
1402711361



SWP 34/87 THE STATE OF KNOWLEDGE ON FARMERS' BUYING PROCESSES FOR MAJOR FARM MACHINERY

C DENNIS ANDERSON
Visiting Professor of Marketing
Cranfield School of Management
Cranfield Institute of Technology
Cranfield
Bedford MK43 OAL
United Kingdom

(Tel: 0234-751122)

(Fax: 0234-751806)

Copyright: Anderson 1987

LIBRARY

INTRODUCTION

A search through a decade of articles appearing in leading journals devoted to consumer and industrial buyer behaviour, marketing research and marketing strategy will show little evidence of attention to farmers' purchase decisions. For example, a recent ten year review of The Journal of Consumer Research, the recognised source for behavioural research in marketing, does not yield a single study which focuses on farmers' product choices (Langston, 1984). The picture is not significantly brighter when scanning the major text books on consumer and industrial buyer behaviour. The simple fact is that farmers' purchase decisions, although significant in frequency, economic value and strategy relevance, have been largely ignored by consumer researchers. Furthermore, to the extent that proprietary studies have been done, they tend not to see the light of day in typical academic/educational periodicals and textbooks.

This complaint is not new. Funk (1972), in a comprehensive review of literature, located only 37 studies on farmer buying behaviour; only one of which was published after 1969. The authors' 1986 search of computerized reference indices using a variety of appropriate keywords failed to reveal more than a handful of behavioural studies on farmers in developed countries in the past decade. Other researchers have had similar disappointing results (Norvell, 1980).

The purposes of this article are to suggest what we should know about farmers' major machinery purchase decisions and to briefly summarise what aspects of these decisions have been studied. The gaps in the research are identified and suggestions are made for broadening both the generation of data on farmers' machinery buying behaviour and the dissemination of findings. First however, it is informative to consider some practical cases of marketing machinery to farmers and to identify the inherent assumptions and issues about farmer buying behaviour which create anxiety for marketers.

COURTING FARMERS' MACHINERY CHOICES

Marketing of new farm machinery products provide appropriate settings for raising issues of buyer behaviour. The typical new product launch scenarios unfolds as follows: A new industrial product has recently been launched by a major firm. A series of launch events has been executed with considerable fanfare. There is an atmosphere of high expectation among the corporate managers and staff. Significant groups of distributors, dealers and potential customers have been exposed to the product in all its physical splendour; they see it, watch it being demonstrated, touch it, give it a trial run, experience its performance and discuss and evaluate its features and benefits among themselves. They also view product brochures and audio-visual material and listen to informative and persuasive sales pitches. The launch events - be they trade shows, field trials/demonstration, promotional media campaigns, or launch "parties" hosted at manufacturing and dealership sites - do indeed attract attendance!

The launch mission commanders (corporate marketing executives) hope that the launch plan will do more than merely attract attention. Attention must lead to a thrust that is sufficient to provide the lift-off to success. Interest, liking, preference, intent to purchase and booked orders (actual purchase choices) must flow from attention. Mission commanders want their product to be on target; they want it to deliver competitively superior features and benefits to a sizeable group of buyers and to begin on a "choice trajectory" of sufficient life to deliver a payload to the firm.

This scenario is not unusual in the farm machinery industry. Within the past decade, Deere and Company, Massey-Ferguson, International Harvesters and others have launched new lines of major farm machinery with multi-location "events" involving hundreds, and often thousands, of farmers, dealers and distributors.

But is the product on target? Do farmers judge the product favourably? Do they feel that it definitely embodies the features and benefits of prime salience to them? Do they view the supportive elements of the product strategy (price, promotion, distribution service, packaging, branding, etc.) to be appropriate? Will they choose the product on their next purchase occasion? Will they evaluate the product favourably after gaining use experience? Unfortunately, these and related issues are frequent areas of post-launch concern to industrial marketers. They cause considerable anxiety for the launch commanders.

There appears to be no shortage of new farm machinery product launch examples. Three will be considered here. In 1979 International Harvester (IH) launched its faster, more reliable and more efficient innovative axial-flow combine to UK farmers (Millns and Crawford, nd.). It arranged major harvesting demonstrations in five regions of the country and invited area farmers and present and potential IH dealers to witness the performance. A total of 3000 acres of various crops were harvested at 120 different locations; thousands of farmers and hundreds of dealers observed the demonstrations.

A number of launch anxieties were present: the axial-flow concept was revolutionary; the product had proven successful in U.S. corn harvesting applications but UK crops and field conditions were significantly different; IH's existing UK combine lines had an image of low market share, spotty distribution and questionable performance; many IH dealers carried competitive combine lines. In short, IH faced a challenging situation in which to win the combine purchase choices of farmers. The product had to be right (or modified to be so), the positioning had to be accurate and the supportive promotional, pricing, distribution and service components had to be conducive to rapid and significant market penetration. Significant initial competition was anticipated and was, indeed, experienced from existing competitive combine lines and, in several years, from product imitation actions of competitors.

Also in 1979 the U.S. based Deere and Company (Custance and Hill, 1980; Paskowski, 1981) engaged in major new product line launches to worldwide markets. Nine tractors and four combines, specifically designed for small-to-medium sized farms, were launched in a grand fashion. A major introductory presentation and jamboree was held at Deere headquarters in Moline, Illinois. Three thousand dealers from Deere's worldwide operations attended by invitation. They viewed the new products in production and in use. In addition, they were exposed to a 48-projector multi-media programme in a choice of four languages and were given comprehensive promotional kits containing 17 varieties each of broadcast advertisements, product literature and specification sheets, eight co-op newspaper advertisements plus a wide variety of direct mail and point-of-purchase material. The product lines were subsequently launched simultaneously to farmers in 14 worldwide market areas. The individual country launches were assisted by dealer demonstrations to farmers and a 1.5 million dollar introductory promotional campaign by Deere.

