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ACCEPTANCE OF RESEARCH RESULTS BY FARMERS

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1. SUMMARY

In 1962 a rabbit eradication campaign was carried out in the Mallee Region of Victoria. After the campaign was completed, a sociological survey was done to assess the farmers' reaction to it. The survey showed that new techniques were rapidly adopted by the farmers concerned. This was due to the intensity of personal contact during the campaign, and to the use of research results as the basis for the recommendations. While research results convinced some farmers to adopt the recommendations, legal, social and situational pressures were important for others. Different sources of information were used by different types of farmers. The more active and progressive farmers used the more expert sources while others used local sources of information. The campaign developed more favourable attitudes to rabbit control and to the use of new methods of control.

2. INTRODUCTION

Rabbits were introduced into Australia in 1859. Since then they have spread to most parts of southern Australia. Frequently in the past they became a plague and denuded the countryside. Laws were passed requiring every landholder to destroy the rabbits on his property. The release of Myxoma virus in Australia by Ratcliffe and his co-workers in CSIRO in 1950 alleviated the problem of rabbit plagues for some time. However, in 1962, in the Mallee region, farmers reported that even while they were sowing their crops rabbits were running under their implements and being killed. They also reported that they expected a proportion of up to 15 per cent of their sown acreage to be eaten by rabbits before they could harvest it.

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Because of this situation the Vermin and Noxious Weeds Destruction Board (VNWDB), Department of Lands, initiated a campaign aimed at the eradication of rabbits in the Mallee Region of Victoria. An extension team (three members of the Research Branch of the Board) addressed 69 meetings in local halls and schools. They outlined the campaign and described the methods of rabbit destruction recommended to be used.

The methods recommended were based on the findings of the Research branch of the Board and the Wildlife Division of the CSIRO. The research results which the extension team presented to the farmers demonstrated the relative efficiencies of the methods available.

The campaign was organized from a central office in the region, manned by the extension team. As well as addressing meetings, distributing printed material to all farmers in the area, preparing press and radio releases and personally visiting farmers, the central office staff were responsible for the supply of carrots, 1080 poison, machinery and manpower to all inspectorates in the region.

The local VNWDB inspector was responsible for ensuring that all farmers were fully informed of the details of the campaign. He divided his inspectorate into treatment areas, ascertained the amount of chopped carrot each farmer required, organized the supply and distribution of chopped carrot in each area, and took legal action against farmers who did not destroy the rabbits on their properties.

After the campaign was completed, the Vermin and Noxious Weeds Destruction Board requested a survey to determine the farmers' reaction to the campaign. The survey was carried out in January-March 1963.

3. METHOD

A number of informal meetings were held with members of the Vermin and Noxious Weeds Destruction Board, the extension team, inspectors, farmers, and research and extension officers of the Department of Agriculture, Soil Conservation Authority and State Rivers and Water Supply Commission. From these meetings the requirements of the sponsors, and the features of the campaign and the region which were suitable for investigation, were determined. Hypotheses were then formulated. Next, a schedule of questions was constructed to obtain the information sought by the sponsors and to obtain data to test the hypotheses.

The schedule of questions was in two parts. Part I was designed to obtain the information required by the Department and to obtain data for the evaluation of the campaign. It was discussed with 120 farmers. Part II was designed to obtain information about farming practices and personal attributes relevant to the hypotheses to be tested. It was presented immediately after Part I to sixty farmers.

A trial run was arranged to ensure uniformity between interviewers, as well as the normal testing of wording, sequence, and respondent orientation.

4. SAMPLING

Of the fourteen inspectorates in the region, the two western, the two southern, and one producing mainly dried fruit, were excluded. A sixth was used for the trial run. Twenty farmers in each of three inspectorates which had similar soil types and rainfall were asked both of the schedules of questions. Twelve farmers in each of the other five inspectorates were asked only the questions in Part I of schedule of questions.

The farmers interviewed were selected at random from all those in the inspectorates who had:—

- (1) the main source of income from cereal crops and/or sheep,
- (2) secure tenure,
- (3) managed the farm for at least three years,
- (4) a farm size of not less than 600 acres, and not more than 20,000 acres.

