THE EVALUATION OF EXTENSION METHODS AND TECHNIQUES AS USED BY HORTICULTURE SPECIALISTS IN THE UNITED STATES

by

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STATEMENT

OF

DEDICATION

I DEDICATE THIS WORK TO THE ONCOMING YOUTH IN EXTENSION HORTICULTURE. MAY THIS CONTRIBUTION SERVE THEM AS A LIGHT UNTO THEIR FIRST STEPS INTO THE REALM OF A TREMENDOUS TEACHING SERVICE.

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INTRODUCTION

Historical Background

Sometimes we lose sight of the significance of that which has gone before us in building a great organization in the name of "The Cooperative Agricultural Extension Service." Knowing a few of the highlights of this early development may help us feel more a part of this tremendous teaching movement.

The Morrill Act means to us the establishment of our ultimate headquarters for state extension work. As a result of this legislation in 1862, every state in the Union would be able to establish a land-grant college. Justin Morrill's objectives were as follows: "Let us have such colleges as may rightfully claim the authority of teachers to announce facts and fix laws and scatter broadcast that knowledge which will prove useful in building up a great nation."

The name Seaman A. Knapp should stand out in our minds as the father of the demonstration method. In the fall of 1903 near Terrell, Texas, the first farm result demonstration was set up by Dr. Knapp. Recent studies indicate that this method is still one of the most effective procedures used by extension workers. Farm demonstration work was started in Virginia in February, 1907, under the leadership of T. O. Sandy of Burkeville, the father of extension work in Virginia.

In 1914, the Smith-Lever Act formally set forth "The Cooperative Agricultural Extension Service." In the signing of this act the policy

of federal assistance to land-grant colleges for teaching, research and extension in agriculture and home economics became the national policy.

Situation

The strength and efficiency of our horticulture extension work for the future lies in the ability to recognize the changing needs and interests of the people. The success of our work will be determined by the extent to which we can adjust our methods to meet these changing needs. It is necessary that we be alert to progressive methods and techniques in extension teaching if a strong program is to be developed.

It has been quite evident that there is a lack of available information on extension methods that might serve as a guide in developing a more effective program for the horticultural industry of Virginia. There are approximately 200 extension horticulturists, also referred to as specialists, employed in the United States under "The Cooperative Agricultural Extension Service." Although the conditions vary from state to state, many of the ideas, techniques and methods used by these specialists may be effectively adapted to other areas. It seemed that this source was a means for evaluating methods, ideas and techniques from the extension workers across the country who were faced with similar problems. A review of the literature indicates that this study represents the first attempt to survey and evaluate the methods being used by horticulture specialists in the United States.

It is hoped that much benefit may be derived from this study, which could have a basic significance to the total horticulture program in the United States.

Objectives

The overall objective is to evaluate extension methods used by other horticulture specialists to give a background for proper selection, timing and proportionately using extension methods to strengthen the program in Virginia.

Specific objectives are as follows:

1. What functions of specialists are of major importance, which are intermediate, and which are minor, according to present conditions?
2. What changes in emphasis on horticulture extension functions and specific activities are desired?
3. How are the various extension methods and activities rated by horticulture specialists?
4. To what extent are certain procedures carried out by horticulture specialists?

The methods employed in extension teaching carry different values. The significance of these methods also vary under different conditions. It is thus important for extension personnel to have a background of method procedure in order to use the right method in the right proportion at the right time. It is hoped that the data from this study will furnish information which can be considered indicative of the relative influence of the various methods and techniques employed by horticultural specialists in the United States.

II

LITERATURE REVIEW

Fundamentals of Extension Education

Wilson and Gallup (20) state that education may be defined as the production of desirable changes in human behavior. The aim of extension education, therefore, is to influence people to make those desirable changes in their behavior that contribute to better farming through an increased amount of useful information or understanding, such as more knowledge about fruit growing, new or improved skills, abilities, and habits, and more desirable attitudes and ideals.

Extension education involves work with people who differ in age, educational status, interests, levels of living, culture, values, and other variables. It involves education on the farms, in the homes, the community meeting place, in the extension worker's office, and under varying circumstances.

Brunner and Yang (2) point out that like all adult education, extension teaching differs from classroom instruction. It grows directly out of the needs and interests of the people. It follows no rigid pattern or curriculum. Participation in its program is wholly voluntary. It holds its constituents only because of the value of what they receive. Obviously the productivity of extension education is greatly influenced by the effectiveness of the teaching methods used and the skill with which the extension worker can fit these methods and the content material to the diverse interests and abilities of each group.

In justification of the Cooperative Agricultural Extension Act, Senator Vardaman said, "The purpose of this bill is to improve man, enlarge his mental horizon, and give intelligent direction to his efforts. The effects also will be to add comforts to the country home, afford greater opportunities to boys and girls upon whose shoulders soon must fall the responsibility of home and the burden of government."

Wilson and Gallup (20) bring out the fact that people are motivated to learn if they can satisfy a basic need through learning. (1) The desire for security, (2) The desire for new experience, (3) The desire for affection or response, (4) The desire for recognition.

It is the job of the extension worker to understand the basic wants or incentives of the people with whom he is working. He should show the learner how to satisfy these basic wants by learning new things. The extension worker should find the personal goals of the learner and associate his teaching with these goals.

Things learned which produce satisfying action tend to be repeated. The farmer who obtains a larger yield is likely to continue this practice. The extension teacher plans and arranges situations and activities whereby the thing to be learned is called to the attention of the prospective learner, his interest developed, desire aroused, and action promoted.

The belief has been commonly held by many educators that learning is a process which is necessarily associated with youth. Ability to learn has been held to decline rapidly with increased age. Smith and

Wilson (16) show where studies indicate that the ages of 25 to 45 are superior to childhood and equal or superior to early adolescence in general ability to learn.

Graham (7) cites that in extension teaching the great mass must be appealed to through certain major, basic instincts. Man is a social, group-loving animal; he prefers to be where others are. We use the crowd-loving characteristic in order to obtain most satisfying results from a lecture, an automobile tour, a field meeting, or other extension activity in a community. Man is also an imitative animal and is impelled to do things that others do. Man has an egoistic instinct, a desire to be known by his fellowmen. It is well, in our extension work, if we can go on a tour and say, for instance, "You have a fine wheat field, or a fine animal." Take notice of the things that are good. One of the weak points in extension work is that we do not pay enough attention to the good things people are doing.

Another appeal to be used in extension work is that made to the instinct that causes a person to save or hoard. It is that saving tendency that we should take advantage of in order to get him to do certain things.

People do things through the suggestion of rhythm. For instance, they may hear the lines: "Lime, manure, and vigorous clover make the farmers smile all over." They may carry that home and put it into practice merely from sensing the rhythm, the reason coming afterwards. There must be a continuity of bringing impressions to people's minds,

by publicity and other means. The story told to the people in the news item is also told in the field meeting, in slogans, rhymes.

The large number of demonstrations helps him to feel that he should do as others do; therefore, the way to his accepting a practice is made easier. Man feels a loyalty and responsibility to a group of which he desires to be a part, and he will defend himself many times by stating that there are others doing the same things that he is doing.

Kelsey and Hearne (9) indicate that to learn readily from another person the learner must have confidence in that person. The tools with which we teach are those methods, techniques, and agencies through which subject matter and information are made plain so that the student can learn. Our success may be to a large degree dependent upon the proper selection and use of the various teaching tools available.

In a review of educational research, Sheats and McClaughlin (15) establish these guideposts: "The use of a variety of methods is better than reliance on a single method"; and "informality of approach is helpful in the teaching of adults."

Deutsch (5) in his study on the effects of cooperation and competition upon the group process concluded "that greater group or organization productivity will result when the members or units are cooperative rather than competitive in their interrelationships."

Effectiveness of Extension Education

It has always seemed to Bromfield (1) that our great agricultural educational structure has been guilty of two great weaknesses: that it

has too often been a closed affair in which professors and research men wrote papers at each other and that much of the material sent out to farmers is so technical and so dull as to be unreadable and at times unbearable. He states that agriculture is an exciting profession, but little of that excitement has ever reached the average practicing farmer. He suggests that the Department, and our State Agricultural Colleges, could undertake no better or more profitable project than to issue a series of pamphlets, written simply and with some degree of enthusiasm, upon the almost endless subjects which arise from the science of agriculture. The nearest approach to such a project is the excellent agricultural year book edited by Gove Hambidge and put out annually by the Department of Agriculture.

Lionberger (10) cited work which showed that a very high percentage of low socio-economic status farmers had no contacts whatsoever with the Agricultural Extension Service. Effectiveness of extension effort increases with the degree to which it is related to existing group and organizational activities. It was shown that a greater number of impersonal methods were being used in the South. A need exists for determining which practices can best be demonstrated, which may be transmitted verbally, and which ones must come as by-products of a long series of planned actions.

Smith and Wilson (16) relate that criticism is sometimes justly made that extension teaching is aimed at the better informed, most progressive farmers and farm women, with too little thought given to influencing the rank and file. Extension studies in five states

indicate that less than 25 per cent of farmers and less than 20 percent of farm women have attended more than an elementary school. Less than 5 percent of the farmers and farm women have received formal educational training beyond high school.

Where some college training had been received, 94 percent of the farmers had adopted extension practices as compared to 89 percent of those with some high school but no college training, and 77 percent of the farmers with eighth grade education or less.

A common assumption is that leaders in community affairs are also the leaders in the acceptance of new practices. However, the study of the psychology of acceptance by Wilkening (18) suggests that the acceptor of new practices is not likely to be the leader in community affairs, such as in the church and local government. There is evidence that the tendency to accept new farm practices is associated with a tendency to accept recent changes in religion, education, and recreational affairs.

Wilson (21) suggests the following two ways for a specialist to increase his effectiveness:

1. Establish satisfaction.

   Unless the economic return or other satisfaction resulting from the new practice is commensurate with the effort or inconvenience involved in its adoption, there will be little indirect spread from one neighbor to another. Indirect spread accounts for nearly one-fourth of the adoption of extension practices.

2. Consider stage of development of the project.

   If sufficient proof exists regarding the local applicability of a given practice, time spent in establishing additional local proof is largely wasted.

Wilson and Clark (19) show that even when farmers had become convinced that a new practice which extension workers recommended was wise and feasible for them to adopt, many of them did not do so because they could not secure certain new materials conveniently, or at a price which appealed to them. In Wisconsin it was shown that where materials are not essential, extension efforts alone resulted in more rapid and uniform adoption of a practice. An extension worker must know when service in information alone is sufficient and when service in materials must also be supplied.

Reaching Low-Income Farmers Through Extension Education

The Agricultural Extension Service promotes much of its work through farm organizations and group associations. In the research study of low-income farmers by Lionberger (11) it is evident that low-income farmers are notably lacking in contact of this kind. Only 31 percent of them were members of a farm organization. He also showed that approximately seven out of ten low-income households were subscribers to farm journals.

Among the low-income farms the most universally available potential source of farm and home information was the newspaper. Nineteen out of twenty households took at least one newspaper. About two-fifths of the

low-income operators obtained farm bulletins. Those with more than eight years schooling requested three times as many bulletins as those completing less than five years.

About 62 percent of the households with gross incomes of less than $500 listened regularly to stations from which useful information could be secured compared to 82 percent of those with gross cash receipts of $1,000 and over.

Diffusion of information from college to farmer via the personal contact route is subject to the limitations of class and clique-imposed associational patterns. Mass communication media on the other hand are little influenced by such factors. It is therefore possible that part of the isolation experienced by the low-income farmers is a function of social distances which restrict free and spontaneous association and which causes the so-called "little farmer" to feel that he has little in common with his "big farmer" neighbor. Reading contacts reach more people and are relatively more prevalent among farmers with the lower incomes and those with less years schooling than personal contacts.

The most universally recognized personal source of farm and home information by operators was friends and neighbors' indirect influence. The relative importance of friends and neighbors as a source of information to low-income farmers suggests the possibility of facilitating useful contacts through community organization.

The rank order of the more important sources of farm and home information recognized by low-income farm households were newspapers, farm journals, neighbors and friends, radio broadcasts, county agents,

PMA office, and farm bulletins. Far more low-income farm operators obtained information through commercialized channels of communication than directly from the College of Agriculture. Only 15 percent of the households headed by farm operators with less than five years schooling obtained useful farm information from farm bulletins. Thus it appears that if any large percentage of those who have less than eight years schooling are to be reached with bulletins, they must be more simply and attractively written.

There is a need for recommendations specifically adapted to the needs of those low-income producers who are generally realistic enough to know they can't risk much for fear of losing all. Three-fifths of those desiring more information believed that it can best be supplied through the College of Agriculture. Thus the value of the College as a source of farm information is recognized even though many make little direct use of the services offered. A multiple approach to the problem of reaching low-income farmers with educational materials is desired. The universality with which these low-income farmers are reached by radio, newspapers and farm journals suggests the need for greater effort directed to improving and extending the use of the media of mass communications as a means of conveying useful farm and home information to them. In view of the close association between farm income, the number and variety of recognized sources of information, and years of schooling completed, increased effort to educate farm youth who wish to farm is imperative if they are to achieve the success hoped for them.

The Role of a Horticulture Specialist

Kelsey and Hearne (9) in their book on "Cooperative Extension Work," point out that the specialist's role is to provide effective educational leadership in a subject matter field. He originates teaching methods and devices. He prepares written materials and visual aids and should be competent in all extension teaching methods. His first obligation is to train the field staff and to provide assistance and material for the use of cooperative workers and leaders. Personal service is held to a minimum consistent with the need for being familiar with current conditions. He prepares the intricate findings of the research worker for use by the farmer. He has an understanding born of intimate contact. In short, he is the key man who helps put science into practice. His enthusiasm must be unfailing, however, that enthusiasm must be tempered with reasonableness and calmness. It is found that the weight of personal influence of extension workers in the United States is basic to successful educational extension work.

Martin (12) says the specialist should contribute the aid that the agents, farmers, and their families cannot get from their own study and observations. Whatever a specialist does it should be done through the county agents. The county agent must be able to give direction to the whole program in his county or he will lose his standing and become discredited in his own position.

Reid and Wilson (14) point out that specialists sometimes have the attitude of "take it or leave it" and this doesn't get results. An analysis of the statements of county workers indicates that they believe

that a specialist to be of maximum assistance in advancing the extension program in the county should:

1. First and foremost know the subject matter of his or her project.
2. Keep in close touch with the local conditions and problems of farm people.
3. Consider the human factor as well as the subject matter.
4. Feel responsibility of getting action by farm people. Do not have a "take it or leave it" attitude.

Participation in extension teaching activities in counties, conferences with agents, field observations, preparation of bulletins and circulars, demonstrational materials, and charts, and the handling of correspondence are their most important activities according to statements of the specialists themselves.

Smith and Wilson (16) point out that extension specialists, whether local, state, or national, are demonstrators of methods as well as carriers of subject-matter. It is just as essential that the state specialist demonstrate the method to the county agent as it is that the county agent demonstrate it to the farmer; and the state extension specialist should profit as much by demonstrations from the federal specialist as the county agent does from the state specialist.

Extension specialists are regarded as essential in an efficient extension organization, as are county agents. Necessities in this line are usually met when there is not more than one extension specialist in any line of work to each 20 to 30 county agents served.

The extension specialists have two dominant program functions. First, there may be considered the function of the extension specialist in developing a state-wide extension program for his subject that shall meet the needs of the state as a whole and each particular part of the state. The next matter for consideration is to get the extension program incorporated, so far as practicable, into the county and community extension programs.

It is presumed that the extension specialist, as a result of his studies, knows the status of his industry in every county of the state and that he will, wherever necessary, present this matter to the county agricultural agent, laying the facts before the agent and encouraging him to adopt the long-time state program in the county, if needed there, and such portion of the short-time program or such phases of it as seem practicable. Where there is a county agent in every county, one specialist can give assistance to and keep keyed to a high state of efficiency the agents and leaders in about 30 counties. The extension specialist visits these in a somewhat orderly way to see that each agent understands and is handling the work all right.

The extension specialist is the extension worker who leads in his line of work, not by authority but by reason of the fact that he knows; he has a fountain of knowledge; his foundations are sure; he gives of his stores abundantly; he anticipates the needs of the field worker; he offers help before the request is made; he gives his all to others that they may succeed, and of course in doing so grows most himself.

Functions of the Federal Extension Horticulturists

Close, Beattie, and Mulford (3) cite that in 1923 three federal extension horticulturists, one giving full time and two giving part time to the work, travelled from state to state, staying from two days to one week with each state extension horticulturist, discussing plans of work, lines of work and methods, and visiting demonstrations throughout the state. These federal workers acted as clearing houses in carrying horticultural information from the Department of Agriculture to the states. They gathered up the best things in horticultural extension work in each state and made them available to all other states. They also sent to each state specialist a monthly mimeographed publication known as the Extension Horticulturist, which contained special information on subject matter and methods.

According to Smith and Wilson (16) each federal extension specialist in charge of a line of work makes a report once every year, in which he or she summarizes all the extension work done in the whole United States by extension specialists during that year. Effort is made to report not only outstanding accomplishments but especially the outstanding methods followed in securing such accomplishments.

The federal extension specialists get out circulars and bulletins from time to time in their respective subjects for regional and national distribution, get out slogans, charts, slides, and movies for use in the states, and give regional and national publicity to important pieces of work. They aim to be as helpful to state extension specialists as state extension specialists are to county agents.