Launch anxieties were likely present. Deere had invested over 40 million dollars in product development and over 350 million dollars in new overseas manufacturing capability. The launch programme involved the most expensive advertising programme Deere had ever used to market new product lines. The positioning strategy chosen was risky in the fact that it was to be consistently executed in all world markets, aided only

by transliteration to the relevant language. The positioning was on the "productivity" dimension, a benefit appeal which Deere believed was a common purchase criterion of all farmers irrespective country and language. This "universal" product benefit was operationalised through copy themes. The copy theme chosen for the new tractor line, in English, was "the schedule master - finish work faster - finish more work". Transliterations resulted in "the full-time factors" (France), "the work-peak breakers" (Germany), "the agricultural planner" (Italy), "the champions of the season" (the Netherlands and Scandinavia), and "the work-master" (South Africa). All advertising formats expressed the major benefit claim; that is, they suggested that the Deere machines were the ones to buy if on-time performance (finish more work faster, i.e. productivity), was important to the farmer. (But just how important is this purchase criterion to farmers?). This claim was supported by descriptions of features and specifications which were designed to provide the core benefits. A further risk feature was the issue of optional features. Which one would appeal most to farmers? There were a total of 220 catalogued options with Deere's new tractor line.

In the autumn of 1986 Massey-Ferguson (MF) launched a "revolutionary" new line of tractors, comprised of five models, to its worldwide markets (Massey Ferguson UK Ltd, 1986). The launch was kicked off with a series of spectacular introductory events at MF's UK world headquarters, to which UK distributors, dealers, farmers and press were invited. Over 2,300 distributor and dealer staff and over 3,000 farmers attended. The guests had an opportunity to see, feel and try the new product, to witness a field demonstration, and to be informed via product literature, sales pitches and a variety of other promotional media and materials. They also were encouraged to book orders. These events were repeated in France and other major MF tractor markets. In France, 900 dealer personnel and 12,000 farmers were attracted to a series of launch/demonstration programmes in eight cities during the 2½ week period.

Were launch anxieties present? If not, they should have been. MF, recently subject to several changes of owners and to numerous reorganisations, is fighting for survival in a very depressed and competitively intense world farm equipment market. It had spent 54 million pounds to redesign an existing tractor line and to perform a "clean sheet" design and development of a revolutionary new tractor line. The revolutionary new tractor featured re-engineering of virtually every major vehicle component: transmission, engine, traction, hydraulics, steering, axels, braking, operator environment and other components and systems. Most revolutionary, perhaps, were the electronification and computer control systems designed for power, traction and draught/drawbar functions and for monitoring and controlling a variety of operating parameters to maximise task performance, operating efficiency and profitability. Indeed, electronics/computer technology appears to have finally landed on farm tractors to produce what MF and the press refer to as the "intelligent" tractor. Would farmers accept this new technology? In addition, the family of tractors were designed in modular, "kit" form; the user could select from a wide range of options to order the tractor design most suited to farming needs. How would the farmer react to modularity? Which options would be chosen? The product positioning and promotional strategy also would appear to the inherently risky. As Deere had done seven years earlier, MF chose a common denominator positioning for all its world market areas. The basic positioning statement is "the revolutionary tractors designed to meet all modern farming needs". This general claim is followed by statements regarding features of the electronics and power train system and claims of increased productivity, performance and profitability. The operator comfort factor is also mentioned. Will farmers in all major world environments be sensitive to the same package of features and benefits?

These three risky farm machinery launch scenarios, though of large scale, are not unusual for the companies involved. Similar anxieties might exist for major, highly visible, industrial capital 'goods' in general.

Why does the risk exist? There are two major reasons. First, the financial stakes are large: in 1979, Deere spent over US$40 million for the design and launch of a new tractor line; in 1986 Massey Ferguson invested over £54 million to develop and introduce modified and new tractor lines. Second, there is a large degree of uncertainty about farmers reaction to new products and associated components of the marketing launch strategy. All too often industrial marketers arrive at the product launch stage without having adequately performed their marketing analysis and buyer behaviour research homework. (Cooper, 1986). Farm machinery marketers are not immune to this criticism; both the design of the new product and its marketing plan are often built upon key assumptions about farmer decision making processes, particularly purchase motivations and willingness to make trade-offs among product features, and these assumptions may not be realistic. Will farmers react in the way marketers assume? Therefore, high risk (large amounts at stake and considerable uncertainty about market success) is present at the time of product launch.

Risk or anxiety can be reduced by increased knowledge about key aspects of farmer decision making processes for major farm machinery items. But, what should be known about farmer buying behaviour? Some concepts and complexities of purchase behaviour will now be considered.

WHAT SHOULD BE STUDIED?

1. Buying decision phases for major durables

What conceptual approaches can be drawn upon to alert practitioners and researchers as to what should be known about farmer buying behaviour? It is popular to represent purchasing behaviour for major durables as a sequential problem solving process. Two of the more frequently cited frameworks are presented in Figure 1 and 2. Figure 1 is the typical representation of the normative decision making phases for individual consumers, while Figure 2 depicts a framework commonly used to describe the normative decision stages of industrial or organizational buyers. Each model has served as an aid to describing, understanding and structuring research on buyer behaviour for significant durable products in the the respective fields of consumer and industrial marketing.