These restrictions excluded 262 farmers from the total population of landholders in the eight inspectorates.

Eighty of these were excluded from the three inspectorates selected for both schedules of questions. This left a population of 444, of whom 60 were interviewed. One hundred and eighty-two were excluded by the restrictions in the five inspectorates to be given only Part I of the schedule. This left a population of 513, of whom 60 were interviewed.

Over all, one farmer in eight was interviewed. The long distances to be travelled, restrictions of time and finance, and the allocation of only two interviewers, did not allow a larger proportion of the population to be interviewed.

Those selected were interviewed, with the exception of one farmer who declined.

5. RESULTS

A. Sponsor information

The specific information requested by the sponsor has been presented in a preliminary report.¹

B. Evaluation of the campaign

(i) ADOPTION OF THE RECOMMENDATIONS

Only four of the 120 farmers interviewed did not follow the recommendations of the campaign. The inspector had found these farms free of rabbits, so action was not required. All other farmers in the sample adopted the recommendations at least in part.

(ii) CHANGES IN SUPPORT FOR THE CAMPAIGN

Forty-seven farmers reported that before the campaign started, they were in favour of such a campaign, while 73 opposed it. After the campaign 104 were in favour of such campaigns, and only 16 were still against them.

(iii) CHANGES IN METHODS OF CONTROLLING RABBITS

The methods which the farmers had used before the campaign and intended to use after the campaign are given in table 1.

¹ H. A. Presser and H. M. Russell.—*A Study of the 1962 Rabbit Eradication Campaign in the Mallee Region*. Interim Report, University of Melbourne, 1963.

TABLE 1
Methods Used to Control Rabbits on Farms

Method	Number Using before Campaign	Number Using after Campaign	Direction of Change	Significance
Carrots and 1080 ..	8	81	more using	very high P .0001
Ripping of warrens ..	115	113	no change	not significant
1080 and oats ..	98	44	less using	very high P .0001
Myxo inoculation ..	50	6	less using	very high P .0001
Trapping and spot-lighting.	51	26	less using	very high P .0001
Fumigation	65	45	less using	very high P .001

There was a highly significant change to using carrots and 1080 and a highly significant change away from the methods not advised for the campaign.

In the year before the campaign only four tons of carrots were used for rabbit baiting in the region. In the year after the campaign the farmers used 280 tons of carrots. This indicates that the statements about carrots and 1080 shown in Table 1 are valid.

(iv) CHANGES IN ATTITUDE TOWARDS RABBITS

After the farmers had stated the methods they used to control rabbits before the campaign began, they were asked what they were trying to do about rabbits. Thirty questions later, after they had stated the methods they intended to use, they were asked what they would now be trying to do about rabbits. The results are given in Table 2.

TABLE 2
Attitudes Towards the Control of Rabbits on Farms

Attitude before the Campaign	Attitude after the Campaign				
	Eradicate	Control	Keep Around	Total	Percentage
Eradicate	43	43	Per cent 36
Control	40	21	3	64	53
Keep around	6	3	4	13	11
Total	89	24	7	120	..
Percentage	74	20	6	..	100

The attitude "Eradicate the rabbit" changed from 36 per cent before the campaign to 74 per cent after it ; that of "Control the rabbits" changed from 53 per cent before to 20 per cent after, and that of "Keep rabbits around" changed from 11 per cent before to 6 per cent after the campaign finished.

(v) CHANGES IN BELIEF

Answers to the question "Has the campaign changed what you think can be done about rabbits" are summarized in Table 3.

TABLE 3
Change in Belief as a Result of the Campaign

Degree of belief that control of rabbits is now possible	Number of Farmers	Percentage
Much more hope	37	31
More hope	47	39
A little more hope	5	4
No change	30	25
Don't know.. .. .	1	1
Total	120	100

The figures indicate that 74 per cent of the farmers believed that with the new methods they could more effectively control rabbits.

C. Sources of Information About the Campaign

The survey was planned to determine what sources of information were used by the farmers, and then to assess the effectiveness of the different sources as communicating agents.

