

# Result demonstration technique—history, philosophy, and contemporary nature<sup>1</sup>

Ben U. Kittrell<sup>2</sup>

## ABSTRACT

The history, philosophy, and contemporary nature of the result demonstration is presented. Its importance to an agronomic educational program in the Cooperative Extension Service is shown. This educational technique has undergone some changes since it was first used in 1903; however, it still remains one of the best educational tools of the Extension worker in an agronomic program.

**Additional index words:** Adoption process, Cooperative Extension Service, On-farm test.

What a man hears, he may doubt;  
What he sees, he may possibly doubt;  
But what he does himself, he cannot doubt.

Dr. Seaman A. Knapp

**T**HE United States has developed the most efficient agricultural system ever known to mankind. A nation with 65% of its population engaged

in farming in 1865 today has approximately 4% in that occupation. The fact that the people of the United States are the best fed and best clothed in the world with only a small percent of its population producing the food and fiber attests to the phenomenal efficiency of the American farmer. What was the prime mover in developing such an efficient system of agriculture? It was, without doubt, the education of the American farmer, an education based upon agricultural research. At the heart of this educational movement in American agriculture lies the result demonstration technique for carrying the results of the research scientist to

---

<sup>1</sup>Paper number 138 of the Journal Series of the North Carolina State University Agricultural Extension Service, Raleigh, North Carolina.

<sup>2</sup>Extension Agronomy Specialist, Department of Crop Science, North Carolina State University, Raleigh, NC 27607.

the farmer. Today, the result demonstration is still a viable educational technique employed in an agronomic educational program designed to bring about desired changes in adult farmers.

The purpose of this paper is to present an overview of the use of the result demonstration technique—its history, philosophy, and contemporary nature as it is used in an agronomic educational program.

### HISTORICAL DEVELOPMENT

Dr. Seaman A. Knapp is credited with the first use of the demonstration method as a means of influencing the adoption of new farm practices. Dr. Knapp was educated in New England as a teacher and became interested in agriculture when he moved to Iowa where he farmed and then taught agriculture at Iowa State College of Agriculture. He later became President of that institution.

In 1885, Dr. Knapp accepted a position as Assistant Manager of the North American Land and Timber Company and moved to Louisiana where the company had purchased some 607,500 ha of land. His job was twofold: 1) to determine what crops could be grown there, and 2) to assist in attracting settlers to that region. A problem arose when the natives of the region, being livestock men, told the potential settlers that the land was not good for farming. This was contrary to Dr. Knapp's opinion.

In desperation, Dr. Knapp decided to demonstrate what could be accomplished with the land. By giving large concessions to prospective settlers, he persuaded several western farmers to stay and do the best that they could. He placed one of the cooperative growers in each of the townships to demonstrate what could be accomplished. After they had become settled and successful in their farming operations, he brought the potential settlers to visit them. He was thus able to overcome the prejudices against the farming potential of the land held by the natives of the area.

In 1901, the USDA became interested in combating the one-crop system of cotton (*Gossypium hirsutum* L.) production in the South. After learning of the success of Dr. Knapp in Louisiana, a number of farms were established at government expense to demonstrate the possibilities of diversified farming. Dr. Knapp was hired and placed in charge of three of these farms. This venture by the government proved to be a complete failure so far as in-

fluencing farmers to change their practices. It did prove to Dr. Knapp that farmers generally would not change their practices by observing what could be done on farms operated at government expense.

It was the boll weevil crises of 1902 that caused great loss to Texas cotton growers and set the stage for launching Dr. Knapp's plan of cooperative demonstration work. After one of his speeches in Terrell, Texas, several growers met with Dr. Knapp and requested a demonstration be set up on a farm in their vicinity. Dr. Knapp agreed to work with them and the townspeople raised \$1,000 to insure against any loss that might occur from the new methods tried. The farm of Walter C. Porter was selected.

The practices prescribed by Dr. Knapp consisted only of those that were already being done by the best farmers. Although the season of 1903 was below average, Mr. Porter announced that he had made \$700 more profit with the new practices of Dr. Knapp than if he had used the methods of which he was accustomed. It was further apparent that the demonstration was highly successful when the results were compared with those of the surrounding farms where the recommended methods had not been used. Mr. Porter announced that he would use these recommended practices on all of his 324 ha the next year and many nearby farm owners that had witnessed the demonstration decided that they, too, would use these practices on their farms.

Sparked by this great interest in the demonstration work and its effects on farmers, a congressional bill called the Smith-Lever Act was passed in 1914. This bill called for, among other things, "giving instruction and practical demonstrations in agriculture and home economics" (3). The act set up a unique program of agricultural education, funded by federal, state, and local governments and administered through the land grant college system in each state. The spirit of this new law was founded on the principles developed by Dr. Knapp in his demonstration work. These principles had such a profound influence that organized groups argued that three-fourths of the federal funds should go to actual demonstration work. One such group was the Soil Fertility League which consisted of such members as President Taft, James J. Hill of the Great Northern Railroad, and William Jennings Bryan (6). The act set forth appropriations to provide an agent in each county to provide this practical help through the demonstration technique.

