EVALUATION OF RURAL EXTENSION

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The question under discussion is how to determine the effectiveness of agricultural extension services. Can the effectiveness be increased if different extension methods are used or can the same results perhaps be achieved at lower cost? If a farmer asks whether or not the effectiveness of a farm method which he uses can be increased, one will probably make a study to compare this method with several alternative methods or one will refer to research that has already been done on this subject. The same holds true for extension teaching. *The only sound way of increasing the effectiveness of an extension program is by making a scientific evaluation of the effects of this program.* The writer will, in the first sections this paper, attempt to outline a few of the results of research which has already been done on extension methods. It will be understood that the writer is only in a position to sketch the main lines and will have to omit many important details. For this reason, I will refer to several summaries of research studies in the literature appendix to my paper. In the second part of my paper (III, IV and V), the manner in which extension evaluation and research can be organized, will be discussed.

I. How effective is the extension service?

The first question is: How effective is the agricultural extension service? The best way of answering this question is to compare the changes in an area where an extension service operates, with an area where little extension work is done. Basically this same approach could be used to discover the effects of fertilizer on crop production. This type of comparitive research has been done by Nielsen at Michigan State University[1], and a similar study is under way in the Indian Programme Evaluation Organization.[2]

In the Michigan Township Extension Experiment, which covered a period of 5 years, five agricultural extension officers were given a township populated by approximately 100 farmers. Normally one agricultural extension officer in that state serves approximately 10 times this number of farmers. This experiment made it possible to interview a random sample of farmers in the 5 experimental townships and in 5 similar non-experimental townships, at the beginning and at the end of the experiment.

In this way, it was discovered that the average increase in nett farm earnings was $ 1646 in the experimental townships and only $ 938 in the control areas. This indicates that an extension program can be quite effective.

To know that an extension program is as effective as this program was in Michigan is important to an extension director if he wishes to convince a Minister of Finance that more funds should be appropriated to extension. If however we are to improve the quality of our extension programs, we have to know more than the mere overall effectiveness of these programs. In such a case we should also be able to predict the results of a change in our extension teaching methods. In order to enable such a prediction, we must try to measure the effects of different teaching methods, instead of making use of the intuitive guess as we usually do. It is extremely easy to use a method in such a way that the change in people aimed at, is not achieved. This choice of the correct method and correct use of the method, poses a problem not only for extension officers, but for advertisers as well. An English advertising campaign, e.g., was designed to emphasize the fact that margarine was used by high class people and was not a substitute for second rate people. One advertisement pictured a family dining by candlelight, using margarine; the company hoped that readers would associate a candlelight dinner with a high class family. The people of Northern England however, associated it with a family whose electricity had been cut off, because they failed to pay their bills. This is obviously not the way to increase margarine consumption. Advertisers have learned from experiences such as this, that it pays to pretest an advertisement before it is published. The advertisement is first shown to a small sample of people from the population for whom it is intended, after which their reactions are called for. Unexpected changes in advertisement are frequently necessary as a result of pretesting. The writer is convinced that extension officers would benefit by pretesting some of their articles appearing in farm journals as well as their radio speeches, in this manner.

Another way in which to obtain an indication of the effectiveness of teaching methods is to measure the size of the audience. It is obvious that when people do not read an article nor attend a meeting, the teaching method is ineffective. It does not necessarily follow that the method was effective when a large number of people read articles or attend meetings. They may be enjoying themselves, but not learning a great deal. If we wish to know which factors in extension activity influence an increase of knowledge, it becomes necessary to dig deeper. During a post graduate course for Dutch medical doctors, e.g., every participant answered a brief questionnaire after every lecture. Participants were asked to rate how well every lecture was presented and how important the subject was considered to be. There proved to be a close relationship between the quality of the presentation and the importance of the subject. In all probability the causal relationship is that well-presented lectures are considered important, regardless of the real importance of the subject. This proved a valuable finding for the organizers of this course, as the theory of learning states rather definitely, that learning will

only take place if people consider the subject to be important. It will, therefore, usually prove more effective to invite a lecturer who presents his subject well, than one who is well versed in this subject, but not able to present it.