(i) ENUMERATION OF ALL SOURCES WHERE THE FARMERS HEARD ABOUT THE CAMPAIGN

The farmers heard about the campaign and the recommendations from a large number of sources. The method used was to ask the question "From where did you hear about the campaign", record the responses, then proceed through a check list of all sources. The responses are given in Table 4.

Impersonal sources of information (printed material and radio) account for 61 per cent of the sources reported, VNWDB officials for 20 per cent and acquaintances account for 19 per cent of the sources where the farmers heard about the campaign.

(ii) MOST INFORMATION

The answers to the question "Which of all the ways you heard about the campaign gave you the *most* information about what to do?" are different from those of where they heard about the campaign.

TABLE 4
Sources of Information about the Campaign

Source of Information	Number of Farmers	Percentage
<i>Impersonal</i> , consisting of—		
Letter from VNWD Board	107	
Articles in local papers	106	
Melbourne daily papers	54	
Farm Papers:		
Weekly Times	86	
Stock and Land	27	
Wheat and Woolgrower	73	
Producer	21	
Countryman	38	
Talks or reports on radio	96	
Television	5	61
<i>VNWDB Officials</i> (personal formal) consisting of—		
Attendance at organized meeting (expert)	49	
Discussion with extension team (expert)	13	
Inspector or assistant on farm (local)	70	
Inspector or assistant elsewhere (local)	26	20
<i>Acquaintances</i> (personal informal)—		
Other farmers	113	
Freezer operators	25	
Trappers	46	19
Total.. .. .	955	100

TABLE 5
Sources of Most Information about the Methods of the Campaign*

Source of Information	Number of Farmers	Percentage
<i>VNWDB Officials</i>		
Organized meeting (expert)	36	
Inspector (local)	76	
Advisory committee members (local)	2	86
<i>Impersonal</i>		
Letter from VNWD Board	4	
Farm papers	7	
Radio	5	12
<i>Acquaintances</i>		
Other farmers	3	2
Total.. .. .	133	100

* Multiple answers were accepted.

Eighty-six per cent of the farmers obtained most information about what to do from VNWDB officials. Only 12 per cent got most information from impersonal sources.

(iii) SOURCE CREDIBILITY

VNWDB officials were again most frequently named when the farmers were asked "Of all the sources of information which ones were you able to believe most readily?" (Table 6)

TABLE 6

*Sources of Information which the Farmers Could Believe Most Readily**

Source of Information	Number of Farmers	Percentage
<i>VNWDB Officials</i>		
Organized meeting (expert)	19	
Extension team (expert)	15	
Inspector or his assistant (local)	53	67
<i>Acquaintances</i>		
Other farmers	9	7
<i>Impersonal</i>		
Farm papers	2	
Letter from VNWD Board	3	
Radio	2	6
Research results	8	7
Own trial	4	3
Believed all	7	5
Believed none	7	5
Total.. .. .	129	100

* Multiple answers were accepted.

Sixty-seven per cent of the farmers believed the officials as sources of information, seven per cent believed other farmers' reports and six per cent believed impersonal sources. Ten per cent of the farmers did not accept any source of information. They gave highest credibility to research results and their own trials.

(iv) MOST HELP IN DECISION

In response to the question "Which of all the sources of information gave you most help in deciding to participate (or not) in the campaign?" an even greater number of farmers gave reasons for participating rather than sources of information. (Table 7)

Sources of information account for only thirty-seven per cent of these responses. Of these officials account for twenty-nine per cent, acquaintances seven per cent, and impersonal 1 per cent. The remainder of the responses are statements why they joined in (number of rabbits on the property thirteen per cent) or explanation why they joined in (research results seven per cent and self seven per cent) or reasons why they felt they had to join in (compulsion twenty-two per cent and group conformity fourteen per cent).

TABLE 7
Sources of Most Help in Deciding to Participate in the Campaign*

Source of Information	Number of Farmers	Percentage
<i>VNWDB Officials</i>		
Organized meeting (expert)	15	
Extension team (expert)	2	
Inspector (local)	27	29
<i>Acquaintances</i>		
Other farmers	11	7
<i>Impersonal</i>		
Letter from VNWDB	1	
Local papers	1	1
Research results	11	7
Self	11	7
Compulsion (fear of legal action)	35	22
Group conformity	23	14
Rabbits on the farm	21	13
Total.. .. .	158	100

* Multiple answers were accepted.

