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SOME FACTORS WHICH INFLUENCED KNOWLEDGE AND USE OF TAIL PAINTING— A STUDY IN EXTENSION

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SUMMARY

A questionnaire was sent to herd owners in Waikato (W), Bay of Plenty (B) and Taranaki (T) regions in early 1978 as a sequel to the promotion of the use of the technique of tail painting by advisers in the W region in August to October 1977. Replies were received from 1412 W, 179 B and 332 T herd owners. Discussion group (dg) members and AB users were more likely to reply than non-dg owners or non-AB users. Whereas 89% of the 1412 W herd owners had heard of the technique, the comparable "awareness" rates in B and T were 87% and 74%, respectively. The "awareness rate" was higher among dg members in each region.

The "adoption rate" (% of users/% of those aware) was 42% in W, compared with 27% and 24% in B and T, respectively. In each region the adoption rate amongst dg members was twice that found among non-dg herd owners, with the W-dg adoption rate being 52%. The results show that advisory services can have a major impact on the adoption of a new technique even though many herd owners may already be aware of it.

INTRODUCTION

Studying the adoption of new technology can prove difficult because of the influence of a variety of factors. Tail painting, when used as an aid to oestrus detection, is a relatively new technique (Macmillan and Curnow, 1977) which has the advantage of being easily demonstrated. The opportunity was taken to exploit these characteristics to obtain a better understanding of the adoption process, and to assess the influence which a promotion campaign conducted by advisers can have on this process.

MATERIAL AND METHODS

In August 1977, advisers (MAF and N.Z. Dairy Board) who serviced discussion groups for Waikato (W) dairy farmers were each issued with a commercial brand of enamel paint and a brush and asked to demonstrate the technique of tail painting as a useful aid in oestrus detection. It was recommended that the technique be demonstrated at group meetings held in September and October. Simultaneously, advisers in the Bay of Plenty (B)

and Taranaki (T) regions were informed of the Waikato trial but were asked not to promote the technique, with details being supplied only to herd owners who specifically requested them. The editors of the major farming journals agreed to withhold from publication articles describing tail painting during the August-October period.

A questionnaire was distributed to suppliers through all Waikato dairy companies and the larger companies in the Bay of Plenty and Taranaki in March or April of 1978. There were three parts to the questionnaire. The first part obtained information on farm locality, herd size, whether or not AB was used in the herd, and whether or not the herd owner was a member of a discussion group organized by a MAF adviser or a Dairy Board consulting officer. This section concluded with a simple question: "Are you aware of the technique referred to as *tail painting* which is used for heat detection in dairy cows?" If the reply was "yes", the herd owner was asked to complete the second section of the form, which contained questions designed to determine if the owner had known of the technique for one or more mating seasons and from where information about the technique may have been obtained. Thirteen options for the source of information were provided, with the owner ticking as many of the options as he considered appropriate. This section concluded with the question: "Have you used tail painting as a form of heat detection in your herd?"

If the answer was "yes", the owner proceeded to the third part. This contained questions about when and how the technique was used, what type, colour and brand of paint was used, which colours were most satisfactory, whether or not the technique would be used in future seasons, and whether or not it was useful, time-saving, accurate, inexpensive and easy to use.

Most of the questionnaires which were returned were satisfactorily completed. Within each region, the completed forms were placed into categories based on whether or not the owner:

- (1) knew of the technique (awareness);
- (2) used the technique (adoption);
- (3) was a member of a discussion group;
- (4) used AB.

Where necessary, chi-square tests were used to determine the statistical significance of differences between regions or groups within regions.

RESULTS AND DISCUSSION

The number of usable replies received from herd owners in each of the three regions (Table 1) represents a response rate of from 25% (W) to 11% (B). This low response rate did not represent a cross-section of herd owners in each region, as discussion group (dg) members and AB users were more likely to complete and return the questionnaire than non-dg members or non-AB users. In the 1977-8 season, 20% of herd owners were members of dg's run by consulting officers, and an additional 8 to 10% of owners were estimated to belong to MAF groups (N.Z. Dairy Board, 1978). This national average of 30% was thought to be less in the Taranaki region in the 1977 season (S.A. McKenzie, pers. comm.). Yet 44% (T) to 59% (B) of questionnaire replies were received from dg members. Similarly, while only 60% of dairy herds used the Dairy Board/Livestock Improvement Association AB services (N.Z. Dairy Board, 1978) and an estimated 5% may have used other AB services, 86 to 90% (Table 1) of replies were from AB users. These sample biases were similar in each of the three regions. While conclusions reached from the analysis of data derived from the questionnaires may not be applicable to the dairy farming population, comparisons between dg and non-dg herd owners within a region or between regions can be justified.

