

ANNUAL REPORT

1961

Project Number 15

VIRGINIA POLYTECHNIC INSTITUTE

EXTENSION DIVISION

Department of Horticulture

(January 1, 1961 - December 31, 1961)

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Agricultural Extension Service
of the
Virginia Polytechnic Institute

Blacksburg
January 10, 1962

Mr. W. H. Daughtrey
Associate Director
Virginia Agricultural Extension Service
Blacksburg, Virginia

Dear Mr. Daughtrey:

I wish to submit the enclosed report of the Fruit Extension Project 15 for the year beginning January 1, 1961 and ending December 31, 1961.

This report is presented in three parts: Part I, Commercial Tree Fruit Production, Part II, Commercial Small Fruit and Specialty Crop Production, and Part III, Home Fruit Production. It includes the activities of the following men assigned to this project.

Howard A. Rollins, Jr., Horticulturist, Project Leader, 75% Extension.

H. Bruce Aroian, Associate Horticulturist, full time Extension, small fruits.

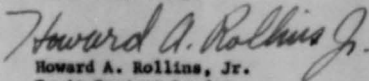
Fred R. Dreiling, Associate Horticulturist, full time Extension, tree fruits.

W. F. Judkins, Head Department of Horticulture, 33% Extension, all phases of Horticulture.

E. L. Phillips, Associate Horticulturist, 75% Extension, tree fruits, stationed at the Piedmont Fruit Research Laboratory, Charlottesville.

George R. Williams, Associate Horticulturist, 75% Extension, tree fruits, stationed at the Winchester Fruit Research Laboratory, Winchester.

Yours very truly,



Howard A. Rollins, Jr.
Fruit Project Leader
Extension Horticulturist

HAR/dd

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RESULTS OR ACCOMPLISHMENTS

PART I - COMMERCIAL TREE FRUIT PRODUCTION

THE TREE FRUIT INDUSTRY OF VIRGINIA

The production of tree fruits is one of the more important agricultural industries in the state. Virginia ranks third in the country in the production of apples with an average annual production of about 10,000,000 bushels valued at nearly 25,000,000 dollars. Virginia is also an important peach producing state with an average production of about 1,500,000 bushels.

The total apple acreage in the state has declined but this reduction has more than been compensated for by increases in per tree yields. The number of individual growers has also declined but average orchard size has increased. Approximately half of the apples produced in Virginia are processed.

As for the future - it is expected that the production of apples will increase at least 25% within the next ten-year period. This will be due in part to a slight increase in total acreage but most of the additional production will come from greater productivity of current acreage. It is also expected that the apple industry will continue to concentrate in the area north of Harrisonburg. There will also be major shifts in production practices within this next ten-year period as growers strive to refine and intensify production techniques to maintain a favorable competitive position with other areas as well as other commodities.

The volume of peaches produced in the state is not expected to change markedly in the next ten-year period, however, the concentration of production is expected to continue to shift from central Virginia to the northern Virginia area and to a lesser extent toward eastern Virginia. As with apples, there is expected to be a continual intensification of production practices. While in the past much of the Virginia peach crop was marketed through fresh fruit channels, the current trend is sharply in the direction of processing. How well the industry will be able to adjust to this trend will have a significant influence upon its future.

THE 1961 SEASON

There were 10,500,000 bushels of apples produced in Virginia in 1961. This is 300,000 bushels more than were produced in 1960 and nearly 800,000 bushels more than the ten-year average. The crop was uniformly distributed throughout the fruit producing sections of the state. This past year Virginia ranked first in the country in the production of Stayman, second in the production of York, Golden Delicious, and Winesap and third in the production of Red Delicious.

Apple buds reached the green tip, or delayed-dormant, stage about a week or ten days earlier than normal, but the weather then turned cold and wet, and delayed further development. Bloom was about normal, but extended over a longer than average period. Following bloom the weather continued to be cool and wet and fruit grew slowly. As the season progressed it became apparent that fruit development was a week to ten days behind normal. It never caught up.

The weather conditions during the remainder of the season were favorable for fruit development with most areas receiving ample moisture supplies. Conditions were nearly ideal for harvest but growers began to complain that fruit size was off. This was apparently due to the slow growing conditions during the first few weeks after bloom.

Fruit quality was good. The finish on Golden Delicious was better this year than it has been for a long time. Most workers are at a loss to explain this. The finish on Stayman was generally poor and there was more than the usual amount of cracking. Apple scab presented a real problem with several mild infection periods occurring before bloom. If it were not for the generally low level of carry-over in most orchards, the problem could have become serious. The cool, wet spring generally resulted in a minimum of insect problems until mid-summer when red and white mites did build up.

While the processing price was not as good as most growers would like to have seen, the season did not turn out badly at all. Growers with early Red Delicious sold them for from 5 to 6 dollars per bushel. The export market was better this year than in the recent past and provided a good market for some of the smaller fruit sizes. The trend towards selling quality fruit in lined field crates continued.

All things considered, this has been a relatively good year for the Virginia fruit industry and because of the uniform distribution of the crop, prospects are very good for at least as good a crop in 1962. In general the Virginia tree fruit industry appears to be in a more "healthy" condition than at any time in the recent past.

THE OBJECTIVES OF THE 1961 COMMERCIAL TREE FRUIT PRODUCTION

EXTENSION PROGRAM

The objective of the 1961 commercial tree fruit extension program was to provide the fruit growers of Virginia, through education, information that would aid them in the solution of their problems. The two most critical problems confronting the Virginia fruit industry were considered to be:

I - Production Efficiency Too Low

- A - In spite of the fact that the annual per tree production of apples in the state of Virginia has risen nearly 50% in the last ten years it is still less than 6.0 bushels. This is considered to be far too low for an efficient orchard operation. The average annual per tree production should be increased at least another 30%.
- B - Growers are not obtaining maximum efficiency from labor and equipment. Labor costs have continually risen and growers must take advantage of all opportunities to increase efficiency of their labor and equipment through increased mechanization if they are to withstand the challenge of competition.

II - The Quality of Fruit Available to the Consumer is Too Low

- A - The average quality of fruit produced is too low. In recent years there has been very significant strides made in the production of quality fruit, however, there is still much room for improvement.
- B - Reduction in fruit quality from the tree to the consumer is excessive. Progress in this area of quality maintenance has not

kept pace with advancements in quality development. It does not pay to raise quality fruit and advertise quality fruit if such fruit is not available to the consumer.

MAJOR PROJECT AREAS OF THE 1961 COMMERCIAL TREE FRUIT PRODUCTION

EXTENSION PROGRAM

In order to carry out the objectives of the commercial tree fruit extension program - that of increasing production efficiency and improving fruit quality - work was carried on in the following seven major project areas.

- 1) Spraying
- 2) Quality Maintenance
- 3) Pruning
- 4) Thinning
- 5) Rodent Control
- 6) Orchard Soil Management and Fertilization
- 7) New Plantings and Tree Removal

The following pages of this report will be devoted to a discussion of each of the above seven major phases of the 1961 commercial tree fruit production program.

SPRAYING

Approximately 44% of the tree fruit extension time was devoted to the broad area of spraying during 1961. Work in this area is considered to be one of the more important phases of the program, first in terms of the importance to the producer and secondly, in terms of providing the consumer with a product that is free from insect and disease blemishes as well as insuring that the fruit is free from harmful spray residues.

WHY?