Farmer purchase behaviour for major farm machinery does not have, and may not need, a model of its own. From a naive perspective, it may be assumed that farmers' major implement purchases are governed by the same behavioural and environmental forces as are individual consumers' decisions for products of similar value. The farmer, after all, is always a person and usually a family member. Naively, one could question why the farmer should behave differently in buying a durable input for farm use than when buying an equivalent valued input for household use. True, it is often difficult to distinguish between personal and family use on the one hand and farm use on the other, as in the purchase of transportation vehicles and computers. However, farmers are owners or managers of economic production operations and their purchase behaviour might more appropriately be analyzed by industrial or organizational buying behaviour concepts; Foxall (1979a) claims that farmers buying decisions for

tractors tend to parallel the behaviour of industrial buyers. Furthermore, the purpose of buying farm inputs is primarily to facilitate the production of other goods (livestock, crops, etc.) and, were production to cease, the farmer would no longer buy farm machinery inputs such as tractors and combines. That is, farmers are subject to a derived demand situation virtually identical to industrial buyers and their behavioural process for durables purchases might closely parallel those of the more rational industrial buyers.

In reality, the stages of farmer purchase processes may not be well represented by either of the frameworks presented in Figures 1 and 2. Figure 2, for example, features a number of rational and organized need analysis, information seeking and evaluation steps before the actual purchase choice is made and implies a rather formalized performance review after the purchase. This normative specification may be too rational and too detailed to represent farmers' actual purchase processes. Figure 1 may present too simplified a view. Nevertheless, conceptualising of choice behaviour as a sequence of problem solving steps has had wide acceptance in the consumer and industrial buyer behaviour literature.

While appropriate modelling of farmers' decision process stages and complexities is an important issue, it is beyond the scope of this paper to present a definitive model. Instead, the focus is on summarizing what aspects or measures of farmers' machinery purchase processes have been studied. The ideas contained in Figures 1 and 2 will be used as convenient bases for classifying the studies. First, however, some of the more important complexities of buying processes will be discussed.

2. Buying complexities

Understanding of the farmer buying processes can be assisted by drawing on other concepts and frameworks that have been used by consumer and industrial buyer behaviour writers and researchers. In this section of the paper, important complexities of buying processes are outlined. This presentation will provide a useful background for assessing recent studies on farmers' purchase processes for major machinery.

Knowing what phases or steps major durables purchasers' use does not provide a sufficient foundation for understanding buyer behaviour and designing marketing programmes. Other issues must be addressed. The key questions or measures associated with each stage of the normative decision process framework are presented in Figure 3. Answers to these questions will provide a richer understanding of the buying process and will allow the marketer to play an active role in attracting buyer attention, preference, choice and repeat purchases.

While Figure 3 adds useful specifics to the buying process framework, there are further complexities which serve to challenge researchers and complicate marketing programmes. One major complexity is the "who?" dimension. "Who" refers to the structure and composition of the decision making unit (DMU) involved in the buying process. It is widely accepted that in many consumer and industrial purchase situations several persons (family members or members of the buying centre) comprise the DMU. Furthermore, each member may play one or more roles (influencer, decider, buyer, user). Some would argue that the "who" question is the critical element in effective marketing research and

strategy. If the research concentrates on a low involvement/low power member of the DMU, the value of the data obtained is minimal. If marketing efforts are directed at unimportant DMU members, results will be disappointing. The farm owner might be an easily located and willing survey respondent, but the farm hand who operates and repairs the equipment might be a more fruitful focus for both research and promotional activities..

Research has indicated that the role and influence of various members of the DMU differs as a function of the phase of the decision making process. Also, it is known that the salience of information pieces and evaluation criteria differ among individual members of the DMU. Therefore, it is not surprising that the "who" dimension of buying behaviour is regarded as critically important.

Another important complexity arises due to the finding that the "why" aspect of buying, (that is, the evaluation and choice criteria), vary by stage in the choice process. For example, the reputation of the supplier or quality of the product might qualify a marketer's offering for inclusion in the set of alternatives the buyer considers, but availability, financing terms or delivery performance might be the key determinants of the final choice.

The foregoing complexities are summarized in Figure 4. The three dimensional diagram captures the essence of the complicated nature of buying decision process. In summary, understanding of buying decisions will be significantly enhanced by measuring the relationships among the buying phase components and the "who" and "why" components of decision making.

Additional complexities arise due to personal/individual, organizational, situational and environmental factors. A number of buying behaviour models and research studies point to the influence of a host of such factors on buyers' choice processes. A summarized listing of commonly suggested factors and how they might apply to purchases by farmers is presented in Figure 5. The implication arising from this presentation is that to fully understand the buyers decision process, it is necessary to determine a broad range of forces acting upon buyers during the time they are faced with the decision. Clearly, it is impossible to simultaneously measure and comprehend the impact of all these decision influencing factors; however, for a given product category, it is essential to detect the major determinants.

WHAT HAS BEEN STUDIED? WHAT GAPS APPEAR?

There are a number of sources for farm machinery purchase behaviour studies but they vary in the frequency and accessibility of relevant studies. Published journals are accessible but are relatively low volume sources. Consumer research and marketing research journals have virtually ignored farmer buying behaviour. General marketing management journals and agricultural economics oriented journals have published studies occasionally. A more abundant source of studies are agricultural/agribusiness colleges and government departments. Unfortunately, the reports produced (typically MSc theses) are frequently inaccessible; they seldom get distilled and distributed in article form and often they are considered proprietary - the sponsor (eg. farm equipment marketing company, trade association or governmental agency) has a vested interest in the results. Perhaps the greatest source of studies is the private sector; most major marketers of farm machinery and other farm inputs have no doubt carried out dozens of proprietary studies to service their marketing analysis, planning and control needs. However, proprietary studies virtually never see the light of day as published literature

and seldom are circulated outside the client firm. This is regretable; researchers and sponsors must strive to disseminate and publish findings, and they must encourage others to build on their studies - the result will be increased knowledge of farmer decision making.