TABLE 1: SAMPLE COMPOSITION OF REPLIES RECEIVED TO TAIL-PAINTING QUESTIONNAIRE

	W*	B	T
No. of replies	1 412	179	332
Response rate (estimate) %	25	11	16
% of replies from:			
discussion group members	56	59	44
AB users	86	90	87

* W = Waikato, B = Bay of Plenty, T = Taranaki regions.

AWARENESS

The rate of awareness of the technique of tail painting varied from 74% in T to 89% in W (Table 2), with this regional difference being significant (T vs. W = $P < 0.01$). In each region a higher proportion of dg members were aware of the technique, with the lowest awareness rate being among non-dg

members in T (63%). These results show that at least among the herd owners returning the questionnaires there was a surprisingly high rate of awareness.

A higher percentage of W herd owners (44%) knew of the technique before the 1976 season, but when replies from those who had not heard of tail painting were excluded the regional differences in the time of awareness were not significant (49 vs. 45 vs. 55; Table 2).

TABLE 2: RATE OF "AWARENESS" OF TECHNIQUE OF TAIL PAINTING

	W	B	T
(a) % knowing of technique in 1977	89	87	74
(b) % knowing of technique for less than 1 yr	45	48	33
(c) % knowing of technique for more than 1 yr	44	39	41
(d) (c) as a % of (a)	49	45	55
(e) Discussion group members	96	92	88
(f) Non-discussion group owners	80	79	63

ADOPTION

The technique was most widely used by W herd owners (Table 3, $P < 0.01$) with this significant difference still remaining after account was taken of the lower awareness rate in T. The "adoption rate" is best measured amongst herd owners aware of the technique. The results in Table 4 show that while the adoption rate in W was higher than in the other two regions, in each region the rate amongst dg members was approximately double that found among non-dg members. The promotion of the technique by advisers in the W region would have extended beyond dg members either directly (adviser-farmer contact) or indirectly (farmer-farmer contact). The adoption rate among non-dg herd owners in W was 10 to 12% higher than the adoption rate among comparable herd owners in B and T (27% vs. 17% or 15%; Table 3). The relative regional differences among dg members were 18 to 20% (52% vs. 34% or 32%).

Thus, regional differences in awareness were comparatively less than differences in adoption rate, with the promotional activities of the W advisers increasing this rate to 52% among dg members. This promotional effect is further demonstrated if the adoption sequence in the W region is analysed. The results

TABLE 3: USAGE RATE AND ADOPTION RATE OF TAIL PAINTING

	W	B	T
Usage rate* (%)	38	24	18
Adoption rate** among:			
discussion group members (%)	52	34	32
non-discussion group owners (%)	27	17	15
aware herd owners (%)	42	27	24

* Includes all replies.

** Excludes those not knowing of technique.

in Table 4 show that the dg members had a higher awareness than non-dg members (a), with a higher proportion of the latter group learning of the technique more recently (b). But whereas 46% of dg members who learned of tail painting in 1977 used it that season, only 28% of equivalent non-dg members used it (d). Similarly, the adoption rate among dg members knowing of the technique in 1976 or before increased by 44% (e-f = 56-12) when the comparable increase among non-dg members was 19% (23-4).

TABLE 4: ADOPTION SEQUENCE IN WAIKATO HERDS OWNED BY DISCUSSION GROUP MEMBERS (dg) OR NON-DISCUSSION GROUP (non-dg) HERD OWNERS

	dg	Group non-dg	Total
No. of herd owners	796	616	1 412
(a) "Awareness rate" (%)	96	80	89
(b) Known only in 1977	41	67	51
(c) Known before 1977 } as % of (a)	59	33	49
(d) Adoption rate* among (b) in 1977	46	28	38
(e) Adoption rate among (c) in 1977	56	23	48
(f) Adoption rate among (c) in 1976	12	4	11

* See Table 3.

PATTERNS OF USAGE AND SOURCE OF INFORMATION

It was recommended that enamel paint be used for tail painting. This advice was adopted by 80% of W users but by only 61% of users in B and T. Similarly, it was suggested that all cows in the herd should be tail painted, with 87% of W users adopting the suggestion. The comparable figures in B and T were 86% and 61%, respectively. It is noteworthy that 15% of W herd

owners also tail-painted their yearling heifers. Only 7% of B and T herd owners did likewise. Regional differences were also noted in the colour of the paint used.

CONCLUSIONS

The results of this survey indicate that the implementation by herd owners of a new technique such as tail painting is a two-stage process — awareness and then adoption. While the media and other means of disseminating information play an important role in creating and increasing awareness, comparatively slow and low rates of adoption will usually result unless a technique is promoted or economic incentives are used in the promotion. Being able to demonstrate a simple technique is an advantage. The role of the adviser working through his discussion groups is one effective way of capitalizing on farmer awareness to achieve the ultimate objective, which is successful adoption.

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