If a new extension project is about to be undertaken in a given state, the extension specialist concerned or the state supervisor may obtain from the Federal Extension Service a digest of the methods employed in conducting similar work in other states.

General Functions of a Specialist

According to an Iowa survey by Sylvester, Arnold, et al., (17) a substantially high percentage of specialists think that they should devote more time to keeping self up to date on subject matter. The two functions which large percentages of the three groups, the administration, specialists, and county workers, think are taking too much of the time of specialists are direct teaching of individuals and groups, and service activities. Fifty-seven percent and 44 percent respectively of the total group think specialists should spend more time on the review of current research, and participating in workshops and short courses. Forty-five percent of the total group would have specialists devote time to assisting county workers with program planning.

This survey of extension methods made in Iowa included 40 administrators, 57 subject matter specialists, and 140 county extension workers. Two-thirds of the total Iowa extension group indicated that specialists should devote more time to the preparation of teaching materials and to keeping county workers posted on subject matter methods. The two duties of specialists which are reported to stand out in the judgment of four out of five Iowa extension workers are those of (1) supplying technical

information in subject matter field and (2) liaison between the research workers of the experiment station and the county extension staff.

Over 60 percent of the time of all specialists was devoted to four functions during the preceding 12 months: direct teaching of individuals and groups, preparation of teaching materials, service activities, and indirect teaching through training leaders. Agricultural specialists place three times as much emphasis on direct teaching of individuals and groups as do home economics and youth specialists. This is accounted for by the greater emphasis on teaching through local leaders on the part of the home economic and youth specialists.

In the Iowa study major suggestions made by county extension workers for the improvement of specialists work were:

1. Provide more and better teaching materials.
2. More emphasis upon program determination and execution.
3. Keeping themselves and county staffs up to date on subject matter methods.

The administration needs to take necessary steps to make clear to all extension specialists which of their functions are major, which are intermediate, and which are minor, and establish a procedure and make available the facilities necessary to expedite this policy. The division of time in the field and in the office for specialists needs to be adjusted and in keeping with their recognized major, intermediate and minor functions.

When considered according to the most desirable basis for conducting extension work, the Iowa survey showed that more than seven out of ten rated three functions as major. These three functions are keeping self up to date, keeping county staff posted and preparing teaching materials. Almost six out of ten considered direct teaching and service activities of minor importance.

Reid and Wilson (14) make the statement that an analysis of the job of the state extension specialist indicates that the work of specialists can be listed under four broad groups: planning functions, training functions, direct teaching functions, and studies to increase effectiveness of work. Their work also shows that the second largest time-consuming activity as indicated by 642 specialists was preparation of teaching materials. This required 14 percent of the time of agricultural specialists.

Keeping Self Up to Date

Departmental staff meetings of experiment station, resident teaching, and extension members of the faculty having like subject matter interests are an important administrative device for promoting effective teamwork among those responsible for the three types of service of the land-grant college. That such departmental staff meetings should be held regularly is the belief of 86 percent of the extension specialist group and 90 percent of the administrative group in an Iowa survey by Sylvester, Arnold, et al. (17). The first choice of the specialist group was to hold such meetings at monthly intervals.

According to Smith and Wilson (16) it is advisable to study what is actually being accomplished as a guide to further efforts. Extension workers will be unable to look upon their work as a profession in the absence of reliable data to guide them in the intelligent prosecution of their work. In other words, extension organization and teaching must acquire scientific background just as the subject matter taught through extension must have a scientific foundation.

Hannah, Cardon, et al., (8) report the importance of extension workers having opportunities for frequent short periods of in-service training to bridge gaps in academic preparation, to serve as refresher training, and to meet changing problems and situations as they affect the job to be done.

Keeping County Staff Posted

Sylvester, Arnold, et al., (17) state that increased emphasis and preference needs to be given by the administration and specialist to the training of the county staff and local leaders with decreased emphasis on direct teaching by specialists.

In a survey of state extension specialist activities by Reid and Wilson (14) where 654 specialists reported, the group indicated that they spent 21.3 percent of their time training county extension workers. The only function with which they spent a larger percentage of their time was on direct teaching in the counties. This activity represented 29.6 percent.

Program Determination

Cunningham (4) in discussing "Outlook in an Extension Program" relates how the fruit committee in the college extension program would make up a fruit program at the state level to serve as a guide to the county fruit committee in making their program at the county level. The fruit program usually contains a section on the general economic situation and outlook as well as sections on the major orchard problems and the suggested educational activities and services available. The place of outlook in these commodity programs is not so much to include a brief statement on outlook, as to keep the programs in tune with economic conditions. This gives the grower the facts and allows him to gear his program to or provide necessary measures for unusual conditions.

Sylvester, Arnold, et al., (17) indicate that in Iowa district extension supervisors in agriculture throughout the years have conferred several times a year with county extension workers regarding their needs, particularly for agricultural specialist help, and have transmitted these requests through a regular procedure to the specialists. It has been the responsibility of the specialists to plan their work so that the fulfilling of the requests can be accomplished. The specialists submit schedules for field work to the scheduling official who maintains a master schedule, submits the dates to counties for approval and in turn notifies the specialists regarding approvals and rejections of proposed county contacts.

Past records indicate that Iowa subject matter specialists spent about 35 percent of their working time out in the state. In the judgment of the administration, specialists, and county workers, this division of specialist time between field and office is about right.

Timing has proved to be an important element in work planning. According to Kelsey and Hearne (9) one of the simplest approaches in timing activities is to let the over-all factors, such as seasonal considerations, fix the months for a given event. Then by thinking about what we must do before this comes about we can "back off" from a given date the blocks of time required to do the preparatory work.

In the report by Reid and Wilson (14) no single factor is pointed to by extension directors as largely determining the counties in which a specialist works. The importance of the project and the request of the agents have most influence on this. The importance of the project with other influences was responsible for the selection of counties for agricultural specialists' work in 83 percent of the states and requests of the agents combined with other factors in 76 percent. One state reports that contacts of specialists with county workers are arranged entirely through the central office.

Clear objectives are the first essentials of a good agricultural extension program. Smith and Wilson (16) indicate that more and more the program of the extension worker is being based on an analysis of economic conditions as they are on the individual farm, the community, the state, the nation and the world. Broad program planning takes into account the fact that the farmer's profits and welfare are not only

determined by what he does himself on his own farm but by what other farmers are doing in other states, other regions, and throughout the nations of the world. It is also dependent on the status of other industries and peoples. All these matters enter into extension program making at the present time.

A good plan of work shows just what is to be done, how the work outlined is to be carried through to completion, who will do it, where it is to be done, and when. Definite goals are usually set and methods outlined for reaching those goals.

A good annual report sets forth what the individual extension worker undertook to accomplish, why certain problems were selected in preference to others, the assistance received from various cooperating agencies, the teaching methods employed, the results obtained, and modifications of plans and procedure for the following year in light of the current year's progress and experience.

Criticisms which Hannah, Cardon, et al., (8) cite have been levelled at the way extension programs are determined. These may be summarized as follows:

1. The program planning is one of form rather than substance, and received too little time and attention for a constructive job.
2. That in too many instances extension program planning does not take into consideration the interests and needs of various sizeable groups in the county. Frequently overlooked are the lower income groups, part-time farmers, farmers living in the poorer land areas, and other such groups.

3. Unconsciously, perhaps, such programs are directed to educating people as agents of production rather than as individuals.

The people who are to benefit from extension work should participate democratically and effectively in determining program emphasis in light of what they believe will benefit them most.

Wilson (21) shows that there is a decided tendency for the number of all practices adopted as a result of extension effort to increase with the number of major projects. This means that emphasis should be shifted from time to time to insure that during a term of years the extension program affects practically all of the farms and farm homes.

Wilson and Gallup (20) stress the importance of aiming the extension teaching plan at the six to seven grade level of education if the goal is to reach the bulk of the farm population effectively.

Use of Teaching Materials and Methods

Kelsey and Hearne (9) show through extension field studies conducted over a long period of years that people are influenced by extension education to make changes in behavior in proportion to the number of different teaching methods with which they come in contact. As the number of methods of exposure to extension information increases from one to nine, the number of farm families changing behavior increases from 35 to 98 percent. However, the percentage of families responding is more rapid up to five or six different methods. When exposed to five different ways, approximately seven out of every eight families receiving

information change their behavior. If a widespread response in learning is desired, repetition in a variety of ways is exceedingly important. The importance of knowing the extension worker personally is emphasized in studies which show that people who have had personal contacts with extension workers have used four times as many practices as have people who have had no contact. The extension worker is also compelled to know people and conditions.

Since the studies of Kelsey and Hearne (9) show that several methods are better than any one method, we are not concerned with choosing the best, but rather with knowing (1) what all the methods are, (2) what each has to contribute, and (3) what is the best combination of personal, group, and mass media for a specific plan of work or educational campaign. The following is a list of several items which should be considered in selecting the methods to be used:

1. The length of time the program has been under way.
2. The character and stage of development of the program; for example, result demonstrations may no longer be needed to give proof of practices recommended.
3. The personality and skills of available workers, both paid and volunteer.
4. The sex, age, education, motives, and other complex human characteristics and customs of the people to be reached.
5. General local conditions, such as seasonal work, weather conditions, available meeting places, organization, and leadership.

6. Financial and other resources, such as equipment, including returns per unit of time spent on the method.

These methods should have flexibility and be capable of easy adaptation to changing conditions.

In studies by Wilson and Gallup (20) it is stated that the choice of teaching methods and activities employed will have a direct bearing upon the success attained in advancing each stage of the extension process. Progress is dependent upon the appropriateness of the methods.

According to Hannah, Cardon, et al., (8) the best educational methods for extension are those which fit the subject matter to be taught; which take into account the educational and economic situation of the people, as well as their cultural practices; and which will reach effectively the largest number.

Extension research reveals that even in a well-defined situation the utilization of several different teaching methods has a cumulative effect. It is necessary, therefore, for the extension worker to be proficient in the selection and use of those teaching methods best suited to a particular situation.

The indirect spread of better practices from one neighbor to another is frequently more important than the direct influence of leading methods. In connection with practices adopted by farmers, oral methods and indirect influence have been most influential.

Smith and Wilson, and Kelsey and Hearne (16,9) state that as all methods employed in extension teaching have differing values which may

vary widely under different circumstances, it is important for extension workers to have knowledge of these teaching instruments, in order that they may use the right methods in the right proportions at the right time. The following data furnish some reliable information which may be considered indicative of the relative influence of the various means and agencies employed in extension teaching. Upon sorting the means and agencies as to whether primarily oral, written, or objective, and eliminating duplication as far as possible, it becomes apparent that oral methods lead with a relative influence equal to 34.9 practices in 100, as compared to 23.0 for objective methods, and 18.8 for written methods. Indirect spread of practices accounts for 23.3 practices in 100.

Knowledge of extension practices and confidence in the recommendation of the extension service are the natural outgrowth of contact with representatives of the extension service and participation in extension activities.

Teaching methods should be employed which over a period of years will bring just as large a proportion of the rural people to be reached as possible into personal contact with extension workers, and into active participation in the activities employed in extension teaching.

The theory that personal sources in diffusing extension information are more convincing than impersonal ones is supported in a study by Lionberger (11). A higher correlation between personal sources of information and approved practice ratings than between either reading

or radio sources and approved practice ratings suggests that personal sources of information may be more effective in influencing the adoption of approved practices than either reading or radio sources.

Brunner and Yang (2) in reporting on values of different methods relate how extension has demonstrated its value, so gained the confidence of its constituency that they will accept news stories and the advice of circular letters as they would not have done in the early years of extension work.

Sylvester, Arnold, et al., (17) report that specialists need to reallocate their time to give preference to the preparation of needed teaching materials for use by county staff members and local leaders. These materials are for specific teaching purposes. Slides, circulars, and charts stand out as being the kinds of teaching materials which the county staff desire specialists to prepare for general state use.

Demonstrations

According to Close, Beattie, and Mulford (3) the extension horticulturist gives demonstrations as are necessary and endeavors to train the county agent and demonstrators so that they may carry on the work in the county throughout the season without further visitation from the specialist.

The chief purpose of the result demonstration is the establishment of confidence on the part of both the extension teacher and the farmer. Having successfully demonstrated that the findings of research apply to

a specific farm problem, the extension worker can speak and write of the practice with the conviction of experience. As indicated by Wilson and Gallup (20) the trend in the use of result demonstrations in extension teaching has been consistently downward over the years. The influence of the result demonstration was highest in soils, corn, soybeans, potatoes, cotton, and tree fruits.

A comparatively small number of people see result demonstrations at the stage when convincing. Result demonstrations started but not completed, duplicated needlessly, or which tend to be experiments rather than demonstrations, increase the cost. Expressed in terms of cost, the result demonstration is only about half as efficient in influencing the adoption of practices as the average of all extension methods.

The demonstration to be most effective according to Wright (22) must deal with problems in which the people are already interested or interest must be aroused. The community should understand just what the demonstration is and what it is intended to teach. Single practice demonstrations which aim to teach one thing at a time are likely to be more effective. Repetition of the same demonstration adds to its effectiveness. It is more likely to be accepted if it comes true time after time.

In a method demonstration skill has neither been taught nor learned until the pupil can actually do the thing with his own hands. Fruit growing and poultry raising are the two fields of agriculture where the method demonstration was credited with more than 20 percent of the practices adopted.

The demonstration method should continue to be employed whenever the occasion warrants. Hannah, Cardon, et al., (8) indicate evidence that with advancing educational status, and growing confidence in the soundness of extension recommendations, there may be less necessity for the employment of this teaching technique, at least in advantageous situations.

Meetings

Hannah, Cardon, et al., (8) emphasized that in recent years, with improved local transportation facilities, there has been a growing tendency to utilize group meetings as a means of conducting extension work. However, a certain degree of selectivity may result when this method of developing a teaching situation is used. This selectivity may be on the basis of educational status where the less well educated are less likely to attend. When such meetings are planned on a commodity basis, as is done in many states and counties, they may attract primarily the larger producers of the commodities being considered. Such commodity centered meetings may not encompass all of the problems common to the welfare of all.

Meetings are adaptable to practically all lines of subject matter and recognize the basic urge of individuals for social contacts. The holding of the meeting may also become the "real" objective rather than the purpose the meeting was intended to advance.

According to Kelsey and Hearne (9) there is a slight preference for night meetings, though 40 percent of persons indicated that they would have

attended regardless of the time held. The results also showed that night meetings did not attract people from as great a distance as did day meetings. Interest in the subject as an attendance reason was less important to those people present at night meetings.

In this same study involving the methods of presenting subject matter at meetings, one conclusion could clearly be drawn from the facts presented. The lecture only method of presentation was the weakest of five methods studied. It ranked fifth in the number of farms influenced and fifth in the number of practices changed per farm.

Farm Visits

Broadly speaking, the farm or home visit is made for the purpose of giving information or obtaining information. This individualized teaching provides for intimate knowledge of farm problems and for reaching those who have little interest in extension. Wilson and Gallup (20) show in a comparison between records in 1930 and 1952 for the United States that the number of farm visits has decreased by 14.8 percent. With the extension service having now won the confidence of the rural people, Brunner and Yang (2) point out that too frequent use of farm visits restricts benefits to too limited a number of people. However, it is safe to say that in a poverty-stricken area where there are few automobiles, general meetings take a lot of time and produce small attendance and few results. Such situations still call for farm visits. Reid and Wilson (14) show that according to the estimates of 642 specialists, 41 percent of the time of agricultural specialists is spent on visits to counties.

News Stories

The function of the news story in extension teaching is primarily one of stretching or expanding coverage. It is the chief means of getting information about extension activities and better practices to the many who participate in other extension activities. It adds greatly to the teaching effectiveness of other methods.

The very large potential coverage of the extension news story is, of course, made possible by the nearly universal practice of reading newspapers. Wilson and Gallup (20) indicate that about 85 percent of the total adult population read one or more newspapers and 65 percent read one or more magazines more or less regularly. The 1945 farm census indicated that approximately 80 percent of the rural farm families take either a daily or a weekly paper and that 70 percent of them receive at least one magazine. The news story is outstandingly at the top of the list of teaching methods in cheapness of influencing change in people.

Circular Letters

Wilson and Gallup (20) cite that circular letters serve two general purposes: (1) to publicize an extension activity like a meeting, exhibit, or television program; and (2) to give timely information on farm and home problems. The form letter may provide additional information to supplement the meeting or radio talk, or it may be the carrier of helpful information to many who seldom, if ever, attend meetings or participate in other extension activities.

Radio

Radio is the most widely accessible of all mass media. It has the ability to disseminate information to the largest number of people in the shortest time. It is unrivaled as a means of getting emergency or timely information to rural people, due to the presence of a radio in 93 percent of all farm homes. Farm people are discriminating listeners. According to Brunner and Yang (2) a farm group in one Midwest state with a strong liking for informational programs preferred that these be presented through interviews rather than talks, especially when concerned with agriculture. A recent study of the extent of use of radio by extension workers in nine North Central states indicated that 87 percent of state subject-matter specialists are utilizing the radio.

Correspondence

While apparently somewhat more effective in extension teaching than the telephone call, the individual letter was not considered an important source of extension information by farmers and homemakers in the study areas used by Wilson and Gallup (20). When you dictate a letter you must lose yourself in order to find your customer. To make your letter interesting, you must be interested.

