FARM FORESTRY

in CLACKAMAS COUNTY, OREGON

by Walter M. Fergerson


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- Ralph DeShazer et al, Sandy
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- H. A. McCutchin, Molalla
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- H. A. Seeberger, Beavercreek
- Cyril Shannon, Mulino
- Ronald Speed, Scotts Mills
- J. E. Stroupe, Boring
- M. E. Turner, Gladstone
- Joseph Vaeichtet, Sandy
- Joseph Wagner, Beavercreek

**Illustration on cover**

In Snohomish County, Washington, a light “cat” is most satisfactory for this type of operation.
SUMMARY

The Clackamas County Farm Forestry Demonstration Project was established in April 1940 by the Soil Conservation Service, United States Department of Agriculture, in cooperation with the Oregon State College School of Forestry, Oregon State Board of Forestry, and the Cooperative Extension Service of Oregon State College.

Objectives of the project were "... to aid agriculture, increase farm forest income, conserve water resources, increase employment, and in other ways advance the general welfare and improve living conditions through reforestation and afforestation ..."

The project was located in the Willamette Valley Farm Forestry Subdivision of the state because this subdivision was judged to have the greatest need for development in farm forestry. Farm forests occupied about one-third of the area. They were principally Douglas-fir, less than 100 years old, in mixture with other conifers.

At the time the project was established, comparatively little use had been made of the farm forests, other than fuel and some clear cutting for the local sawmills.

Records of rates of tree growth in the farm woods or forests indicate the stands are increasing at the rate of 2½ cords, or 1,000 board feet, per acre each year.

An analysis of all surveys prepared for cooperating farmers indicates that one-fifth of Clackamas County farm land should be dedicated to the production of a woods crop.

Farm forestry is primarily a farming job, and labor is an important item in getting forestry applied in the farm woods. In planning the woods work, therefore, it is essential that consideration be given to available farm labor for woods work.

A calendar of operations for the average farmer indicates that 36 per cent of his total time can be used for woods work. Several operators provided full-time employment for hired labor by planning woods work for them.

An advantage of using farm labor to harvest woods products is indicated by the fact that stumpage sells for $5, logs at the roadside $14, and rough sawn lumber at $35 per thousand feet board measure. The majority of the cooperators found it was good business to harvest their woods crop in spare-time periods.

The farm forester has assisted farmers in developing complete land use and woodland management plans, and has helped in the application of appropriate woodland management prac-
tices. In order to do this, marketing information was assembled, assistance was given in harvesting and selling woods products, and training was offered in the use of improved types of equipment. Prior to the planning, detailed inventories were made of soil types, slope, erosion, and vegetative cover.

Successful woodland management is dependent on the farmer's (1) long-time interest, (2) financial stability, (3) knowledge or source of knowledge of woodland management, and (4) available markets.

Farm forest management plans were developed for more than 6,600 acres of farm forest land on farms of 43 cooperators. One hundred and fifty other farmers were assisted in doing woods work. Cooperating farmers bought and planted 18,000 trees, harvested approximately 4,400 cords of fuel, 192,000 board feet of sawlogs, 50,000 board feet of lumber, 2,500 fence posts, 43,000 lineal feet of piling, and 110,000 lineal feet of round products, having a total value of $44,000.

As a result of an accelerated demand for woods products, more requests for assistance were received by the farm forester than could be acknowledged. Of those farmers, other than cooperators, who were assisted, the value of their woodland products harvested was in excess of $9,000.

Other land use conservation practices were applied by cooperating farmers. For example, crop rotations were established on 897 acres, 467 acres were seeded to pasture, and 83 acres were cleared for crop and pasture use.

Prior to the establishment of the Clackamas Farm Forestry Project, markets for woods products from the farms had not been developed even though Clackamas County is part of the Portland trade area. During the war, demands for timber products exceeded the supply. There were some 35 small mills operating within the project area, and poles and piling markets were strong.

Principal markets were for sawlogs, fence posts, small round products, fuel, pulp, piling, poles, and medicinal herbs and roots.

By the use of an improved type of pulpwood saw, thinnings in young Douglas-fir stands were made at a profit to the owner. The use of stationary and semiportable sawmills has resulted in the complete stripping of many woodlots. There is a need for a sawmill having greater portability than the average small sawmill now in use within the project.

In cooperation with the Clackamas County extension agent, educational activities were directed toward informing farmers of the program and demonstrating forest management practices, as well as assisting in youth training programs.
Farm Forestry in Clackamas County, Oregon

By Walter M. Ferguson

Project Farm Forester, Soil Conservation Service
United States Department of Agriculture

I. INTRODUCTION

The Clackamas Farm Forestry Demonstration Project was one of some forty odd such projects established throughout the United States under authority granted by the Cooperative Farm Forestry Act of 1937. The Clackamas project was established in April 1940 by the Soil Conservation Service, United States Department of Agriculture, with the cooperation of the Oregon State College School of Forestry, Oregon State Board of Forestry, and the Cooperative Extension Service of Oregon State College, through J. J. Inskeep, Clackamas County agricultural agent.

Following the development of a farm forestry program for the State of Oregon* by the Oregon State Farm Forestry Committee, the Willamette Valley was selected as the farm woodland subdivision of the state having the greatest need for developments in the management of farm forests and the utilization and sale of their products.