This act set forth the Cooperative Extension Service which is today the largest adult education organization in the world.

### PHILOSOPHY

Gilbertson and Gallup (3) have defined a result demonstration as:

A demonstration conducted by a farmer, homemaker, or other person under the direct supervision of an extension worker to prove the advantages of a recommended practice or combination of practices. It involves careful planning, a substantial period of time, adequate records and comparison of results. It is designed to teach others in addition to the person who conducted the demonstration.

Dr. Knapp found the influential power of the demonstration method in his Louisiana venture of enticing settlers to farm a new and unknown land. However, when this method was utilized by the government it proved to be a failure. Even with the demonstrations under the supervision of Dr. Knapp, growers would not adopt the new practices that were demonstrated at government expense. This convinced him that some means other than the use of publicly owned land must be used if growers were to overcome their skepticism and begin to adopt the new practices.

It was after the first successful demonstration conducted on the Porter farm at Terrell that Dr. Knapp knew he had found the key to making his educational approach work. It was this approach that led him to say in a later speech: "What a man hears he may doubt; what he sees he may possibly doubt; what he does for himself, he cannot doubt" (2).

Dr. Knapp found that not only did the demonstrations influence the cooperator, but most important was its influence on other farmers in the community who witnessed the demonstration or talked with the cooperator. In one of Dr. Knapp's later speeches he said: "No further argument is necessary after the demonstrations have been made. Facts do the talking" [See S. A. McMillan, Lurline Collier, and Esther Martin, 1936. Carrying the complete farm and farm-home demonstration to the farm and farm home. Symp. Regional Conf. S. States (Houston, Texas), Mimeo.].

Bailey (1) states that this phenomenon is "similar to Gabriel de Tarde's theory of the instinct of imi-

tations" which is "the personal influence of one human being upon another." He further states that research findings by rural sociologists show that friends and neighbors are an important source in the diffusion of farm practices. This is especially true during the evaluation and trial stages of the adoption process.

The result demonstration technique has been used rather extensively by the Cooperative Extension Service since its inception. However, studies have shown that programs in agronomy lend themselves to this method of teaching much more so than those in areas involving livestock, marketing, foods, nutrition, clothing, and health (1). In a good agronomic program, the demonstration is used as the "hub" around which the overall program is based. However, this does not mean that the demonstration is the entire program. Studies have shown that to be most effective several different teaching methods must be used (7). These must be interrelated to obtain the maximum adoption of the recommended practices. Thus the demonstration can be used locally as a source of local information for tours, news articles, circulars, meetings, radio and television programs, and other teaching methods. In addition, state and area Extension Specialists can use the summarized data from several counties to develop an educational program on an area or statewide basis.

In addition to providing a source of local information, the demonstration can provide the Extension Agent with the confidence he needs to promote the adoption of the information learned. It also builds the confidence of the cooperating grower, in himself as well as the Cooperative Extension Service.

The demonstration must remain as an educational tool and never become just a data gathering technique. It should be based on sound research findings or practices that have been proven to be sound. The objectives should be educational objectives and not agronomic. The intended audience, in which the demonstration is to bring about change, should be identified; this audience will usually include: 1) the grower, 2) other growers in the community and surrounding area, 3) the agribusiness community, and 4) Extension personnel working with the demonstration (A. Perry, 1971. Demonstrations in an oilseeds educational program. Paper presented at S. Extension Agron. Workshop, Lubbock, Texas.).

## CONTEMPORARY NATURE

More than 70 years have passed since Dr. Knapp set up his first successful demonstration. Today it is still the basic tool used by Extension Agents involved in an agronomic program.

Changes have been made in the way the demonstrations are conducted; however, the principle of learning by doing remains the same as it was on the Porter farm in Terrell in 1903. Some demonstrations have become sophisticated tests and some have been developed to illustrate one idea or principle. Others use a combination of practices in one crop or use the whole farm much as Dr. Knapp first used. The educational objectives are still the same.

### The Test Demonstration Farm

The Test Demonstration Farm Program which has been in effect for many years emphasizes the teaching of farm management principles and encourages the adoption and efficient use of improved technology. The program is jointly sponsored by the Tennessee Valley Authority and the State Agricultural Extension Service. Joint programs such as these have been conducted in 28 states. This type of program is long-range in that the program continues on the same farm for 6 to 10 years and is designed so that Extension Agents can establish whole-farm demonstrations which serve as examples for others in developing a successful farm business. This approach provides the information needed to solve problems in economics and production that are needed by commercial farms (4, 5).

### The Demonstration of One Practice

Demonstrations which emphasized only one practice have been used extensively in agronomy. These demonstrations are simple in design and easy to adapt to any farm where the conditions are suitable for such a demonstration. The objectives may be to measure only one practice, such as liming versus no lime or the recommended rate of fertilizer versus no fertilizer. With this simple type of demonstration many tests could be established within a county and the results could easily be obtained. They could also be moved to new locations the next year if necessary or desired.