One of the difficulties of effective evaluation is that many educational objectives can only be reached by a sequence of methods and not by one extension method alone. For instance, consider the adoption of a new farm practice. This usually takes time. Very often when a farmer first becomes *aware* of a new practice, he considers the people who have deviated from the traditional method in order to adopt the new practice as rather queer, if not crazy. After hearing more about this practice, he may become *interested* in it. As a result of this interest, the rate at which he obtains information about the practice will increase, and he will start to *evaluate* whether or not the practice will be of value on his own farm. If he decides that it may prove a useful practice, he will, whenever possible, first *try* it on a small scale. Only after his personal experiment works well, will the farmer *adopt* the practice on a large scale and use it continuously. In the United States a period of more than two years often elapses from the moment a farmer first hears of a new practice until he adopts it. In other countries with less progressive farmers, this period will as a rule be longer.

This analysis of the adoption process has important implications for extension teaching because in the different stages of the adoption process, farmers need different kinds of information and use different sources of information. In countries with literate farmers, the farmers usually first hear of a new farm practice through the mass media: the farm papers, radio, and TV. During the stage where the decision to adopt a practice is made, however, the mass media become quite unimportant. Instead, personal influence is much more important at this stage. The most progressive farmers are influenced by the extension officers, and the remainder are influenced mainly by other farmers. We are not yet quite sure as to how the adoption process works in countries where farmers are not literate and do not have radio's. There are indications from a study by Rahim in Pakistan, that demonstration plots may take over the role of the mass media to create awareness of a new practice in such countries.[3]

The implications of the adoption process for the evaluation of extension work is that it is of little use to study the influence of one separate method on the adoption of a new practice. One should rather analyze the role of this method in the whole process of change. One may not expect adoption of a farm practice due to the effect of an article in a farm journal. One can only hope that a series of articles on the same subject will arouse farmers' interest in the subject and stimulate them to put questions to their extension officers and to other farmers. The result will depend on the reactions of these people. It may be possible that the reaction of other farmers is not favourable to the adoption of the practice advocated. In that case the article will not have had much effect, unless one is able to change the reactions of other farmers. The best way to change their reactions is to join their discussions. In that case the extension officer might be able, by raising the right questions at the right time, to influence the farmers' reactions

in such a way that they would favour the adoption of the practices advocated in the article.

This would also mean that one might expect more change in the farmers' behaviour after a group discussion than after a lecture. It is easy to validate this statement. Experiments have shown that group discussions which are guided by well-trained discussion leaders are indeed more effective than lectures, in changing people's behaviour patterns, and are even more effective than individual advice. It is often easier for a group to change as a whole than it is for one person to deviate from the norms of his group.

A practical consequence of these research findings for extension is, that a well-planned extension program in which a concentrated attempt with the right succession of extension teaching methods is made, to solve one problem, will be much more effective than an extension program in which some attempts are made to solve many problems. An illustration can be given from the Indian Farm Radio Experiment.[4] A series of educational radio programs were followed in some villages by discussions among a group of farmers without the presence of an extension officer or civil servant. The participants in these discussion groups changed their behaviour much more, than farmers in control villages who had no group discussions. E.g. the percentage who used rat poison increased from 43 to 76 percent in the group discussion villages, but among the control group, the percentage only increased from 37 to 41 percent. A discussion without the presence of an extension officer, and not preceded by a radio program on this subject, would probably not have been as effective. This study indicates that the combination of two comparable teaching methods had much more effect than the use of each of them separately. Similar results have been achieved in France, Canada and Japan.

A few illustrations have been given of the way in which we can evaluate extension programs and of the results achieved. In the next part of the paper two other problems will be discussed: 1. Which problems should be studied? 2. Who should study these problems?

II. Problems to be studied

It will be agreed that problems which are of practical value to extension officers should be studied, since it are they who have to take decisions regarding the best extension methods to be used. At present, one often has to make guesses which extension methods are best, since little information is available on the selection of these methods. The situation could be improved by studying the effects of decisions made by extension workers, but it is impossible to do research on each decision to be made in this field. In the first place, the findings of such studies are usually not available until considerable time after the decision. The following years' decisions often have to be made under somewhat different circumstances and on different problems. Secondly, we simply do not have the research workers nor the research funds needed, to do so many studies. In fact the same situation prevails for farmers' decisions; we cannot study each of their decisions.