The farm forests of the Willamette Valley subdivision are approximately 80 per cent Douglas-fir in mixture with western redcedar, western hemlock, and white fir. About 10 per cent of the forests are composed of maple, cottonwood, and alder. The stands are principally even-aged young growth following logging and fires. Frequently, there are remnants of virgin stands remaining as individual trees, since the initial logging was very largely a high-grading job.

Many of these young growth stands have become merchantable. Fire hazards are not excessive primarily because the stands are relatively isolated. Most of the fire damage of the past has been caused by slash and clearing fires.

Considerable acreages in farm ownership have been cut-over and repeatedly burned. Consequently they are not now restocking to trees. Their principal use has been for pasture, for which they are not very productive.

* Copies on file with all cooperating agencies.
At the time the project was established, comparatively little use was made of the farm forests other than limited grazing and as a source of fuel, ties, and occasionally piling. Farmers had not begun to realize that their woods crop was an important source of revenue.

From April 1940 to July 1945, the period covered by this report, the project forester worked with interested farmers located within the project area in developing and demonstrating forest management.

Figure 2. This aerial view of a section of Clackamas County is representative of most of the farming area within the county. Heavy black lines are farm boundaries. Note that part of each farm unit is growing a woods crop.
practices and methods of utilization of farm forest products. This report summarizes progress made, explains methods used, and sets forth problems needing further work.

II. OBJECTIVES

The objectives of the farm forestry program as stated in the Cooperative Farm Forestry Act were “... to aid agriculture, increase farm-forest income, conserve water resources, increase employment, and in other ways advance the general welfare and improve living conditions through reforestation and afforestation ...”

In order to do these things, the farm forester encouraged and assisted a limited number of cooperating farmers to:

1. Use their land for growing the crops to which it is best suited for continuous production.

   Suitability of land for various uses was determined by a survey that recorded soils, slopes, erosion and present land use. Based on these data, recommendations were made for a safe use that could be made continuous.

2. Grow a woods crop of greatest possible quantity and quality on land best suited to that use and use at home or sell the products of the woodland as they would any other crop.

   To do this, requires that the land be fully stocked with the proper number of trees of the best species at all times, and a plan be followed for harvesting the wood grown at rather frequent intervals. This also means that trees of poor quality and trees competing with crop trees be removed first, whenever a use can be made of the wood.

3. Harvest and use or sell the woods crop so as to return the greatest profit to him.

   The farmer should harvest and convert the raw material to as near the final product as is feasible during the period of the year when demands of other crops are least; use products for home and ranch needs in such manner as to get the greatest benefits (e.g., preserve nondurable woods when used in contact with the ground); and know the quality and quantity of materials that he sells, and dispose of them to the best available market.

III. DESCRIPTION

Clackamas County

In 1940, the rural population was fairly stable. Settlement had begun nearly 100 years earlier, and clearing land for crop and pasture use had progressed steadily. A majority of the farmers had owned land for a considerable length of time. Many were descendents of the original settlers. Grain and livestock were major crops. In the areas adjacent to Portland and Oregon City, farms were constantly being divided into smaller units.
By June 1945, legume and grass seed production had become a major cash enterprise. Old farm debts were largely paid off. During the four-year period a huge turnover in land ownership occurred. A majority of the new owners had no farming experience and assumed heavy mortgages in spite of large down-payments. Many took advantage of wartime prices to clearcut immature farm timber crops. This type of cutting naturally sacrificed much of the future growth and interrupted the production of continuous timber crops.

Timber markets improved to a point where wartime demands were greater than the supply. Fuelwood markets still absorbed the bulk of the low-grade material, but pole and piling markets became outlets for all material cut to specifications.

Figure 3. An aerial photograph showing land use on the Charles Marshall farm. This pattern is typical of many farms in Clackamas County.
During war time, some 35 sawmills were operating in the project area. Most of these depended on logs cut from farms and small private timber holdings in the project area. An additional 25 sawmills were located within an area five miles from the project boundaries.

The 1940 agricultural census indicated that in Clackamas County there were 65,748 acres of farm timberland. Table 1 shows that Douglas-fir 20 inches or less in diameter constituted 54 per cent of the farm forest area. Most of this needed stand improvement to promote maximum growth of high quality products and to salvage trees lost through suppression. The application of such practices depended on the material being cut having a market value sufficient to make a good return for labor.

Table 1. Occurrence of Timber Types in Agricultural Zones of the County

| Per cent |
|-----------------|-----|
| Douglas-fir, old-growth, 40 inches plus | 2.8 |
| Douglas-fir, second-growth large, 21 inches plus | 8.7 |
| Douglas-fir, second-growth small, 6 inches to 20 inches | 29.6 |
| Douglas-fir, second-growth reproduction, under 6 inches | 24.4 |
| Other conifers | 4.0 |
| Hardwoods | 11.9 |
| Non-restocking burns and cutovers | 19.5 |
| | 100.0 |

Project area

The original project area was located in the west central portion of the county. In 1941, the project boundaries were extended to include the entire agricultural area in the county and included 350,000 acres of land.

The climate consists of a long winter rainy season with practically no rainfall during the months of July and August. Rainfall is 45 inches annually at Oregon City, the project headquarters. Snow seldom lasts for more than two weeks at a time.