Exhibits

From the standpoint of influencing farmers and homemakers to adopt improved practices, the exhibit is apparently the least effective of all

extension teaching methods. To plan and prepare the extension exhibit, to set it up, provide personnel to explain it, and finally to dismantle and remove it requires a considerable expenditure of time. According to Wilson and Gallup (20) the conclusion must be drawn that public relations and considerations other than teaching should be given the heaviest weight in determining the emphasis to be placed upon extension exhibits. Brunner and Yang (2) point out that even though exhibits as such are rarely responsible for changing a home or farm practice, nevertheless they unquestionably implant ideas and arouse interest.

Television

Closeup pictures on television may even make it possible for the viewer to see key operations more clearly than when many people are present at a method demonstration. An abundance of inexpensive published material to supplement the television presentation is important.

Visual Aids

Every study made of what people want to read finds pictures topping the list. Brunner and Yang (2) find that the average motion picture, especially if it does not have a sound track, is more effective if accompanied or followed by explanatory verbal comments. This also permits direct application to local conditions. Distributing literature on the topic of the film is also effective. Often a comedy short or travel film is used along with an educational movie on agricultural practices.

Tours

Close, Beattie, and Mulford (3) suggest that an orchard tour is the most effective means of acquainting people with the results of a spraying or other orchard demonstration, because they can see just what has been accomplished. As a means of spreading influence, there is nothing to equal automobile tours. Such tours are usually held in the summer and fall, when results of demonstrations are evident, but sometimes they are held in the spring, as orchard-pruning tours. They have been popular and most effective in teaching the pruning of fruit trees of different ages and sizes under different growing conditions.

Discussion Groups

In the last 15 years according to Smith and Wilson (16) increasing use has been made of discussion groups. They permit an exchange of views, and a pooling of information. Essential to successful discussion in most cases is the presence of an informed resource person or the availability of impartial materials which raise questions and present all sides of the issue under consideration.

The panel discussion is excellent for presenting controversial subjects. There is a danger, however, of the panel lapsing into a series of set speeches with no real discussion.

Use of Teaching Methods

Extension methods as indicated by Wilson and Gallup (20) are used to stimulate people to make changes that result in better farming. The

cycle includes: (1) a sound program related to the needs of people; (2) an intelligent teaching plan; (3) carrying out the plan systematically; and (4) appraising progress.

The methods used in extension teaching fall into three use classifications:

1. Individual contacts, such as farm visits, office calls, result demonstrations, and other individual contact methods.
2. Group contacts, such as meetings of all kinds.
3. Mass media, such as publications, radio, news stories, and other media.

Mass contact methods reinforce what is being taught through face-to-face methods and reach a much larger and different clientele. Field studies (Table 1) indicate that of 81 practices in 100 adopted as the result of various teaching methods, 25 were credited to individual contacts, 33 to group contacts, and 23 to mass media methods. The indirect influence resulting from the direct teaching effort accounted for 19 percent of the new practices. Meetings of all kinds, principally method demonstration meetings and general meetings, were responsible for influencing one-third of the practices adopted, or 32.8 percent.

TABLE 1. RELATIVE FREQUENCY WITH WHICH EXTENSION METHODS WERE REPORTED AS HAVING INFLUENCED THE ADOPTION OF IMPROVED PRACTICES. Reproduced from Wilson and Gallup (20)

METHOD	PERCENTAGE OF PRACTICES 44,788 practices--15,454 farms and homes in 32 areas--27 states 1923-41
INDIRECT INFLUENCE	19.0
METHOD DEMONSTRATION MEETINGS AND LEADER TRAINING MEETINGS	18.2
GENERAL MEETINGS, EXTENSION SCHOOLS	14.6
FARM OR HOME VISITS	10.8
NEWS STORIES	9.7
BULLETINS	8.5
OFFICE CALLS	6.5
RESULT DEMONSTRATIONS	6.1
CIRCULAR LETTERS	3.0
RADIO	1.2
CORRESPONDENCE, INCLUDING STUDY COURSES	1.1
EXHIBITS, INCLUDING POSTERS	0.9
TELEPHONE CALLS	0.3

When relative cost of teaching methods as well as relative effectiveness are both considered, news stories and radio are the cheapest methods of influencing changes in practices. The cost of influencing the adoption of practices through extension exhibits is 17 times greater than when news stories and radio are employed.

According to Wilson and Gallup (20) such factors as age of the adult farm population, tenure status, and location of the farm or home have little bearing upon the adoption of extension recommended practices by farm people.

Subject Matter

Wilson and Gallup (20) cite that what is being taught may be relatively simple or extremely complex.

1. Where the new practice is similar to those already being followed, the news story, radio, or circular letter will be effective, whereas complex or unfamiliar practices will require face-to-face contacts and written materials.

2. In the early stages of a project, attention must be given to the establishment of local proof of the practice.

3. Manual skills can best be taught through method demonstrations and television.

4. Teaching methods which have proven successful in one subject-matter project are likely to be equally successful where the second subject-matter line of work is similar.

It must be remembered that the satisfaction likely to follow the adoption of the recommended practice largely determines the extent to which that practice is passed on from one neighbor to another. This indirect influence in the field of agriculture was reported by Wilson and Gallup (20) to be the lowest for tree fruits, vegetables, poultry, and rural engineering practices.

In the final analysis the extension worker is faced essentially with a series of compromises, as the selection of methods involves judgment of many factors. Attention must always be focused upon the sum total of teaching done as the result of the entire year's teaching effort rather than upon the return from a particular unit of time.

Specific Extension Activities

Extension's widespread use of unpaid local leaders and demonstrators is a unique contribution to the field of out-of-school education and social organization. According to Hannah, Cardon, et al., (8), to the maximum degree practicable, leaders should be selected by the members of the group they are to serve. They should not be arbitrarily selected by an extension worker on the basis of evidence of a particular skill or economic position, in the mistaken belief that such are necessarily earmarks of successful leadership.

The special group conference where a small number of specialists, supervisors, and agents meet to consider a special problem or piece of work was rated higher than other types of conferences in the study by

Reid and Wilson (14). The headquarters staff conference was considered of next greatest value.

Participation in teaching activities was rated of higher importance than other purposes for which specialists visit counties. Conferences with extension agents in their offices and observation of work under way in the field were rated of about equal value in visits to the counties.

Agricultural specialists, particularly, devote considerable time to attending meetings of commodity organizations and enterprise groups. Such meetings held upon a local or county basis were considered of high value by nearly one-half of the agricultural specialists reporting in the work of Reid and Wilson (14).

Correspondence with agents and farm people was rated of high or medium value by 81 to 87 percent of the specialists. Circular letters to agents were considered of medium to high value by 53 to 75 percent.

From 75 to 89 percent of the agents reporting received subject-matter help from specialists. Forty-seven percent of the agents desire more help from specialists in keeping posted on subject-matter developments. The preparation of bulletins, circulars, and demonstration materials for use by specialists or county workers was given a high rating by 63 percent of the agricultural specialists.

Publicity

Close, Beattie and Mulford (3) conclude that an extension horticulturist who has his work well in hand has printed or mimeographed matter

on most of, if not all, the lines of work in his projects. Such material is of great value also in working up sentiment on problems not yet started in a community.

To keep a subject before the public, an intensive campaign of publicity is begun and continued several months before actual demonstrations or meetings are held. In Kansas, it was decided to put on an orchard clean-up campaign. People with orchards became convinced that the orchards must be cleaned up. The people responded enthusiastically, and the orchards were cleaned up.

The many forms of written or printed material may be used to generate interest or to give specific information. According to Galloway (6) we have failed too often to give full consideration to the readability of our writing. We have written with our fellow workers in mind rather than the farmer and his family. The important thing is to consider your potential reader and his reading ability.

Kelsey and Hearne (9) cite studies in readability which show that all personal pronouns in reference to home, family, and familiar things have the effect of holding interest.

In a publication on Agricultural College Bulletins (13), Dr. M. C. Merrill, former Chief of Publications, U.S.D.A., points out two major defects common to the manuscripts submitted to him. "First, they are too long and detailed; and second, they do not accurately indicate the contents of the papers. They are too inclusive. They omit important phases of investigation or they place improper emphasis on certain points.

Most editors agree that the bulletin title should be short, preferably four or five words. It should contain a verb and be interest arousing as well as give a fair idea of what the publication is about.

In writing bulletins, it is an inviting appearance that is desirable, but it is the content in relation to the need of possible readers that counts most. Important criterion in the success of bulletins are as follows:

1. There must be a demand for the bulletin.
2. The subject matter must be timely.
3. Tell a simple, readable story and use pictures that tell a story.

According to Smith and Wilson (16) emphasis is now being placed upon short rather than long bulletins, eight to twelve page circulars being especially favored. Simplicity is the keynote. The unattractiveness of earlier bulletins has given way to artistic cover pages, appropriate illustrations, color printing, and easily readable type. Readily understandable words are rapidly replacing the technical. Simple sentences and short paragraphs are being used. These refinements have greatly stimulated interest and increased the usefulness of bulletins and circulars but cannot take the place of valuable content. If the subject matter information included is of a helpful nature, the bulletin will be read regardless of the presence or absence of pictures and an attractive cover page.

Wilson and Gallup (20) point out that information set forth on the printed page is considered authentic, can be studied at leisure, reread at intervals, and kept for later reference.

Brunner and Yang (2) found that the state with the lowest educational status among the farm population distributed only one-seventh as many bulletins as a New England state with an educational status at the national average, despite the fact that the former has ten times as many farmers as the latter.

Evaluation of Accomplishments

Results of an Iowa survey by Sylvester, Arnold, et al., (17) indicate five principal ways in which specialists tend to evaluate progress at present in their respective subject matter fields. They are:

1. Number of meetings held.
2. Attendance at meetings.
3. Number of counties requesting their service.
4. Number of counties assisted.
5. Comments of persons in groups contacted.

The most desirable basis for evaluating specialists' work would be to place much greater emphasis on objective data, such as:

1. Survey of changes made in selected counties.
2. Survey of changes made statewide.
3. Survey of information obtained from county staffs.

Reid and Wilson (14) plainly state that the problem of measuring extension accomplishments and the contributions of specialists to the success of the extension teaching program is not being adequately met. There is need for administrative and supervisory officers to devise measures of extension results which are not only valid and reliable but which will enable one to determine in an objective way just how much is being accomplished. In making plans with agents specialists may well give more thought to the obtaining of suitable information by which to gauge the success of a particular endeavor.

Smith and Wilson (16) suggest that since extension work is concerned with developing a more prosperous agriculture and a more satisfying home and community life, the results of extension effort must be expressed in terms of changed farm and home practices, increased economic returns, local leaders developed, people trained, and community activities inaugurated.

Meetings, demonstrations, farm visits, and similar activities of extension workers cannot be considered as definite accomplishments but merely as means to the end. There is a close relationship, however, between activities which bring rural people into participation in extension and provide a means of contact with representatives of the extension service.

The adoption of new or better practices by farmers is undoubtedly the best single measure of extension accomplishment. Increased economic returns and raised standards of living are accomplished by means of better practices adopted.

It was shown by Smith and Wilson (18) that extension work is from two to three times as efficient in getting better practices adopted in some areas as in others. The time has come when extension needs more of the so-called "fundamental" research. Evidence is needed as to why some people participate in extension educational efforts and others do not. Educational research has historically been largely preoccupied with research and evaluation within the setting of formal classroom education. Extension education is carried on in a vastly more flexible situation.

Wilson and Gallup (20) suggest that when the acceptance of a seemingly desirable practice having general application to the farms of an area lags unduly, it is important to check the teaching plan for coverage and reexamine the practice itself.

III

THE INVESTIGATION

Scope of the Study

This investigation evolved from the need for more far reaching information in the field of extension horticulture in order to build, execute and strengthen our program in Virginia. Literature was found very limited in regard to the study of extension methods and techniques specific to horticulture. There is a need for information that will permit an evaluation of present methods and techniques and enhance a greater belief and confidence in the program pursued by the specialists.

Sometimes we lose sight of what goes into an effective method. Possibly we don't give a certain method a good chance to be effective by neglecting the background preparations. We need to take stock of what is involved in methods that make them effective.

In our field of work there are around 200 extension horticulturists in the United States. This personnel should be an excellent source of method and technique information much of which can be effectively adapted to other areas.

Procedure of the Study

As a background for this study the writer set out to develop a comprehensive review of the literature. A thorough listing was made of all relevant and timely subjects from the periodical index and the card index file back to the early twenties. The resulting periodicals,

bulletins, pamphlets, and books were reviewed. A large number of references were reviewed only to find that their content was philosophical in nature and not concrete to the objectives being sought. In due time, however, a "literature review" was rounded out that has proved very helpful in supporting this investigation.

In November of 1952 a survey was made from the Agricultural Extension Service files in Washington, D. C., covering the Extension horticulture annual reports and plans of work from 17 different states. This further verified the significance of information contained in the extension horticulture work from other states.

On this same trip an interview was arranged with Dr. J. L. Matthews of the Educational Research Section of the United States Department of Agriculture, for information in developing an extension research study. Particular emphasis was placed on suggestions for developing a questionnaire in obtaining the data for this investigation.

In July, 1953, Dr. R. J. Haskell, Federal Extension Horticulturist, announced this graduate study in his periodical communication to all the extension horticulturists in the United States.[1]

Shortly thereafter the writer sent a letter to each of these extension horticulturists inviting them to participate in the study and present any problems or questions for use in the questionnaire.[2] A reply of 20 percent was received with some of the more appropriate questions being included in the final questionnaire.

In September of 1953 the writer appeared before a group of extension horticulturists from across the country in connection with

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[1] See Appendix, p. 94
[2] See Appendix, p. 95

The American Society for Horticultural Science Meetings. At this time the scope of the investigation was outlined and an appeal made for their participation.

Up to this time considerable effort was being devoted to formulate an effective questionnaire. The questionnaire technique of research was reviewed and studied through the guidance of Dr. T. J. Horne of the Vocational Education Department. As the literature review on this investigation progressed concurrently, question after question came to light. They were typed on 3 x 5 file cards and at one time numbered over 200. This necessitated a careful selection, wording and organization of the questions. The questions were selected and reworded many times until it was felt they were in their best form. The questionnaire is outlined under seven main categories. These seven headings are also included and followed as a major portion of the literature review. Members of the writer's graduate committee were instrumental in reviewing and passing along their judgment on a rough draft copy of the questionnaire. In February 1954 the questionnaire[3] was printed, envelopes addressed and ready for mailing.

After two months, April 1954, a follow-up letter[4] with another copy of the questionnaire was sent to those who had not responded.

At the final count 149 questionnaires had been returned from a list of 192 horticulture specialists. This gave a return of 77.6 percent. In the 149 replies every question was not answered. This was caused by some horticulturists spending only a small percentage of their total time in extension work or because of the nature of the work

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[3]See Appendix, p. 96
[4]See Appendix, p. 97

in a particular state the question was inapplicable. Still others felt unqualified on certain questions because of their short tenure as a specialist. Irrespective of this variation there is a good representation on all phases of the questionnaire. Most issues under question will have between 120 and 130 specialists responding.

The next step was to compile this vast amount of information and tabulate the data. At the outset each questionnaire was given a number, one to 149. Then the data were recorded for each question under the respective number. In this way there was no chance of losing the identity of the source of information. After recording the data from each questionnaire under the specific question, tabulations were made and transferred to another record journal. From here the final "results and discussion" were developed.

During the process of completing this survey several requests have been made for preliminary reports. The first such report was given before the Extension horticulture section meeting during the Southern Agricultural Workers Conference held in Louisville, Kentucky, in February 1955. A similar report was presented to the Extension horticulturists in connection with the national meeting of the American Society for Horticultural Science, held at East Lansing, Michigan, in September 1955. A series of large charts were prepared and used to discuss certain phases of the survey. Three requests have been made for 2 x 2 slide sets of these charts. The slides have been made and sent to the specialists. Upon request the papers presented at the two meetings have been mimeographed and letters sent with them to the participating members.

IV

RESULTS AND DISCUSSION

Participants in this research study were asked to indicate their tenure in the field of extension horticulture. Only nine percent of the respondents to the questionnaire had less than one year of experience. Twenty-nine percent of the group had one to five years experience. Twenty-seven percent had five to ten years experience and over one-third had more than ten years experience as a specialist. These data indicate that a high percentage of the respondents had considerable experience in extension horticulture.

Often land-grant college employees divide their time between research, teaching, and extension. It was found that 105 of the 149 respondents were on full time extension. The remaining 44 made up the equivalent of 20 additional specialists on 100 percent extension time. This indicates that of the 149 respondents 84 percent of the group are equivalent to full time specialists.

The participating personnel also divide their time under the three principal branches of extension horticulture: fruits, vegetables, and ornamental horticulture. To arrive at a relative figure of the number of respondents under each section of extension horticulture, those spending 50 percent or more of their time in a section were noted. Of this group 30 percent of the specialists came under ornamental horticulture, 35 percent under the vegetable section, and 35 percent under the fruit section. This indicates a well distributed representation from the three principal branches of extension horticulture.

This gives us a cross section background into the experience, time devoted to extension, and the representation of the horticulture sections of those contributing to the development of this investigation.