There is probably no area that fruit growers need more assistance with than the highly technical area of spraying and general pest control. New, highly effective, mild spray chemicals and programs have been a boon to the industry, but along with this refinement in orchard pest control has come an increased complexity of spray considerations. A grower today must not only consider the effectiveness of an individual material or combination of materials in controlling insects and diseases, but he must also consider the compatibility of one material with another, the possible phytotoxic effects, the influence upon fruit finish, and the possibility of accumulating harmful spray residues. By providing orchardists with spray information and assisting them with pest control problems, losses from insects and diseases have been held to a minimum. It is now difficult to find a wormy apple in a commercial orchard. Probably even more important is the fact that the newer, more refined spray programs have resulted in increased yields, thus providing an increased production efficiency in most orchards.

The greatest benefit derived from work in this area has been realized by the consumer through the improved quality of the products she receives. During this past season special emphasis was given to the problem of spray residues. Every possible precaution was taken to help growers make certain that the fruit they offer to the consumer was free of harmful spray residues.

WHAT?

During this past season the principal objectives of the work in the area of spraying were to help the fruit growers in Virginia through education develop and carry out pest control programs that would:

- 1) Result in effective insect and disease control,
- 2) Cause a minimum of adverse influence to fruit finish,
- 3) Cause a minimum of phytotoxic influences,
- 4) Avoid harmful spray residues,
- 5) Accomplish the above with maximum efficiency.

HOW?

All activities relating to pest control and spray problems are grouped under the general heading of the Virginia Spray Service. The extension phases of the Virginia Spray Service are as follows.

1961 Virginia Spray Bulletin

Prior to the 1960 season the Virginia Spray Bulletin was completely revised and the spray recommendations offered were based upon orchard situations. The purpose of presenting the spray programs in this manner was to allow the grower an opportunity to evaluate his specific situation and select that program which would best satisfy the needs of his orchard. This approach proved to be very successful. When the 1961 bulletin was prepared the same general format was maintained, however, due to new research findings the specific recommendations were modified from those made in 1960.

The Virginia spray bulletin has long enjoyed an enviable reputation throughout the fruit producing sections of the country, an illustration

of which is found in the fact that in 1961, as in the past, West Virginia purchased approximately 2000 copies of the Virginia bulletin for distribution to the growers in that state. They have already expressed a desire to purchase copies again in 1962.

Approximately 7000 copies of the Virginia spray bulletin were distributed throughout the state to growers and other persons requesting them. Requests were also received from people in other important fruit producing sections of the country.

Spray Notices

During the critical spray season special and unexpected insect and disease control situations arise. In order to disseminate pest control information quickly to growers and assist them with the proper timing of their sprays, special notices are distributed to all growers requesting them. The rapid dissemination of information possible through the use of these notices has been of real value to the fruit growers of Virginia. They also have provided a means of keeping growers on their toes regarding the latest spray residue information.

During the 1961 season a total of 16 apple spray notices were prepared and distributed to about 2400 growers on the apple spray notice mailing list. A total of 12 peach spray notices were prepared and sent out to approximately 1600 growers on the peach spray card list.

RADIO

The most critical time of the year for spraying is the six to eight-week period starting with the first opening of the apple buds in the spring. The major problem during this period is apple scab. Control

decisions are greatly influenced by weather conditions. One of the more successful phases of the Virginia Spray Service has been a series of five-minute, life, early-morning, daily radio programs. A portion of each of these programs is devoted to a detailed weather report. The remainder of the time is devoted to an evaluation of the weather conditions with recommendations as to the best spray procedures to follow based on these weather conditions.

During the 1961 season a total of 126 individual programs were presented over stations covering at least 90% of the fruit production of the state. Mr. G. R. Williams presented a daily program over Station WINC Winchester which was carried simultaneously over Station WSIG Mt. Jackson, Virginia. Mr. E. L. Phillips conducted a daily five-minute radio program during the critical spray period over Station WCHV Charlottesville while Mr. F. R. Drilling conducted a similar program over Station WSLS Roanoke, Virginia. Dr. Rollins assisted with the above programs whenever practical.

The spray service radio programs have provided an excellent means of maintaining close contact with the industry and has helped increase the industry's confidence in the fruit extension program. In this way the overall effectiveness of fruit extension has increased.

Meetings

Meetings provide excellent educational opportunities. During the past year various types of meetings were held through which spray information was disseminated. The Virginia Spray Service program for 1961 was first introduced and discussed at the Virginia State Horticultural Society meeting in Roanoke. During the month of February a series

of ten, all-day fruit schools were held in the important fruit producing sections of the state. One half day at each of these schools was devoted to orchard pest control.

In addition to fruit schools numerous area fruit meetings were held during the spring and summer months to discuss current pest control problems. In several of the areas fruit meetings were held in late fall to review the results of the 1961 program and identify mistakes. These sessions have been popular and help growers avoid making the same errors twice.

In Virginia there are many technical spray representatives of various chemical companies. These representatives advise fruit growers regarding insect and disease problems and are performing a very valuable service. In an attempt to improve the quality of the information passed on to the growers, evening meetings were held on a weekly basis during the critical spray season at the Winchester Fruit Research Laboratory. All persons concerned with making spray recommendations to fruit growers were invited to attend. This included extension and research people as well as technical representatives, not only from Virginia but from nearby states as well. The main purpose of these meetings was to give the technical representatives and extension and research workers an opportunity to discuss current problems and coordinate their control recommendations and in so doing reduce the confusion at the grower level. As a result there has been much closer cooperation among all persons in the area making pest control recommendations. Dr. A. B. Groves, pathologist, and Dr. C. H. Hill, entomologist, located at

the Winchester Fruit Research Laboratory, have generally served as discussion leaders at these meetings.

The technical representative spray meetings also provide an excellent means of rapid dissemination of current, up-to-date information since each fruit grower in the area is usually contacted in person at least once during the week following the meeting by one or more of the persons in attendance. In order to maintain the general atmosphere of these meetings, that is, to encourage open and free exchange of information, fruit growers were not invited to attend. All persons involved felt that the fruit growers of the area would benefit to a greater degree if this policy was strictly adhered to. During the 1961 season a total of eight meetings were held with an average attendance of 35.

Orchard Visits

The spray bulletin, spray notices, and spray service radio programs, as well as meetings, are all effective means of disseminating spray information. However, they must be supplemented by individual orchard visits if a well-rounded effective program is to exist. The success of any extension program depends upon the confidence of the industry in the persons making the recommendations. This confidence is usually most readily gained by occasional personal contact. It has been found that through offering sound guidance on pest control problems, the specialist's suggestions on other matters are more readily accepted.

During the 1961 season a total of approximately 512 orchard visits were made during which spray assistance was rendered. The tree fruit extension staff personnel located in the various fruit producing

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sections of the state were in a position to provide county agents and growers with prompt and effective assistance dealing with insect and disease control problems. Usually when a problem arises it must be handled immediately. Mr. George Williams located at the Winchester Fruit Research Laboratory worked primarily with the northern Virginia fruit counties. Mr. E. L. Phillips located at the Piedmont Fruit Research Laboratory at Charlottesville worked largely in the fruit counties of the central and eastern Virginia sections while Mr. F. R. Dreiling located at Blacksburg worked primarily with the fruit counties of the southern and south-western part of the state. Dr. Rollins worked over the entire state keeping abreast of problems arising in the various sections and maintaining a close coordination between all phases of the Virginia Spray Service.