A partial search of the literature, carried out by the author, produced five published articles on farmer machinery purchase behaviour and six unpublished reports. Readers no doubt will be able to add to the list. What aspects of farmer machinery purchase decisions appear to have been studied, based on a preliminary review of available empirical studies? What gaps appear to exist and how might our state of knowledge of farmers' machinery buying behaviour be improved?

Figure 6 presents a summary classification of the measures employed in the studies reviewed for this paper. The measures are classified by stage of the farm machinery decision process and the sample size (number of farmer respondents) and product focus of the studies are indicated. As indicated, all stages of the decision process have been investigated, though seldom in a single study. Evaluation behaviour and dimensions of search receive the most attention by researchers. Tractors were the focus of most studies and, in some, tractors and combines were the decision "object" in question. A few studies employed general product category descriptions such as "major machinery" or "farm implements". One study combined both a product choice and a choice of distribution outlet in its use of "Tractor/Dealer" as the focus of questioning. Interestingly, few studies measured potential covariates or segmenting variables and when these were addressed they tended to be limited to selected characteristics of the farm (eg. type, size) and farmer (eg. age). Only one study measured any of the many environmental forces to which farmers are subjected.

A comparison of Figure 6 (what has been studied) to Figure 5 (what should be known) produces some interesting observations. The general message is that there are large gaps in the research coverage pertaining to farm machinery purchase behaviour. The research shortcomings associated with each phase of the decision process will be discussed in turn.

Problem/Need Recognition

Understanding problem or need states of farmers can be useful to machinery marketers. For example, the factors precipitating needs can be useful bases for promotional appeals; the timing (cyclicality, seasonality) of needs can be used to schedule promotional media; and, changes in need specifications can provide ideas for product modification and new product opportunities. Also, knowing which segments (eg. farms, farmers) experience particular problems or needs can assist in target market definition and selection decisions.

Only four studies measured dimensions of problem or need states and only two made any attempt to examine the factors or conditions that gave rise to the farmers decision that an additional or replacement machine was needed. None of the studies examined segment differences in needs or problems faced.

Search behaviour

A purchase of a major farm machinery item represents a large financial investment and a relatively infrequent purchase occasion for farmers, therefore, considerable information seeking activity and deliberation time is likely to occur. An understanding of the amount of farmers' search activity, the types of sources and information components they utilise and the relative importance they place on different sources and

information components can go a long way towards increasing the effectiveness of the marketers promotional programmes. Promotional expenditures may be largely wasted if they employ media (sources) infrequently consulted by farmers or message content that is of low salience to them.

As indicated in Figure 6, little attention has been given to measuring the extent of pre-purchase search activity in farm implement buying. Only two studies measured the extent of search (deliberation) time and there was only one measure observed for each of "dealer visits" and "trade show attendance" activities. Distance travelled to dealer, which may be viewed as a measure of search effort, was investigated in three studies. The types of information sources used and the degree of importance of these sources (or importance of information content obtained) was treated in only three studies. Overall, there is limited research treatment of the important search phase of farm machinery purchase decisions.

Evaluation behaviour

This is perhaps the most important aspect of farmers' buying decisions for marketers. The competitive battle for machinery sales and market share is fought on claims of offering competitively superior product features and benefits to farmers. Each manufacturer hopes both that its brands and models will be seen by farmers as delivering a superior package of benefits over competitive offerings and that farmers will actually vote in their favour at the time of purchase.

If the manufacturer's product and supportive marketing strategy components are "right", it will fare relatively well in the battle for sales and market share; if they are "wrong", dismal market performance will result. Chances of getting things right will be greatly enhanced if the marketer understands and acts upon key dimensions of farmers' evaluation behaviour, such as : what criteria farmers use and find most salient when sizing up competing brands of farm machinery; what perceptions farmers have of different brands/suppliers; what trade-offs they are -willing to make between and among product features; how they reduce the set of possible brands to a final choice; and, which segments of farmers evaluate in which manner.

Not surprisingly, aspects of farmers' evaluation behaviour are the most frequently employed measures across machinery purchasing studies. From Figure 6, it is evident that both product evaluations and dealer evaluations have been studied. The latter is a particularly appropriate focus of study since the choice of dealer may precede and determine the choice of machinery manufacturer (brand). Of the evaluation measures employed, importance ratings or rankings for a list of purchase criteria (factors) are most common and some studies went the next step to determine how the farmer rates competing offerings (brands, manufacturers) or the same list of evaluative dimensions.

Measures of buying intentions, an important pre-choice behavioural state, have received only limited attention. This would appear to be at variance with the state of knowledge for other major durable consumer and industrial goods (eg. appliances, cars, industrial machinery) for which surveys of buying intentions are an annual occurance.

A major deficiency in knowledge of farmers' evaluation behaviour is the issue of trade-offs among purchase criteria. Not a single farmer behaviour study explored trade-offs, despite the fact that farm machinery manufacturers' products inevitably embody design trade-offs and their market systems often present the farmer with trade-offs between product performance, price and dealer service components. It is difficult to find a marketing situation where one alternative is clearly superior (scores at the most

favourable level) on all relevant evaluative dimensions. In fact, one of the most popular techniques in consumer research is the conjoint measurement and analysis technique which allows conclusions about the trade-offs buyers appear to make in purchase of multi-attribute purchase situations (Green and Tull, 1978). The application of this technique to farm machinery buying is long overdue.

Another glaring deficiency in studies of evaluation behaviour is the lack of attention to determining the how and why of the thought processes used by farmers to reduce the set of aware or considered brands down to a final choice. Mason (1985) did attempt to address these issues with a small sample (N=25) of farmers, although her approach did not take advantage of the considerable literature on methods and findings in the area of evoked set constructs (see for example Brisoux, 1982). The composition of farm machinery brand sets (eg. awareness set, considered set, hold set, reject set) and the reasoning/evaluation processes farmers use to narrow and finalise choice, are a fruitful area for study. It is regretable that both academics and practitioners alike appear to have ignored this important topic.