(v) CONVINCED TO USE CARROTS AND 1080

Similar results were obtained in answer to the question "What particular point in the whole campaign 'sold' the idea of using carrots and 1080 to you?" (see Table 8)

TABLE 8
Points that Convinced Farmers to Use Carrots and 1080*

Source of Information	Number of Farmers	Percentage
<i>VNWDB Officials</i>		
Recommended by VNWDB	23	15
<i>Acquaintances</i>		
Recommended by other farmers	2	1
Research results	59	41
Compulsion (fear of legal action)	26	17
Group conformity	19	13
Own experiment	6	4
Carrots were available	8	6
Support for the campaign	4	3
Total	147	100

* Multiple answers were accepted.

Research results convinced forty-one per cent of the farmers that they should use carrots and 1080. Legal and social pressures and VNWDB officials account for most of the remaining responses.

D. Interrelationships

(i) MANAGEMENT AND PERSONAL FACTORS

Sixty farmers in three inspectorates were asked part II of the schedule of questions, as well as part I. From the responses to part II the following measures were obtained.

Management Score. This was based on the use of eleven farming practices recommended by the Department of Agriculture and the Soil Conservation Authority in the Mallee region. The practices were applicable to most farmers engaged in that industry in the Region. To make the scores equivalent for wheat and/or sheep farming, the total points were divided by the number of practices applicable to that farmer, e.g., a farmer who did not grow wheat was not penalized for not following the wheat recommendations.

Innovativeness Score. This score was based on the adopter categories, or the year of adoption of barrel medic, lucerne and sulphate of ammonia. Extra points were given for experimentation with new pasture varieties.

Printed Matter Utilization Score. This was based on the number of journals and books obtained, multiplied by the systematic reading habits of the farmer.

Social Participation Score. This was based on the number of organizations to which a farmer belonged. One point was given for each of, membership, attendance at meetings, and holding office.²

Farm Organization Score. This had the same basis as the social participation score but used farm organizations only.

Knowledge and Use of Department of Agriculture. This was based on knowledge of the location of demonstration plots, visits to field days, and contact with extension officers of the Department of Agriculture.

INTERRELATIONSHIPS WITH MANAGEMENT SCORE

The management score was tested for association with a number of personal attributes and farm measures. These are given in Table 9.

TABLE 9
Attributes Associated with Management Score

Attribute	Direction of Association	Significance of Association
Innovativeness	+	< .005 Highly significant.
Education	+	< .02 Significant.
Printed matter utilization score ..	+	< .03 Significant.
Knowledge and use of Department of Agriculture	+	< .05 Significant.
Philosophy of farming (Farming as a business)	+	< .05 Significant.
Income per acre	+	< .07 Doubtful.
Regular holidays	+	< .06 Doubtful.
Social participation score	+	Not significant.
Participation in farm organizations ..	+	Not significant.
Size of farm	—	Not significant.
Age	—	Not significant.

² F. S. Chapin.— Social Participation and Social Intelligence. *American Sociological Review*, Vol. 4 (April, 1939).

The farmers with high management scores adopted innovations earlier, were better educated, read more widely and thoroughly, attended field days and talked with extension officers more often, and regarded farming as a business rather than a way of life. They also tended to have a higher income per acre and to take holidays more regularly, than farmers with low management scores.

INNOVATIVENESS

The innovativeness score showed a different pattern of association to that shown by the management score. Results are given in Table 10.

TABLE 10
Attributes Associated with the Innovativeness Score

Attribute	Direction of Association	Significance of Association
Philosophy of farming (Farming as a business)	+	< .005 Highly significant.
Printed matter utilization score	+	< .02 Significant.
Knowledge and use of Department of Agriculture	+	< .06 Doubtful.
Size of farm	+	< .07 Doubtful.
Regular holidays	+	< .07 Doubtful.
Education	+	Not significant.
Social Participation score	+	Not significant.
Participation in farm organizations	+	Not significant.
Income per acre	+	Not significant.
Age	—	Not significant.