Articles

A total of 19 articles were published during 1961 dealing with the general problem area of spraying. A significant proportion of these were printed in Virginia Fruit magazine. Some of these articles brought out some of the background information upon which control recommendations are based. It has been found that a number of growers are continually seeking more and more information about some of their more critical problems. The tree fruit extension staff has encouraged their accumulation of this type of information. Unless people know the basic considerations they will never reach the point where they will be able to make intelligent decisions regarding some of their more technical problems. These articles were designed to help the growers even become better informed.

SUMMARY OF ACTIVITIES THROUGH WHICH SPRAY WORK WAS FURTHERED

Spray Bulletins prepared	1
Spray bulletins distributed	7000
Apple spray notices prepared	16
Persons to whom each apple spray notice was sent....	2400
Peach spray notices prepared	12
Persons to whom each peach spray notice was sent....	1380
Spray service radio programs	126
Articles prepared	19
Fruit schools.....	10
Spray meetings	8
Local fruit grower meetings and tours	57
Orchard visits during which spraying was discussed..	512

RESULTS

The Virginia Spray Service program is basically a prevention program rather than a corrective one, thus making specific accomplishments difficult to identify. There are, however, some very definite developments that have taken place in recent years that may be directly attributed to the activities of the Virginia Spray Service.

Within the past ten-year period there has been more than a 50% increase in the per-tree production of apples. This increase has come about largely due to the adoption of milder, less phytotoxic spray programs. Virginia has led the country in the development of these progressive programs and the full benefits are still to be realized. Because of the significant increases in per tree yields, some growers are reporting that their per bushel costs have actually gone down over the last decade.

Quality is difficult to evaluate numerically, but all signs point to the fact that the average quality of "Virginia apples" has improved. This is especially true from the standpoint of insect and disease blemishes as well as fruit finish. In most commercial orchards it is now difficult to find a wormy or scabby apple. While the Virginia Spray Service works largely with the producers, the real benefits of work in this area are realized by the consumer.

During this past season the machinery that had been established over the past several years for the rapid dissemination of information produced valuable dividends. The cool, wet spring created conditions almost ideal for the spread and subsequent development of apple scab, however, because of the daily contact with the growers through the radio spray service programs and through the spray notices it was possible to pass on direct up-to-the-minute recommendations based on the current conditions. Because of past close association with the industry, growers had confidence in the recommendations of spray service personnel and by harvest it was apparent that what could have resulted in serious losses due to apple scab caused only minor losses here and there. Had it not been for the effectiveness of the Virginia Spray Service, losses from apple scab alone would easily have mounted to several million dollars.

During the 1961 season as was also true in 1960, primary emphasis was placed on disseminating residue tolerance information and guidance. Virginia growers cooperated fully with this program and as a result to date, as far as the writer is aware, there have been no instances in which Virginia grown fruit has been found to contain over the allowed

amounts of pesticide chemical residues.

One strong indication of the value of the Virginia Spray Service information is found in the extremely high regard that the Virginia Spray Bulletin is held. West Virginia considers this bulletin to be of enough value to purchase a copy for each and every grower in that state.

QUALITY MAINTENANCE

During the 1961 season approximately 4.0% of the total tree fruit extension time was devoted to work in the area of quality maintenance.

WHY?

Virginia growers have made very significant advances in improving the quality of the fruit they produce. They are, however, frequently unable to maintain that quality through to the consumer. At the present time the weakest link in the quality chain is the link between the tree and the consumer. It does very little good to produce quality fruit if such quality is not passed on to the consumer.

There are a number of problems involved in the maintenance of fruit quality, but three of the most important are:

- 1) Fruit offered to the consumer is frequently not of the proper stage of ripeness.
- 2) The fruit offered to the consumer is frequently badly bruised.
- 3) Fruit offered to the consumer shows indications of various physiological disorders.

WHAT?

The objective of the work in this area was to help growers provide the consumer with fruit of better quality by placing emphasis on:

- 1) Bruise prevention,
- 2) Maturity and fruit condition,

- 3) Proper use of stop-drop sprays,
- 4) Maintaining proper storage conditions for apples,
- 5) Proper use of scald inhibiting chemicals.

HOW?

During this past season several methods of disseminating quality maintenance information were used. Various topics relating to the general problem were discussed at area fruit schools and other fruit grower meetings. Spray notices were sent to each grower stressing the proper use of stop-drop sprays and scald inhibiting chemicals. Copies of five previously prepared publications, "Stop-Drop Sprays for Apples", "When to Pick Virginia Apples", "How Long Will Your Apples Keep?", "The Storage of Virginia Apples", and "How to Pick Virginia Apples" were widely distributed.

This past season much time was also devoted to work on specific problems. For example, Mr. Dreiling conducted bruise tests in one of the larger packing houses and offered suggestions where improvements could be made. These changes were made. Dr. Rollins devoted time to working with members of the Agricultural Engineering Department on the general area of mechanical harvesting of apples.

A number of growers have erected "on the farm" storages this past year. A number of these growers were given personal assistance in the most effective operation of these storages.

One of the more recent research developments in the area of quality maintenance has been in relation to the use of scald inhibiting chemicals. Much of the research in the effective use of these materials was carried on in Virginia. This past fall a number of growers were anxious to try

this new technique and considerable personal assistance was rendered. As a result several hundred thousand bushels of apples were treated.

SUMMARY OF ACTIVITIES THROUGH WHICH QUALITY MAINTENANCE
WORK WAS FURTHERED

State Horticulture Society meetings	1
Area fruit schools	10
Local fruit grower meetings	9
Radio programs	3
Articles prepared	5
Publications distributed	465
Orchard visits	61

RESULTS

The results of work in this area are slowly becoming aparent. Growers are generally placing greater emphasis upon such things as bruise prevention and maturity. There is a shift toward bulk boxes. This shift is in part due to the reduction in bruising that occurs from the use of bulk boxes. There is also a gradual shift in the direction of "on the farm" storages thus allowing more growers to store their fruit loose and pack the fruit as it is sold. The use of scald inhibiting chemicals is being rapidly accepted.

While it is always difficult to accurately evaluate results in an area such as this, there are encouraging reports coming back from the markets. Representatives of the Virginia State Apple Commission in the field are reporting that the reputation of Virginia apples is improving because of a better quality product reaching the consumer.

PRUNING

As in the past, pruning was an important phase of the 1961 tree fruit extension program with specialists devoting approximately 9% of their time to this work.

WHY?

Refinement and intensification of production practices requires careful attention to tree training and pruning. This is particularly true during the first few years after an orchard is planted. Because of the renewed interest in the establishment of apple plantings both on standard and dwarfing rootstocks at various spacings, work in this area has become more critical than ever.

Greater attention is also being devoted to the production of quality fruit. If high yields of high quality fruit are to be produced, trees must be "opened up" to allow adequate penetration of the spray chemicals and sunlight to insure effective pest control as well as maximum red color development.

WHAT?

The principal objective of work in this area was to teach the importance of the correct training of young trees and the proper pruning of mature bearing trees.

HOW?

Numerous means of communication were employed. Pruning was discussed at area fruit schools, local fruit grower meetings, as well as over the radio. The circular, "Pruning Apples, Pears, Cherries, and Plums" was revised by Mr. F. R. Dreiling and distributed to all growers. Another circular, "Pruning Peach Trees" which was previously prepared

by Mr. F. N. Drelling was also widely distributed.

The method demonstration is the most effective means of teaching pruning techniques and principles. During this past year the fruit extension staff conducted a total of 59 individual pruning demonstrations, 12 of which were planned and published. At these demonstrations instruction was given in the proper training of both non-bearing apple and peach trees as well as mature apple and peach trees. At all of these demonstrations an attempt was made to stress principles. Growers generally know how to prune, but they frequently do not utilize pruning to its fullest potential.