Evaluation of General Functions of Specialists

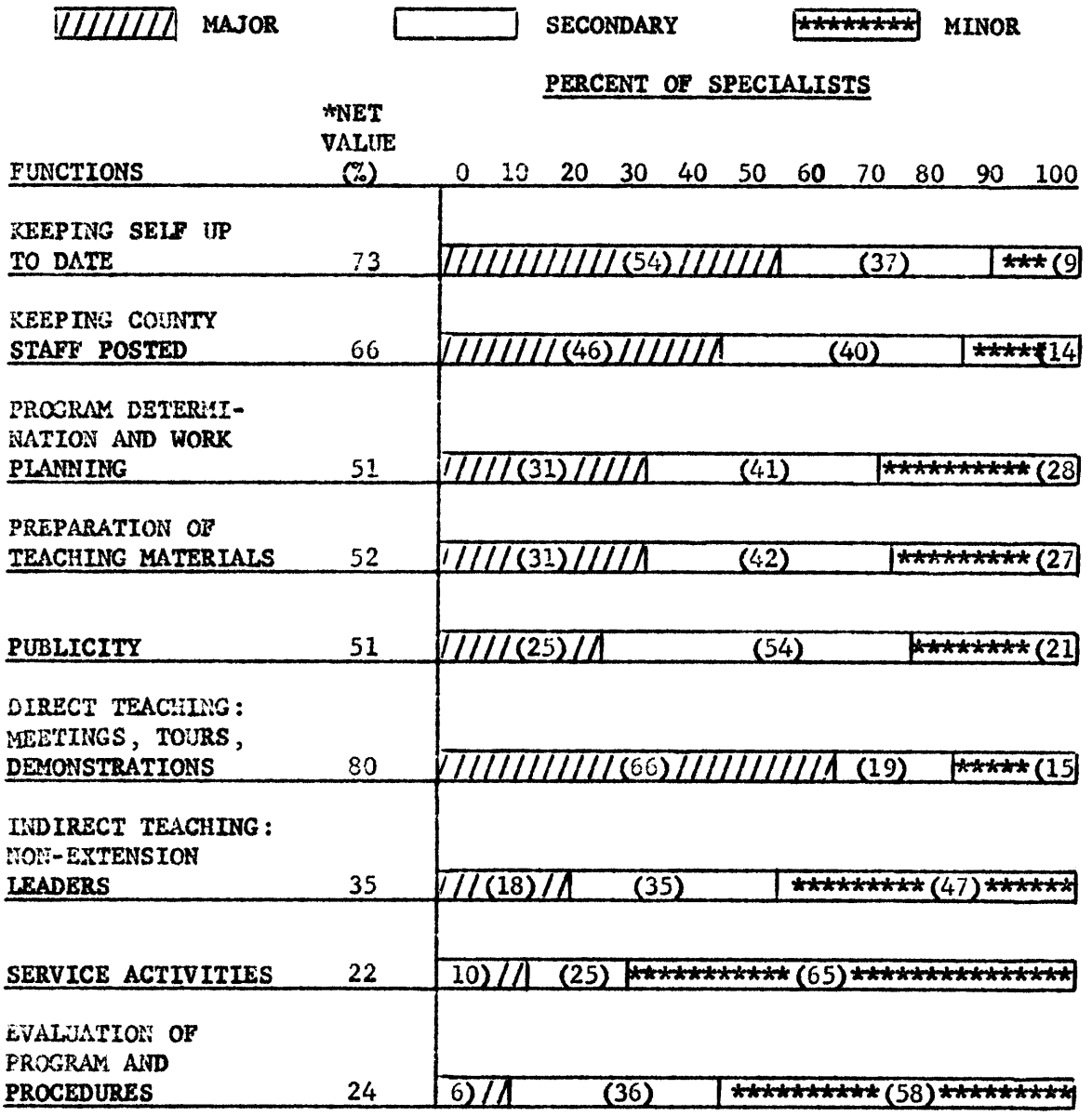
We find that the basis of doing extension work often lacks a definite concept of which general functions are of major importance, which are of secondary, and which are of minor importance. It is understood that this will vary somewhat depending on conditions confronting the specialist. However, what is the pattern of our specialists across the country that we might have some guide in projecting our ideas for future work planning? Statements of the general functions of specialists were outlined and the respondents to the questionnaire were asked to indicate which functions he considered to be major, secondary, or minor. These functions were rated by the specialists according to the present basis, and the most desirable basis for conducting extension work.

A net value figure was determined to give a single overall rating for each function under the present basis and most desirable basis. Each reply for a major function was assigned a value of one to represent a first choice item; each reply for a secondary function was given a value of two to represent a second choice item; and each reply for a minor function was given a value of three to represent a third choice item. The total value of the replies for a particular function was then converted to a percent figure to give the overall rating of the functions.

One hundred percent would represent complete acceptance of the function as a major activity of the specialist. The net value on the present basis of conducting extension work (Figure 1) shows that "direct teaching through meetings, tours, and demonstrations" rated the highest with 80 percent. "Keeping self up to date" and"keeping county staff posted" followed with 73 and 66 percent respectively.

In establishing a major, secondary or minor function concept, it was found that "direct teaching through meetings, tours and demonstrations," and "keeping self up to date" were recognized by a majority of the respondents with 66 and 54 percent respectively to be a major function. The function "publicity" was considered by a majority with 54 percent to be of secondary importance. "Service activities" and "evaluation" were rated by a majority as a minor function by 65 and 58 percent respectively. We have now established a definite concept for five out of the nine functions. A concept can be established among the remaining functions with the largest response of 46 percent for "keeping county staff posted" indicating major significance. "Program determination and work planning" with 41 percent and "preparation of teaching materials" with 42 percent show the largest percentage under secondary importance. The final function is "indirect teaching through training of non-extension leaders" which indicates a minor importance with 47 percent. This evaluation places three functions in the category of major importance, three under secondary importance, and three under minor importance and reveals a definite concept on a pattern for conducting extension work.

FIGURE 1. AN EVALUATION OF THE GENERAL FUNCTIONS OF HORTICULTURE EXTENSION SPECIALISTS. A survey of the present basis of conducting extension work as reported by 134 specialists in the United States.



* Net value expressed as percent, with 100 percent representing complete acceptance of the function as a major activity of the specialist.

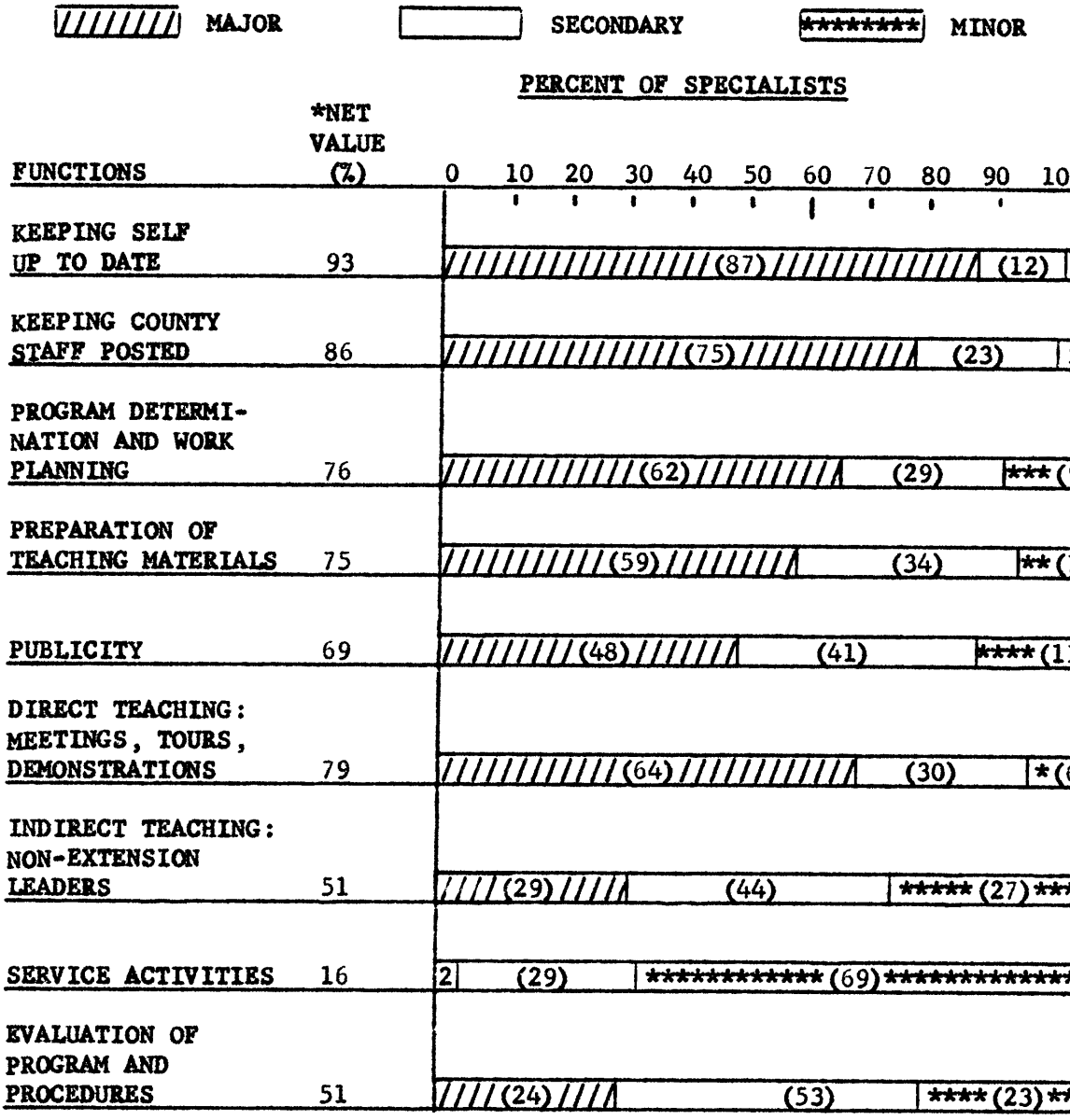
Under the most desirable basis of conducting extension work (Figure 2) the net value of the functions show "keeping self up to date" with an outstanding rating of 93 percent. "Keeping county staff posted" and "direct teaching through meetings, tours and demonstrations," follow with 86 and 79 percent respectively. In an Iowa survey (17) of all agriculture specialists it was significant to note that "keeping self up to date" and "keeping county staff posted" were two functions considered of major importance. In establishing a concept for the general functions we find that six of the functions fall in the category of major importance, two under secondary importance and one under minor importance.

Specialists indicated a 33 percent increase on "keeping self up to date" between the present basis and most desirable basis of doing extension work. The functions of "keeping county staff posted," "program determination and work planning," and "preparation of teaching materials" showed an increase of approximately 30 percent. This evaluation reemphasizes the importance of program adjustment in line with "keeping self up to date."

Keeping Self Up to Date

In keeping self up to date we find that 77 percent of the specialists report having staff meetings for the discussion of horticultural subject matter. Monthly and weekly intervals were cited as being the more popular frequency for holding the meetings. A number of these specialists were found to participate in meetings on an

FIGURE 2. **AN EVALUATION OF THE GENERAL FUNCTIONS OF HORTICULTURE EXTENSION SPECIALISTS.** A survey of the most desirable basis for conducting extension work as reported by 128 specialists in the United States.



* Net value expressed as percent, with 100 percent representing complete acceptance of the function as a major activity of the specialist.

irregular basis through the year. Although weekly intervals were cited as frequently as monthly intervals, some respondents may have inadvertently designated seminar meetings as staff meetings.

In response to the value of these meetings in establishing an understanding to problems, it is evident that specialists hold them in high esteem (Table 2). Forty-two percent of those responding rated the meetings as good. Seven out of ten specialists rated them good to excellent. Only three out of ten rated the meetings fair to poor. Out of 31 specialists not having staff meetings for the discussion of subject matter, 30 indicated that it would be desirable to hold such meetings. These data would indicate that a monthly meeting with the horticulture extension, research, and resident teaching personnel would aid in strengthening the specialist's program.

TABLE 2. THE EVALUATION OF HORTICULTURE DEPARTMENT STAFF MEETINGS IN ESTABLISHING AN UNDERSTANDING IN SUBJECT MATTER AND EXTENSION WORK.

EVALUATION	PERCENT OF SPECIALISTS REPLYING
Excellent	28
Good	42
Fair	27
Poor	3

To make the most efficient use of our time in keeping self up to date, it would be helpful to know what features of workshops, short

courses, refresher courses, or meetings caused them to be helpful. Comments were invited on a free answer basis. Several of the more frequent statements are as follows:

1. An exchange of ideas, methods, and new approaches on mutual problems.
2. A discussion of recent research with recommendations for practical application.
3. An opportunity for informal discussions with workers from other states on methods and procedures in planning and conducting extension programs.
4. A discussion of good subject matter in own and related fields.

In these sessions the specialists are seeking an interexchange on what is being taught and how it is being taught to give new life to their programs.

With the present day problem of keeping abreast of subject matter, we ask, "What publications are best serving the horticulture specialists across the country?" Under a specific classification listing publications by title and their address, the specialists cited 58 different pieces of literature.[5] There are 12 publications which were mentioned most frequently (Table 3). THE AMERICAN SOCIETY FOR HORTICULTURAL SCIENCE PROCEEDINGS headed this list followed by the AMERICAN FRUIT GROWER magazine and the MARKET GROWERS JOURNAL.

Under a listing of publications of general classification[6], state experiment station publications were found to be of foremost importance. The second source of information mentioned most often was state experi-

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[5] See Appendix, p. 98
[6] See Appendix, p. 103

ment station progress reports. The third source was newsletters from horticulture specialists in other states. It is evident that there is a wide source of literature which specialists use in keeping up to date.

TABLE 3. AN EVALUATION OF THE 12 MOST FREQUENTLY MENTIONED PUBLICATIONS USED BY HORTICULTURE SPECIALISTS.

PUBLICATION	PERCENT OF SPECIALISTS USING PUBLICATION
AMERICAN SOCIETY FOR HORTICULTURAL SCIENCE PROCEEDINGS	37
AMERICAN FRUIT GROWER MAGAZINE	12
MARKET GROWERS JOURNAL	11
AMERICAN VEGETABLE GROWERS MAGAZINE	10
GARDEN FACTS (U.S.D.A.)	7
THE PACKER	4
AMERICAN NURSERYMAN	4
FLORIST REVIEW	3
FLOWER GROWER MAGAZINE	3
BIBLIOGRAPHY OF AGRICULTURE (U.S.D.A.)	3
FARM RESEARCH (N. Y. EXP. STA.)	3
EXTENSION SERVICE REVIEW (U.S.D.A.)	3

Keeping County Staff Posted

Training activities are one of the principal means of keeping the county extension staff posted. What is the nature of the horticulture

specialists training activities in other states that we might have a guide for projecting our program into the future.

We find that two-thirds of the respondents to the questionnaire indicate that they held direct group training programs with county personnel. The most popular training activity in the field was "subject matter field days or tours" as indicated by 41 percent of the total group. Under training activities at the college "training conferences or workshops" was mentioned most frequently by seven out of ten specialists. It was found that five times as many training activities were held in the field as at the college. The average number of days per training school was 1.2 days in the field and 2.3 days at the college. There were approximately five different training activities per year for each specialist responding.

How effective is this training program for the county extension staff? A summary of the data shows that 53 percent of the specialists report the program to be good to excellent with 47 percent indicating a poor to fair showing. The analysis of this data does not indicate a significant evaluation.

Another way of keeping the county staff posted is by the circulation of timely information during the year. Through the questionnaire it was found that eight out of ten specialists were sending such information to the county personnel at least four times a year. It was interesting to note that seven out of ten specialists have the county personnel send this same information on to the growers, whereas three out of ten specialists send it directly to the growers. It is evident that the

monthly interval is the most desirable frequency for sending out timely information. This was indicated by 40 percent of the respondents. The writer received 293 pieces of literature from the respondents as examples of the kind of information being used in other states. This literature will be reviewed for ideas that may be incorporated in the Virginia program.

