motivations for segment membership. It could be that Balance buyers, the oldest segment, have simply learned from experience to include several factors in their selection process; or it could be that having less education as the Convenience buyers do, leads to placing more trust in working with suppliers who are easily accessible. Demographic differences are often easily measurable and understanding the relationships between demographic variables and behavior could provide clearer direction to field sales and service professionals. Similarly, understanding the reasons that larger buyers tend to be Price buyers could help equipment sellers better position their offers. Whether larger buyers weigh price higher because they believe they will receive preferential service or because they possess service capabilities in their own operations is an interesting question for future research to address. Although not directly measured in this study, the broader impact of trust and commitment within relationships between equipment dealers and their large farm customers could explain some of the attitudes toward loyalty and relationship warrants attention as well.

Future research should focus on how to implement a targeted marketing plan when there is one dominant segment and three other distinct segments. How should a capital items firm tailor their marketing to these segments? Can a single marketing plan targeted at the Balance segment also serve the other segments that are more focused on a single attribute such as price or service? Should there be separate marketing plans for each or can some of these segments be combined? Perhaps most importantly, researchers should work to uncover the information content and mode of delivery that is most meaningful to buyers. Given how much money manufacturers and dealer invest in advertising, farm shows, and websites the general lack of usefulness of this information across all segments is disturbing. Less disturbing is the value placed on information that comes

from dealer and manufacturer staff, but if willingness to shop at a variety of locations continues to grow, even those resources must continue to be challenged to improve their skills and knowledge.

From an academic perspective, one hole in the market segmentation literature is understanding the causal factors that motivate farmers to choose a particular buying behavior. The economics literature offers several theoretical foundations such as search cost, opportunity cost, and risk aversion that could offer additional insight into how a particular farmer's buying behavior evolves.<sup>4</sup> In future iterations of the Large Commercial Producer project, we intend to develop questions about farmer motivations for their buying behaviors.

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<sup>4</sup> We are indebted to a reviewer for this suggestion.



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