Since the topic of purchase criteria is at the heart of evaluation behaviour, it is tempting to take a closer look at what has been measured and found. Figure 7 outlines the various operational definitions of evaluation criteria importance used in studies of farm machinery buying and presents the corresponding findings for the four most important criteria. It is striking to note the variety of decision settings employed. Some of the studies (eg. Foxall, 1979; Mason, 1985) focussed on the most recent machinery item purchased and asked the farmer (in retrospective fashion) to rate or rank the importance of a list of possible purchase criteria of factors in terms of influence on or salience to this recent decision. Others provided a more hypothetical measurement setting by asking farmers to think about "when" or "if" they were to consider a purchase (e.g. Bevan, 1986; Von Tilburg, 1986). It is also significant to note that the operational settings employed varied in the level of generality/specificity of the criteria, and the "size" of the decision component treated. At the general or macro level, a list of somewhat broad or lumpy constructs (criteria) are applied to what can be called a "wholistic" decision. For example, Foxall (1979) asked about the tractor decisions (i.e. the whole tractor,) and Eaton (1984) asked about the dealer (i.e. the whole dealer). In contrast though Bevan (1986) assessed the salience of general (macro) criteria to the wholistic new tractor decision, he also focussed more finely on more micro criteria and decision sub-components such as: dimensions of product design, price and performance; manufacturer reputation; and sub-categories of dealer service. In essence, the micro view represents a disaggregated look at "the" decision and considers that a set of rather specific criteria or evaluative dimensions apply to each sub-decision category. It is difficult to speculate on which approach, macro or micro, is the most valid representation of the farmers' thought processes and evaluation behaviour.

Clearly, conclusions about the order of importance of purchase criteria to farmers differ depending on the level of aggregation used in criteria and decision component settings. This is apparent in the right hand side of Figure 7. The obvious message is that marketers must be careful to ascertain what operational definitions were used to produce study findings before they use the findings to design their marketing programmes. For example, a micro-focussed study might suggest that cab-height and visibility are key determinants of farmers' buying behaviour, but the best cab design might not sell a single tractor. The "wholistic" attributes such as tractor price, dealer service and product reliability may be the appropriate, deterministic constructs for designing and implementing a successful tractor marketing system. If marketers want to monitor trends in purchase criteria or evaluation behaviour or to compare the results of one

study to another, they must design/choose studies with consistent operational definitions for the measures employed.

Though not reported in Figure 6 or 7, an examination was made to determine the extent to which segment differences in evaluation behaviour have been studied. The results are disappointing; the vast majority of studies did not measure any potential covariates (segmenting variables) and those that did seldom contained an analysis of segment differences in criteria salience or product perceptions. However, the scanty evidence does produce two useful observations. First, as evidenced by Norvell (1980) and Bevan (1986), the evaluation behaviour (most notably, salience of criteria) appears to differ by farm type (eg. arable versus livestock versus mixed; large versus small farms). Second, though individual co-variates (univariate analysis) may not produce significant results, a combination of covariates (multivariate analysis) does (Johnson, Brown and O'Grady, 1985).

Choice Behaviour

Ownership history (ie., an inventory of machinery owned/operated) has received attention in five studies recorded in Figure 6. However, upon closer examination, it becomes apparent that brand or make of ownership is only dealt with in two of these studies. Brand information provides an opportunity to study brand/manufacturer loyalty patterns, a very important aspect of choice behaviour. Neither study did analysis for loyalty patterns or segment differences in loyalty, however.

Dealer patronage behaviour was measured in three studies but, again, there was no analysis of patterns and covariates. Since the objective of all farm machinery marketing effort could be stated as "to get repeat choice and usage of the marketers products and dealers", poor treatment of loyalty issues is lamentable; particularly so since a large body of methods and findings on loyalty has been in existance in the consumer behaviour and marketing research literature for decades.

Post-purchase behaviour

On-the-farm machinery performance and the farmers' satisfaction with the product, manufacturer and dealer should be monitored after the sale is made. Only four studies examined any aspects of post-purchase behaviour. Furthermore, none of the studies analysed for segment differences in post-purchase measures.

Covariate

A host of individual, organisational, situation and environmental forces can influence farmers' purchase decisions. These focres are seldom studied and when measured are seldom used to analyse for segment differences in decision making behaviour. With one exception (Johnson, Brown and O'Grady, 1985) the analysis, where attempted, is restricted to univariate analysis of a few farm or farmer characteristics.

SUMMARY

This paper has explored some conceptual farmeworks which can help organize both the review and conduct of research into farm machinery purchase behaviour. Though the specification of what should be studied and what has been studied is based on partial coverage of concepts and extant empirical studies, a number of significant gaps are revealed. In general, the knowledge of farmers' machinery purchase decisions is lagging

far behind where it should be given the significance of farmer purchasers and the availability of a strong tradition of studies and methodological tools in the consumer behaviour research field. It is hoped that both researchers and practitioners will work towards filling the gaps in topics, measurements, analyses and availability of results regarding farmers' major machinery purchase decisions.