The solution we seek is the development of a scientific theory which will facilitate the prediction of results, for all decisions which a farmer might make. Such a theory must necessarily be on a rather abstract level. This however causes some uncertainty in the application of the theory of concrete situations, and we therefore need applied research, which should not be based on trial and error, to solve these practical problems. It should test the practical predictions which can be made from scientific theory developed by basic research in agriculture. This basic research in agriculture is at present often close to sciences such as biochemistry and plant physiology. We have naturally, not yet achieved this ideal situation. There are many urgent problems in Dutch agriculture for which no solutions have yet been suggested by theory. Therefore, the applied research worker has to try and find a solution on a basis of trial and error or else the farmer has to guess the solution. This does not mean, that we should not keep in mind the ideal situation for which we are striving.

Quite probably this holds true not only for the decisions farmers have to make, but also for the decisions extension officers have to make. We should try and develop scientific theory for both extension officers' as well as farmers' decisions. In this field we will need basic as well as applied research. One difficulty is that scientific theory in extension methods has not as yet been developed to the same extent in agriculture. Nevertheless, a good deal of theory is available in sociology, psychology, public administration, etc. which has important implications for extension. Most of this theory has not as yet been used systematically, partly because the different possible ways to apply it has not been tested by applied research.

The solution to many extension problems cannot yet be suggested on theoretical grounds. For this reason, further development of basic research in the social sciences is urgently needed, but as long as theory does not provide a solution to our problems we must employ trial and error. The rate of this trial and error process can greatly be increased by careful observation of its results. Suppose, e.g., that we should start a farm TV program in the Netherlands. In such a case, theory can only be of little assistance to our design of the program. After ten years therefore, experience will have made our TV farm program considerably better than the first year's program. The rate at which we learn from this experience could be increased by learning in a systematic way. We experiment, in fact, when we emit different farm programs. By systematic observation and analysis of farmers' reactions to these programs, I am convinced that we could increase a good deal the rate at which we improve the quality of the TV farm programs. My conviction is based partly on the experience of the Audience Research Section of the BBC. They found, e.g., that on the average people only remember 25 percent of the information of a TV program. Therefore, one will have to repeat important points, if one wants to put a message across.

Summarizing, what we need is:

1. a stimulation of basic research in the behaviourial sciences;
2. research on the possibility of applying this theory to extension problems;

3. systematic observation and analysis of the trial and error process from which we have to learn. Often this analysis can be made in such a way as to increase the body of scientific theory which will help us to predict the results of our work in different situations.

III. The organization of extension evaluation [5]

The kind of research output we get depends to a large degree on the organization of the research. Usually the more freedom the research worker has in his work, the more he will contribute to theory and the less he will contribute to practicality. Also, the more contact the research worker has with colleagues in his own speciality and the less he has with people in action agencies, the more he will contribute to scientific theory. We also have to consider the effects of extension research organization for communicating research findings, to action people.

What we would actually like to have is research on different levels of direct applicability. Therefore, we should not only use one kind of research organization, but several. One of the main questions is whether extension evaluation should be done by a research worker within the extension service or by an outside agency. One can find both kinds of organizations. In India, e.g., the Programme Evaluation Organization is completely independant of extension and community development agencies. In the USA, on the other hand, most states have an extension research officer within their extension staff, and the Federal Extension Service has its Division of Extension Research and Training. The effect is probably that the research work in India is a bit more basically orientated than it is in the USA. Furthermore, there are some problems which can be studied by the Indian organization, but not by the American one. It is well known that the effectiveness of an extension service does not depend only on the work done in the field, but also on the decisions made at the top of the organization. An independent research organization may question these decisions, but it is difficult for a staff member of an organization to question the decisions of his director and still receive promotion.

On the other hand, communication of research findings to workers in the field is easier for a staff member of the same organization than it is for an outside agency. It may be so easy that the extension research officer within the extension organization is expected to spend most of his time on training extension personnel rather than on research. The difficulties which arise in communication from an outside agency are probably a bit less in India than in many other countries. In India the community development organization managed to get more than 60 000 staff members within eight years. The leaders were well aware that it is impossible to find so many well trained extension agents and experienced supervisors, but they were unable to delay development of the country until these people were available.

