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Margaret Brown

*AgResearch Ltd, New Zealand Grasslands Research Centre, [margaret.brown@agresearch.co.nz](mailto:margaret.brown@agresearch.co.nz)*

Denise Bewsell

*AgResearch Ltd, New Zealand Lincoln Research Centre, [denise.bewsell@agresearch.co.nz](mailto:denise.bewsell@agresearch.co.nz)*



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# Using a Market Segmentation Approach to Better Target Agricultural Extension Programs—Aligning Learner Needs with Learning Programs

**Margaret Brown**

Senior Scientist

AgResearch Ltd, New Zealand

Grasslands Research Centre

Palmerston, New Zealand

[margaret.brown@agresearch.co.nz](mailto:margaret.brown@agresearch.co.nz)

**Denise Bewsell**

Scientist

AgResearch Ltd, New Zealand

Lincoln Research Centre

Christchurch, New Zealand

[denise.bewsell@agresearch.co.nz](mailto:denise.bewsell@agresearch.co.nz)

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**Abstract:** Agricultural Extension has traditionally been based on the assumption that farmers' have similar learning needs and styles, whatever the subject matter. In this article we argue that undertaking market segmentation can greatly enhance the value of the Extension program by better aligning participant needs with program objectives and delivery modes. We outline a case study from New Zealand where market segmentation was used to inform the design of an Extension program for sheep and beef farmers on feed planning. A series of four differentiated workshops were developed. Early evaluation indicates that this approach is well received by farmers.

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## Introduction

Franz (2007) called on the Cooperative Extension System, as the largest adult education institution in America, to better meet the needs of the "adults they serve." It is widely recognized that adult learning should be learner centered (Bruner, 1968; Knowles, Horton, & Swanson, 2005). We should not presume that we, the people who design and deliver adult learning, know what it is that adult learners wish to learn and what form or style they wish that learning to take. However, it has proved difficult at times to successfully put this into practice. Successful learning commences with a comprehensive understanding of learner needs and readiness for the learning (Ota, DiCarlo, Burts, Laird, & Gioe, 2006; Rogers, 1969). However, often a "one size fits all" mentality prevails. In this article we outline how we questioned this approach to learning, using a case study from New Zealand. We made use of a market segmentation approach to inform the design of an agricultural extension program tailored to the identified needs of the participants.

## Background

Most New Zealand sheep and beef farmers use pastoral based farming systems. The ability to assess current pasture feed quantity and quality, to predict future pasture growth rates, and to assess the costs of feed production are activities collectively known as "feed planning." Currently there is a range of tools available in New Zealand to assist farmers to make feed planning decisions. They include models based on the whole farm system, farm mapping software, models of pasture growth and sward dynamics, to relatively simple models designed to assist with grazing decisions (Litherland, Snow, & Dynes, 2004). Use of these tools implies that a farmer is formally feed planning.

In 2003, the results of a survey of sheep and beef farmers indicated that feed planning skills could be improved (Lambert, Tarbotton, Bray, & Westbrooke, 2003). The industry body, Meat and Wool New Zealand (M&WNZ), identified the need to develop a learning program whereby sheep and beef farmers could be encouraged to make more of the grass they grew, i.e., by updating their knowledge of feed planning, learning about new methodologies and recently developed computer-based decision making tool, and being encouraged to move towards the use of formal feed planning methods on their property. Although M&WNZ felt that there was a need to increase farmers' use of feed planning, it was also recognized that many farmers consider their current informal or intuitive methods of feed planning to be adequate for their needs.

## Purpose

This article outlines our use of a market segmentation approach to inform the design of an agricultural Extension program in order to tailor it to meet the identified needs of the participants. While the case study is from New Zealand, we believe that the approach is relevant to all Extension professionals, particularly those interested in developing more participatory learning approaches, as suggested by Franz (2007).