In addition to the principles and practices of pruning, an attempt was made wherever possible to encourage the use of various equipment in the pruning operations to increase overall efficiency. Such equipment included power pruners, pruning platforms and brush shredders for the elimination of brush from the orchard.

SUMMARY OF ACTIVITIES THROUGH WHICH PRUNING WAS FURTHERED

Method demonstrations planned	12
Method demonstrations spontaneous	47
Area fruit schools	10
Local fruit grower meetings	11
Radio programs	3
Articles	3
Pruning circulars revised	1
Orchard visits	96

RESULTS

It is estimated that at least 90% of the trees set out in commercial plantings within the past five years have received some form of

training. Within the past few years there have been well over 1,000 acres of new apple plantings trained according to one of the newer principles advocated during pruning demonstrations. This principal involves the stubbing back of non-permanent laterals instead of removing them completely. This is done to improve crotch angles. Since the tree fruit extension staff has taken the initiative in advocating this procedure all of the plantings handled in this way received their information from extension either directly or indirectly.

There has also been a general increase in the proper pruning of mature bearing trees as growers begin to realize the importance of this practice in intensifying fruit production. There is also a general shift in the direction of more efficient pruning methods. It is estimated that at the present time there are over 70 pruning platforms in use in Virginia orchards. Most growers using pruning platforms are using them in conjunction with other labor saving equipment. It is also estimated that in at least 60% of the apple acreage of Virginia brush shredders are used for the elimination of brush. One grower reported that he was able to cut up brush in his orchard at the rate of more than 50 acres a day.

THINNING

Approximately 5% of the tree fruit extension time was devoted to work in the area of thinning.

WHY?

Both apples and peaches have a tendency to "set up" more fruit than the leaf surface of the tree can support. When this occurs the fruit will be small, poorly colored and of low quality and the tree will

frequently produce little or no fruit the following year. If quality fruit is to be produced and if annual high production is to be encouraged, it is essential that some form of fruit thinning be practiced when oversetting occurs.

APPLES

The hand-thinning of apples is too costly to be considered practical, particularly in these days of mounting labor cost. Even if growers could afford to hand-thin, they would usually be unable to get the job done early enough to be of real benefit. In spite of the variability that has been associated with the use of chemical thinning sprays, growers are strongly encouraged to use them and gain experience with them.

Peach growers can no longer afford to hand-thin if they are to realize a profit, however, they must thin. Growers have been encouraged to use the rubber hose or pole method of thinning because it has been repeatedly shown that peaches can be thinned in this manner for only 10 to 20% of what it would cost to hand-thin.

While much work is being conducted both experimentally and in the form of extension demonstrations with chemicals to thin peaches, there is still no dependable chemical available.

ORCHARD

The subject of apple thinning was discussed in detail at fruit schools and at the State Horticulture Society meetings. On these occasions emphasis was placed on those factors that influence the results with chemical thinning sprays. Emphasis was placed on the use of the

adjuvant Tween-20 with the hormone naphthaleneacetic acid which has been found recently through research efforts to greatly reduce the variability associated with chemical thinning sprays.

An extension circular on the subject of chemical thinning of apples was prepared and distributed. This publication included background information leading up to the current recommendations and was written in a semi-technical fashion. This was done on the principle that growers must become students of their operation and that it is not always sufficient to merely give the "how" of a new practice but an understanding of the "why" is also important. This circular was also published as an article in Virginia Fruit. A number of leading growers testified that they greatly appreciated this approach and indicated they would like to have more extension material delving into the why along with the how dealing with other phases of the fruit production operation.

In addition to meetings, articles and publications on the subject of chemical thinning, personal assistance was rendered to those growers interested in using chemical thinning sprays in commercial operations. This personal guidance was considered to be an important teaching tool. By helping a few leading growers with specific problems, they became better informed and were in a better position to guide other growers in their area.

As the season developed and it appeared as though chemical thinning would be important this year a special spray notice was sent to

all growers covering the basic essentials of chemical thinning procedures.

A comprehensive set of result demonstrations were lined up and plans made, however, frosting conditions during bloom and other adverse weather influences reduced peach set to the point where only "touch-up" thinning would be necessary in most cases. For this reason the thinning of peaches was not strongly emphasized in 1961.

SUMMARY OF ACTIVITIES THROUGH WHICH THINNING WORK WAS FURTHERED

State Horticulture Society Meetings	1
Area fruit schools	10
Fruit grower meetings	10
Articles	2
Radio programs	9
Orchard visits	90
Circulars prepared	1
Circulars distributed	3500

RESULTS -

As a follow-up to the 1961 chemical thinning work, extension personnel visited as many orchards as possible where sprays had been used and attempted to evaluate grower results for future information. In general, chemical thinners in 1961 were successful with a high percentage of the growers following the guidance of the fruit extension staff. Nearly all growers using naphthaleneacetic acid to thin apples used it with the adjuvant, Tween-20 which serves as evidence that growers were following the guidance of the service. Virginia has led the nation in the application of the use of Tween-20 with naphthaleneacetic

acid. Almost without exception growers were well pleased with their results this year.

As a result of the continued use of chemical thinning sprays, the variety Golden Delicious is no longer considered to be a seriously alternate bearing variety. This has given growers encouragement in planting this very desirable, high-quality variety.

RODENT CONTROL

Approximately 4% of the tree fruit extension time was devoted to mouse control work. This is a reduction from the time devoted to this work in the past, but is due to the fact that because of past heavy emphasis in this area and improved control measures, the problem of mouse control is not as critical now as it was five years ago.

WHY?

It has been reliably estimated that up until recently fruit growers in the state of Virginia lost between 500,000 and 1,000,000 dollars a year as a direct result of mouse damage. However, this does not tell the entire story. Whenever the productivity of a block of trees is reduced either due to missing trees or reduced productivity of individual trees, the cost of producing each bushel of apples in that block increases sometimes to the point where a profit can no longer be realized. When this happens, it is not only the injured trees that are lost, but the entire block as well. The above losses occurred in spite of consistent efforts on the part of growers to control mice through the use of poison baits. With the development of the endrin ground spray method of control losses from mouse injury have been drastically reduced. However,

failures still occur, usually due to misconceptions on the part of the grower as to how the spray should be applied and it is for this reason that more recently extension efforts have been devoted to trying to correct these misconceptions and help growers realize optimum control.

WHAT?

During the 1961 season the principal objective of work in this area was to inform and educate growers in the basic principles involved in controlling mice with endrin ground sprays. Emphasis was also placed on some of the newer research developments that have occurred within the past year.

HOW?

The basic principles of endrin ground spray mouse control were discussed at each of the area fruit schools and also at local fruit grower meetings. A demonstration of new developments in equipment was held in relation to the Four-State Summer Tour at Blacksburg during July. Two separate articles were prepared and published in Virginia Fruit to emphasize the proper methods of good mouse control. The circular, "Mouse Control with Ground Sprays" was completely revised to include information to help growers obtain better control as well as to describe some of the newer developments in mouse control spraying equipment. A spray notice listing the essentials of mouse control was sent to each apple grower in the state prior to optimum time for mouse control.

In addition to the above mass-media approaches to the use of endrin ground sprays, a number of individual orchard visits were held in order to assist growers with mouse control problems. For the most part these

visits consisted of helping the grower determine the extent to which mice had invaded his orchard and what the necessity for control measures might be.