Prior to settlement, the area was covered with heavy stands of Douglas-fir except for occasional fern covered openings caused by lightning or Indian fires.

About one-third of the project area was in farm timber, mostly Douglas-fir stands up to 100 years old. At the time the project was set up, prices of farm products were comparatively low. Many farmers depended on woods work for cash income. Years of grain farming had lowered soil fertility resulting in increasing erosion. Legume and grass seed production was just getting underway. Generally, fuelwood was the main forest crop. Demand for piling and sawlogs was light. Most mills were located where logs could be yarded directly to the mill. There was little inclination to clear any but the best land.
IV. PROGRAM

During the initial period of the project, it was necessary for the farm forester, in cooperation with the county agricultural agent, to spend considerable time in acquainting farmers with the newly initiated farm forestry demonstration program. This activity was combined with the establishment of a few well-chosen demonstration farms. With these cooperating farmers, actively engaged in applying good woodland management practices, as a nucleus, further educational work was much simplified.

At the outset information on markets for farm woods products was needed. It was much easier to convince the farmer that his woods crop had a value if he could be told what products could be removed, how that could be done, where they could be sold, and the price of those products. It was also important to have basic physical land data. Since clearing was a practice commonly accepted and generally conceded as a common need, it was particularly important to know the best permanent safe use of the land.

The principal activities of the farm forester were: surveys and analyses of the farm land and farm woods, development of manage-
ment plans for the farm woods, assisting farmers in starting the application of various woodland management practices, collecting woods products marketing information, assisting cooperating farmers in harvesting and selling their woods products, working with farmers in application of various types of preservative treatments of non-durable woods, introducing labor saving devices for harvesting woods products. In addition, during the period following Pearl Harbor, considerable assistance was given to many farmers in harvesting and marketing all kinds of woods products to aid in the war effort. The principal accomplishments by major activities of the project are described in the following sections.

Use of land

The farm forester assisted the farmers to work out and apply complete soil and water conservation plans for every acre of their land. In these plans, the farm forestry enterprise was integrated with the entire farm operation. The cooperating farmer's written plan was based on the physical capacity of the land to produce continuously without soil damage or wastage. Conservation practices were employed by the farmers to attain maximum productivity from each acre without soil loss or damage. These practices included changes in cropland use and other improvements on permanent pasture and cultivated land as well as operations in woodland.

Prior to making a farm plan, the land was inventoried on the basis of soil types, slope, erosion, and vegetation cover or use. From this record, the land was classed into eight land capability classes. The cooperating farmers and the farm forester prepared a plan for the future use of the land in line with the proper land capability classes.

Table 2 is a summary of the first 3,800 acres so surveyed and indicates the probable land use trend in the future. Woodland covered two-fifths of the land inventoried. Slightly more than one-half of the woodland was suited for more intensive use. In light of the study, woodland probably always should cover at least one-fifth of Clackamas County's farm land.

Table 2. Present and Potential Land Use According to Capability

<table>
<thead>
<tr>
<th>Percentage of total in present use</th>
<th>Potential uses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cropland</td>
</tr>
<tr>
<td>Cropland 41</td>
<td>39</td>
</tr>
<tr>
<td>Pastureland 20</td>
<td>13</td>
</tr>
<tr>
<td>Woodland 39</td>
<td>21</td>
</tr>
<tr>
<td>Totals 100</td>
<td>73</td>
</tr>
</tbody>
</table>
In some instances, the size of the farm indicated a need for clearing timber from land suitable for crops and pasture to make a better economic unit. In other instances where immature timber stood on areas to be cleared, it was found to be better business to allow the timber to mature 10 to 20 years before harvesting. In a few instances, it was necessary to return cropland to forest use. Occasionally cropland needed to be returned to pasture use. Land of the 43 farmers, who cooperated in the project, totaled 6,624 acres, of which 2,550 were in woods before plans were developed. Of these 2,500 acres of farm woods, the farmers expected to convert 330 acres to crop use.

In developing the woodland phase of the farm plan with the farmer, specific recommendations were made for such essential features as protection from fire, prevention of damage by domestic livestock, method and rate of harvesting, the products to be removed, and the use of farm labor in doing the woods work. Since growing a woods crop on the farm is primarily a farming job and secondarily a forestry job, it should be done by the farmer. It is essential then that plans be made for the appropriate use of available farm labor. It was necessary to keep in mind the farmer's annual calendar of operations, his current woods resources, the productive capacity of his woods, home and ranch needs, and current markets for products that he can sell.

During the early days of the project, intensive surveys and analyses of farm woodland conditions were made. The purpose of this was to give the farmer a report that would tell him the species, composition, age, density, rate of growth, and general health of his woodland. It was soon recognized, however, that some of this information was not pertinent to the actual woods work needed for good silviculture, or possible for the farmer to do because of its economic aspects. Even if the farm woods is in a condition to permit inauguration of an intensive management program on a sustained yield or a continuous cropping basis, the average farmer is not ready to embark upon such a program. Whether actual or imaginary, there are reasons why he cannot do it. Establishing an intensive program of forest management in the farm woods is an evolutionary process that requires time. Therefore, during the last two years of operations, the data gathered on farm woods conditions were restricted to those necessary for planning a safe, practical operation for the ensuing four or five years. The intensity of surveys, or amount of physical data gathered, was controlled by the degree to which the farm woods were the limiting factor in management. In other words, in those cases where need for wood products or utilization of farm labor were greater than the obvious available supply of woods
products or outlets, a determination was made of the actual productive capacity of the farm woods.