FIGURE 1

PHASES OF THE INDIVIDUAL CONSUMER BUYING PROCESS

1. Problem recognition
2. Search for information
3. Evaluation of alternatives
4. Purchase (product choice)
5. Post purchase behaviour

Source: Engel, J.F., Kollat, D.T., and Blackwell, R.D., Consumer Behaviour (New York: Holt, Rinehart and Winston, 1968), p.47

FIGURE 2

PHASES OF THE INDUSTRIAL/ORGANIZATIONAL BUYING PROCESS

1. Need recognition
2. Definition of the characteristics and quantity of item needed
3. Development of specifications to guide the procurement
4. Search for and qualification of potential sources
5. Acquisition and analysis of proposals
6. Evaluation of proposals and selection (choice) of (product and) suppliers
7. Selection of an order routine
8. Performance feedback and evaluation

Source: Robinson, P.J., Farris, C.V., and Wind, Y., Industrial Buying and Creative Marketing (Boston: Allyn and Bacon, Inc. and the Marketing Science Institute, 1967), pp.13-18

FIGURE 3

KEY ISSUES IN UNDERSTANDING BUYING PROCESSES

Phase of the Choice Process	Illustrative Questions (Measures) to be Assessed
Problem or Need	* What precipitates the need? * What are the dimensions of the need (timing, frequency, specifications)? * What segment differences exist in problem or need states?
Search Behaviour	* What type or direction of search occurs (i.e. what type of information pieces are sought, what types of sources are used)? * What degree of search occurs (i.e., number of: sources consulted, shopping trips made, stores/dealers visited, hours/weeks spent)? * What is the relative salience/usefulness of sources accessed and of information acquired? * What segment differences exist in the type, degree and salience of search?
Evaluation Behaviour	*What criteria are used to identify and evaluate alternatives? * What is the relative importance of criteria? * How do competing products and suppliers rate on these criteria? * What trade-offs are made among criteria? * What separate decisions are evaluated? * What stages or steps are used in the evaluation process? * How is the consideration set narrowed to a final choice? * What are the segment differences in evaluation behaviour?
Selection/Choice	* How is the act of purchase carried out? * What degree of brand, manufacturer and distributor/dealer loyalty exists. * What are the segment differences in choice behaviour?
Post-Purchase Behaviour	* What post-purchase activity/evaluation is carried out? * What are the consequences? * What segment differences exist in product use, satisfaction/dissatisfaction and subsequent actions?