## Methods

Market segmentation has been identified by a number of researchers as having application to agricultural technologies (Emtage, Herbohn, & Harrison, 2006; Kaine & Bewsell, 2002; Kaine, Bewsell, Boland, & Linehan, 2005; Strong & Jacobson, 2006). Market segmentation is a method for dividing a heterogeneous population into groups or segments that are homogenous (Dickson & Ginter, 1987; Strong & Jacobson, 2006). Different characteristics, such as geographical information or demographic information, can be used to segment a population (Blocker & Flint, 2007; Haley, 1968). We sought to understand the context or environment in which farmers make decisions about feed planning (Kaine & Lees, 1994). Determining what influenced decision making on feed planning by classifying farmers into segments enabled us to commence the development of a range of appropriate learning opportunities.

In-depth interviews were undertaken with 15 sheep and beef farmers in order to understand the context in which feed planning is carried out on farm. Five segments were tentatively identified. The information gathered from these interviews was used to design a postal survey to collect data on feed planning from a wider range of farmers. A copy of the survey is available upon request from the authors.

The survey was piloted, finalized, and mailed in August 2006 to 1,000 sheep and beef farmers who had been randomly selected from the M&WNZ database. Cluster analysis was used to segment respondents into three groups based on their responses to the survey questions of their experiences with feed planning. The specific questions used were:

- I feed plan informally, that is by intuition and past experience

- I feed plan formally, that is I estimate pasture cover and/or use some tool to calculate pasture cover
- I do not use a formal feed plan as seasonal variability in my area makes it difficult to use a feed plan effectively
- I am relatively new to the industry and/or my farm and find feed planning useful
- I have used a feed plan previously but no longer need to
- I changed my farm system (e.g. new cropping program, subdivided and changed to rotational grazing) and needed a feed plan to manage the change
- My farm has more undeveloped than developed pasture and so feed plans are not as relevant
- I started feed planning after struggling to feed stock (e.g. an unexpected snow event)

Initially the cluster analysis was used to classify respondents into five segments. However, this analysis did not provide useful information for each segment or provide direction for workshop development because three of the segments were very small. The cluster analysis was repeated, with the result that respondents were classified into three segments. This segmentation gave more useful information in light of the need to develop a range of targeted learning opportunities.

## Results and Conclusions

### Interview Results

Three new entrants to farming (i.e., those who had less than approximately 3 years on farm) and who currently feed plan informally were interviewed. Five older farmers who currently feed plan informally were also interviewed. Seven farmers, currently using a feed planning tool, were interviewed. The information collected in the interviews indicated that location, farm type, and farm size did not markedly influence feed planning decisions. However, being a new entrant to farming, having a change of farming system to include cropping, and crises such as unexpected snowfalls did influence farmers to adopt formal feed planning tools. Information gathered in the interviews was used to develop an initial segmentation.

### Survey Results

Approximately 1,000 surveys were sent to sheep and beef producers. A 25% response rate was achieved. The majority of respondents were male (92%). Most were 46 years of age or older (71%). Most of the respondents had over 11 years of experience as a sheep and beef farmer (88%). Details are provided in Table 1.

**Table 1.**

## Characteristics of Survey Respondents

|   | <b>% Respondents</b> |
|---|----------------------|
| <b>Gender</b>   |                      |
| Male  | 92                   |
| Female  | 7                    |
| Not given   | 1                    |
| <b>Age</b>  |                      |
| 17 â— 30  | 5                    |
| 31 â— 45  | 24                   |
| 46 â— 55  | 33                   |
| 56 +  | 38                   |
| Not given   | 1                    |
| <b>Years of Experience as a Sheep and Beef Farmer</b> |                      |
| 0 â— 3  | 1                    |
| 4 â— 10   | 8                    |
| 11 â— 20  | 20                   |
| 21 +  | 68                   |
| Not given   | 3                    |

## Feed Planning and Pasture Management

The majority of respondents indicated that they informally feed plan (79%). Only 19% said they had a formal feed plan. 23% of respondents said they found feed planning to be useful on their farm. Most respondents said they were able to judge pasture cover by eye and so did not need to measure pasture growth (52%). These details are outlined in Table 2.