Integration of forestry with other farm enterprises

The project's demonstration of successful farm woodland management was dependent on: (1) the farmer's long-time interest, (2) his financial stability, (3) his knowledge or source of knowledge of woodland management, and (4) suitable markets. In addition, there are other considerations, but of less importance, such as: (1) kind and amount of wood products needed for use on the farm, (2) available labor supply on the farm, (3) condition of the woodland and volume available for cutting, and (4) availability of suitable tools and equipment. The farm forester assisted farmers in all of these items.

Labor available for woodland cutting depends on what can be spared from other farm operations. Weather conditions do not permit work in cultivated fields during a portion of the winter months, and short slack periods occur during other seasons of the year, as between planting season and haying time. Woods work will fit into these periods as shown in Table 3.

<table>
<thead>
<tr>
<th>Month</th>
<th>Woods work</th>
<th>Other farm work</th>
<th>Per cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>February</td>
<td>75</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>March</td>
<td>50</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>April</td>
<td>25</td>
<td>75</td>
<td></td>
</tr>
<tr>
<td>May</td>
<td>25</td>
<td>75</td>
<td></td>
</tr>
<tr>
<td>June</td>
<td>10</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>July</td>
<td></td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>August</td>
<td></td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>September</td>
<td></td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>October</td>
<td></td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>November</td>
<td>50</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>December</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>36</td>
<td>64</td>
<td></td>
</tr>
</tbody>
</table>

Examples illustrating the use of spare farm labor used for woods work follow: Chris Fisher of Beavercreek and his hired man spent all their time in the woods when it was too wet for other farm work. This provided full-time employment and made the job more attractive for the hired man. Together they spent a total of 500 hours a year in the woods. C. R. Marshall, Mulino, worked on about the same basis, spending 460 hours a year doing woods work. Jacob Schnack of Molalla and two sons spent 1,000 hours a year in their woods.

Wood products needed on farms included fence posts, fence rails, and structural timber. C. R. Marshall, Mulino, Paul Eaton,
Estacada, J. E. Stroupe, Boring, and Joe Vaeretti, Sandy, used chemicals to preserve Douglas-fir posts cut from their woodlands in 1945. Paul Eaton took timbers from his woods for barn construction instead of using sawn lumber.

Figure 5. Three cords of fuelwood an acre were cut from this 55-year-old stand on the Chris Fisher farm near Beavercreek after thinning for car stakes. As wages and stumpage, the fuelwood returned $21 per acre and the car stakes $25, a total of $46 per acre. The stand would be ready for another intermediate harvest in ten years. This is an example of a Douglas-fir stand, from 50 to 80 years old, that can be partly cut for poles, piling, and sawlogs without greatly reducing the final harvest cut of the stand on maturity.
Almost all farmers had dragsaws, buzzsaws, and hand tools for woods work, and all had horses or wheel tractors for light woods work. Only 2 of the 43 farmers had crawler tractors heavy enough to yard large logs, and only 1 had a sawmill. Seven had trucks suitable for hauling light fuelwood or short logs. Lack of suitable equipment explained why farmers sell stumpage to contract loggers whenever heavy products are involved.

The Swedish pulpwood saw was introduced by the project and tried on ten demonstration farms in thinning operations. The saw proved its worth for use on trees under 8 inches in diameter and resulted in thinnings that would not have been made otherwise. One outstanding example was cutting suppressed and intermediate trees in a 45-year-old stand of Douglas-fir on the Jacob Schnack farm (Molalla). Schnack and his son cut 4,500 hop poles that sold for $1,440 delivered. Wages earned were in excess of $1 an hour per man. Previous attempts at such cutting with regular tools had been discouraged and not particularly profitable.

Marketing farm forest products

From the time of initial settlement in Clackamas County, land clearing and logging of virgin timber have furnished an abundance of cheap wood products for local consumption. This condition of adequate local supplies resulted in little value being placed on wood products. By 1945, the condition was changing rapidly. Land clearing had slowed down considerably, and much land to be put to intensive use during the next decade already had the timber removed. Most of the virgin timber had already been cut from the farming area. This type of cutting is now confined to the foothills and mountains in the eastern part of the county, 10 to 40 miles away from farming localities.

During the wartime shortage of lumber, there was a need and a limited market for poles as a substitute for dimension stock used in farm construction. The farm forester assisted in expanding the piling and pole markets for farmers as well as assisting farmers in cutting material to specifications. Demand for sawlogs increased to a point where all such material could be sold, provided it was cut and yarded to serviceable roads.