FIGURE 4

A THREE DIMENSIONAL DIAGRAM OF SOME COMPLEXITIES OF BUYING BEHAVIOUR

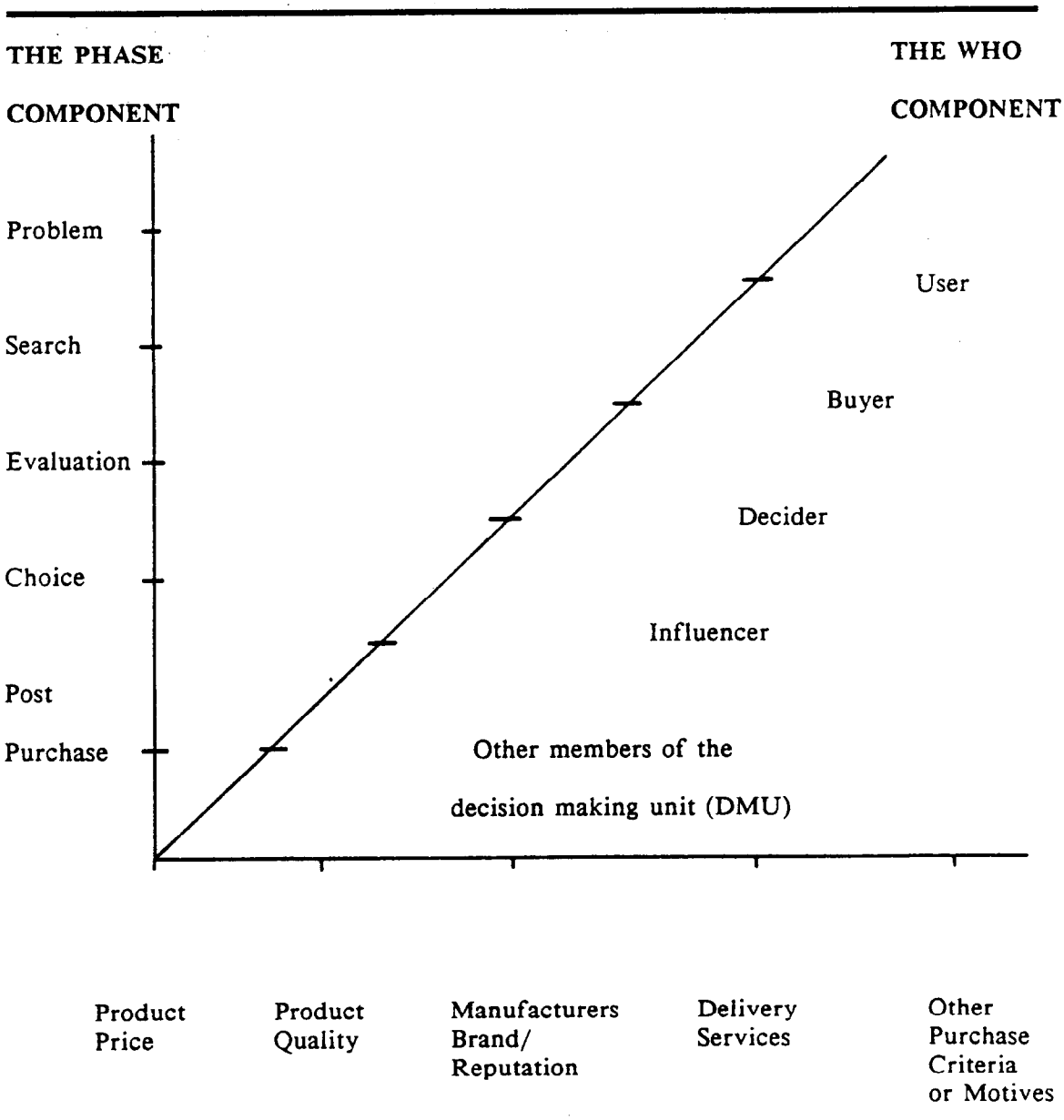


FIGURE 5

FORCES INFLUENCING FARMER DECISION MAKING

LEVEL	ILLUSTRATIVE QUESTIONS
INDIVIDUAL	What are the farmers individual demographic and socio-economic and risk handling characteristics? How do these impact on decision making?
ORGANIZATIONAL	What are the characteristics of the farming operation (type, size, ownership structure, geographic location)? How do purchase processes vary by characteristics of the farming operation?
SITUATIONAL	What type of buying situation exists? Is it a new task, a straight rebuy or a modified rebuy situation? What degree of risk and urgency of need is felt? What previous purchase and use experiences are relevant to the present decision? How do these factors influence the farmers purchase behaviour?
ENVIRONMENTAL	What are the past, present and future **economic** indicators for the farming economy and the farmers particular operation? How will these factors influence the farmers purchasing plans and processes? What **physical** (e.g. climatic) forces might shape the farmers purchase behaviour? What changes in technology are relevant to farmers and how do farmers react to new **technology**? What government **(political/legal)** policies and programmes are available to farmers and what impact do they have on buying plans and processes? Are there **social/cultural and ecological** movements and attitudes (e.g. social groups, energy and soil conservation, environmental chemical contamination) which influence farmers decisions? How are farmers purchasing plans and processes influenced by the actions of **competitive** farm input (e.g. machinery) marketers?

FIGURE 6

SUMMARY OF MEASURES INVESTIGATED IN STUDIES OF FARM MACHINERY BUYING

DESCRIPTION OF MEASURES USED	STUDIES (Sample size and product category)
Problem or Need Recognition	
■ Additional purchase or replacement?	- Foxall (1979a;1979b) N=55 Tractors
■ Replacement cycle:	- Mason (1985) N=83 Tractors
■ Timing of purchase:	- Mason (1985)
■ Factors precipitating need:	- Bowden (1984) N=300 Tractors; Nordbo, Schaffner & Strangeland (1957) N=31 Tractors & Combines
Search Behaviour	
■ Awareness of brands:	- Kirkup (1987) N=2841 Tractors N=908 Combines
■ Sources used:	- Foxall (1979a;1979b); Bowden (1984), Mason (1985)
■ First step taken:	- Kirkup (1987); Foxall (1979a; 1979b)
■ Search time:	- Kirkup (1987); Mason (1985) N=25 Tractors
■ Trade shows attended:	- Bowden (1984)
■ Number of dealers visited:	- Norvell (1980) N=207 farm implements
■ Distance travelled to dealer:	- Norvell (1980); Eaton (1984) N=174 Tractors & Combines; Bevan (1986) N=100 Tractor/Dealer
■ Importance of pieces of information:	- Eaton (1984)
■ Relative importance of information sources:	- Norvell (1980)
■ Rating of level of influence from third parties:	- Bevan (1986)

Evaluation Behaviour

(1) Product Evaluation

■ Number/name of brands considered:	- Norvell (1980); Bowden (1984); Mason (1985)
■ Brands rejected:	- Mason (1985)
■ Importance of purchase reasons/ motives/criteria/factors:	- Nordbo (1957); Foxall (1979a;1979b); Norvell (1980); Mason (1985); Johnson et al (1985); Von Tilburg (1986); Bevan (1986)
■ Ratings of competitive brands/ manufacturers:	- Bowden (1984); Mason (1985) Bevan (1986)
■ Buying intention:	- Kau and Hill (1972) N=? grain dryers; Bowden(1984); Mason(1985)

(2) Dealer Evaluation

■ Importance of criteria:	- Norvell (1980); Bowden (1984); Eaton (1984)
■ Ratings of specific dimensions of dealer services/reps./staff:	- Bowden (1984); Eaton (1984)

Choice Behaviour

■ Ownership history (no. of machines):	- Kau and Hill (1972); Bowden (1984); Mason (1985)
■ Ownership (brands now owned):	- Bowden (1984); Mason (1985)
■ Bought new versus used:	- Foxall (1979a, 1979b); Mason (1985)
■ Dealer patronage behaviour:	- Foxall (1979a,1979b); Bowden (1984); Eaton (1984)
■ Likely action if dealer changed brands:	- Bowden (1984)

Post Purchase Behaviour

■ Use experience (brands operated):	- Bowden (1984)
■ Suggestions for product design improvements:	- Mason (1985)
■ Satisfaction with dealer:	- Eaton (1984)
■ Suggestions for improvements to dealer services:	- Eaton (1984)

Demographics and Others

■ Farm and farmer characteristics:	- Kau and Hill (1972); Norvell (1980); Bowden (1984); Johnson et.al. (1985)
■ Farm characteristics only:	- Foxall (1979a;1979b); Eaton (1984); Mason (1985); Bevan (1986)
■ Environmental factors:	- Norvell (1980)

FIGURE 7

SUMMARY OF IMPORTANCE OF EVALUATION FACTORS/CRITERIA IN FARM MACHNERY PRODUCT AND DEALER CHOICE

STUDY AND DEFINITION OF MEASURE USED	ORDER OF IMPORTANCE OF TOP FOUR FACTORS/CRITERIA
"TRACTORS"	
1. Foxall (1979a,1979b): (Re: factors influencing most recent tractor decision, N=55)	- Technical performance, past experience, price, after sales service.
2. Mason (1985): (Re: most recent tractor purchase; reason for choosing brand over competitors, N=25)	- Dealer factors, previous experience, good resale value.
(Re: suggestions for needed design improvements, N=83)	- Cab height, visibility, transmission, steering.
(Re: importance of specific design features to meet own particular needs, N=151)	- Visibility, cab access, seating, controls.
(Re: Importance of suggested improvements to tractor design to meet own farming needs, N=151)	- Clutch, fuel economy, starting, braking system.
3. Bevan (1986) N=100: (Re: importance of general criteria when considering the purchase of a new tractor)	- After sales service, price, manufacturers reputation, product's technical performance.
"TRACTOR/DEALER"	
1. Bevan (1986) N=100: (Re: importance of dimensions of tractor's technical performance in choice of tractor/dealer)	- Reliability, compatibility with implements and other tractors owned, operator convenience, ease of access for maintenance/repair.