The farmers with high innovativeness scores regarded farming as a business, and read more widely and thoroughly. They tended to have larger farms, to attend field days and talk with extension officers, and to take holidays more regularly than farmers with low innovativeness scores. Compared with management, innovativeness for this sample shows less association with education and efficient use of resources, and a closer association with farm size.

(ii) COMMUNICATION

The interrelationships between sources of information and personal attributes of the farmers were investigated to ascertain whether any sources of information had a differential effect. As age, education, knowledge and use of the Department of Agriculture and other variables showed no definite relationships with sources of information about the campaign, they are omitted from the following tables.

Likewise as impersonal sources and acquaintances receive only a small proportion of the responses, they are omitted. These omissions will affect the totals in each of the subsequent tables. As management and innovativeness scores were constructed for 60 farmers, the totals will be 60, less those who did not mention the variable under discussion. For the remaining attributes the total will be 120 less those who did not mention the variable under discussion. Totals for those can be obtained from Tables 5, 6, 7 and 8.

TABLE 11

Association Between Officials as Sources of Most Information and Attributes of the Farmers

Attribute		Number of Responses Mentioning VNWDB Officials			Significance	Comments on use of Information Sources
		Expert	Local	Total		
Management score . . .	High ..	10	16	26	N.S.	
	Low ..	9	21	30		
	Total ...	19	37	56		
Innovativeness score ..	High ..	15	16	31	.05	Significantly more of the highs use expert sources. Disproportionately more lows use local sources.
	Low ..	4	21	25		
	Total ...	19	37	56		
Printed matter utilization score.	High ..	19	23	42	.05	Disproportionately more highs use expert and lows use local sources.
	Low ..	19	53	72		
	Total ...	38	76	114		
Social participation score ..	High ..	10	10	20	N.S.	
	Low ..	28	66	94		
	Total ...	38	76	114		
Participation in farm organizations.	High ..	17	18	35	.02	Disproportionately more highs use expert and lows use local sources.
	Low ..	21	58	79		
	Total ...	38	76	114		

TABLE 12

Association Between Officials Quoted as Sources of the Most Credible Information and Attributes of the Farmers

Attribute		Number of Responses Mentioning VNWDB Officials			Significance	Comments on use of Information Sources
		Expert	Local	Total		
Management score . . .	High ..	9	11	20	N.S.	
	Low ..	10	17	27		
	Total ...	19	28	47		
Innovativeness score ..	High ..	14	12	26	.05	Disproportionately more highs believe expert and lows believe local sources.
	Low ..	5	16	21		
	Total ...	19	28	47		
Printed matter utilization score.	High ..	18	13	31	.01	Significantly more high believe expert. Disproportionately more lows believe local sources.
	Low ..	16	40	56		
	Total ...	34	53	87		
Social participation score..	High ..	10	5	15	.05	Disproportionately more highs believe expert and lows believe local sources.
	Low ..	24	48	72		
	Total ...	34	53	87		
Participation in farm organizations.	High ..	16	8	24	.01	Significantly more highs believe expert. Significantly more lows believe local.
	Low ..	18	45	63		
	Total ...	34	53	87		

Differential use of official sources, for most information. (Table 11)

Disproportionately more of those farmers with high scores for innovativeness, reading and participation in farm organizations used the expert official sources (meetings and extension team) than did those with low scores, who generally used the local official source, the Inspector.

Differential use of official sources which the farmers could believe most readily. (Table 12)

The farmers with high scores for innovativeness, reading, and participation in social and farm organizations believed the extension team members most readily while those with low scores believed the inspector.

The results for most help in decision are similar to those above, but because the numbers mentioning officials is small, the results do not reach the .05 levels of significance.

Different explanations and reasons given for deciding to participate in the campaign.

As shown in Table 7, many farmers, instead of stating the sources of information which were most help in deciding to participate in the campaign, gave explanations why they joined in the campaign. (The results are given in Table 13.)

Significantly more of those with high management scores stated that research results induced them to participate in the campaign while disproportionately more of those with low management scores gave reasons why they felt they had to participate.

Different explanations and reasons given for using the recommended bait.