Advancement was made in marketing small round material, such as hop poles, turkey roosts, treated fence posts, and car stakes, to absorb a portion of the thinnings from 30- to 50-year-old stands. Even though marketing conditions in 1945 were more favorable than at any other time in the history of the county, farmers saw the need for development of cooperative marketing facilities. They generally agreed that it would be better to sell processed products, and felt this
could be facilitated by the use of small portable mills. Of the 35 mills within the project, about 30 could be classified as semiportable, but the cost of moving and resetting them usually varies from $300 to $1,000. These costs have made it necessary to cut at least 300,000 board feet at each setting, and have resulted in the complete stripping of many woodlots which, otherwise, would have permitted small cuts to be made at short intervals for an indefinite period.

Following is a summary of market outlets for forest products harvested in the project area, June 1945:

**Sawlogs:** Twenty-two mills were buying Douglas-fir sawlogs, delivered at the mill. Other mills were sawing their own timber. Four were buying hardwood logs.

**Fence Posts:** There was a ready demand for all cedar fence posts cut. Buyers were local farmers.

**Small Round Products:** These products, mainly thinnings, had a limited demand. Car stakes and hop poles were sold in sizes as small as a 4-inch top.
Fuelwood: Demand for fuelwood of all kinds had far exceeded the supply for the three-year period preceding this report. Outlets were residents of Portland and adjacent communities.

Pulpwood: Two mills were buying hemlock, spruce, cottonwood and true firs. A desirable development is indicated by the recent installation of processes to utilize Douglas-fir in two mills outside of the project area. Installation of such a process at any mill offers an opportunity to timber growers to market a large per cent of tree volumes.

Douglas-Fir Piling: Six yards were buying piling.

Cedar Poles: Two yards were buying poles.

Medicinal Herbs and Roots: Two of the main companies were purchasing these products.

Extensive application (others)

Practices found to be good on the demonstration farms should naturally be used by other neighboring farmers. Accelerated wartime cutting made it paramount that these conservation practices be put into effect in all farm woods. Requests were received by the

Figure 7. A Douglas-fir stand, 25 years old, on the E. S. Kruse farm near Sherwood. It needs thinning to prevent trees from becoming too tall for their diameter, and consequently subject to snow and ice damage. In 1945, no market existed for material that should be removed as thinnings from stands of this age. Markets need to be developed for small material before intensive management can be applied to young stands.
farm forester from other than demonstration farmers for assistance on marketing and managing farm timber. The United States Department of Agriculture Farm Forestry Committee decided these requests should be serviced to the extent that time permitted away from the demonstration farms. During the fiscal year 1945, fifty of these requests were serviced. Assistance given included estimates of forest products available from conservation cutting, outlines of farm forest management practices, market information, and logging techniques.

From these outside contacts in 1945 nine farmers began cutting operations on 375 acres of farm timberland. Products cut from these operations amount to 21,000 lineal feet of small poles, 25,000 lineal feet of piling, 350 cords of fuelwood, and 825,000 board feet of logs. Total value of these products was in excess of $9,000. Ten acres of trees were planted by two cooperators.

Figure 8. A pile of 14-foot hop poles cut on the Russell Scamlin farm forest near Sandy. These poles, 3 to 8 inches in diameter at small end, sold for 30¢ each on the road; returned $1 an hour to the operator as wages for cutting and yarding, plus $4.50 a cord as stumpsage. In a 45-year-old stand of Douglas-fir, 150 poles an acre were cut, taking only suppressed and intermediate trees. During 1944 and 1945, some 40,000 linear feet of small poles were removed from 7 demonstration farms from thinning measures.
A mimeographed circular entitled *Markets for Farm Forest Products in Clackamas County, Oregon* was published and given wide distribution for use of all farmers in the county.

**Educational activities**

Educational activities of the project were carried out with the direction of the Clackamas County Agent. Educational activities were directed toward informing farmers about the activities of the project and progress made through demonstration.

Newspapers were used most effectively, and numerous news items on the progress of the project were published. During the fiscal year 1944, a column, "Clackamas Tree Farmer," was prepared for weekly publication.

Youth education was considered important, and the farm forester contributed to the 4-H Clubs, high school agricultural classes, grade schools, and high school biology classes. Besides numerous informational talks given to these groups, other assistance was given. Arrangements were made with the Ostrander Logging and Railway Company to furnish prizes for 4-H Club work. At the 4-H Club summer school in 1944, tree growing instructions were given to 100 boys and girls. Sets of soil and forest bulletins were furnished to 2 high schools and 95 elementary grade schools. Farm forestry tours were held for the agriculture classes of three high schools in 1944 and 1945.

Numerous talks were given and motion pictures shown to County Grange meetings and other farmer gatherings.

**V. RESULTS**

By 1945 forestry demonstrations covering 6,624 acres on 43 farms had been planned and work was under way on each. Of these, 8 farms, totaling 1,664 acres, were planned between July 1944 and June 1945. The farmers intended to keep 2,220 acres in woodland. Besides the regular demonstration farms, the project forester worked with an additional 150 farmers to assist them in their woodland problems. Such assistance included estimating kind and volume of woods crops that could safely be removed immediately, outlining long-time woodland management plans, locating markets for the products, cutting products to specifications, and planning tree plantations.

Farmers cooperating with the project bought and planted 18,000 tree seedlings and planted them on 16 acres of land. In carrying out their woodland plans, they harvested 4,401 cords of fuelwood, 192,000 board feet of logs, 50,000 board feet of lumber, 2,542 fence posts, 43,000 linear feet of piling, and 109,731 linear feet of round prod-
ucts. These had an approximate value of $44,000. Harvest cuttings of forest products were made from 162 acres of woodland. Thin-nings were made on 70 acres of woodland.