**Table 2.**  
Percentage of Respondents Who Feed Plan and Monitor Pasture

|  | <b>% Respondents</b> |
|--|----------------------|
| Informally feed plan                                     | 78                   |
| Feed plan formally                                       | 19                   |
| Seasonal variation in area makes feed planning difficult | 21                   |

|   |    |
|---|----|
| Regularly use a rising plate meter or probe | 4  |
| Regularly use a sward stick                 | 6  |
| Judge pasture growth by eye                 | 52 |
| Monitor soil temp. & rainfall               | 24 |

## Description of the Three Segments

The first segment consisted of survey respondents who indicated that they informally feed plan. This segment represented 49% of respondents. Only 13% of farmers in this segment indicated they found feed planning to be useful on their farm. Respondents in this segment gave no indication that they had any particular issues or problems (e.g., changing their farming system to include cropping) that might require them to feed plan more formally.

The second segment, representing 29% of respondents, consisted of farmers who also indicated that they had informal feed plans. However, these respondents also indicated there were a range of reasons for this. Some felt that informal feed planning was the most appropriate approach given the seasonal variation in their area (73%). Others indicated they had used a formal feed plan in the past but no longer needed to (21%). In addition, some respondents thought that having undeveloped pasture meant that feed plans were not as relevant (24%). Only 8% of farmers in this segment indicated they felt feed planning was useful on their farm.

The third segment, 22% of respondents, consisted of farmers who formally feed plan. In contrast to respondents in other segments, 61% indicated that feed planning was useful on their farm. Some farmers in segment 3 indicated they were new to the industry or farm (8%), while other indicated that they had changed their farming system and needed a feed plan to manage that change (22%).

Key challenges were identified for an industry-driven learning program. Specifically, being able to design a learning program that farmers in segment 1 would take part in, and being able to provide information on feed planning that addressed issues identified by farmers in segment 2 (namely seasonal variation and undeveloped pasture).

## Learning Preferences

Survey respondents indicated that workshops needed to cater for a range of farmers of any age and level of experience (42%). Respondents indicated they were interested in a range of technical information. Farmers were asked whether they felt they would need extra training to help develop their computer skills, given that the new tools would require basic computer skills. 49% of respondents indicated they would be interested in furthering their computer skills.

There were some differences between the segments in their responses to questions about the types of learning events that might be useful. For example, farmers in segment 3 were more likely to be interested in other feed planning technology (44% of segment 3, in contrast to 23% of segment 1 and 30% of segment 2). Farmers in segment 3 were also more interested in furthering their computer skills (72% of segment 3, in contrast to 43% of segment 1 and 42% of segment 2).

## Workshop Development and Delivery

The findings of the segmentation identified the need for a series of differentiated workshops to meet the differing feed planning needs of farmers and their particular ages, experience and situations. A series of four differentiated workshops were developed. The findings also identified the opportunity for a trial of elearning approaches as a new delivery mechanism for farmer discussion and information acquisition.

### *The FeedSmart Workshop Series*

The segmentation found that there were a large number of respondents (49%) who stated that they currently feed plan informally and that they were not particularly interested in changing to more formal approaches. Despite their large numbers, we decided we would not make this group the main focus of our delivery program in the first instance, because they had indicated clearly that they saw little reason to change their current feed planning practices. Instead we decided to commence our delivery by targeting segments 2 and 3, those farmers who had either tried formal feed planning in the past or who were currently using formal feed planning approaches. We chose these segments to work with in the first instance, because they had clearly identified their feed planning needs and interests and these needs and interests fitted well with the FeedSmart feed planning computer based programs.

#### i) Tools for Feed Planning Workshops

These workshops consisted of an interactive, hands-on computer session that introduced farmers to recently developed feed planning tools and allowed the participants to work through various feed scenarios such as drought events. In response to the survey findings, which indicated farmers would like help with computer skills, each "tools" workshop was limited to 15 participants, and each workshop was facilitated by two presenters in order to give participants individual assistance with computer skills.