One therefore feels the necessity to learn systematically from experience, e.g. from the reports of the Programme Evaluation Organization. In India however, I believe there are people who doubt the advisability of publishing criticism of the Community Development

programme in the reports of the Programme Evaluation Organization.

Apart from research for direct applicability, staff members of universities or agricultural colleges in many countries, are found who do extension research. They are often also interested in developing scientific theory on human behaviour along with their interest in the applicability of their findings. In the writer's opinion, it is necessary to do research of this kind in all agricultural colleges which train extension officers at the graduate level.

It may even be wise for extension services to go one step further by granting money for research to well-qualified social scientists who do research with important implications for extension, even if their research is based on problems which are not directly related to extension. Through research grants the extension service can interest these people in extension problems. There are many of these research workers who could help to increase the effectiveness of extension teaching as changing people's behaviour is not only a means to an end for the extension service, but also for education, industry, marketing, politics, etc. Most of the social scientists' research findings in these areas are not yet utilized by extension officers as they should be. It would be wise to stimulate better communication between social scientists and extension officers by such grants.

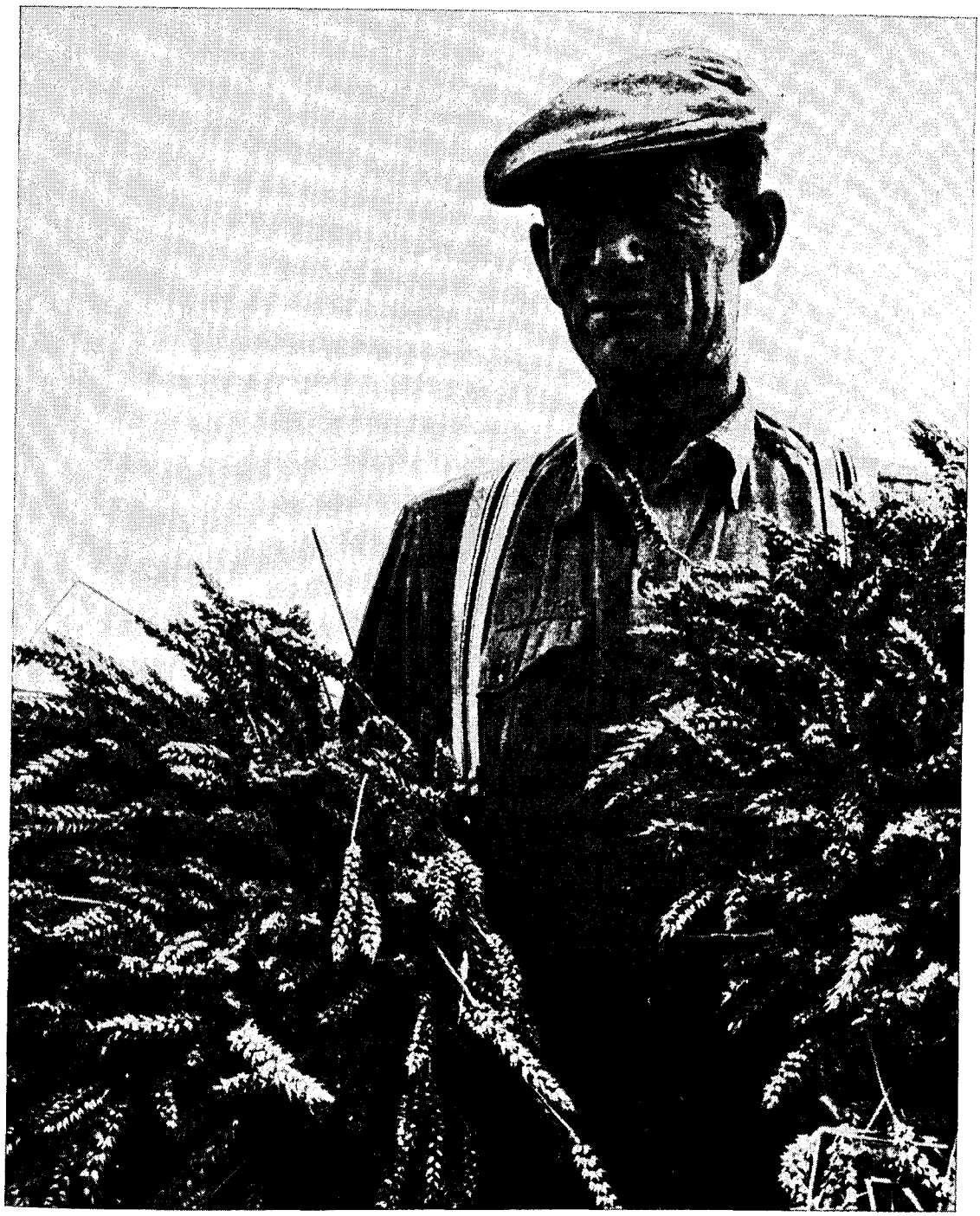
A good start in extension research is to induce a graduate student either in the social sciences, in agriculture, or, preferably, in rural sociology, to write a thesis on this subject. Naturally, the main object of a student's thesis is that he should learn from it. Valuable results are therefore not necessarily to be expected. It can however often be done at very low cost, as each student is required to write a thesis. If such a thesis supplies valuable information, it could be used to convince people in executive positions that more research in extension should be financed. As a rule, it is much easier to convince these people with the results of a good study in their own country, than with an abstract statement on the potential value of extension research. There is little use in promoting extension research if there are no qualified research workers available, as research of poor quality will do more harm than good, especially when one tries to get extension research started.