## The All-Practice Demonstration

The all-practice demonstration has been used very successfully in many crops throughout the United States. The objectives of this type of demonstration is to bring together all the recommended practices to be used for a particular crop. It has the advantage over the one-practice demonstration in that it puts together all practices known to give the maximum return to the grower. Many growers may have used one or two recommended practices, but the all-practice demonstration would give them a chance to see the whole package put together. This type of demonstration is excellent in persuading growers to put to use all available knowledge for a particular crop. One of its limitations is that it is hard to measure the actual yield effects since it is compared to what the grower has been doing or against the grower's regular crop which may have involved some of the practices that are in the demonstration.

### The On-Farm Test

A more sophisticated approach to the demonstration technique that is becoming more popular today is called the on-farm test. This approach still uses the fundamental principles of the demonstration method but the results are more reliable. This type of demonstration uses a scientific experimental design so that results can be statistically analyzed. Tests are designed within the demonstration to analyze one practice; but with several different treatments; then the grower is better able to make up his mind as to the treatment that will give him the highest net returns under his farm conditions. These type of demonstrations are kept simple by only using a limited number of treatments in the test design. By proper identification of the treatments involved, growers in the community are able to visit the demonstration and observe the treatments throughout the growing season. This method gives an opportunity under controlled conditions to try new ideas such as chemicals, fertilizers, practices, etc., before they are available for grower use. Growers have a chance to evaluate these new ideas under grower conditions prior to trying them on their farms. This approach also provides an excellent opportunity for growers, agribusiness personnel and Extension personnel to work together; they are thus better equipped to serve the grower through this new knowledge that is developed.

An example of the use of the on-farm test technique can be cited from my experience with an agronomic tobacco (*Nicotiana tabacum* L.) program in North Carolina. In this program more than 100 replicated tests are conducted each year under the supervision of County Extension Agents. Co-operating growers are selected by the agents. Extension Agronomy Specialists from North Carolina State University provide the type of tests to be conducted and offer assistance in establishing the test in the counties. The Extension Agent in each county chooses the type of tests which will best provide benefits for the growers of his county. The results of these tests are written by the Extension Specialists each year in a publication and distributed to growers throughout the state through the County Extension Agent's office. Television programs, weekly radio programs, and magazine and newspaper articles on a statewide basis all reflect the results obtained from these on-farm tests. In addition to the statewide program, each Extension Agent is able to use these tests in developing tours during the growing season. He also uses the results of the tests to provide the foundation for educational meetings, radio programs, newspaper articles, etc., in his own county.

#### Use in Developing Countries

Dr. Knapp's successful technique of educating American growers has been used with much success with small farms in developing countries (8). A noted example is the Puebla Project of Mexico. There, with the aid of demonstration plots on typical small farms, the native growers were able to observe as much as a fourfold increase in yields of maize (*Zea mays* L.) with improved practices. The demonstration cooperators were selected by the native growers in a village. This helped other farmers relate to the demonstrational plots which were grown in close proximity to their own farms. The results proved that even though they are skeptical of change, the small, marginal farmers burdened with poverty will usually adopt practices within 2 or 3 years when they understand the reasons for the change.

The demonstration technique has proved to work as effectively in Africa as it has in the United States

and Latin America. In Kenya the demonstration is considered the center of the Extension Service's methodology. Originally, the plan was to have a demonstration within walking distance of every farmer. In 1965 there were 5,000 demonstrations located on typical farms throughout the country. In all cases the farmer, rather than the outside expert, did most of the talking at field days and public meetings. Other means of communication are used in Kenya as in other countries to reach the masses. However, it is the farm demonstration that remains the most persuasive device.

#### CONCLUSION

The demonstration method is still applicable today in developing agronomic programs for farmers. It is important that the educational objectives be paramount when developing these programs. Much information can be gleaned from this educational technique but it must be combined and interrelated with many other methods to obtain the maximum and quickest adoption of those practices which prove to be successful to the grower's operation.

#### REFERENCES

1. Bailey, W. C. 1964. Result demonstrations and education. *J. Coop. Ext.*, Vol. II, No. 1.
2. Cline, Rodney. 1936. The life and work of Seaman A. Knapp. George Peabody College for Teachers, Nashville, Tennessee.
3. Gilbertson, H. W., and Gladys Gallup. 1957. Result demonstration manual for extension workers. USDA, Fed. Ext. Serv. Agr. Handbook 123. Washington, D. C.
4. Graham, Franklin P. 1966. Illinois test demonstrations prove "learning by doing" still effective in 1960's. *USDA Serv. Rev.*, Vol. 37, No. 11.
5. Hinton, Troy W. 1969. Tennessee intensifies farm management education through test demonstration farms. *USDA Ext. Serv. Rev.*, Vol. 40, No. 8.
6. Peterson, Renee, and William Peterson. 1960. University adult education. Harper & Brothers, New York.
7. Sanders, H. C. 1966. The Cooperative Extension Service. Prentice Hall, Inc., New Jersey.
8. Streeter, Carroll P. 1973. Reaching the developing world's small farmers. The Rockefeller Foundation, New York.