SUMMARY OF ACTIVITIES THROUGH WHICH RODENT CONTROL WORK WAS FURTHERED

Area fruit schools	10
Fruit grower meetings	14
Radio programs	1
Articles prepared	3
Circulars distributed	4000
Orchard visits	54

RESULTS

The tree fruit extension staff can point to the wide acceptance of the endrin ground spray method of mouse control with pride of accomplishment. This method of mouse control was developed by Dr. Frank Horsfall, Jr. of the Department of Horticulture at V.P.I. and as soon as his research results warranted recommendation, the tree fruit extension personnel started to work with Virginia growers. The method was first commercially used in Virginia in 1954 and within two years had become a standard practice throughout the state and from there spread rapidly to other sections of the country. An indication of the widespread acceptance of this method is found in the demand for the revised circular, "Mouse Control with Endrin Ground Sprays". Within 30 days after this circular became available, West Virginia purchased enough copies to distribute one to each grower in that state. The information was duplicated and disseminated to all growers in the state of Indiana

and two of the larger spray chemical distributors in the country purchased sufficient copies to supply each of their technical representatives in the United States with one. Dr. Rollins was asked to take part in a fruit school in Ohio and on the program of the annual meeting of the North-Carolina fruit growers to discuss mouse control through the use of endrin ground sprays.

The effectiveness of the endrin ground spray method of control is no longer questioned in Virginia and Extension no longer needs to "sell" the method. If a grower has a moderate to serious mouse problem he readily accepts the endrin ground spray method as the best approach.

ORCHARD SOIL MANAGEMENT AND FERTILIZATION

During the 1961 season approximately 9% of the tree fruit extension time was devoted to work in the area of orchard soil management and fertilization.

WHY?

In the production of apples it is important that fertilizer applications be regulated so as to encourage maximum production of quality fruit. In general, Virginia growers have had a tendency to fertilize too heavily with nitrogen, thus sacrificing fruit quality. This fact has been verified by chemical analysis of apple leaves and has been brought about by adjustments in other phases of the fruit production program.

In the production of peaches, it has been found that certain nutrients may be in short enough supply to be exerting harmful influences. A leaf analysis survey indicated that 30% of the orchards samples throughout the state had one or more nutrient low enough so that an addition of

that nutrient would prove beneficial.

In recent years there has been a trend toward the intensification of fruit production practices and under such a program it is essential that young trees be grown quickly and brought into heavy production at an early age. This entails moisture conservation practices, weed control and proper fertilization.

WHAT?

The principal objective of the tree fruit extension program in the area of orchard soil management and fertilization was to educate growers as to how they might evaluate the fertilization requirements of their mature trees based on individual tree response. In addition to information on the nutrition of apple and peach trees, cover crop management and moisture conserving practices were also stressed.

HOW?

The subject of fertilization and tree fruit nutrition was reviewed in two different articles published in Virginia Fruit. In addition to basic information, growers were given guide lines they could follow in evaluating their own plantings.

The nutritional status of Virginia orchards was discussed in detail at four area fruit schools and at the Virginia State Horticultural Society meetings. These discussions were based largely upon recent results of research carried on in Virginia.

Potassium fertilization demonstration plots were established in three Virginia apple orchards. These plots were observed during the summer and fall and samples taken for more critical analysis. To date, no beneficial responses have been observed, thus indicating the soundness

of past and current fertilization recommendations.

The use of chemical weed killers in non-bearing orchards has been critically evaluated and recommendations will be available in 1962. A leaflet has been prepared for distribution early in 1962.

SUMMARY OF ACTIVITIES THROUGH WHICH ORCHARD MANAGEMENT
WORK WAS FURTHERED

Area fruit schools	4
Local fruit grower meetings	26
Articles	15
Circulars prepared	1
Radio programs	2
Result demonstrations	5
Orchard visits	114

RESULTS

The fertilization of Virginia orchards has improved in recent years as has also general cover crop management and weed control in young plantings. All of this is taking place in the general refinement and intensification of production practices. Growers are attempting to maintain high yields while also obtaining top-quality fruit. At the suggestion of tree fruit extension personnel, many large growers have completely eliminated the fertilization of Stegman apples for a period of two years or more in an attempt to bring the nutritional level of the trees down to a point where fruit quality will be improved.

While most growers are not yet using chemicals for weed control, this has been due to the lack of available information and it is anticipated that with the distribution of the recently prepared circular, the use of herbicides in non-bearing orchards will become widespread during the coming year.

NEW PLANTINGS AND TREE REMOVAL

During the 1961 season tree fruit extension personnel devoted approximately 8% of their time to work in this general area.

WHY?

The very future of the Virginia apple industry depends upon wise decisions made at the time of establishing new plantings. The success or failure of an individual orchard operation is often determined at the time of planting. It is very important that the grower make the right decisions as to varieties and strains. He must anticipate the consumer demands, fifteen years hence. He must also give attention to site, location, and soil; for an improper decision with any of the above may result in failure.

The possible use of clonal rootstocks and semi-dwarf trees in commercial plantings is being given serious consideration. The interest in establishing plantings on size controlling rootstocks is based upon the fact that smaller than standard trees will come into heavy production at an earlier age, thus reducing the capital investment necessary. It is also probable that these trees properly spaced may be more readily adaptable to increased mechanization. The right type of guidance along these lines is vital to the very future of the industry.

It is equally important that peach growers make wise planting decisions. One of the more important decisions they must make is in the selection of the proper varieties since there are many good varieties now available. It is also important that these trees be established on good sites.

WHAT?

The principal objective of work in this area during 1961 was to provide growers with up-to-date information upon which they might base their decisions in the selection of varieties, sites, soils and rootstocks.

HOW?

In order to inform growers of the various factors that should be taken into consideration in the establishment of new plantings, such topics as varietal selection, sites, pollination and size-controlling rootstocks were discussed at the Virginia State Horticultural Society meetings and at the various fruit schools and local fruit grower meetings held throughout the state.

In addition to these discussions, a number of publications have been prepared and have been widely distributed. The circular, "Peach Varieties for Virginia" was revised and distributed to all peach growers. The previously prepared publications, "Apple Varieties for Virginia", "Budding and Grafting of Apple Trees" and "Nectarines for Virginia" were also widely distributed. In addition to these publications, four new publications were prepared and distributed to offer guidance in this general area. They are, "Establishing an Apple Orchard", "Size Controlling Rootstocks", "Soils for Peaches", and "Soils for Apples". In addition to the above listed publications a number of articles were published in Virginia Fruit and elsewhere during the year dealing with the possibilities of tree size control in a progressive fruit industry.

Since peach varieties vary so considerably from one location to

another, six individual peach variety demonstration plantings were established several years ago in six different locations throughout the state. This past year these six plantings provided excellent demonstrational material for the fruit growers living in the vicinity of these plantings. It was found that growers were able to evaluate the newer varieties very effectively by frequent visits to these plantings. A seventh peach varietal planting has been planned for establishment in 1962. This planting will be set out in an area where considerable peaches are grown but none of the new varieties have adequately been tested.

There has been renewed interest in the budding and grafting of apple trees. First, to improve the pollination picture in established plantings and also to change over some of the less desirable varieties to more desirable varieties. A number of individual demonstrations were held as well as discussing this subject at some of the fruit grower meetings.