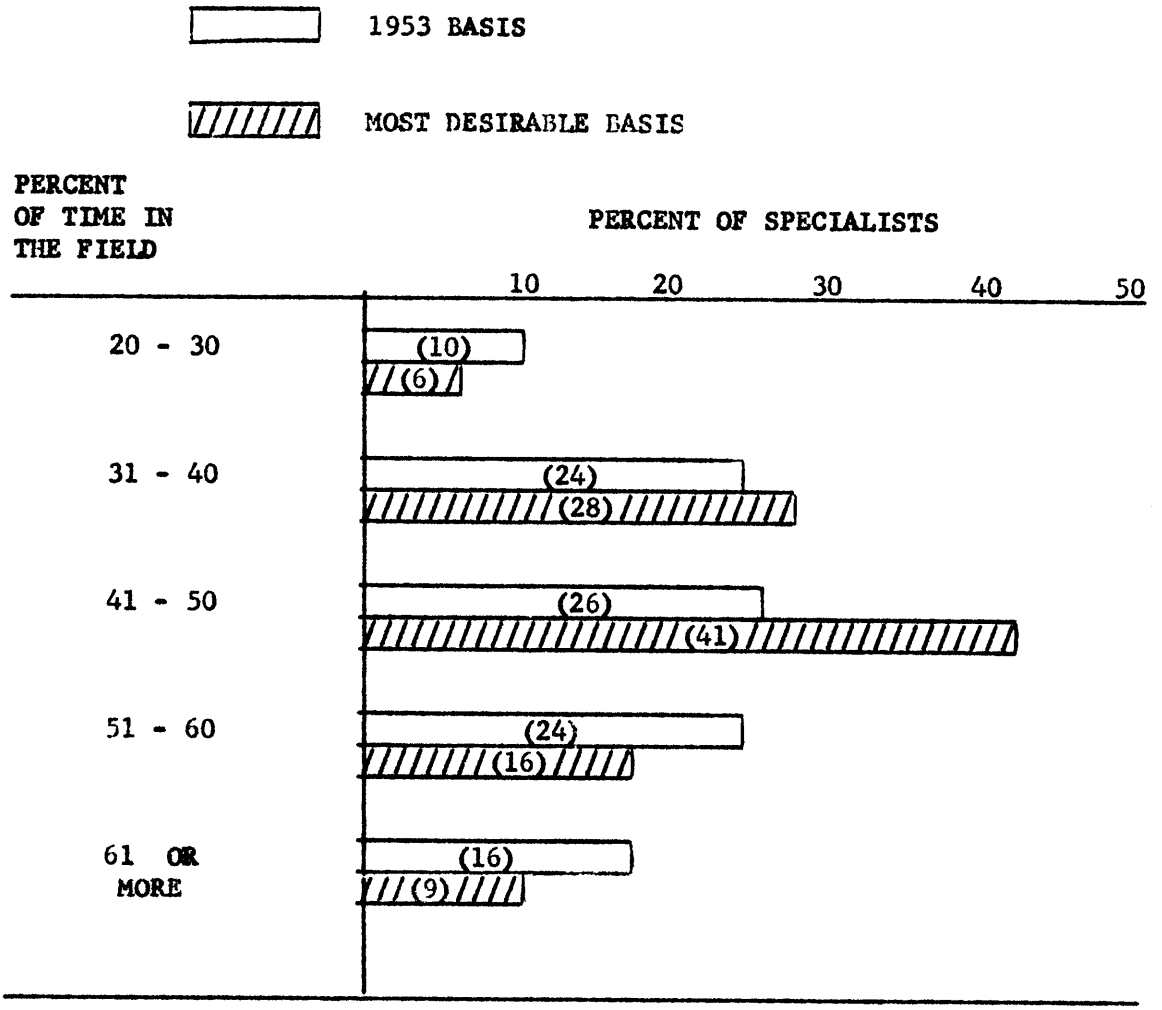
Program Determination

The success of our horticulture extension program may depend to a large degree on the effective arrangement of field commitments. An effective method of setting up these commitments with a major portion scheduled specifically to the calendar month in each year's plan of work seems the ultimate objective.

The data from this research study clearly shows that only 30 percent of the county commitments were arranged in advance from the county plans of work. Thirty-nine percent of the county commitments were made from requests received through the year from county extension personnel. Seventeen percent of the field work was carried out through the year as the result of timely suggestions to the county staff. The remaining fourteen percent of the commitments were made with special interest groups independent of any contact with the county extension staff.

The amount of extension time that a specialist should spend in the field is a controversial issue. This raises the question of the amount of extension time spent in the field by horticulture specialists across the country (Figure 3). The response shows that 74 percent of the

FIGURE 3. TIME SPENT IN FIELD WORK BY THE HORTICULTURE SPECIALISTS. A survey comparing the year 1953 and the most desirable time as reported by 125 specialists in the United States.



specialists are in the field between 31 and 60 percent of their time with a mean of about 46 percent of their time away from the office.

As a further guide from this investigation we look to the pattern that the respondents have set as the "most desirable" time to spend in field activities (Figure 3). Sixty-nine percent would spend between 31 and 50 percent of their time in the field with a mean of about 40 percent of the time away from the office. This would indicate we are spending more time in the field than is desirable. When we look back at our concepts of the functions of a specialist, it would seem desirable wherever possible to spend more time at headquarters on such functions as "keeping up to date on subject matter."

The Use of Teaching Materials and Methods

Good movies are very effective in extension teaching; however, their usefulness is limited in a particular state once they are used before an audience. We can have a wider source for films by keeping a list of good movies which have been used by other horticulture specialists in the United States. A listing[7] was compiled and carries 112 films with a wide range of subjects. At the earliest date possible the writer plans to review a number of these movies for tentative use in our own extension program.

The proper use of supporting material in extension teaching contributes to the success of the entire program. In a listing of 15 teaching materials the respondents were asked to indicate those prepared in 1953, those used in 1953, and those needed for future use (Table 4).

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[7] See Appendix, p. 104

TABLE 4. **SUPPORTING MATERIALS USED IN EXTENSION TEACHING.** A survey indicating the materials prepared in 1953, used in 1953 and needed for future use as reported by 128 specialists in the United States.

NATURE OF MATERIAL	PREPARED IN 1953	USED IN 1953	NEEDED FOR FUTURE	TREND IN NEED PERCENT
LESSON PLANS	32	31	31	-
PROJECT GUIDES	34	38	42	+ 10%
DEMONSTRATION OUTLINES	51	54	58	+ 7%
BULLETINS OR CIRCULARS	100	83	102	+ 22%
MIMEOGRAPHED MATERIAL	117	87	100	+ 15%
CHARTS, GRAPHS, OR TABLES	43	45	61	+ 35%
SLIDES OR FILMSTRIPS	93	114	63	- 45%
MOVIES	7	24	52	+ 116%
PHOTOGRAPHS	64	65	75	+ 15%
POSTERS	27	44	30	- 32%
EXHIBITS	58	64	61	- 5%
SPECIMENS	41	47	49	+ 4%
CARTOONS & DRAWINGS	16	20	37	+ 85%
BLACKBOARD	33	46	37	- 20%
FLANNELBOARD	25	36	38	+ 6%

Of the three highest teaching materials prepared in 1953, 117 specialists indicated "mimeographed subject matter," 100 indicated "bulletins or circulars," and 93 indicated "slides or filmstrips." Under those used in 1953, 114 specialists reported "slides or filmstrips," 87 used "mimeographed subject matter," and 83 used "bulletins or circulars." Of those materials needed for future use 102 specialists need "bulletins or circulars," 100 need "mimeographed subject matter," and 75 need "photographs."

The trend in percentage increase or decrease of teaching materials between those used in 1953 and those needed for future use was interesting to note (Table 4). The greatest net increase was in "movies" with 116 percent. This was followed by "cartoons and drawings" with an 85 percent increase. The next highest with an increase of 35 percent was "charts, graphs and tables." It seems evident in this survey of teaching materials that certain visual aids play a prominent part as supporting material in extension teaching.

There was a 45 percent decrease in the need for "slides or filmstrips." This might be explained by many specialists having now acquired a workable supply of slides and filmstrips.

The result demonstration when properly used is one of the most effective methods in teaching new practices. However, the writer has found that only a small number of people are available to see result demonstrations at the time they are convincing. This has happened repeatedly after considerable time and expense were involved.

What records are taken by horticulture specialists to facilitate the use of result demonstrations? The data from the questionnaire indicates that eight out of ten take pictures of their result demonstrations. Seven out of ten report yield records and about six out of ten use records of quality comparison. Only five percent of the specialists indicate that they did not take records of their result demonstrations.

What are some of the outstanding techniques used in other states which are helpful in recording and using result demonstrations? In the analysis of the free answers from this study a similarity in thinking was quite pronounced on two suggestions. Each of these suggestions were noted by more than one-third of the entire group. They were as follows:

1. Results are used in color slides or pictures.
2. Results are used at field days, tours or grower meetings.

Another method which stood out in the analysis was the "use of results in publicity."

Other suggestions noted for study and possible program incorporation are as follows:

> The use of a simple standard form for limited records by the demonstrator or county agent.
>
> The result demonstrations develop as a part of a grower planned crop improvement program. The growers follow the demonstration throughout the year. Thus the cooperator feels his obligation to keep records and carefully follow the procedure.

> At canneries the company erects a sign that lists the names of demonstrators and their yields to date, with an average for that cannery's area to date.
>
> The cooperator is provided with a complete outline of what is expected from him. This explains how the county agent, specialist and grower fit in. He is told that without his part the whole demonstration is a waste of time.
>
> Demonstrations are planned and outlined by the extension specialist. The district agent selects counties where they should be held. Forms are prepared for recording observations or results, completed by agents and mailed to the district agent.

If the horticulture specialists across the country were to look back over the causes of failure in their result demonstrations, what would be the more common faults? In summarizing the compiled listing, the more frequent statements in order of importance are as follows:

1. Demonstrator did not carry out the proper procedure.
2. Specialist was unable to give sufficient supervision and follow-up.
3. Weather conditions were adverse.
4. County personnel made poor choice of cooperator.

Four principal means of using the result demonstration were listed to establish a rating on the effectiveness of each. The respondents rated "tours, field days held during the growing season," and "tours, field days held at harvest time" as very effective by 59 and 60 percent respectively. The group indicated "pictures taken for use at meetings" of secondary importance by 41 percent. The final method of using "charts made from records and discussed at meetings" was of minor

significance by 34 percent. Further investigation would be desirable to determine the methods and techniques used by specialists in getting growers to attend tours and field days held at harvest time.

To what extent are we using the result and method demonstrations? The specialists were asked to indicate for the result demonstration and the method demonstration whether they were being used more, less, or about the same amount as compared to previous years (Table 5). Under the method demonstration five out of ten of the respondents gave evidence that they were making more use of this function. Three out of ten indicated they were making the same use of method demonstrations. For the result demonstration over five out of ten of the respondents cited a greater use and more than one-fourth showed the same use of this function. Several authorities in the field of extension teaching have pointed out that the use of the result demonstration has declined considerably over the previous years. According to this survey of extension horticulturists, such a supposition cannot be upheld.

TABLE 5. SPECIALISTS EVALUATION OF RESULT AND METHOD DEMONSTRATIONS
A comparison in the number of result and method demonstrations being conducted as related to previous years.

	PERCENT OF SPECIALISTS REPLYING	
EVALUATION	RESULT DEMONSTRATIONS	METHOD DEMONSTRATIONS
More	51	50
Same	28	31
Less	21	19

Specific Extension Activities

How far should the horticulture specialist extend himself into the development and service of local grower organization groups? Of the specialists reporting, 94 indicate a total of 1,087 local grower organizations in their work. The average number of organization meetings attended through the year was 11 per specialist. Comparing this figure with our Virginia program, we are attending a greater number of county grower organization meetings than is reported by other specialists.

When asked to put a value on the success of regular meetings with local county grower organizations, we find a majority of 58 percent rating them good (Table 6). Nine out of ten of the entire group rate the meetings from good to excellent. Not a single response reported a poor evaluation. From these results it would seem that a great many horticulture specialists have registered their stamp of approval on county organizations as a teaching medium.

TABLE 6. SPECIALISTS EVALUATION OF REGULAR MEETINGS
An evaluation of the success of regular meetings with county grower organizations.

EVALUATION	PERCENT OF SPECIALISTS REPLYING
Excellent	31
Good	58
Fair	11
Poor	None reported

With the remarkable influence of indirect spread of information between growers in changing practices, it seems highly desirable to have grower participation in our teaching activities. This research study shows that 86 percent of the specialists usually have grower participation on the programs of horticulture schools.

What are some of the most effective means of using grower participation? In summarizing the suggestions from the questionnaire, one technique stood out above the others with three out of ten of the specialists citing "use of leading growers on panel discussions with the leader bringing out important points." Many of the specialists stressed that a pre-panel meeting should be held prior to the scheduled panel, and that an outline of questions should be followed in the panel discussion.

Two other frequently mentioned suggestions with one out of ten respondents each were: "use of a question and answer period" and "have growers on planning committees to plan county programs and choose subject matter to be discussed at schools and meetings." This last statement was supplemented by a number of respondents with the suggestion that specialists supply a list of topics and possible speakers.

Other suggestions listed for consideration and study are:

Use colored slides taken by specialists on grower's farm with the grower discussing the various aspects of his practices at schools and meetings.

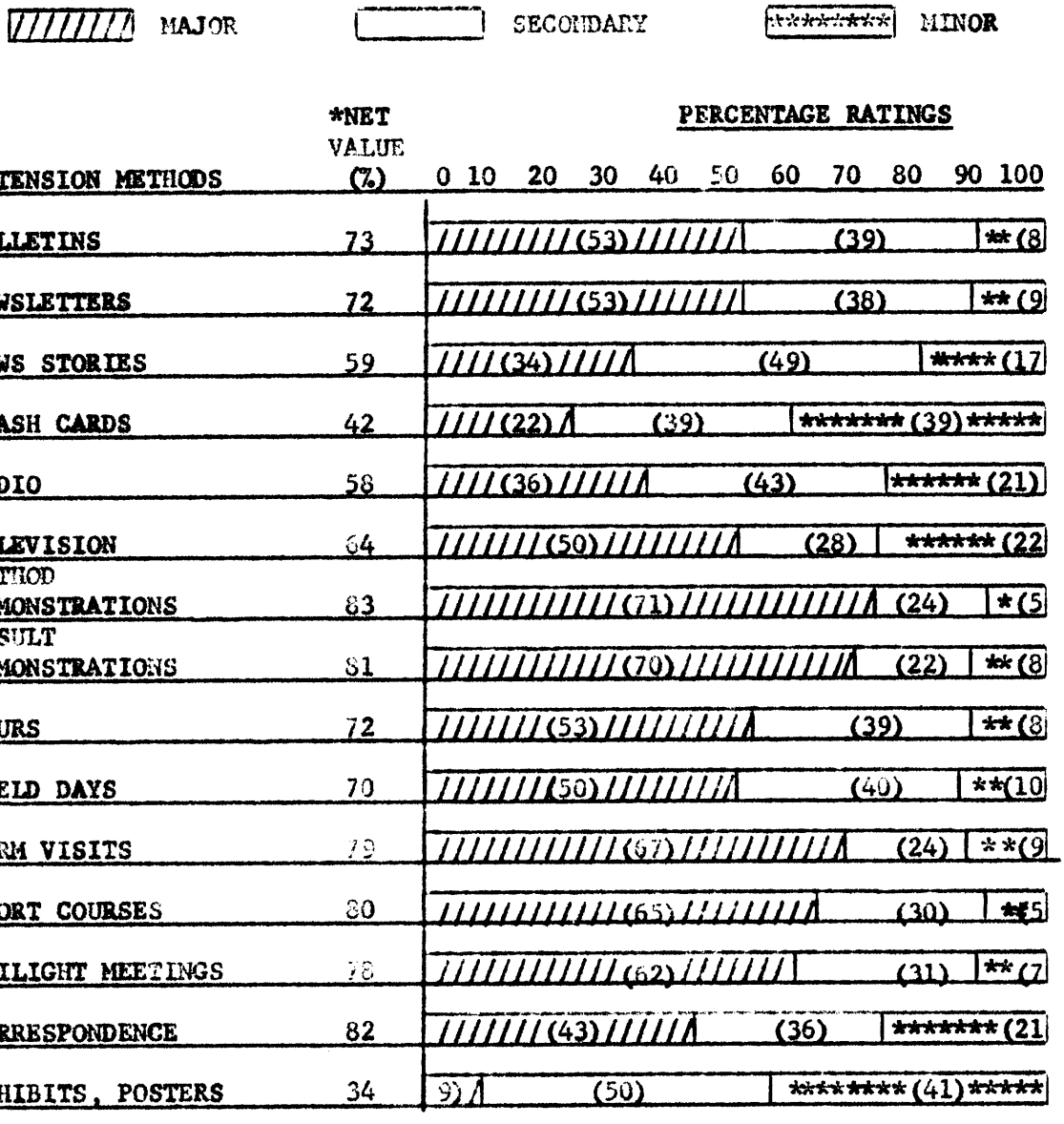
Have grower chairman call on other growers to identify materials or slides as part of regular meeting or school program. The chairman to have an advance briefing on the slides by the specialist.

It becomes evident from the many suggestions that advance preparation is of utmost importance where using grower participation.

Many methods and activities are used in executing an extension teaching program. To what extent are they being used and what degree of effectiveness is experienced by horticulture specialists across the country? Fifteen of the more commonly used extension methods and activities were listed. The respondents were asked to classify each one according to major, secondary, or minor effectiveness (Figure 4). Seven out of ten specialists related that "method demonstrations" and "result demonstrations" were of major effectiveness. "Farm visits" and "short courses" followed with 67 and 65 percent respectively, putting them in the class of major effectiveness. Although only 45 respondents were using "twilight meetings" it was given a major effectiveness rating by 62 percent. "Bulletins," "newsletters," and "tours" complete the evaluation of extension methods considered of major effectiveness by a majority.

The average number of methods conducted or written for one year per specialist using each method was significant to note (Table 7). The yearly averages per specialist were 28 method demonstrations and 24 result demonstrations. The specialists averaged 182 "farm visits" and six "short courses" per year. These data provide an interesting yardstick which may serve as a comparative guide for extension horticulturists.

FIGURE 4. THE EFFECTIVENESS OF EXTENSION TEACHING METHODS AS USED BY EXTENSION HORTICULTURE SPECIALISTS. A survey showing the importance of 15 more commonly used methods as reported by 133 specialists in United States.



* Net value expressed as percent, with 100 percent representing complete acceptance of the function as a major activity of the specialist.

TABLE 7. METHODS USED BY EXTENSION SPECIALISTS
The average number of methods conducted or written for one year per specialist using each method.