The farmers also carried out conservation practices on their pas-ture and cropland. They put into effect improved crop rotations on 897 acres of cropland and seeded 467 acres of pastureland. The latter was of importance, particularly because the furnishing of ade-quate livestock pasture reduced overpasturing of woodlands. Other practices carried out included cross-slope planting, cover cropping, crop residue utilization, fertilizing crop and pastureland, and others. In bringing readjustments of land use, farmers cleared 83 acres of woodland for crop and pasture use.

INCOME FROM FARM FORESTS

One goal of the demonstration was to show that a properly managed farm woods would provide a year-to-year income just as crop land and pastureland do. The five-year demonstration period was adequate to indicate probable continuous annual returns as a result of proper management and marketing, although the timber was not on a sustained yield basis at the start.

Records of the cooperators, however, indicated that the average 50-year-old stand grew the equivalent of 2½ cords or 1,000 board feet of wood per acre annually. Actual earnings from the individual woods depended, of course, on the type of products that were available for cutting and the degree to which the farmer processed the product. To illustrate, in some instances, the 1,000 board feet of timber growth was sold as stumpage for $5, while in others, farmers cut and yarded it to the road for $14 or sawed it into lumber which sold for $35. Stands ranged from seedling stage up to 80 years old with a few overmature groves.

Most of the operations the farmers carried on during the period were pointed to getting their woods to produce a year-by-year profit-able return later. Depending on the relative maturity of the woods, the farmers mainly were engaged in thinning or clearcutting.

Relatively high wartime prices for low-grade material, such as fire wood and rough sawlogs, encouraged the farmers to harvest those trees that ordinarily are left to rot in the woods. This enabled the farmers to get their timber in shape quickly so that a woods crop could be harvested at frequent intervals, when prices would return again to normal.

By 1945, timbered land values in Clackamas County ranged from $10 to $150 an acre, with many 50-year-old stands moving at $50 per acre. Taxes and fire protection costs were estimated to average
30¢ an acre per year. Thus, annual income from the farm woods in excess of that amount is a return on investment and to management. Whether it pays the farmer to harvest the timber himself or to market it as stumpage depends on the returns he can realize from the sale of stumpage and his labor off the farm, as compared to the returns for his own labor and management when used to harvest his woods crop.

Figure 9. Mature and overmature stands of Douglas-fir often present a problem to timber owners from the standpoint of containing a high percentage of defective material. Being close to a good fuel market, this condition does not present a serious problem to the farm woodlot owner because he can dispose of it as fuel. From each acre, 30 cords of fuelwood were cut from defective trees in this old-growth stand, leaving 30 cords in sound trees. The fuelwood returned $90 an acre as stumpage. The sound trees were to be removed as sawlogs. Russell Scramlin farm.
A majority of the cooperators found that it was good business to harvest the woods crop in spare-time periods. In addition, they enjoyed the advantage of getting their woods in better shape for production of future timber crops.

**CASE HISTORIES**

The following case histories of the management of several farm woods show what farmers have been able to make from their woods. In all instances, wage values of the farmer's own work were figured at 50¢ an hour for 1942, 75¢ for 1943, and 90¢ for 1944.

1. **C. R. Marshall, Mulino**

Size of farm: 95 acres, plus an additional acreage of cropland leased for grain production.

Type of farm: Dairy (5 cows), hay, grain, and seed.

Woodland: 30 acres, consisting of 22 acres of well-stocked 60-year-old Douglas-fir and 8 acres of well-stocked mature Douglas-fir. Both age classes are Site II.

Home and ranch timber needs, annual (farmer's current estimate): 10 cords of fuel, 100 fence posts, and miscellaneous poles and lumber.

Timber management plan: Periodically thin the young stand, cut small poles, piling and sawlogs. At 80 to 100 years, clearcut by strips for fuel, sawlogs and other materials, and allow new stand to develop by natural seeding.

Farm labor available for woodland work: Two men—the owner and son for part time during the winter season.

Woods work: Three-year period, 1942 through 1944. Cutting has consisted of clearcutting mature trees for fuelwood, and thinning or taking an intermediate cut from the young stand for poles and fuelwood.

Financial returns:

Gross receipts from sale of products ...........................$1,840.60

Cost of harvesting—

Cash expense (hired labor, equipment rental, and materials) ..................$380.00

Value of own labor (1,396 hours) ...... 907.40 1,287.40

Net returns to land and management ..................................$ 553.20
Annual returns per acre:
- Gross income .................................. $20.45
- Cash expense .................................. 4.22
- Wage income (hours worked by owner, 15.2*) ............. 10.08
- Income to land and management .................. 6.15
- Wood volume cut .................................. 2.4 cords

Remarks: It was estimated that Marshall's woodland will produce 1 1/4 cords continuously. This was one-third less than actual cut and would indicate overcutting. About one-third of the income, however, was from thinnings not included in arriving at the sustained yield figure. An effort was made, moreover, to remove a large amount of low value material while prices were good, reserving higher value material for future cutting.

2. Chris Fisher, Beavercreek

Size of farm: 120 acres, plus 20 acres of leased land for grain production.