SUMMARY OF ACTIVITIES THROUGH WHICH NEW PLANTING AND TREE REMOVAL
WORK WAS FURTHERED

Area fruit schools	10
Fruit grower meetings	20
Articles prepared	15
Circulars prepared	4
Circulars distributed	11,000
Radio programs	2
Peach varietal demonstrations	6
Budding and grafting method demonstrations	19
Individual orchard visits	177

RESULTS -

While there have been no surveys of tree populations made since 1956, there are strong indications that since that time there has been a slight increase in both apple and peach plantings. It is estimated at the present time that at least 25% of the apple trees and a similar percentage of the peach trees are of non-bearing age. This is generally considered in excess of that needed to maintain tree populations. For the most part new plantings are being set on only the best sites and are being more carefully planned than was true a few years ago. This is in part due to the fact that the newer plantings are in the hands of more experienced and successful growers.

There is a great deal of interest in the use of size-controlling rootstocks in the newer plantings and growers are anxiously seeking guidance from extension staff personnel with respect to how these plantings should be handled. It is estimated that there are now close to 500 acres of semi-dwarf trees that have been planted within the last few years.

CONTRIBUTIONS TO REGIONAL PROGRAMS

During the 1961 season, tree fruit extension staff members took an active part in a number of regional horticultural activities. During early September, Dr. Rollins and Mr. Dreiling attended the American Society for Horticultural Science meetings at Purdue University and took an active part in discussions that were held in connection with these meetings. Dr. Rollins was selected to serve on the program committee representing the south-east to plan future extension programs in connection with these society meetings.

Mr. E. L. Phillips attended the Southern Association of Agricultural Workers meetings held in Jackson, Mississippi during February. He presented information on peach thinning at these meetings and exchanged production information with research and extension people from other sections of the south-east.

During the year there were several workshops held to further the mutual exchange of fruit production information. Fruit extension personnel took an active part in these workshops. Mr. G. R. Williams and Dr. Rollins participated in the Dwarf Tree Fruit Association meetings held in Hartford, Michigan in March. Mr. F. R. Drelling contributed to the success of the pruning workshop held in Kentucky.

Mr. E. L. Phillips attended the South-Eastern Peach Workers Conference in Hendersonville, North Carolina and Dr. Rollins, Mr. Drelling, Mr. Phillips and Mr. Williams all took an active part in the Cumberland-Shenandoah Fruit Workers Conference that was held in November in Hagerstown, Maryland.

In June, Dr. Rollins was asked to present a paper on size-controlling apple rootstocks at a dwarf fruit tree symposium held at Storrs, Connecticut. He also presented two talks, one on chemical thinning and the other on mouse control at the North Carolina Horticultural Society meetings at Asheville, North Carolina.

In October the extension horticulturists of the southern region held a workshop in Washington, D. C. Mr. Williams, Dr. Rollins and Mr. Drelling participated in this workshop. Dr. Rollins served as program chairman for these meetings.

In addition to participation in the programs of regional meetings, two publications prepared by members of the fruit extension staff have contributed greatly to the extension programs of other sections of the country. The 1961 Virginia Spray Bulletin was used in identical context in West Virginia and was also widely distributed throughout the fruit producing sections of the country and world. The publication, "Mouse Control with Ground Sprays" was revised during the fall and within thirty days after the revision became available distribution had been made to all fruit growers in the state of Virginia, West Virginia and Indiana. Two different large spray chemical distributing companies purchased sufficient copies to provide one each with each of their field representatives in the United States.

PART II - COMMERCIAL SMALL FRUIT PRODUCTION

The small fruit industry is becoming a more important segment of Virginia's agriculture. Approximately 7300 acres of berry crops provide Virginia farmers with over \$3,000,000 income each year. Small fruit producers are in most cases farm operators who rely on these cash crops as a major source of their income. More than 2200 families are involved in commercial small fruit production. The majority of the plantings are from 1 - 3 acres in size. Approximately half of the 6500 acres of strawberries produced find their way into processing channels.

THE 1961 SEASON

Favorable conditions were largely responsible for a very good 1961 strawberry harvest season. The 5% increase in the production of small fruits was due to the increased production in the major commercial production areas. Better than average plant stands due to favorable growing conditions during 1960 were responsible for much of this increased production. New varieties and improved cultural practices also played an important role. Relatively cool weather during the harvest period was responsible for the excellent picking and shipping conditions. Berry growers averaged nearly 2¢ a pound more for their fruit in 1961 than they did in 1960.

THE 1961 COMMERCIAL SMALL FRUIT EXTENSION PROGRAM

The two most critical problems confronting Virginia berry growers are, poor fruit quality and low per-acre yields. In developing the small fruit extension program these two problems were kept in mind. During the

1961 season increased efforts were made to provide small fruit growers with information that would help them solve these critical problems. During the 1961 season 70% of the time of the specialist assigned to small fruit work was devoted to activities in this area.

WHY?

Most agricultural enterprises are profitable only when they are conducted on a large scale. This presents a serious handicap to those farmers who lack sufficient land and capital to finance such enterprises. Berry growing, however, is one type of farming that can be successful on a small scale. Where suitable land is available, profitable crops of berries may be produced with low investment in machinery and equipment.

Increasing labor costs is resulting in more family unit small fruit operations, with off farm working members of the family assisting with the enterprise. To be successful such operations must be efficient. These people need information and guidance.

WHAT?

During 1961 the primary objectives of the small fruit program was to help Virginia berry growers through education: (1) Select suitable varieties from which more profitable yields may be secured. (2) Improve site selection and soil preparation. (3) Adopt modern cultural techniques. (4) Develop better pruning techniques. (5) Improve harvesting techniques. (6) Carry on more effective marketing.

HOW?

The mass-media approach such as radio and news releases were used where practical. The superior commercial aspects of some of the new varieties were emphasized. Descriptions of a number of the tested and

proven varieties were made available to agents and growers. An attempt was made to resolve the more important varieties into several classes: (1) For commercial planting, (2) For limited commercial planting, (3) To satisfy special local demands.

Subject matter was compiled from information obtained from a number of experiment stations including our own as to weed control in strawberries and vineyards. This material and other pertinent information was made available to growers. Several newer herbicides were obtained from manufacturers and trial applications were made cooperatively with the weed control specialists. Additional trial applications were made with selected growers.

Summer mulching, which has proven to be an important cultural step, was emphasized. Several growers were selected to help test black plastic mulch. Radio and news releases stimulated interest in the value of summer mulching of bramble and vineyard plantings. The resulting conservation of soil moisture and the control of weeds were responsible for a marked increase in production and a real saving in cultivation costs.

Many established growers have been accustomed to doing very little in the way of insect and disease control. Years ago, successful production of small fruits was possible with a minimum amount of spraying. However, with the increasing number of insects and disease pests growers have no alternative but to carry out a thorough spray program. Trial applications and information releases were made concerning a number of the newer chemicals. Good cooperation was received from pathologists and entomologists in this phase of the program.

Pruning demonstrations were held in thirty-one counties in an effort to train the new growers and to encourage many of the established

producers to follow recommended practices. The value of summer pruning to obtain sturdy bramble plants was emphasized. An increased number of vineyard owners became acquainted with the relatively new technique of pruning cane growth by establishing a "weight balance" of the prunings to yield. This method gives the grower a more accurate basis for counting the number of buds to retain rather than depending upon the visual judgement which has been the general practice in commercial vineyards in the past. By following this procedure the yield becomes adjusted very closely to the productive potential of the vines.

Present-day thinking as to the small fruit harvesting techniques were outlined and made available to growers. Emphasis was placed on such factors as time of picking, new types of containers and picking techniques. Greater care as to the stage of maturity at harvest time in relation to shipping distances was emphasized. Factors of grading and packing were also taken into consideration. A number of growers were encouraged to pack and ship in smaller containers to satisfy the requirements of the larger markets.