In line with adult learning theory (Knowles et al., 2005), the design and development of the workshops were carried out with end user, that is farmer, input. To achieve this, farmers were involved in all stages of the planning, development and piloting of the workshops.

#### ii) Introduction to Feed Planning Workshops

The survey work had identified a need for workshops for people new to feed planning. The aim of these workshops was to provide farmers with a basic knowledge of feed planning principles and animal feed requirements and experience with pasture measurement and simple feed calculations. These workshops featured a balance of in the field activities as well as presentations, discussions, and simple feed planning activities. These workshops also gave participants a brief overview of more advanced feed planning approaches and recently developed computer based tools. An important feature of these workshops was the co-facilitation of the presentations by a local "credible" farmer along with an agricultural scientist.

Although these workshops were developed specifically for farmers new to feed planning and it was envisaged that the majority of these would be young farmers, a number of farmers from segments 1 and 2 attended. Feedback from the presenter indicated that they attended to affirm their current practices, to learn how to handle extreme weather events like droughts, and to view the new feed planning technologies.

#### iii) Special Interest Workshops

Special interest workshops were provided to meet the needs of groups of farmers around the country who requested workshops that were tailored to their needs. To ensure that each workshop met the particular needs

of each group, the facilitator worked with members of the group to collaboratively design workshop structure and content. The groups that requested this type of workshop included rural women, agricultural learning institutions, and large farms with several employees.

#### iv) Key Influencer Workshops

Although not identified specifically by the survey and interviews, previous experience from another agricultural Extension program had highlighted the importance of providing the people who assist and support farmers, e.g., vets and farm consultants, with workshops on the same subject as the farmer workshops in order to inform the support personnel about the programs. To this end we designed and carried out series of key influencer workshops specifically for fertilizer representatives and farm consultants.

### ***The elearning Trial***

The elearning trial was scheduled to commence late 2008. This trial aims primarily to investigate in more depth the interest and readiness of farmers to use a range of elearning mediums in Extension programs. In particular, we wish to investigate the feasibility of supplying farmers with Extension programs on topics such as feed planning via the New Zealand Ministry of Education video-conferencing network, possibly supported by other at home learning mediums such as Skype and Moodle. The elearning trial is based on and supported directly by personnel from North Dakota State University who have been using elearning mediums, and in particular video-conferencing, as an Extension delivery approach for agricultural communities for nearly 20 years.

## **Educational Importance and Implications**

This approach to the construction and delivery of agricultural learning programs highlighted several significant considerations and implications for other people who may wish to use this approach. In particular, the use of market segmentation to identify learner prior knowledge and learning preferences reinforced our supposition that it should not be presumed that "one size of learning experience" will fit the needs of all learners. The findings of the study reported here showed that the target group of farmers had a wide set of learning needs based on prior knowledge, experience, age and gender.

We fully acknowledge that the identification of farmers' prior knowledge and preferred learning styles and the subsequent design, development, and delivery of a series of workshops to meet these identified needs has significant cost and time implications for Extension developers. However, we believe that this up-front investment is worthwhile, because it will increase the impact of extension events and programs. At the time of writing this article, we were still in the early stages of the delivery program. However, early farmer review of the workshop series resulted in very positive feedback. In particular, farmers endorsed this approach to Extension because they stated they were able to attend workshops that catered for their specific needs rather than having to attend more generic workshops aimed at a wide range of knowledge and skill levels.

Use of farmers in all stages of the development of the workshops was perceived by the farmers to be a very positive move. They reported that this collaborative approach made them feel that they had been "listened to" and that the resulting workshops were relevant to their needs, were pitched at appropriate levels, were held at times and in places that they had asked for, and took account of local contexts, issues, and scenarios.

In conclusion, it is our contention that, despite the additional time and cost of using a market segmentation approach as the basis for the design of a series of workshops on a topic, workshops designed in this way result in Extension programs that are truly based on adult learning theory rather than purporting to do this. We also contend that workshops designed in this way offer learners more appropriate workshop design and



delivery than is possible under the more traditional "one size fits" all approach to agricultural Extension programs.

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