EXTENSION METHODS	AVERAGE NUMBER
Bulletins	1.68
Newsletters	13.10
News Stories	23.12
Flash Cards	2.72
Radio	21.46
Television	3.35
Method Demonstrations	28.15
Result Demonstrations	23.77
Tours	5.23
Field Days	6.85
Farm Visits	182.18
Short Courses	5.99
Twilight Meetings	7.24
Correspondence	616.31
Exhibits and Posters	3.48

Publicity

An essential segment of extension teaching is publicity which at its best will effectively fortify the execution of an extension program.

With the advent of television has come the question of what adjustments can be made in our extension activities to meet the demands of this media. From an analysis of the specialists' response, several suggestions recurred more frequently. They were as follows:

1. Provide county workers with appropriate subject matter and teaching aids for television programs.

2. Make greater use of slides, blackboard, flannelgraph and other teaching aids on live programs.

3. Make short movies of important field activities, demonstrations, and practices for television programs. These same movies to be used at meetings in areas not served by television.

4. Personal contacts, meetings with garden clubs, service clubs and other local groups should be minimized in the areas where they are covered by television programs.

Under publicity the question arises as to the preferred physical make-up of publications. It was noted that three-fourths of the specialists indicated a preference to "small circulars and specific to separate practices" with the remaining response given over to "extensive bulletins with full information on cultural practices." A number of the respondents commented that there was a place for both types of publications.

Suggestions have been advanced that specialists would benefit in the exchange of prepared subject matter which they have used on television. A listing[8] from this survey cites 83 different horticultural

[8]See Appendix, p.112

subjects which have been presented on television. The writer plans to request and review a number of these subjects.

The specialists were asked for new techniques and ideas which have proved helpful in their extension program. The most frequent technique mentioned by the greatest number was the "use of colored slides along with the discussion method." Other suggestions mentioned more frequently were the "use of grower panels," "flannelgraphs," and "question and answer periods."

Other ideas listed for study and possible use in our program are:

> Reduce the time spent on correspondence by preparing short, single-page mimeographed circulars on answers to specific problems and questions which frequently come through the mail.
>
> It is evident that very few growers read bulletins. Thus I have experienced success with the following. Supply the grower or growers with an appropriate bulletin and go over it with them systematically instead of making a speech. This helps remove bulletin resistance, familiarizes him with the contents and allows the grower to help himself.
>
> Ask the growers on a tour to submit a guess of the number of peaches on a particular tree or the number of bushels on several trees and award a prize.
>
> The use of quick test pH indicator paper obtained from the Micro Essential Laboratory, Brooklyn 10, New York, as an attention getter prior to field meeting talks on soil liming has gone over good.
>
> The term grower clinic seems to attract more growers than the words "short course, meeting or school," for many people are allergic to these terms.
>
> Bringing in successful growers from other areas or states has proven an effective educational method in our program.

We have experienced success with a session on quizing the experts. Speakers sit on a panel at the end of the regular program. During the day growers have put written questions on numbered or signed slips of paper and handed them to the chairman. The moderator reads the question. Unless it is answered satisfactorily the grower gets a prize. Prizes are awarded by local merchants or dealers.

I demonstrate everything I can. For our garden schools I carry a box of soil in which I plow, fertilize, sow seed, and set plants. I also demonstrate the value of organic matter with tubes of soil.

We have demonstrations making evaluations of spray deposit by placing 3" x 4" glass slides coated with Dri-Film from Eastman Kodak Company on the end of a pole and in the top of apple trees.

We have had success with conversation panels. The specialist sits with several growers and informally discusses the subject matter. Each person has an outline of the material to be covered.

In conclusion of this horticulture extension research survey, each respondent was asked to relate one thing more than anything else that he thought would enable specialists to make a larger contribution. There was no response of unusual significance, but rather a more vivid declaration to certain elements contributing to a stronger program. The statements mentioned most often in order of emphasis are:

1. Allot sufficient time for the specialist to gain a greater knowledge of subject matter and enable him to try new ideas in his program.

2. Provide better planning to give specialists adequate time for preparation prior to meetings, schools, demonstrations, and television programs.

3. Have a well-defined program for the training of county extension workers.

4. Provide for a more complete coverage of easy-to-read, quick-to-use one topic leaflets or small circulars.

Other statements considered for deliberation are:

A willingness to fit our program to changing conditions instead of doing about the same thing year after year.

Have an overall extension program set up for each county or area showing what specialists are needed, when needed and on what problem. There is too much competition by specialists for county personnel's time.

Provide an exchange of subject matter and methods between horticulture specialists by a central agency such as the United States Department of Agriculture.

Use more pictures, cartoons and fewer words to get the story across in our publications. For example, cartoon the apple scab story. Give the scab organism a personality and have it fighting the elements and man.

To enhance the effectiveness of annual reports the specialist should state the most outstanding accomplishments, and also give special attention to the outstanding methods followed in securing such accomplishments. This material is then useful as a reference to the writer and to other extension specialists.

Make efficient use of talks prepared for grower schools and meetings by also preparing copies at the same time for news articles and radio programs.

The need for more time was evident with practically every suggestion related to program improvement. This feeling was aptly summarized by one specialist's statement, "I never have time to do as good a job as I think I could do." This vividly brings home the need for continued study and evaluation of our extension methods and techniques.

V

SUMMARY AND CONCLUSIONS

The object of this investigation was to study and evaluate extension methods and techniques to strengthen our extension horticulture service to the growers of Virginia. The questionnaire technique of research was used in the investigation. The findings in this study point the way to giving us a fundamental concept of what goes into many of the methods and techniques used in a horticulture extension program.

There were three general functions of the specialists which were of major importance under both the present basis and most desirable basis of conducting extension work. They were direct teaching through meetings, tours, and demonstrations, keeping self up to date on subject matter and methods, and keeping county staff posted.

As a method of keeping self up to date, the study indicates that monthly subject-matter meetings with the horticulture extension, research and resident teaching personnel would aid in strengthening the specialists' program. It is the writer's belief that this should be carried a step further by holding separate meetings under the fruit, vegetable and ornamental sections. A specialist should be appointed as moderator of each section and a skeleton outline of each program set up to expedite the efficiency of this function.

In line with this practice it would be well to allocate sub-projects[9] among the specialists within a section to concentrate on

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[9] See Appendix, p. 118

specific subjects in keeping up to date. Then at the monthly sectional meetings the specialists would report on developments in his sub-projects, redispersing information to his co-workers. Problems arising from the field where we need a mutual understanding can be discussed at these meetings. The responsibility of field demonstrations might also be carried out by those specialists who have been allocated the corresponding sub-projects.

This investigation would indicate a pressing need to allot a specific amount of time each month for the review of literature. The writer plans to set up such a schedule, adjusting to the literature rated high in this survey. To keep such information at our finger tips, it seems imperative that a specialist maintain a file card system for indexing and abstracting subject matter. Such a system would lend itself to preparations in connection with a number of extension teaching methods.

In an analysis of the effectiveness in training county extension personnel there is a lack of a significant evaluation. We are led to believe that training programs for county personnel are falling short of their mark in many instances. A concentrated effort for an annual district county personnel training school seems to be most desirable. The presentation of subject matter through various extension methods would be given in an effort to encourage the personnel to carry some of the horticulture teaching program in the counties. The survey indicates that a large number of specialists held training schools as subject matter field days or tours. The specialists have fallen far

short in supplying and demonstrating the use of teaching materials for the county personnel. Another method used by a large number of horticulture specialists in keeping the county staff posted is to send out timely newsletters at monthly intervals.

In determining the specialist's extension program we need to arrive at a larger number of commitments set in advance from the county plans of work. At times a high proportion of requests of an emergency nature are experienced which disrupt the continuity of a carefully planned program. This also promotes delinquency on the part of the specialist who in turn may be inadequately prepared for other commitments scheduled in advance from the year's plan of work. The writer suggests that we endeavor to arrange our calendar schedule for the year with days necessary for the preparation of field activities and consider these days as definite commitments. These preparatory commitments would be set up on the basis of the year's prearranged field activities determined through the county commodity committee or the county extension personnel. The commodity committee planning meetings are a yearly activity in many counties and should be set up in advance so that the specialist can make a circuit in attending these meetings. A definite program lends itself to greater belief and conviction in that program on the part of the specialist and will facilitate greater coordination.

It would be well for the specialist to promote the setting up of programs for grower organization meetings six months or a year in advance. The specialist should provide teaching aids for the county agent to carry some of these meetings.

When the specialist is requested to make a visit in a county it would be well for the county personnel to state the nature of the assistance desired. The problem may be solved by sending a bulletin or a letter. If the visit is necessary it will still help the specialist to prepare himself and study the situation in advance. A large number of specialists send out timely newsletters to growers through the county personnel which may account for fewer emergency visits.

The extension teaching materials which stood out above all others in preparation and use were mimeographed subject matter, bulletins or circulars and slides or filmstrips. There is an outstanding demand for movies in teaching materials needed for future use.

Some of the difficulties encountered in result demonstrations can be avoided by advance planning. A decision should be made on just what demonstrations are needed to accomplish our objectives. The number to be held for the year should be based on what can be adequately followed. A result demonstration should indicate a real problem which in turn will receive grower support. Post cards sent out by the grower cooperator have proved to be effective in announcing a demonstration. The use of colored slides and data at grower meetings and schools is well supported as an effective way to utilize result demonstrations.

Comparing the survey figures on county grower organization meetings with the Virginia program, we are attending a greater number of meetings than is reported by other specialists. It would seem that the programs of these local grower organizations should be broader in scope, covering allied fields and possibly issues of community, state and national concern.

The success of regular meetings with county grower organizations was rated exceptionally high.

Greater effort should be placed on increased grower participation at grower meetings, schools and clinics. The specialist should plan on advanced preparation with the county agent and the participating grower. One method to try is to prepare colored slides of a farm operation from which the grower can give a discussion.

Five extension methods stood out above all others when rated on relative effectiveness. In order of effectiveness they were method demonstrations, result demonstrations, farm visits, short courses and twilight meetings.

The use of television as an extension method has a promising future for horticulture. Television is a compliment to other extension methods and not a substitute. At present, due to lack of adequate coverage and heavy demand for time in live programming, no more than a limited number of programs seen justified. Horticultural programs should carry a heavy consumer appeal. Greater publicity needs to be given to extension television programs. If a specialist is giving a demonstration on television, the growers in the receiving area should be notified as they would be if the demonstration were being given in their respective counties.

A large majority of the specialists indicated that there was a preference in extension publications for small circulars dealing with a specific topic.

In this study of horticulture extension methods it is evident that in the use of extension methods the individual situation must be considered above all else for the maximum effectiveness. Knowing your people and the situations that will influence the use of methods is vital to their effective use. It was reassuring to note that other specialists cited methods and techniques which we are now using in our Virginia program. This has helped to evaluate these methods. Several new techniques from this investigation were incorporated in our extension program this past year. It is hoped that this graduate thesis will prove to be a helpful reference in the future for guiding our horticulture programs toward better service.

The search for techniques and methods to teach adult farm people goes much deeper than trying to effectively educate them from the standpoint of changing practices in farming and increasing their standard of living. Much depends on the early educational influence upon the farm youth. These future farmers of our country must be adequately prepared through our entire educational system if they are to be receptive to extension teaching.

VI

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Rural Sociology. Vol. 17. (2) 132-143. June, 1952.

(11) Lionberger, Herbert F.

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Mo. Agr. Exp. Sta. Bul. 441. 1949.

(12) Martin, O. B.

The Demonstration Work.

The Naylor Co., Publishers, San Antonio, Texas. 1941.

(13) Porter, W. D. and Sumner, W. A.

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Dept. Agr. Journalism. Univ. of Wisc. Bul. 8. (II) 1936.

(14) Reid, T. Roy, and Wilson, M. C.

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Ext. Ser. Cir. 189. Sept., 1933.

(15) Sheats, Paul H., and McLaughlin, Lawrence K.

Methods in Adult Education.

Review of Educational Research. Vol. 20. 207-215. June, 1950.

(16) Smith, C. B. and Wilson, M. C.

The Agricultural Extension System of the United States.

J. Wiley and Sons, New York. 1930.

(17) Sylvester, E. P., Arnold, Floyd, et. al.

Functions of Extension Specialists.

Agr. Ext. Ser., Iowa State College, Ames, Iowa. St. 383.

April, 1952.

(18) Wilkening, E. A.

A Socio-Psychological Approach to the Study of the Acceptance of Innovation in Farming.

Rural Sociology XV: 352-364. December, 1950.

(19) Wilson, M. C. and Clark, W. W.

Make Extension More Effective.

Wisc. Agr. Exp. Sta. Bul. 387. November, 1926.

(20) Wilson, M. C. and Gallup, Gladys.

Extension Teaching Methods.

U. S. Dept. Agr. Ext. Serv. Cir. 495. August, 1955.

(21) Wilson, M. C.

Extension Methods and Their Relative Effectiveness.

U. S. Dept. of Agr. Tech. Bul. (106) Feb., 1929.

(22) Wright, W. J.

A Study of Demonstrations as Used in Cooperative Extension Work.

Ext. Serv. Cir. 26. Oct., 1926.

The vita has been removed from the scanned document

IX

APPENDIX

UNITED STATES DEPARTMENT OF AGRICULTURE
EXTENSION SERVICE
Washington 25, D. C.

For your information

July 23, 1953

TO ALL STATE EXTENSION HORTICULTURISTS:

A matter of interest to you and all of us is that Fred R. Dreiling, associate extension horticulturist in Virginia, is conducting a graduate study on "Evaluation of Extension Methods and Techniques as Used by Horticulture Specialists in the United States." The overall objective of this study is to furnish a better background for using proper methods in the right proportions at the right time. Mr. Dreiling's plan is to collect data from horticultural extension specialists of the various states by means of a questionnaire. He will analyze the information obtained to show what patterns are being followed and what changes in methods seem desirable. When you receive this questionnaire we hope you will give it your prompt and serious attention. We are living in an age of continual change and the success of horticultural extension work lies in our ability to keep posted and to gear our methods and techniques to meet these changing needs and interests of the people we serve. Through this study of Mr. Dreiling's we have an excellent opportunity to fortify our program with some of the methods, ideas, and techniques being used by our fellow extension horticulturists across the country.

Very truly yours,

R. J. Haskell,
Acting Extension Horticulturist

V. P. I. AGRICULTURAL
EXTENSION SERVICE
BLACKSBURG, VIRGINIA

August 12, 1953

TO STATE HORTICULTURE SPECIALISTS

As you may recall in a recent notice dated July 23 and addressed to ALL STATE EXTENSION HORTICULTURISTS, Dr. R. J. Haskell calls your attention to a graduate study on "The Evaluation of Extension Methods and Techniques as Used by Horticulture Specialists in the United States."

In our extension work we often become absorbed in our day-in and day-out work without seeing a broader perspective of the problems and approaches. Our influences can become a limitation. With keeping abreast of subject matter the problem it is today, effective teaching methods often take a back seat. It would seem to me that there is an opportunity to bring before us some of the methods and techniques from our fellow extension horticulturists.

It is our earnest effort to run this survey in an endeavor to fortify and strengthen the extension program in Virginia. It is also our wish to make the information most helpful and useful to other horticulture specialists in the United States. Copies of the findings will be made available to those interested. Before circulating a questionnaire on this study, I would like to solicit your thoughtful consideration to the following: "Do you have any suggestions as to how we might make this study more effective, or do you have any questions that you would like to put before other horticulture specialists in the United States?"

Thanking you for your time and consideration, I am

Sincerely yours,

Fred R. Dreiling
Associate Horticulturist

FRD:BL

Evaluation of Extension Methods and Techniques

Dear Fellow Extension Workers:

What extension methods are we using? Are they giving us the most for our efforts? How are we selecting, timing, and proportionately using these methods? What changes in emphasis may be desirable?

The many suggestions in response to my letter which you received last summer were finally boiled down into the following questionnaire. It is hoped that through the response of each specialist we will be able to answer the above questions. The questionnaire is sent at this time to reflect information from the 1953 work.

If you wish to explain any of your answers, feel free to write between questions. Your cooperation in answering each question to make this a significant study and one most Helpful to other specialists will be deeply appreciated. Copies of the findings will be made available for your deliberation.

Thanking you for your time and consideration, I am

Sincerely yours,

Fred R. Dreiling
Associate Horticulturist

V.P.I., Blacksburg, Va.

Your Name _____

Address _____

1. Years of experience as horticulture specialist. Less than 1 year. ____ ; 1 to 5 yrs. ____ ; 5 to 10 yrs. ____ ; more than 10 yrs. ____

2. What per cent of your working time is devoted to Extension Horticulture? _____ %

a. What per cent of this time is devoted to:

Ornamental extension work ___ %
Vegetable extension work ___ %
Small fruit extension work ___ %
Tree fruit extension work ___ %
Others _____ ___ %
_____ ___ %

EVALUATION OF GENERAL FUNCTIONS OF SPECIALISTS

3. Indicate by numbers 1, 2, or 3 how you would classify the general functions of specialists using this value scale:

1 - Major or primary functions
2 - Secondary functions
3 - Minor functions

} Use numbers 1, 2, or 3 wherever applicable under (a) and (b)

In column (a) classify according to present basis of conducting your extension work. In column (b) classify according to a basis of operation that you personally think would be most desirable.