Family-Size Units

Wherever practical family sized units have been encouraged to supplement declining farm income. As a result three-fourth of the new acreage set out this past season was on a family size unit basis. Unit demonstrations of various groups such as "Young Farmer Organization", "Future Farmers of America", and "4-H" and part-time farm operators (e.g. coal miners) have demonstrated rather conclusively that higher yields and superior quality berries can be obtained from plantings of

from $\frac{1}{2}$ - 2 acres in size. Of major importance is the fact that small acreage unit expansion has supplemented meager incomes for many farm families.

Trials and Demonstrations

County agent conferences, meetings and demonstrations were held to furnish up-to-date information having to do with a number of new chemicals used in the control of grass and weeds, insects and diseases. Cooperator trials including such chemicals as Eptam, and MHI-30 were carried out to determine control of weeds and excess runner plants respectively.

Additional trials were placed where plastic mulch was used with five growers strategically located in various commercial areas. Several of the leading strawberry growers in eastern Virginia were encouraged to fumigate their soil with some of the more readily available fumigants to determine their effect as to increased production by controlling nematodes. It has been established that nematodes are partly responsible for some of our low yielding strawberry acreage.

The scarcity of good nursery stock continues to be a major problem for many growers, especially new producers just getting under way. Nurseries and plant growers within reasonable shipping areas were screened and county agents and growers were acquainted with the sources and the varieties of planting stock available. Disease factors continued to make bramble nursery stock, especially to raspberry growers, quite difficult to procure. It is little wonder there is a growing demand for raspberries and blackberries in the face of a dwindling supply of same.

Small Fruits and Roadside Stands

Farm visits, radio and news releases and correspondence were some of the means of interesting growers in diversifying their fruit and vegetable production operation to fit the requirements of roadside stands. Several growers were assisted with plans and construction of up-to-date roadside stands. It is quite obvious that Virginia growers have not scratched the surface in exploring this phase of marketing. Maximum prices can generally be received for higher quality produce with minimum marketing time lost. Roadside stands are ideal outlets for the highly perishable berry crops. An increasing number of berry growers this past season were encouraged to try the "pick-your-own" approach for harvesting and sale of their crops. Growers were urged to consider this approach when problems existed in the way of harvest labor needs and in the case of variable markets. Successful experiences of growers in this state as well as in other sections of the country have shown conclusively that more consideration should be given to this phase of the marketing procedure.

Nut Production Project Activity

The growing interest in home nut plantings and small commercial plantings has resulted in more time being devoted to this specialty crop. Nearly ten percent of this specialist's time was devoted to promoting and servicing nut culture on Virginia farms. Over the past ten years cooperation has been given to Tennessee Valley Authority nut trial plantings program. These plantings have included Chinese chestnuts, English walnuts, black walnuts, filberts and pecans. In

recent years new trial plantings have been confined primarily to Chinese chestnuts, filberts and black walnuts. For the most part these plantings were located in the southwestern Virginia counties of the "Tennessee Valley Authority" shed. However, permission was received to place some of the plantings in other areas of the state. For the most part this past season replacement trees were obtained for a large number of the cooperators. Drought conditions continued to be responsible for most tree failures.

Another phase of the nut project activity has been to give out stratified and germinated selected Chinese chestnuts which were packaged in small plastic containers of forty seeds each. These packages in turn were distributed to interested agents and individuals in a number of the southwestern Virginia counties. A number of reports indicate that good stands of seedling trees were started by a majority of the cooperators. Additional requests have already been received for continuation of this activity.

RESULTS -

Significant accomplishments were apparent as a result of the 1961 small fruit program. An increased number of growers used more up-to-date cultural practices, commencing with a better selection of varieties and improved soil preparation ahead of planting. Various uses were also made of some of the newer chemicals to control disease, insect and weed pests.

Results seemingly show up more vividly in the suggested changes in pruning techniques. Heavy grape production resulted from following

recommendations as to the balanced pruning in the vineyard. Summer

PART III - HOME FRUIT AND NUT PRODUCTION

pruning demonstrations were responsible for many growers discarding the use of trellises and stakes for black raspberry and blackberry plantings. These require somewhat less care than fruit trees and

A considerable number of growers followed through with the marketing suggestions as to shipping in the smaller baskets and containers. An additional number of growers were rewarded as a result of the "pick-your-own" approach where previously they had experienced difficulty as far as quantity and quality of labor was concerned.

production of nuts in the home planting. Over the past ten years trial plantings of nut trees have been established with farm and home owners through the Tennessee Valley Authority.

During the 1961 season approximately 6% of the time of the tree fruit specialists, Rollins, Phillips, Williams and Dreiling was devoted to work in the area of home fruit production. Mr. Aroian, small fruit specialist, spent 30% of his time on home fruit production.

Fruit extension specialist, Phillips, who is located at Charlottesville reported that in this area there has been a heavy increase in demand for personal help on ornamental and vegetable plantings along with home garden fruit work. Although the position held by Mr. Phillips was not set up to service these phases of horticulture, the people making the requests are entitled to help where it might be rendered. In 1961 the number of visits was twice as much as made in 1960 and six times as many as in 1959. It is predicted that this demand will continue to increase. This staff member will find it necessary to judiciously restrict service activity in the ornamental and vegetable

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PART III - HOME FRUIT AND NUT PRODUCTION

Small fruits are usually given primary consideration for backyard plantings. These require somewhat less care than fruit trees and are adapted to limited areas. We find, however, improved adaptability in dwarf fruit trees to many home plantings. The advent of all-purpose pest control spray mixtures has made it easier to control insects and diseases.

In addition to growing fruit there is considerable interest in the production of nuts in the home planting. Over the past ten years trial plantings of nut trees have been established with farm and home owners through the Tennessee Valley Authority.

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fields to carry out his primary responsibility to the commercial fruit growers of his area.

WHY?

Much of our labor force in the nation's industry work at jobs which are highly routine. This type of work gives little satisfaction of something accomplished. People continue to be shifted from farming to industry. The tensions of present-day living continue to mount. All this has created a trend to "back-to-nature's way". The growing of fruits at home to many people serves as a diversion and a satisfying type of recreation. To some careful attention to growing practices takes the edge off that grocery bill. To still others it can be a healthy therapy. The future place of growing fruits as an avocation could well share in the role of a major contribution to the sociological and physiological needs of our society.

As people retire earlier in life, an increased number attain retirement, our life expectancy increases, our work week becomes shorter, vacations longer and as people move from cities to urbanized areas, work in this project becomes more important. It is expected that the interest in this area will continue to expand. There will be an increasing responsibility for extension work with this segment of our population. Each year requests increase from 4-H groups, vocational education teachers, community improvement clubs, county tour groups for information on home fruit production.

WHAT?

If the home gardener is to be successful with his venture it is necessary that he develop an understanding of fundamentals in good production practices.

Objectives in this area were to disseminate cultural information to as many interested people as possible. Subject matter stressed was:

- 1) The importance of proper selection of planting site and varieties,
- 2) Accurate timing, thorough application and proper use of pesticide chemicals,
- 3) The proper methods of pruning young and mature fruit trees,
- 4) Good soil management practices.

HOW?

The mass-media extension methods were used for the dissemination of information in this area. Radio talks and news articles have been found to be effective in serving the home fruit grower.