Type of farm: Dairy (10 cows), hay, grain, and seed.

Woodland: 22 acres consisting of 14 acres of medium-stocked mature Douglas-fir, and 8 acres of 50-year-old well-stocked Douglas-fir. Both age classes are Site III.

Home and ranch timber needs, annual (farmer's current estimate): 4 cords of fuel, 100 fence posts, miscellaneous poles and lumber.

Timber management plan: Mature timber to be clearcut in blocks and restocked through natural seeding. Intermediate harvest cuts to be made in the young timber periodically until maturity at 80 to 100 years.

Farm labor available for woods work: Two men—owner and hired man for part-time during winter.

Woods work: Three-year period, 1942 through 1944. Cutting has consisted of clearcutting part of the mature stand for fuelwood, and thinning the young stand for small poles and piling.

Financial returns—
- Gross receipts from sale of products ......................... $1,465.20
- Cost of harvesting—
  - Cash expense (hired labor, equipment, rental and materials) .................. $481.20
  - Value of own labor (483 hours @ 80¢) .................................. $386.40 867.60

Net returns to land and management ......................... $ 597.60

* Hired labor amounted to $1.25 an hour.
Annual returns per acre—
  Gross income ...........................................$22.20
  Cash expense ........................................... 7.29
  Wage income (hours worked by owner, 7.3*) .......... 5.85
  Income to land and management ....................... 9.05
  Wood volume cut ....................................... 2.9 cords

Remarks: Sustained yield was estimated at about one-half of the foregoing cut. A portion of the cut, however, was from thinnings of immature stands; these were not included in computing sustained yield.

3. Russel Scramlin, Canby

Size of farm: 250 acres.

Type of farm: Grain and seed.

Woodland: 83 acres, consisting of 37 acres of well-stocked 45-year-old second-growth Douglas-fir, 18 acres of well-stocked mature Douglas-fir, and 28 acres of medium-stocked Oregon oak. All conifers growing on Site III.

Home and ranch timber needs, annual (farmer’s current estimate): 10 cords of fuel.

Timber management plan: Thin young fir stands for small poles; clearcut mature fir in strips and restock to Douglas-fir by natural seeding; no immediate treatment for oak.

Farm labor available for woods work: No labor on farm available; dependent on hired labor.

Woods work: For a two-year period. Three acres of the young timber were thinned, removing 460 small poles 14 feet long. Removing only defective trees, 1⅓ acres of mature fir was partly cut for fuel.

Financial returns: Receipts for sale of products from thinning the 45-year-old fir totaled $55 per acre. Cash costs amounted to $27.50 per acre, leaving a profit of $27.50 per acre as investment and management return.

Products cut and sold from the mature stand amounted to $300 per acre. Subtracting cash costs for wages, a balance of $90 per acre remained as a return to land and management.

Remarks: The 45-year-old stand could be thinned at 10- to 15-year periods netting a like or larger return. Cutting in the mature stand removed defective trees which constituted about one-half of the total volume of the stand. The remainder will be removed for sawlogs at a later date.

* Hired labor amounted to same as that worked by owner. Therefore, a total of 14.6 manhours were employed on each acre each year.)
These operations indicate what might be expected in financial returns from both partial and intermediate harvest cuttings in mature Douglas-fir stands and young stands 40 to 50 years old.

4. **Jacob and Rudolph Schnack, Molalla**

 Size of farm: 378 acres.
 Type of farm: Livestock, hay, and grain.
 Woodland: 147 acres consisting of 100 acres of 45-year-old well-stocked Douglas-fir, and 47 acres of medium-stocked mixed oak and fir. All growing on Site III.

 Home and ranch timber needs, annual (farmer's current estimate): 10 cords of fuel, miscellaneous posts, poles, and lumber.

 Timber management plan: Thin young fir at intervals of 5 to 10 years until it reaches a maturity of about 80 years. Clearcut the mixed oak and fir, and encourage natural reproduction of Douglas-fir.

 Farm labor available for woods work: Two men; part-time during winter season.

 Woods work: Harvesting operations during 1944 were begun in the young fir timber. Thirty acres were selectively cut, removing 4,500 poles 14 feet long, 4 to 8 inches in diameter, which were sold to hop growers.

 Financial returns: Total income on an acre basis for the area from which the partial harvest was made amounted to $45 per acre. Harvesting the poles required 32 manhours per acre. At $1 an hour, this amounted to $32 an acre, leaving $13 an acre as a return from the land and to management.

 Remarks: This intermediate harvest removed only suppressed and intermediate trees and did not remove crop trees.

5. **Mrs. H. Bostrom, Oregon City**

 Size of farm: 95 acres.
 Type of farm: Subsistance farm.
 Woodland: 69 acres of Site III well-stocked 60-year-old Douglas-fir with a scattered overstory of mature trees.

 Home and ranch timber needs, annual (farmer's current estimate): 5 cords of fuel.

 Timber management plan: Immediate management was to remove overstory of mature trees. Temporary management only was planned until sons return from Army duty.

 Farm labor available for woods work: None.

 Woods work: In 1943 and 1944, 60 cords of fuelwood stumpage were sold to townspeople on a “cut-it-yourself” basis. Only mature trees were cut.
Financial returns: For two years, $180.
Remarks: This method of selling timber was well suited to the farmer's needs and for getting labor to harvest the woods crop.