FUNCTION	(a) Present basis	(b) Most desirable basis
A. Keeping self up to date on subject matter and methods		
B. Keeping county extension staff posted on subject matter and methods		
C. Program determination and work planning -Both county and state level		
D. Preparation of teaching materials -As demonstration materials, charts, slides, project guides, photographs, etc.		
E. Publicity -Radio and television scripts, publications, circular letters, news stories, etc.		
F. Direct teaching through grower meetings, extension schools, demonstrations, tours, etc.		
G. Indirect teaching through training of leaders other than extension personnel		
H. Service activities -Judging fairs, pest identifications, etc.		
I. Evaluation of procedures, methods, outcomes, progress reports, etc.		
J. Other functions (specify below)		

KEEPING SELF UP TO DATE

4. How often do you have staff meetings in your horticulture department for discussion of horticulture subject matter?
Frequency _____ (No meetings _____)

   a. If meetings are held, how successful are they in establishing an understanding of problems in your subject matter and extension work? Excellent ____ Good ____ Fair ____ Poor ____
   b. If such a meeting is not held, would it be desirable? _____

5. If you attended subject matter workshops, short courses, refresher courses or meetings, what features caused any of these to be helpful? _____

6. Give the names and sources of some of the most helpful published material in keeping abreast of new subject matter in your field, such as periodicals, proceedings, newletters, etc.

_____

_____

_____

_____

_____

KEEPING COUNTY STAFF POSTED

7. Indicate in following table any direct group training of the county extension staff in your field which was done during 1953. (No training program _____)

Nature of Training Activity	Number of such training activities conducted during last year	Average number days per training school
In Field - At district conferences of county staff		
Subject matter field days or tours for field staff		
Others (specify) _____		
At College		
Training conference and workshop		
Refresher course, short courses		
Others (specify) _____		

8. How effective do you find training of the county extension staff for assistance in the teaching of your subject matter?
   Excellent _____ Good _____ Fair _____ Poor _____

9. Do you send out timely information at least four times a year in keeping county personnel informed on subject matter? (e.g. newsletters) Yes _____ No _____ (Sample appreciated)

   a. Also sent directly to growers from your office? Yes ___ No ___
   b. Sent to the county personnel who send it to growers?
      Yes ___ No ___
   c. How often is this information sent out? _____

PROGRAM DETERMINATION

10. How are your commitments to the field arranged? Approximately what per cent of your field work is carried out through:

   a. Requests made each new year for your county commitments from the county plans of work ___%
   b. Requests from time to time through the year from county extension personnel ___%
   c. Your timely suggestions for field work made through the year to the county extension personnel ___%
   d. Specify others: _____ ___%
   _____ ___

   Total - 100%

11. How much of your extension time did you spend in the field last year? 20 to 30% _____; 31 to 40% _____; 41 to 50% _____;
   51 to 60% _____; 61% or more _____

   a. Which of the above do you consider the most desirable time spent in the field? _____ %

THE USE OF TEACHING MATERIALS AND METHODS

12. List the title and source of good movie films which you have used.

_____ _____
_____ _____
_____ _____
_____ _____

(If sufficient movies, a complete listing will be circulated)

13. Check (√) in column (1) materials prepared last year, column (2) materials used last year, and column (3) materials needed for future use.

Nature of Material	(1) Materials Prepared Last Year	(2) Materials Used Last Year	(3) Materials Needed for Future Use
*Lesson plans			
*Project guides			
*Demonstration outlines			
Bulletins or circulars			
Mimeo. subject matter			
Charts, graphs, or tables			
Slides and filmstrips			
Movies			
Photographs			
Posters			
Exhibits			
Specimens			
Cartoons and drawings			
Blackboard			
Flannelboard			
Other:			

*Samples appreciated.

14. What records do you make of result demonstrations? (Check those applicable)

   None _____ Quality comparison _____
   Yield records _____ Shape comparison _____
   Size comparison _____ Pictures _____
   Color comparison _____ Others (specify) _____

15. Please suggest any techniques or methods which have proved helpful in the recording or use of result demonstrations. _____

_____
_____
_____

16. If you have experienced failure on result demonstrations, what have been the most common faults? _____

_____
_____
_____

17. How do you use the information from result demonstrations in teaching the grower? (Rate in order of effectiveness by numbering, 1, 2, 3, 4, ...)

Tours, field days held during the growing season _____
Tours, field days held at harvest time to view results _____
Pictures taken for use at meetings _____
Charts made from records and discussed at meetings _____
Other uses of information _____ _____
_____ _____

18. How would you compare the number of demonstrations being conducted in your field as related to previous years?

	More	Same Number	Less
Result demonstrations (check one)	_____	_____	_____
Method demonstrations (check one)	_____	_____	_____

SPECIFIC EXTENSION ACTIVITIES

19. Under your subject matter field, how many county or combined county grower organizations do you have in your state? _____ number

a. How many of these organization meetings did you personally attend last year? _____ number

b. How would you evaluate the success of regular meetings with county or combined county grower organizations?
Excellent _____ Good _____ Fair _____ Poor _____

20. Do you usually have grower participation on the programs of horticulture grower schools? Yes _____ No _____

21. Any techniques used in getting and using grower participation or effective methods used in grower schools would be appreciated.

_____
_____
_____
_____
_____
_____
_____
_____

22. For the following extension activities please indicate in column:
(A) Relative effectiveness using 1, 2, 3, or X value scale.
(B) Give number of each conducted or written by you last year

1 - Major or primary effectiveness
2 - Secondary effectiveness
3 - Minor effectiveness
X - Not used

} Use 1, 2, 3, or X wherever applicable to you under spaces of column (A) only.

Extension Teaching Activity	(A) Use 1,2,3 or X wherever Applicable for Relative Effectiveness	(B) Number Conducted or Written by You Last Year
Bulletins		
Circular letters or newsletters		
News stories		
Flash cards		
Radio		
Television		
Method demonstrations		
Result demonstrations		
Tours		
Field days		
Farm visits		
Grower schools or short courses		
Twilight field meetings		
Correspondence		
Exhibits and posters		
Other methods:		

PUBLICITY

23. Suggest plans for adjusting extension activities to meet the demands of television as an extension method. _____

_____
_____
_____
_____
_____
_____

24. What physical make-up of publications is preferred in your field? (Check one)
    1. Small circulars and specific to separate practices ____
    2. Extensive bulletins with full information on the cultural practices ____
    3. Other forms _____ ____

25. If you keep your prepared material of subjects presented on television, please give below or enclose list of these subjects.

_____

_____

_____

(If enough subjects, a listing will be compiled for exchange)

26. Can you suggest any techniques from your program which have proved helpful? Example: Based on the experience of Horticulturist Vierheller of Maryland, short movies have been successfully used here in Virginia at the beginning of morning and afternoon sessions during our grower schools. These were well received and assembled the group for the first topic of discussion.

_____

_____

_____

_____

_____

_____

27. The "best" can always be made "better." What is the one thing, more than anything else, that would in your judgement enable specialists to make a larger contribution to the extension program?

_____

_____

_____

_____

_____

28. I would like to receive the results of this study. Yes ___ No ____

An enclosed envelope is provided for the return of completed questionnaire and sample copies requested in questions 9 and 13. Thank you.

V. P. I. AGRICULTURAL
EXTENSION SERVICE
BLACKSBURG, VIRGINIA

April 6, 1954

Dear Co-Workers:

Several months ago I circulated a questionnaire to all Extension horticulturists on the "Evaluation of Extension Methods and Techniques." I am now trying to round up as many of these leaflets as I can.

We have a quota set up for the returned forms in order to make this a significant study. If you could help us meet this quota by filling out the questionnaire form, I would appreciate it very much. In case your original copy is not close at hand, I am enclosing another with a self-addressed envelope.

With sincere appreciation, I am

Very truly yours,

Fred R. Dreiling
Associate Horticulturist

FRD:bl

Enclosures

LITERATURE USED IN KEEPING ABREAST OF SUBJECT MATTER

Specific Classification

Agricultural Chemicals
Industry Publications, Inc. Publication Office
123 Market Place, Baltimore 2, Maryland

Agricultural Leaders' Digest
139 North Clark Street, Chicago 2, Illinois

American Association for Advancement of Science
1515 Massachusetts Avenue, N. W.
Washington 5, D. C.

American Farm Bureau Federation Fruit and Vegetable Summary
Merchandise Mart
Chicago 54, Illinois

American Fruit Grower
American Fruit Growing Publishing Company
Willoughby, Ohio

American Journal of Agronomy
Agronomy Journal, American Society of Agronomy, Publisher
2702 Monroe Street, Madison, Wisconsin

American Journal of Botany
Business Manager, William B. Drew, Department of Botany and
Plant Pathology, Michigan State College, East Lansing, Michigan

American Nurseryman
American Nurseryman Publishing Company
343 South Dearborn Street, Chicago 4, Illinois

American Pomological Society
St. Louis, Missouri

American Potato Journal
Published by the Potato Association of America
New Brunswick, New Jersey

American Rose Magazine
The American Rose Society, 4048 Roselea Place, Columbus 14, Ohio

American Vegetable Grower
American Fruit Grower, Publisher, Willoughby, Ohio

Appalachian Apple Service
123 South Church Street, Martinsburg, West Virginia

Better Farming Methods
Watt Publishing Company, Mount Morris, Illinois

Better Fruit
Better Fruit Publishing Company, 1135 South East Salmon Street
Portland 14, Oregon

Bibliography of Agriculture (U.S.D.A.)
United States Department of Agriculture Library, U.S.D.A.
Washington, D. C.

Biological Abstracts
J. E. Flynn, Editor; Biological Abstracts, Inc., Publisher
University of Pennsylvania, 3814 Walnut Street
Philadelphia, Pennsylvania

California Agriculture
Agricultural Publications, 22 Giannini Hall, University of California
Berkeley 4, California

Cumberland Shenandoah Fruit Workers' Conference Proceedings 1954
Virginia Polytechnic Institute, Horticulture Department
Blacksburg, Virginia

Eastern Fruit Grower
Boyce, Virginia

Extension Service Review
Cooperative Extension Service, U.S.D.A., Washington 25, D. C.

Farm Research
New York State Agricultural Experiment Station
Geneva, New York

Florist Exchange
Florists Exchange and Horticultural Trade News
A. T. DeLaMare Company, Inc., 438 to 448 West 37th Street
New York 18, New York

Florist Review
Florists Publishing Company, 343 Dearborn Street
Chicago 4, Illinois

Flower Grower Magazine
Circulation Manager, Flower Grower, Albany 1, New York

Fruit Varieties and Horticultural Digest
Department of Horticulture, Michigan State College
East Lansing, Michigan

Garden Facts
Dr. R. J. Haskell, U.S.D.A., Washington 25, D. C.

Gladiolus Magazine
Publications of New England Gladiolus Society
Hudson, New Hampshire

Horticultural Chemicals
Industry Publications, Inc. Publication Office
123 Market Place, Baltimore 2, Maryland

Horticultural Abstracts
Commonwealth Agricultural Bureau, Farnham Royal, England

Horticulture Magazine
Horticultural Hall, Boston 15, Massachusetts

Landscape Architecture
American Society of Landscape Architects, Publisher
9 Park Street, Boston 8, Massachusetts

Market Growers Journal
11 South Forge Street, Akron 4, Ohio

News Releases (U.S.D.A.)
United States Department of Agriculture, Washington 25, D. C.

Ohio Nursery News
Department of Horticulture
Ohio State University, Columbus, Ohio

Pacific Coast Nurseryman
Cox Publishing Company, 1427 South Baldwin Avenue
Arcadia, California

Phytopath
Phytopathology, Saul Rich, Business Manager
32 Street and Elm Avenue, Baltimore, Maryland

Plant Disease Reporter
Issued by Plant Disease Epidemics & Identification
Agricultural Research Service, U.S.D.A., Washington, D. C.

Plant Physiology
Box 749, Lancaster, Pennsylvania

Plants and Gardens
Brooklyn Botanical Garden, Brooklyn 25, New York

Popular Gardening
90 State Street, Albany, New York

Proceedings of the American Society for Horticultural Science
H. M. Munger, Editor and Business Manager, Cornell University
Ithaca, New York

Proceedings of the Association of Southern Agriculture Workers
P. O. Box 1460, New Orleans, Louisiana

Publication of Rose's Incorporated
Roses Incorporated, Atlanta, Georgia

Publications of the American Carnation Society
American Carnation Society
Philadelphia, Pennsylvania

Publications of the American Delphinium Society
American Delphinium Society, Morgantown, West Virginia

Publications of the National Chrysanthemum Society
National Chrysanthemum Society, Bogota, New Jersey

Rural New Yorker
Rural New Yorker Publishing Company
333 West 30th Street, New York 1, New York

Seed World
327 South La Salle Street, Chicago 4, Illinois

Small Homes Council
Small Homes Council, University of Illinois
Urbana, Illinois

Soil Science
The Williams & Wilkins Company, Baltimore 2, Maryland

Southern Seedsman
H. L. Peace Publications, 624 Gravier Street, New Orleans 9, Louisiana

Spud-O-Light
United Fresh Fruit and Vegetable, Washington, D. C.

Sunset Magazine
Lane Publishing Company, 576 Sacramento Street
San Francisco 11, California

The Packer (Produce)
The Packer Publishing Company, 201 Delaware Street
Kansas City 5, Missouri

U.S.D.A. Agricultural Research
Agricultural Research, Agricultural Research Service
U.S.D.A., Washington 25, D. C.

Vegetable Growers News
Virginia Truck Experiment Station
P. O. Box 2160, Norfolk 1, Virginia

Weed Control Conference Proceedings
Southern Weed Conference Proceedings, E. G. Rodgers,
Conference Secretary, Floyd Hall, University of Florida
Gainesville, Florida

Western Fruit Grower
E. B. Weinard, Publisher
717 Market Street, San Francisco 3, California

LITERATURE USED IN KEEPING ABREAST OF SUBJECT MATTER

General Classification

Experiment Station Progress Reports from Other States

Experiment Station Publications from Other States

Newsletters from Horticulture Specialists in Other States

Proceedings of Various State Horticultural Societies

Seed Dealers Catalogues

State Experiment Station Newsletters

State Experiment Station Progress Reports

State Experiment Station Publications

State Extension Bulletins

United States Department of Agriculture Bulletins and Circulars

United States Department of Agriculture Yearbooks

GOOD HORTICULTURE MOVIES WHICH SPECIALISTS HAVE USED

Film Title	Source of Film
"A Parasitic Plant" (10 min.)	Encyclopedia Britannica Films, 1150 Wilmette Avenue, Wilmette, Illinois
"African Violets"	California Spray-Chemical Corporation, 1618 East Elizabeth Avenue, Linden, New Jersey
"All-American Roses" (Sound, color, 13 min.)	Films of the Nations Distributors, Inc., 62 West 45th Street, New York 36, New York
"Apple Harvest Time" (Color, 17 min.)	Wooden Box Institute, 724 Sharon Building, San Francisco, California
"Apples"	Virginia Department of Conservation and Development, Richmond, Virginia
"Azaleas and Camellias"	California Spray-Chemical Corporation, 1618 East Elizabeth Avenue, Linden, New Jersey
"Background for Beauty"	Smith, H. J., Mississippi State College, State College, Mississippi
"Benefit of Mulches"	Michigan State College, East Lansing, Michigan
"Better Gardens for Better Health"	Ferry-Morse Seed Company, Box 77, Detroit 31, Michigan
"Better Seed"	Maine Department of Agriculture, Augusta, Maine
"Betty's Fruit Groves" (Color, sound)	J. I. Case Company, Racine, Wisconsin
"Blueberry Growing in New Hampshire"	University of New Hampshire, Durham, New Hampshire
"Bountiful Heritage"	Ferry-Morse Seed Company, c/o James W. Wilson, Detroit 31, Michigan
"Bouquet of Beauty" (Sound, color, 30 min.)	Swift and Company, Plant Food Division, Baltimore, Maryland

Film Title	Source of Film
"Breeding Better Food Crops"	Klingbeil, G. C., University of Wisconsin, Madison, Wisconsin
"Carnations"	Sherwood, C. H., Iowa State College, Ames, Iowa
"Climate and the Apple" (18 min. color)	Farm Film Foundation, Eye Street, Washington 6, D. C.
"Colorado Peaches" (Color, sound)	Denver Rio Grande Railroad Company, Denver 1, Colorado
"Combat"	General Chemical Division, Allied Chemical & Dye Corporation, 40 Rector Street, New York 6, New York
"Dreams Come True" (Sound, color, 30 min.)	Swift and Company, Plant Food Division, Baltimore, Maryland
"European Garden Movie"	California Spray-Chemical Corporation, 1618 East Elizabeth Avenue, Linden, New Jersey
"Farm Gardens"	Duncan, A. A., University of Maryland, College Park, Maryland
"Farm to Kitchen with a Market Basket"	Alabama Agricultural Extension Service, Auburn, Alabama
"Five Hundred Thousand to One"	Pennsylvania State University, University Park, Pennsylvania
"Flower Arrangements for the Home #1 and #2" (Color, 19 min.)	International Film Bureau, Inc., 47 East Jackson Boulevard, Chicago 4, Illinois
"Flower Arrangements of Williamsburg"	Film Distribution Section, Colonial Williamsburg, Williamsburg, Virginia
"Flowers at Work" (11 min.)	Encyclopedia Britannica Films, 1150 Wilmette Avenue, Wilmette, Illinois
"Food for Thought" (Sound, color, 30 min.)	Swift and Company, Plant Food Division, Baltimore, Maryland