Short, precise, factual publications are effective. During the past year the following circulars and leaflets were distributed to home producers of fruit and nuts:

- "Tree Fruits for Home Use",
- "Spray Fruit - A Spray Program for Home Gardeners",
- "Dwarf Fruit Trees",
- "Grape Pruning Suggestions",
- "Spray Programs for Grapes",
- "Pruning Muscadine Grapes",
- "Black Root Rot for Strawberries",
- "It's the "Berries" to Grow Small Fruits",
- "Four-H Strawberry Manual",
- "Strawberry Pest Control",
- "Blueberry Varieties",
- "Pruning Figs",

- "Why Figs Fall to Bear",
- "Planting Chestnut Trees",
- "Scoring Chinese Chestnut Seeds",
- "Improved Chinese Chestnut Variety Tests",
- "Seedust as a Mulch",
- "Budding and Grafting Apple Trees",
- "Propagation of Trees and Shrubs".

Work in the area of home fruit gardening was furthered through work with the home demonstration and garden club leaders. Lectures and pruning demonstrations were given to three groups of leaders who in turn relayed the information to their club members.

The home fruit gardening phase of the fruit extension program was furthered by lectures and discussions presented at garden clubs, rural meetings, community and county-wide meetings, Four-H Clubs, F. R. A. training programs, and community improvement clubs.

In addition to mass-media means of disseminating information, publications and lectures, a number of individual visits and demonstrations were also carried out. These were handled whenever possible with the fruit extension workers commercial fruit production field work in the particular area. Home fruit gardening information was disseminated in connection with the Garden Lovers' Short Course, the Institute of Rural Affairs, and the Annual Extension Workers' Conference, all of which were held at Virginia Polytechnic Institute.

Discussions on nut culture were held at six community meetings. The subject was also discussed at several leader training meetings. Nut circulars were handed out at each of these sessions.

Three radio tapes were devoted to the culture and the problems of family-sized nut plantings. In connection with other county work in the state approximately 30 trial plantings were visited. The possibility of growing various types of nuts was also discussed during visits with county agents during the year.

Seedlings from nearly a bushel and a half of selected, germinated Chinese chestnuts were grown during the past year in nine counties. These were distributed by county agents at community and garden meetings.

SUMMARY OF ACTIVITIES THROUGH WHICH HOME FRUIT PRODUCTION
WORK WAS FURTHERED

Radio talks	40
Pruning demonstrations	110
News articles written	13
Personal visits on problem situations	241
Correspondence relative to this project	677
*Publications circulated from this area	5120
Meetings	
4-H	4
Vocational agriculture	6
Community and county	9
Garden Clubs	5
Community Improvement Clubs	5
Short courses	4
Service clubs	6

* County agents also distributed publications in this area.

RESULTS -

With the general approach as outlined above we are able to reach a large number of people with home tree fruit, small fruit, and nut tree plantings. It is the intent that in the years to come these people will be better informed and will be able to guide their neighbors in adopting recommended practices. It is our opinion that this program will serve to help these people attain greater satisfaction in producing more and superior quality fruit for home use. It will also greatly enhance the value and enjoyment of the avocation.

Accomplishments in the area of home fruit production are difficult to evaluate, however, some measure may be taken from the increase in requests. We find that in working with rural-urban groups more and more requests are received for literature pertaining to the care of home fruit plantings.

SUMMARY OF FRUIT EXTENSION ACTIVITIES FOR 1961

In order to accomplish the objectives outlined at the beginning of the 1961 season, fruit extension personnel carried on numerous activities. The various forms of mass-media such as radio, newspaper, magazines, and extension publications, were used wherever practical. A considerable amount of educational material was also disseminated through various fruit grower meetings. The most effective series of meetings held during the year were ten area fruit schools. Nine of these schools were one-day meetings while one was a two-day meeting. All of the schools held this year were well attended and in each case the attendance was up slightly over that of the past. While mass-media and meetings are

effective as means of disseminating subject matter information, they must be supplemented by personal contact work in the form of orchard visits where a grower may be given personal assistance and guidance with specific problems. It has also been noted that the confidence a grower gains through an occasional contact visit greatly increases the effectiveness of all other means of communication that the extension worker has at his disposal. In addition to the activities carried on in direct connection with the fruit extension program, staff members have also contributed significantly to the general activities of the over-all extension service. During 1961 approximately 11% of the fruit extension time was devoted to general extension activities such as extension conferences, Institute of Rural Affairs, etc. This is an increase of 3% over the amount of time spent in these activities during the 1960 season.

SUMMARY OF ACTIVITIES CARRIED OUT
DURING 1961

General

Conferences with individual agents.....	286
Orchard visits	899
Miles traveled	97,343
Talks to groups	191
Letters	1984

Publicity

Bulletins prepared	1
Bulletins distributed	approx. 9,000
Circulars prepared	8
Circulars distributed	approx. 21,000
Leaflets prepared	2
Leaflets distributed	approx. 7,000
Articles prepared (magazines and newspaper).....	48
Radio programs	146
Circular letters	15
Apple spray notices prepared	16
Apple spray notices distributed	32,000
Peach spray notices prepared	12
Peach spray notices distributed	14,000

Meetings

Area fruit schools	10
Total attendance	775
Fruit grower meetings	45
Total attendance	2015
Field days and twi-light meetings	16
Total attendance	1030
Technical spray representative meetings	7
Total attendance	234

Demonstrations

Pruning demonstrations (planned)	12
Pruning method demonstrations (spontaneous)	47
Budding and grafting method demonstrations	19
Peach variety result demonstrations	6
Peach thinning method demonstrations (planned).....	1
Peach thinning method demonstrations (spontaneous).....	14
Apple nutrition result demonstrations	3
Fairs judged	5
Site surveys	25

In addition to the above activities the fruit extension staff members took part in the following meetings:

American Society for Horticultural Science, Lafayette, Indiana
Association of Southern Agricultural Workers, Jackson, Mississippi
Cumberland-Shenandoah Fruit Workers' Conference, Hagerstown, Maryland
Four-State Summer Horticultural Society Tour, Southwest Virginia
Peach Workers' Conference, Hendersonville, North Carolina
Annual Meeting of Dwarf Fruit Tree Association, Hartford, Michigan
Experiment Station Conference, Blacksburg, Virginia
Apple Blossom Festival, Winchester, Virginia
Garden Lovers' Short Course, Blacksburg, Virginia
Dwarf Fruit Tree Symposium, Storrs, Connecticut
Midwest Pruning Conference, Henderson, Kentucky
North Carolina State Hort. Society meetings, Ashville, North Carolina
Southern Regional Extension Horticultural Workshop, Washington, D.C.
West Virginia State Horticultural Society Meetings, Martinsburg, W. Va.
Peninsula Horticultural Society Meetings, Delaware
Farm and Home Week, University of Maine

ANALYSIS OF PROJECT SITUATION

During 1961 significant progress was made in the fruit extension program, however, there was a shift in program emphasis due to the changing needs of the tree and small fruit industries. In general there was a reduction in the amount of personal service type of work done with an increase in the educational program.

The industry is undergoing change. There are fewer producers, but each operation is larger. The trend is in the direction of intensification of production practices. Growers are seeking more advanced scientific knowledge upon which to base production decisions. To satisfy these needs the fruit extension team spent more time gathering, evaluating, and finally disseminating the latest technical information in 1961 and less time in personal service work.

There has been an elevation of the subject matter discussed at fruit grower meetings and there is a general wider inclusion of the "why" in extension publications. In certain instances applied research projects have been carried on to find the answers to practical problems.

In conclusion the fruit extension program is undergoing a general updating in order to provide the fruit industries of the state with the type of information needed.