6. Paul Eaton, Estacada
Size of farm: 135 acres.
Type of farm: Part-time livestock farm.
Woodland: 72 acres consisting of 60 acres of well-stocked 50-year-old Douglas-fir and 12 acres of medium-stocked mature Douglas-fir. All are growing on Site III.
Home and ranch timber needs, annual (farmer's current estimate): 10 cords of fuel, 100 fence posts, and timbers for barn reconstruction.
Timber management plan: Periodic thinning of the 50-year-old timber until the stand reaches a maturity of 80 to 100 years. At maturity, clearcut the stand in strips and reestablish the stand by natural seeding.
Farm labor available for woods work: Limited, except for hired labor.
Woods work: Intermediate harvests were made in the 50-year-old stand, removing 36 cords of fuelwood, 100 fence posts, and the equivalent of 3,170 board feet for barn construction timbers.
Financial returns: Total value of material harvested amounted to $489.25. Cash costs, including hired labor, were $150. Returns to owner for his labor and from his woods, $339.25.
Remarks: Labor available on the farm for woods work was not sufficient to harvest current annual growth.

7. K. C. Rasmussen, Beavercreek
Size of farm: 77 acres.
Type of farm: Dairy.
Woodland: 11 acres of well-stocked Douglas-fir 80 to 100 years old, growing on Site III.
Home and ranch timber needs, annual (farmer's current estimate): 10 cords of fuel and lumber for building repairs.
Timber management plan: Remove home timber needs until an opportunity occurs for liquidating woodland and converting the land to pasture.
Labor available for woods work: One man at off-seasons.
Harvest operations: A small sawmill was placed in the timber and clearcutting began in 1944.
Financial returns: To date, the following values were obtained from the woods:
**FARM FORESTRY**

**Per MBM Per acre**

- Cash cost of mill operation: $6.66
- Paid labor: 11.17
- Balance left as wages for farmer, and stumpage: 16.67

**Total**: $34.50

Remarks: This example indicates returns from harvesting the “final crop” grown to an age of 80 to 100 years. Harvesting the timber will require 2 to 4 years work as an off-season job. This is the only cooperator whose entire woodland was growing on land suited to a more intensive use, and where the timber had reached economic maturity. Generally the farm woods are of a younger age class and are not all growing on land suited to annual crop cultivation.

**VI. CONCLUSIONS**

1. Agricultural development of the area had been at the expense of converting forest land to crop and pasture use. About one-half of the existing farm forest area could be converted to more intensive use. Such additional conversion should be carefully weighed in the light of land capability.

2. In some instances, farm forestry enterprises were integrated into the general farm business. The greatest stumbling blocks were the lack of farmer information and interest, financial stability of the farmer, and proper markets. The work of the project assisted in overcoming the drawbacks. Wartime markets and the general upward trend of forest products prices also helped. Farm labor for woods work fitted very well into almost all farm operations. All farms needed a quantity of wood products for home use. Farmers had tools for most light woods work, but few had means to handle heavy products or to process products for the consumer.

3. Most farm timber holdings could be the source of an immediate profitable income. During wartime, prices for products were such that there was an adequate return for wages, management, and investment. Forest income depended on the degree of processing products. For sawn lumber this amounted to $35 an acre a year in some instances.

4. Records were started on a number of farm woodland operations to determine actual income data.

5. Assistance given to farmers in harvesting forest products contributed to the war effort in that more products were taken from the woods, and the woods were left in a more productive condition.
6. Other soil conservation practices applied as a part of the land use program contributed to increased production of other crops and provided safeguards insuring more permanent use of the land.

7. Markets needed to be developed for some forest products, particularly for small round material from early thinnings.

8. Educational activities for farmers, future farmers, and the general public needed to be started so everyone could appreciate forest management as a practical farm enterprise.

9. Successful application of farm forest practices depended on whether immediate wages could be obtained from putting the practice into effect.

10. Need for continual and additional demonstration in farm forest management practices became apparent.

**VII. RECOMMENDATIONS**

In the young-growth Douglas-fir area of western Oregon, more information is needed to facilitate the application of forestry practices to farm forests. It is recommended that further data be obtained on the following items:

1. The comparative productivity of various classes of land from forest, pasture, or crop uses. Factors to be considered are labor and equipment required to produce and harvest the crop, capital investment, and taxes.

2. Methods for simplification of general farm forest management recommendations so farmers may more readily understand and apply them.

3. The determination of the average annual consumption of wood products for farm and home use.

4. The number of mandays required each year to apply forest management practices (including harvesting and processing products) from each acre of farm forests.

5. The economic feasibility of applying forest management practices to the farm forests so farmers may cut more products than they could otherwise, and yet protect the growing stock.

6. The comparative costs of farmer application of preservative treatments to nondurable woods for use as fence posts as compared to other kinds of fence post material now in use, as a way to expedite markets and use of nondurable species now available in local abundance.

7. The relative advantage to the farmer of marketing his forest products through a cooperative marketing association or through a timber agent, as compared to marketing these products himself.

8. The advantages of on-the-farm conversion of logs into lumber by portable mills as compared to selling logs and buying lumber.