Film Title	Source of Film
"Fungus Plants" (11 min.)	Encyclopedia Britannica Films, 1150 Wilmette Avenue, Wilmette, Illinois
"Fresh from the Garden"	Whitehead, E. L., Oklahoma A. & M., Stillwater, Oklahoma
"Fruit Culture" (35 min., color)	Christopher, E. P., University of Rhode Island, Kingston, Rhode Island
"Garden for Abundance"	National Garden Bureau, Director: 210 S. Desplaines Street, Chicago 6, Illinois
"Garden Insects"	University of Missouri, Columbia, Missouri
"Gardening" (11 min.)	Encyclopedia Britannica Films, 1150 Wilmette Avenue, Wilmette, Illinois
"Gateway to Health"	National Apple Institute, Washington 6, D. C.
"Gift of Green"	Schoenemann, J. A., University of Wisconsin, Madison, Wisconsin
"Glory of Spring" (Color, 10 min.)	International Film Bureau, Inc., 57 East Jackson Boulevard, Chicago 4, Illinois
"Goodbye Weeds" (15 min., color)	New York State College of Agriculture, Ithaca, New York
"Grow Your Own" (20 min.)	New York State College of Agriculture, Ithaca, New York
"Growing Vegetables for Processing"	Pennsylvania State University, University Park, Pennsylvania
"Handling and Storage"	Christopher, E. P., University of Rhode Island, Kingston, Rhode Island
"Harvest in a Hurry" (Apples, color, 17 min.)	Wooden Box Institute, 724 Sharon Building, San Francisco, California
"Home Food Gardens" (27 min., color)	New York State College of Agriculture, Ithaca, New York

Film Title	Source of Film
"Home Gardens"	Duncan, A. A., University of Maryland, College Park, Maryland
"Home Landscaping"	Michigan State College, East Lansing, Michigan
"Home Vegetable Gardens"	New York State College of Agriculture, Ithaca, New York
"How Does Your Garden Grow?" (Sound, color, 30 min.)	Swift and Company, Plant Food Division, Baltimore, Maryland
"How to Grow Beautiful Roses"	California Spray-Chemical Corporation, Richmond, California
"How to Grow Dahlias" (Color, 20 min.)	International Film Bureau, Inc., 47 East Jackson Boulevard, Chicago 4, Illinois
"How to Grow Gladiolus" (Color, 16 min.)	International Film Bureau, Inc., 47 East Jackson Boulevard, Chicago 4, Illinois
"How to Grow Iris"	International Film Bureau, Inc., 47 East Jackson Boulevard, Chicago 4, Illinois
"How to Grow Roses" (Color, 22 min.)	International Film Bureau, Inc., 47 East Jackson Boulevard, Chicago 4, Illinois
"How to Plant Dutch Bulbs" (Sound, color, 14 min.)	Films of the Nations Distributors, Inc., 62 West 45th Street, New York 36, New York
"In Virginia Gardens"	Virginia Department of Conservation and Development, Division of Publicity and Advertising, Richmond 19, Virginia
"Irrigation"	Duncan, A. A., University of Maryland, College Park, Maryland
"Labor Saving Ideas"	Bobb, A. C., University of Connecticut, Storrs, Connecticut
"Leaves" (11 min.)	Encyclopedia Britannica Films, 1150 Wilmette Avenue Wilmette, Illinois

Film Title	Source of Film
"Life of a Plant" (Color, 11 min.)	Encyclopedia Britannica Films, 1150 Wilmette Avenue, Wilmette, Illinois
"Making the Most of a Miracle"	The American Plant Food Council, Barr Building, 17th Street, N.W., Washington 6, D. C.
"Making Rural Communities More Attractive"	Rasmussen, A. O., Pennsylvania State University, University Park, Pennsylvania
"Miracle of the Can"	Modern Talking Pictures, Washington, D. C.
"Miracle of the Trees" (Color, 10 min.)	International Film Bureau, Inc., 47 East Jackson Boulevard, Chicago 4, Illinois
"Miscellaneous Botany"	Sherwood, C. H., Iowa State College, Ames, Iowa
"Modern Chrysanthemums"	Perkins, Jackson; Newark, New Jersey
"Modern Chrysanthemums for Fall Beauty" (Sound, color, 20 min.)	Films of the Nations Distributors, Inc., 62 West 45th Street, New York 36, New York
"Modern Roses"	Perkins, Jackson; Newark, New Jersey
"Modern Roses on Parade" (Sound, color)	Films of the Nations Distributors, Inc., 62 West 45th Street, New York 36, New York
"Mums the Word"	George Ball Company, Inc., West Chicago, Illinois
"Mysteries of Plant Life"	California Spray-Chemical Corporation, 1618 East Elizabeth Avenue, Linden, New Jersey
"Nations United for Spring Beauty" (Sound, color, 20 min.)	Films of the Nations Distributors, Inc., 62 West 45th Street, New York 36, New York
"Orchard Brush Removal" (Color)	New York State College of Agriculture, Ithaca, New York

Film Title	Source of Film
"Pecan Production and Marketing"	Rosborough, J. F., Tyler Experiment Station, Tyler, Texas
"Plant Growth" (11 min.)	Encyclopedia Britannica Films, 1150 Wilmette Avenue, Wilmette, Illinois
"Plant Oddities" (Color, 10 min.)	International Film Bureau, Inc., 47 East Jackson Boulevard, Chicago 4, Illinois
"Plant Traps" (10 min.)	Encyclopedia Britannica Films, 1150 Wilmette Avenue, Wilmette, Illinois
"Picking Apples"	Washington State Apple Commission, Yakima, Washington
"Picking Pointers for Apple Pickers"	New York State College of Agriculture, Ithaca, New York
"Potato Production for Profit"	University of Nebraska, Lincoln, Nebraska
"Potatoes Unlimited"	Union Pacific Railroad, 120 Broadway, New York, New York
"Right as Rain" (Irrigation)	Aluminum Corporation of America, Gulf Building, Pittsburgh 19, Pennsylvania
"Roots of Plants" (10 min.)	Encyclopedia Britannica Films, 1150 Wilmette Avenue, Wilmette, Illinois
"Roses"	Sherwood, C. H., Iowa State College, Ames, Iowa
"Science Serves the Farmer"	Michigan State College, East Lansing, Michigan
"Seed Dispersal" (10 min.)	Encyclopedia Britannica Films, 1150 Wilmette Avenue, Wilmette, Illinois
"Soil Management"	Duncan, A. A., University of Maryland, College Park, Maryland
"Spring Blossoms" (Color, 19 min.)	International Film Bureau, Inc., 47 East Jackson Boulevard Chicago 4, Illinois

Film Title	Source of Film
"Springtime in Holland"	Associated Bulb Growers of Holland, Inc., 29 Broadway, New York, New York
"Starting Plants from Seed"	National Garden Bureau, Director: 210 S. Desplaines Street, Chicago 6, Illinois
"State Parks in Olde Virginia"	Virginia Department of Conservation and Development, Division of Publicity and Advertising, Richmond 19, Virginia
"Story of Broccoli"	University of California, Berkeley, California
"Story of Celery"	University of California, Berkeley, California
"Story of Modern Roses" (25 min., color)	New York State College of Agriculture, Ithaca, New York
"Sweet Potato Production and Marketing"	Rosborough, J. F., Tyler Experiment Station, Tyler, Texas
"The Cranberry Story" (Color, sound)	University of Massachusetts, Amherst, Massachusetts
"The Home Orchard"	Alabama Agricultural Extension Service, Auburn, Alabama
"The Pecan in Texas"	Texas A. & M., College Station, Texas
"The Shortest Way Home"	University of Maryland, College Park, Maryland
"The Way to Better Vegetables" (Sound, color, 15 min.)	Swift and Company, Plant Food Division, Baltimore, Maryland
"The Yam Goes to Market"	Louisiana State University, University Station, Baton Rouge, Louisiana
"Time-Lapse Photography" (Color, 10 min.)	International Film Bureau, Inc., 57 East Jackson Boulevard, Chicago 4, Illinois
"Tournament of Roses"	Sherwood, C. H., Iowa State College, Ames, Iowa

Film Title	Source of Film
"Trace Minerals"	American Plant Food Council, Barr Building, 17th Street, N.W. Washington 6, D. C.
"Transplanting Shrubs, Evergreens, and Trees"	New York State College of Agriculture, Ithaca, New York
"Vegetable Varieties You Should Know"	Pennsylvania State University, University Park, Pennsylvania
"Victory Gardening" (27 min.)	New York State College of Agriculture, Ithaca, New York
"Washington State Appleland"	Washington State Apple Commission, Yakima, Washington
"What's Behind a Rose"	Roses, Inc., Box 625, Eustis, Florida
"Where New Flowers are Bred"	National Garden Bureau, Director: 210 S. Desplaines Street, Chicago 6, Illinois
"Your Apple Orchard"	University of Maryland, College Park, Maryland
"Your Farm, Tomorrow's City"	Michigan State College, East Lansing, Michigan

SPECIALISTS HAVING ON HAND WRITTEN MATERIAL OF SUBJECTS PRESENTED ON TELEVISION

Subject	Specialist
"African Violet"	Butterfield, Norman W., Waltham Field Station, Waltham, Massachusetts
"Apple Time in Delaware"	Stevens, Robert F., University of Delaware, Newark, Delaware
"Benefit of Mulches"	Cox, Joseph T., Michigan State College, East Lansing, Michigan
"Budding Trees"	Oberly, Gene H., Utah State College, Logan, Utah
"Bulb Planting"	Cox, Joseph T., Michigan State College, East Lansing, Michigan
"Care of House Plants"	Stevens, Robert F., University of Delaware, Newark, Delaware
"Care of House Plants"	Sherwood, C. H., Iowa State College, Ames, Iowa
"Carnations"	Butterfield, Norman W., Waltham Field Station, Waltham, Massachusetts
"Chrysanthemums"	Butterfield, Norman W., Waltham Field Station, Waltham, Massachusetts
"Corn Earworm Control"	Williams, G. R., Texas A.& M.,College Station, Texas
"Culture of Greenhouse Plants"	Sherwood, C. H., Iowa State College, Ames, Iowa
"Dish Gardens and Terrariums"	Stevens, Robert F., University of Delaware, Newark, Delaware
"Fertilization"	Duncan, Andrew A., University of Maryland, College Park, Maryland
"Figs in the Home Orchard"	Hutchison, John E., Texas A.& M., College Station, Texas
"Flower Arrangements"	Sherwood, C. H., Iowa State College, Ames, Iowa

Subject	Specialist
"Fresh Apple Varieties on North Carolina Markets Today"	Hatton, T. T., North Carolina State College, Raleigh, North Carolina
"Fresh Peach Varieties on North Carolina Markets Today"	Hatton, T. T., North Carolina State College, Raleigh, North Carolina
"Getting Good Potatoes"	Pratt, Arthur J., Cornell University, Ithaca, New York
"Gladiolus"	Butterfield, Norman W., Waltham Field Station, Waltham, Massachusetts
"Grafting"	Kimball, M. H., 156 P.B. U.C.L.A., Los Angeles 24, California
"Grow Your Own Plants" (Propagation)	Hutchison, John E., Texas A.& M. College, College Station, Texas
"Home Landscaping"	Cox, Joseph T., Michigan State College, East Lansing, Michigan
"Know Your Apples"	Oberly, Gene H., Utah State College, Logan, Utah
"Landscape Design"	Burton, L. H., University of Arkansas, Fayetteville, Arkansas
"Landscaping the Home Grounds"	Stevens, Robert F., University of Delaware, Newark, Delaware
"Landscaping the Small Yard"	Drage, C. M., Colorado A.& M., Fort Collins, Colorado
"Lawn Design"	Kimball, M. H., 156 P.B. U.C.L.A., Los Angeles 24, California
"Lawn Pests"	Kimball, M. H., 156 P.B. U.C.L.A., Los Angeles 24, California
"More Food and Fun in the Garden"	Hutchison, John E., Texas A.& M. College, College Station, Texas
"Mulching"	Duncan, Andrew A., University of Maryland, College Park, Maryland
"National Vegetable Week"	Thomson, Cecil L., University of Massachusetts, Amherst, Massachusetts

Subject	Specialist
"Peach Varieties"	Oberly, Gene H., Utah State College, Logan, Utah
"Perennials"	Stevens, Robert F., University of Delaware, Newark, Delaware
"Pest Control"	Stevens, Robert F., University of Delaware, Newark, Delaware
"Pruning Trees"	Kimball, M. H., 156 P.B. U.C.L.A., Los Angeles 24, California
"Planning and Planting Vegetable Gardens"	Thomson, Cecil L., University of Massachusetts, Amherst, Massachusetts
"Planning Farm Home Grounds"	Tarr, Margherita, Iowa State College, Ames, Iowa
"Planning Farmsteads"	Tarr, Margherita, Iowa State College, Ames, Iowa
"Planning Your Home Grounds"	Tarr, Margherita, Iowa State College, Ames, Iowa
"Plant Adapted Varieties"	Hutchison, John E., Texas A.& M. College, College Station, Texas
"Plants for Memorial Day"	Butterfield, Norman W., Waltham Field Station, Waltham, Massachusetts
"Planting the Home Yard"	Tate, Harvey F., University of Arizona, Tucson, Arizona
"Planting Trees, Shrubs, and Flowers"	Tarr, Margherita, Iowa State College, Ames, Iowa
"Potato Production for the Home Gardener"	Kemper, Claude R., West Virginia University, Morgantown, West Virginia
"Potato Production Guide"	Sheldrake, Raymond, Cornell University, Ithaca, New York
"Preparing Plants for Winter"	Cox, Joseph T., Michigan State College, East Lansing, Michigan
"Pruning"	Stevens, Robert F., University of Delaware, Newark, Delaware

Subject	Specialist
"Pruning and Staking Tomatoes"	Scott, F. H., Virginia Polytechnic Institute, Blacksburg, Virginia
"Pruning Evergreens"	Cox, Joseph T., Michigan State College, East Lansing, Michigan
"Pruning of Ornamentals"	Pridham, A. M. S., Cornell University, Ithaca, New York
"Pruning Peach Trees"	Spurlock, Donald H., Louisiana State University, Baton Rouge 3, Louisiana
"Pruning Roses"	Tate, Harvey F., University of Arizona, Tucson, Arizona
"Pruning Tomatoes"	Cox, John A., Louisiana State University, Baton Rouge 3, Louisiana
"Pruning Tomatoes"	Cunningham, Clyde, Federal Building, Lapeer, Michigan
"Pruning Trees"	Kimball, M. H., 156 P.B. U.C.L.A., Los Angeles, 24, California
"Roses"	Butterfield, Norman W., Waltham Field Station, Waltham, Massachusetts
"Seed Germination"	Kimball, M. H., 156 P.B. U.C.L.A., Los Angeles 24, California
"Seed Germination and Transplanting"	Oebker, Norman F., University of Illinois, Urbana, Illinois
"Seed Treatment"	Duncan, Andrew A., University of Maryland, College Park, Maryland
"Soil Moisture Relations"	Kimball, M. H., 156 P.B. U.C.L.A., Los Angeles 24, California
"Starting the Home Vegetable Garden"	Pratt, Arthur J., Cornell University, Ithaca, New York
"Starting Tomatoes"	Hutchison, John E., Texas A & M., College Station, Texas
"Summer Care of Vegetable Gardens"	Thomson, Cecil L., University of Massachusetts, Amherst, Massachusetts

Subject	Specialist
"Sweet Corn"	Thomson, Cecil L., University of Massachusetts, Amherst, Massachusetts
"The Pumpkin in Pumpkin Pie"	Duncan, Andrew A., University of Maryland, College Park, Maryland
"The Use of Flowers"	Drage, C. M., Colorado A.& M., Fort Collins, Colorado
"The Use of Shrubs"	Drage, C. M., Colorado A.& M., Fort Collins, Colorado
"The Use of Trees"	Drage, C. M., Colorado A.& M., Fort Collins, Colorado
"Thinning Fruit"	Kimball, M. H., 156 P.B. U.C.L.A., Los Angeles 24, California
"Tomato Production for the Home Gardener"	Kemper, Claude R., West Virginia University, Morgantown, West Virginia
"Transplanting Plants"	Cunningham, Clyde, Federal Building, Lapeer, Michigan
"Trees for Coolness"	Cox, Joseph T., Michigan State College, East Lansing, Michigan
"Use of Fertilizer"	Kimball, M. H., 156 P.B. U.C.L.A., Los Angeles 24, California
"Vegetable Garden Varieties"	Graves, Harry A., North Dakota Agricultural College, State College Station, Fargo, North Dakota
"Vine Cutting of Sweet Potatoes"	Cunningham, Clyde, Federal Building, Lapeer, Michigan
"Walnut Harvest"	Kimball, M. H., 156 P.B. U.C.L.A., Los Angeles 24, California
"Weed Control"	Pridham, A. M. S., Cornell University, Ithaca, New York
"Winter Care of Roses"	Graves, Harry A., North Dakota Agricultural College, State College Station, Fargo, North Dakota

Subject	Specialist
All Phases Of	
1. Fruit 2. Flowers 3. Vegetables 4. Lawns 5. Trees 6. Shrubs	Cott, A. E., Iowa State College, Ames, Iowa

A MASTER PLAN OF THE TREE FRUIT EXTENSION PROGRAM

▨ - Initiation ■ - Concentrated Effort ▩ - Follow-Up