IV. Evaluation by extension officers

We have not yet discussed what the extension officer can do about extension evaluation. In the writer's opinion, the most important advantage of evaluation by extension officers is stimulating the attitude: 'What the farmer learns is more important than what I tell him'. It has often been said in this book, that a basic principle in good extension teaching is that one has to start where one's clients are, and with the problems which they consider important.

For a good advisory officer therefore, listening is at least as important as speaking. When an extension officer tries to evaluate his program, he has to listen to the farmers, because only the farmers themselves can tell him what they have learned. Thus, listening to one's clients is important for local advisers, but it is even more important for supervisors, directors, and

Just as the farmer tries to evaluate his harvest the adviser tries to ascertain whether the method he followed was the right one



editors. Even though a local adviser does not make a special effort to listen in a systematic way, he will meet many clients during the course of his daily work and form some idea of their opinions. The farmers he meets are however usually more progressive than the average farmer and therefore, the impression he has of his clients is somewhat distorted. This distortion will be much more serious for the extension officers working at higher levels, as they will meet mainly the top men in the farmers' organizations as well as other very progressive farmers. These people cannot tell how the average farmer thinks, because often they do not know them. In the writer's opinion, it is very useful for the leaders of the extension service to participate in evaluation, because interviewing gives them an opportunity to listen to a random sample of ordinary farmers.

Participation in evaluation is also excellent training for young extension officers. One can hardly imagine a better training program than listening systematically to farmers' reactions to previous extension programs. It will make them critical of these programs and, we also hope, of their own work. This critical attitude can bring about a good deal of improvement in the effectiveness of extension work.

Here we touch on a difficult subject in extension evaluation. The object of this evaluation is to find ways of improving the extension service. Since none of us is perfect in his work, it is usually possible to improve our work. Some extension directors will form the opinion that the field officer has done a poor job, whereas they would have had no idea, if they did not see the evaluation results which would otherwise not have been available. Under these circumstances hardly any evaluation can be expected. If, on the other hand, directors are happy to have staff-members who try to improve their mistakes, a situation would present itself in which evaluation could have very effective results.

Another problem is that it is only possible to be a good extension officer if one is convinced that one's work is worthwile. A good evaluator on the other hand, should be willing to discover the worthlesness of his extension program; he should certainly not assume beforehand that the program was effective. I therefore, do not believe that an extension officer is the correct person to evaluate the overall effectiveness of his program.

As a rule, extension personnel are willing to admit that some improvement in certain aspects of their program might have been possible. Even though the extension officer is not fit to evaluate the effectiveness of his program as a whole, he could certainly evaluate small parts of the program. He could discover e.g. that the language used in his article was too difficult to be understood by most of the people for whom it was intended.