The large number of explanations and reasons stated as the points that "sold" carrots and 1080 to the farmers permits examination of whether a differential effect of explanations or reasons existed. (Table 14)

The farmers with high scores for reading and participation in farm organizations give explanations why they joined in the campaign, and those with low scores give reasons why they felt they had to join in. But those farmers with high scores for innovativeness gave reasons why they felt they had to join in and those with low scores gave explanations why they did join in. This is another case where the innovators are different from the remainder. Some further aspects of the results are detailed by Russell.³

³ H. M. Russell. *A Survey of the Rabbit Eradication Campaign in the Mallee*, M.Agr.Sc. Thesis, University of Melbourne, 1964.

TABLE 13
Association between Explanations and Reasons Given for Deciding to Participate and Attributes of the Farmers

Attribute	Explanations			Reasons			Total	Significance	Comments
	Self	Research Results	Group Conformity	Group Conformity	Compulsion	Compulsion			
Management score ..	High ..	4	3	6	8	8	21	.05	Significantly more highs give explanations and disproportionately more lows give reasons.
	Low	1	9	16	16	26		
	Total ..	4	4	15	24	24	47		
Innovativeness score	High ..	3	4	7	13	13	27	..	N.S.
	Low ..	1	..	8	11	11	20		
	Total ..	4	4	15	24	24	47		

TABLE 14
Association between Explanations and Reasons for Using Carrots and 1080 and Attributes of the Farmers

Attribute	Explanations		Reasons		Total	Significance	Comments
	Research Results		Compulsion	Group Conformity			
	High	Low					
Management score . .	High	14	9	4	27	N.S.	
	Low	17	8	7	32		
	Total	31	17	11	59		
Innovativeness score	High	13	12	7	32	.05	Disproportionately more highs give reasons and lows give explanations.
	Low	18	5	4	27		
	Total	31	17	11	59		
Printed matter utilization score.	High	27	7	5	39	.05	Disproportionately more highs give explanations and lows give reasons.
	Low	32	19	14	65		
	Total	59	26	19	104		
Social participation score.	High	12	5	1	18	N.S.	
	Low	47	21	18	86		
	Total	59	26	19	104		
Participation in farm organizations.	High	21	4	3	28	.05	Disproportionately more highs give explanations and lows give reasons.
	Low	38	22	16	76		
	Total	59	26	19	104		

DISCUSSION

The campaign which this study reports was unique in the area covered (approximately 25,000 square miles), in the intensity of the extension effort, and in the stress placed on the results of research. Every farmer was informed by a letter and pamphlet, by personal contact, and by articles and notices released through mass media. Every farmer was encouraged or forced to take action to destroy the rabbits on his property.

The evaluation study shows 100 per cent adoption of the main recommendations in a period of five months. As well as the rapid and complete adoption of the recommendations at that time, the campaign induced considerable changes in behaviour, opinion, attitudes and aspirations in the area.

One of the chronic complaints of people concerned with affecting changes is the adoption lag; or the time taken for people to adopt the results of research. The speed and magnitude of the changes in this study approach what extension officers are attempting to achieve.

Mass media (impersonal sources) are regarded as an efficient means of getting information to people because of the potential effect in relation to the financial cost and personal effort involved. Sixty-one per cent of all the sources from where the farmers heard about the campaign are impersonal sources. This supports the finding that mass media creates awareness of new developments.

However, only 12 per cent referred to impersonal sources as the source of most information, 6 per cent as the source of highest credibility, and only 1 per cent as most help in deciding to participate. In one area of the region where the local press and radio highlighted opposition to the campaign, there was no discernable difference between the responses of the farmers in that area and the responses in other areas where the mass media supported the campaign. This suggests that mass media have little effect beyond the awareness and interest stages of the adoption process.

Mass media were used intensively during the campaign, but no single source reached all the farmers. Prior to, and during the campaign the local press carried editorials, articles and notices about the campaign. Ninety per cent of the farmers recalled reading about the campaign in the local newspapers. Similarly with radio, where the number of talks, news items and notices deterred some regular listeners from turning on the radio, 80 per cent reported hearing about it on the radio. Early in the campaign every landholder was mailed a letter explaining the campaign. Ninety per cent could recall receiving and reading it. The one presentation mailed direct to each farmer reached as many farmers as the many presentations in the mass media.