(Re: importance of dimensions of tractor's specifications in choice of tractor/dealer)	- Range of gears, options available, hydraulic lift capacity, type and level of cab specification.
(Re: importance of dimensions of tractor purchase price in choice of tractor/dealer)	- Trade-in allowance, price discounts, resale value (of new tractor), credit and rate of interest offered.
(Re: importance of dimensions of manufacturers reputation in choice of tractor/dealer)	- Reliability of products, quality of engineering, listening to/understanding farmers' needs, experience in agricultural industry.
(Re: importance of dimensions of dealer's after-sale service in choice of tractor/dealer)	- Ready parts availability, technical competence, availability of reliable technical advice, availability of replacement/loan tractors.
(Re: importance of dimensions of dealers pre-sale service in choice of dealer/tractor)	- Trade-in estimates, tractor testing and trial facility, technical advice from dealer/rep, availability of reliable information on products.

"TRACTOR AND COMBINE"

1. Nordbo, Schaffner & Strangeland (1957) N=31:

(Re: reasons for selecting particular make/model)	- Make previously owned, best "deal" (i.e. best trade-in allowance and best cash discount)

2. Johnson, Brown & O'Grady (1985) N=905:

(Re: importance of factors in decision making process)	- Old machine wearing out, change in size of farm operation, time available due to weather, fuel efficiency.

"FARM IMPLEMENTS"

1.	Norvell (1980) N=297: (Re: importance of influences on implement purchase)	- Past experience, dealer service, product quality, spouse influence.

"MAJOR MACHINERY"

1.	Von Tilburg (1986) N=263: (re: importance of factors when buying major machinery)	- Quality, service, price, brand.

"DEALER"

1.	Eaton (1984) N=174: (Re: importance of factors in choice of machinery dealer)	- Parts availability, competitive prices, quality of after sale service, convenient location.
2.	Norvell (1980) N=207: (Re: relative importance of dealer characteristics on dealer choice)	- Dealer service, reputation, product quality and availability, dealer reliability.

REFERENCES

Bevan, Robert A. Unpublished MSc Thesis. Silsoe College, Cranfield Institutute of Technology (1986).

Bowden, A.J. Unpublished MSc Thesis. Silsoe College, Cranfield Institute of Technology (1984).

Brisoux, J.E. The Evoked Set Phenomenon in Consumer Behaviour: A Critical Review. Unpublished Working Paper. University of Quebec, Three Rivers (1982).

Cooper, Robert G. Winning at New Products. Toronto: Holt Rinehard and Winston (1986).

Cunstance, P. and Hill, R.W. John Deere Schedule Masters (A). Cranfield, Bedford. Case Clearing House of Great Britain and Ireland. No. 581-014-2 (1980).

Eaton, S.M. Unpublished MSc Thesis. Silsoe College, Cranfield Institute of Technology (1984).

Funk, Thomas F. Farmer Buying Behavior: An Integrated Review of Literature, Working Paper AE/72/16, Guelph University, Canada. (1972).

Foxall, G.R. Industrial Buying Decisions During Recession: Farmers' Tractor Purchases, 1977-78. Management Decision Vol 17(4) 317-25 (1979a).

Foxall, Gordon R. Farmers' Tractor Purchase Decisions: A Study of Interpersonal Communications in Industrial Buying Behaviour. European Journal of Marketing Vol 13(8) 299-308 (1979b).

Green, Paul E. and Tull, Donald S. Research for Marketing Decisions 4th ed. Englewood Cliffs, N.J.: Prentice Hall (1978) Chap.14

Johnson, Thomas G., Brown William J. and O'Grady, Kevin. A Multivariate Analysis of Factors Influencing Farm Machinery Purchase Decisions. Western Journal of Agricultural Economics 10(2) 294-306 (1985).

Kau, Paul and Hill, Lowell. A Threshold Model of Purchasing Decisions. Journal of Marketing Research Vol.IX 264-70 (August 1972).

Kirkup, Malcolm. Personal Communications (1987).

Langston, A. Lizbeth. Ten Year Summaries and Index of The Journal of Consumer Research. Journal of Consumer Research 10 455-500 (March 1984).

Mason, J. Unpublished MSc Thesis. Silsoe College, Cranfield Institute of Technology (1985).

Massey Ferguson (UK) Ltd. Voice. Coventry, England: 4(3) (Autumn 1986).

Millns, John A. and Crawford, Ian. International Harvester and the Axial Flow Combine (Part A). Cranfield, England: Department of Marketing and Management, Silsoe College (nd).

Nordbo, Marvin T., Schaffner, LeRoy and Stangeland, Sigurd. Decision Making Processes In Farm Machinery Selections. North-Dakota Agricultural College, Bulletin No. 410 (June 1957).

Norvell, D. Wayne. Farmers' Buying Behaviour as Related to the Purchasing of Farm Implements in Kansas. College of Business Administration, Kansas Agricultural Experiment Station, Manhattan, Kansas. Report No. 80-173-A (1980).

Paskowski, Marianne. Deere & Co., Industrial Marketing 66 (Feb. 1981).

Van Tilburg, Aad. Personal Communications (1986).