V. The proportion of the extension budget to be spent on extension research

In the Netherlands, and I believe also in the United States, the amount spent on extension research is $\pm$ 0.25 percent of the total extension budget. In India about four times as much is spent on extension evaluation, but in most other countries it is lower, sometimes even

o percent. If we want to determine the correct amount we should ask ourselves how important knowledge of good extension methods is, compared to e.g. knowledge of the best agricultural practices. In the writer's opinion, it is as important for an extension service to have a sound knowledge of extension methods as it is for agriculture to have a sound knowledge of agricultural practices. In the Netherlands we spend about 1 percent of the gross agricultural income on agricultural research. I therefore believe that approximately the same proportion of the extension budget should be spent in a profitable way on extension research, although at the moment, it will not be possible to find a sufficient number of well qualified research workers, to do the work.

If it is necessary to start extension research in a country it is better to start it on a small scale. It is at least the writer's experience that we should first learn how to do the research of this kind. It is cheaper and quicker to gain experience from small scale research than from studies in which several thousands of farmers are included.

[1] The Michigan Township Experiment. Techn. Bull. 274 and 284. Michigan State University, Agricultural Extension Service, East Lansing, USA.

[2] Bench Mark Survey. Reports 12, 13, 16, 17, 21, 22, 23 and 24, Programme Evaluation Organization, New Delhi.

[3] The diffusion and adoption of agricultural practices. Pakistan Academy for Village Development, Techn. Publ. 7, Comilla.

[4] J. C. MARTHUR and P. NEURATH – An Indian experiment in farm radio forums. UNESCO, Paris, 1959. 132 pp.

[5] My discussion of this subject is based mainly on:
M. A. STRAUS – Social-Psychological Aspects of Extension Research Organization. National Extension Research Seminar, Division of Extension Research and Teaching, U.S. Dept. of Agriculture, Washington D.C., pp. 193-217.

Literature appendix

The research methods which can be used in an evaluation study were not discussed in this article, because it is impossible to supply sufficient information in a brief article to enable readers to do their own research. Those readers who want to do evaluation should consult a social scientist preferably from their own country. In addition it might be useful to read some publications on research methods and on research findings.

An excellent first introduction on evaluation techniques is:
M. JAHODA and E. BARNITZ – The nature of evaluation. International Social Science Bull., Vol. VII, No. 3, 1955, p. 353-364. A part of a special issue on evaluation techniques.

A brief but clear view of the research methods which can be employed in evaluation is supplied in:
S. P. HAYES – Measuring the results of development projects: A manual for field workers. UNESCO, Paris, 1959. An advantage of this book is that it lacks the sociological and psychological jargon one finds in several other publications.

A good description of the way in which extension officers themselves can evaluate their activities is given in:
H. RHEINWALD – Evaluation in rural extension, in: J. M. A. PENDERS – Methods and Programme Planning in Rural Extension, Wageningen, 1956.

The American handbook on evaluation is:
F. P. FRUTCHEY et al. – Evaluation in Extension; Prepared by the Division of Extension Research and Training, Ives, Topeka, Kansas, 1959. 107 pp.

This article only gives an idea of the results of extension evaluation, and the implication of the social sciences for extension. More literature on these subjects is to be found in the following summaries:
E. M. ROGERS – The diffusion of innovations. New York, Free Press, 1962. Gives an excellent summary of 506 studies from all parts of the world on the adoption of new farm practives and the diffusion of other innovations.
E. DE S. BRUNNER et al. – An Overview of Adult Education Research, Chicago, Ill., 1959. Gives a summary of 500 American studies on agricultural extension and other adult education programmes.
H. I. ABELSON – Persuasion; How opinions and attitudes are changed. Springer Publishing Co, New York, 1959. 118 pp. A practical summary of those parts of social psychology which have important implications for extension.
J. T. KLAPPER – The effects of mass communications. New York, Free Press, 1960. This book gives an excellent summary of the evaluation of mass media, mainly outside agricultural extension, but the findings can be applied to extension.

An example of basic research which has important implications for extension is the analysis of the differences between traditional peasants and modern farm managers of the Italian rural sociologist:
B. BENVENUTI – Farming in cultural change. Van Gorcum, Assen, 1961.

The most recent Dutch study in this field is:
A. W. VAN DEN BAN – Boer en landbouwvoorlichting, De communicatie van nieuwe landbouwmethoden. Van Gorcum, Assen, 1963.