No attempt was made to ascertain the spotlight effect of impersonal sources (first heard about it) or the reinforcement effect, although the large number of mass media sources mentioned suggests that they had some reinforcement effect.

Officials of the Vermin and Noxious Weeds Destruction Board gained the greatest proportion of mentions. They received 20 per cent of the mentions of where the farmers heard about the campaign, 86 per cent for most information, 67 per cent for highest credibility, 29 per cent for most help in decision, and 15 per cent for convincing farmers to use carrots and 1080. This is one half of *all* the mentions, and two thirds of all the mentions of actual sources of information. VNWDB officials had more effect than all other sources combined. This is not usual. The Australian studies of Parish (1954); Fallding (1957); Emery and Oeser (1958); Wilkening, Tully and Presser (1962); and McCarthy and Tugby (1962);⁴ indicate that only 25 per cent to 40 per cent of farmers use departmental sources of information. These are the extension officers—experts residing in the area. Most of the farmers use acquaintances and other farmers who have adopted the recommendations of the experts and who are able to communicate their experience and opinions. The campaign was managed by VNWDB officials of two types. The first type was expert and non local—the visiting extension team. Their duties were to organize the campaign as a whole, and to present the research results and the recommendations at the meetings of farmers. They were equivalent in many ways to the extension officer of the other studies. Thirty per cent of the farmers referred to them as sources of information. This percentage is about the same as that for extension officers.

The second type of official information source was the local VNWDB inspector. The inspectors were concerned with the mechanics of the campaign in their inspectorates including any legal action necessary if the farmers did not get rid of the rabbits. They received two-thirds of the mentions for officials. This fact, combined with the lack of reference to acquaintances, indicates that the inspectors replaced other farmers as the second step in the normal process of diffusion of information. It accounts for the high proportions of officials as sources of information. Personal contact and information given by a local official instead of acquaintances was a factor in the success of the campaign.

Studies concerning the communication of information about improved practices, Ryan and Gross (1943); Emery and Oeser (1958); Parish (1954); Fallding (1957); Rogers (1961); Wilkening (1952); Beal (1958); North Central Regional Extension Publication No. 13 (1961)⁵ show that different types of farmers use different sources of information. Earlier adopters seek out the more expert sources of information, read more high level books, are better educated and attend meetings. The later adopters seek information from other farmers, especially those who are more expert than themselves (Wilkening, Tully and Presser (1962)).⁶

⁴ R. M. Parish.—Innovation and Enterprise in Wheat Farming. *Review of Marketing and Agricultural Economics*, Vol. 22, No. 3 (September, 1954).

H. Fallding.—Social Factors in Serrated Tussock Control. University of Sydney, *Department of Agricultural Economics Research Bulletin* 1, 1957.

F. E. Emery and O. A. Oeser, *Information, Decision and Action* (Melbourne University Press, 1958).

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In this study similar results were obtained. Farmers who were more innovative, who read more, and who participated in social and farm organizations used the VNWDB extension team officials as sources of information. Those who were less innovative, read less and did not attend meetings relied on the local official source, the VNWDB inspector. This is further evidence that the inspector replaced other farmers as the local source of information.

The results (Tables 13 and 14) show that the two types of officials were used by different types of farmers for different reasons. The more progressive farmers used the extension team because they were the most expert sources of information and because they used research results as the basis for their recommendations. The less progressive farmers used the local inspector because he was responsible for organizing the area poisoning and because he had the legal power to force them to act. That is, progressive farmers participated because the evidence suggested it was the sensible thing to do, and the others participated because the law, and the opinions of their neighbours insisted that they join in. The success of the campaign was therefore partly due to the use of legal and social pressures by the inspector to force the later adopters to act. This finding has implications for rapid adoption of new practices in situations where legal pressure as well as other pressures, can be applied.

Acquaintances played only a minor part in the campaign. They account for 19 per cent of the responses of where the farmers heard about the campaign, 2 per cent for most information, 8 per cent for the most credible source, 7 per cent for most help in decision and 1 per cent for conviction to use carrots and 1080. These unusually low percentages have already been reported. It is to be noted that for some, other farmers are still the most credible source, and the most help in decision for a few farmers. Although the opinions of other farmers did not have much direct effect in the campaign, comments volunteered by farmers indicated that the reports by farmers in other districts of the effectiveness of the methods had considerable effect in breaking down the initial opposition to the campaign.

⁵ B. Ryan and N. C. Gross, "The diffusion of Hybrid Seed Corn in Two Iowa Communities", *Rural Sociology*, Vol. 8, No. 1 (March, 1943).

Emery and Oeser, *op. cit.*

Parish, *op. cit.*

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⁶ Wilkening, Tully, and Presser, *op. cit.*

An unusual observation is the explicit reference to research results. Farmers reported that the figures showing research results were sufficient to convince them of the desirability of using the recommended methods. Seven per cent of farmers reported that they believed the research results most of all sources of information. If to this is added communicators who presented research results, and the farmers' own experiments, then research results account for 36 per cent of the highest credibility. For most help in deciding to participate in the campaign, research results gained 7 per cent of the responses, and in combination with the extension team which used them they account for 25 per cent of the most help in decision. When considering points that convinced farmers to use carrots and 1080, research results were named by 41 per cent of the farmers. That is, for credibility and influence on decision the research results presented by the extension team influenced one-third of the farmers.

The specific mention of research results rather than the extension team raises the question, "Are the farmers who quote research results similar to those who mention the extension team?" For source credibility, research results have a random distribution with a tendency towards a negative association. That is, while the farmers who mention the extension team have "high" scores, those who mention research results tend to have "low" scores. For most help in decision research results are associated with better managers and the more innovative, and are randomly distributed for other attributes. As a method of persuasion to use carrots and 1080, research results are positively associated with reading and participation in farm organizations, but negatively associated with innovativeness. The associations found between research results and attributes of the farmers are less consistent, and in some cases are reversals of the associations found between the extension team and attributes of the farmers. This shows that research results affected a wider range of farmers, and in some cases, a different type of farmer to those who referred to the extension team. The presentation of a simple factual message such as a table of research results, may induce some farmers to follow the recommendations. Other farmers followed the recommendations for other reasons. Some farmers reported that they had a large number of rabbits on their property and they wanted to get rid of them. They saw the recommendations for destroying rabbits as directly applicable to them in their situation, and therefore followed them. The number of rabbits on the property determined the action taken in this case. Those farmers who read widely tended to see the applicability of the recommendations more clearly (14 highs to 7 lows). Other personal attributes were randomly distributed.

There is evidence that the less progressive farmers felt that they were forced to follow the recommendations. For most help in decision significantly more of the poorer managers quote compulsion and stated that they joined in because their neighbours were taking the recommended action. For using carrots and 1080 significantly more with low scores for reading and for participation in farm organizations give the same reasons, that is they were pushed into participation by legal and social pressures. The significant numbers of farmers with high scores for innovativeness who reported that they also were pushed into participating by legal and social pressures indicates that, as shown in section D (i) (page 156), innovators and the majority of adopters have some different characteristics.

The main points from this study are that:—

- (1) Research results clearly presented are acceptable, comprehensible, and may affect the actions of most types of farmers.
- (2) Personal contact has more effect on action than impersonal information.
- (3) Different types of farmers use different sources of information. The more progressive use the cosmopolitan sources, while the less progressive use local sources. The local source can be personal contact with other farmers, or a local government agent, providing that he is well informed in the subject and that he contacts the farmers personally.
- (4) The capacities to innovate, and to adopt recommendations appear to be based on some different characteristics.
- (5) Information or knowledge about a new practice are only part of the explanation why farmers adopt the practice. Knowledge pulls some types of farmers towards adoption. Situational, social, economic and legal pressures push other types of farmers into adopting some recommendations.
- (6) Well organized extension campaigns using all possible means of persuasion (e.g., communication of research results, and situational, social, economic and legal pressures) can achieve major changes in attitudes, opinions, beliefs and behaviour in a short period of time.