Farm Forestry
in Clackamas County, Oregon

by Walter M. Fergerson

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Joseph Wagner, Beavercreek
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. Since July 1, 1945 it has been administered by the Forest Service, U. S. Department of Agriculture, in cooperation with the same agencies.

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 $\frac{2}{3}$ 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 $4 to $6, logs at the roadside $16 to $18, and rough sawn lumber at about $45 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 practices. 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.

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.

By April 1947 about 600 farmers had been given woodland management assistance. During the earlier years of the project, farm forester Ferguson developed farm forest management plans for 43 of them.
As a result of an accelerated demand for woods products, more requests for assistance were received by the farm forester than could be acknowledged.

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.

Since December 1946, there has been a portable type sawmill, known as the Jackson Lumber Harvester, operated in the project area. This mill custom saws the farmers' logs to produce lumber on the farm for home use.

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*
Revised by A. L. Parker and C. R. Ross

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 red cedar, 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.

At the time the project was established, comparatively little use was made of the farm forests other than limited grazing and as a

* Formerly Project Farm Forester, Soil Conservation Service, United States Department of Agriculture. Administration of the project was transferred from the Soil Conservation Service, United States Department of Agriculture, on July 1, 1945. Alvin L. Parker has been Project Farm Forester since that time. Plans have been made to transfer administration of the project to the State Board of Forestry by July 1, 1948. Parker and Extension Forester Charles Ross revised this bulletin. It was reviewed by Paul M. Dunn of the School of Forestry, Lynn F. Cronemiller of the State Board of Forestry, Walter Thompson of the Forest Service, and Sam L. Sloan of the Soil Conservation Service.
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 1947, the period covered by this report, the project forester worked with interested farmers located within the project area in developing and demonstrating forest management practices and methods of utilization of farm forest products. This report summarizes progress made, explains methods used, and sets forth problems needing further work.

Figure 1. Aerial view of a section of Clackamas County representative of most of the farming area within the county. Heavy black lines are farm boundaries. Part of each farm unit is growing a woods crop.
II. Objectives

The objectives of the farm forestry program stated in the Cooperative Farm Forestry Act are "... 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 accomplish these objectives, the farm forester has continued to encourage and assist a limited number of cooperating farmers:

- To grow the crops for which their land is best suited for continuous production.

  The suitability of land for various uses was determined by a survey that recorded soils, slopes, erosion, and present land use. Recommendations based on this information were made for the safest continued land use.

- To grow a woods crop of the greatest possible quantity and quality on the land best suited for such production and to use their woodlands products for market or home use as they would any other farm crop.

  An optimum woods crop requires the land to be fully stocked with the proper number of trees of the best species at all times. A plan of harvesting must be carefully followed. Whenever a use can be made of the wood, the trees of poor quality and those competing with crop trees should be removed first.

- To harvest and use their woods crop so as to receive the highest possible returns.

  The farmer should harvest and convert the raw material of his woods crop to as near the final product as is feasible during the period of the year when demands of other crops are least. He should use his woods products in such manner as to get the greatest benefits from his labor and woodlands. Nondurable woods used in contact with the ground should be treated with chemical preservatives. The farmer should also know the quality and quantity of materials he sells. He should be alert to sell his products in the best available market.

III. Description

Clackamas County

In 1940, the rural population of Clackamas County was almost stable. Settlement had begun nearly 100 years earlier, and clearing land for crops and pasture had progressed steadily. A majority of the farmers had owned their lands for a long time. Many of them were descendants of the original settlers. Grain and livestock were the major crops. In the areas near Portland and Oregon City, farms were continually being divided into smaller and smaller units.
By 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 low-grade material, but pole and piling markets became outlets for all material cut to specifications.

Figure 2. Aerial photograph showing land use on the Charles Marshall farm. This pattern is typical of many farms in Clackamas County.
It was estimated in April 1947 that 150 sawmills were operating in the project area. Most of them were dependent on logs cut from farms and small private timber holdings. Another 50 sawmills were located within five miles of 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**

<table>
<thead>
<tr>
<th>Timber Type</th>
<th>Per cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Douglas-fir, old-growth, 40 inches plus</td>
<td>2.8</td>
</tr>
<tr>
<td>Douglas-fir, second-growth large, 21 inches plus</td>
<td>8.7</td>
</tr>
<tr>
<td>Douglas-fir, second-growth small, 6 inches to 20 inches</td>
<td>29.6</td>
</tr>
<tr>
<td>Douglas-fir, second-growth reproduction, under 6 inches</td>
<td>24.4</td>
</tr>
<tr>
<td>Other conifers</td>
<td>4.0</td>
</tr>
<tr>
<td>Hardwoods</td>
<td>11.0</td>
</tr>
<tr>
<td>Non-restocking burns and cutovers</td>
<td>19.5</td>
</tr>
<tr>
<td></td>
<td>100.0</td>
</tr>
</tbody>
</table>

### 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 simplified.

Figure 3. The project area.

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 derived, 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 management 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 nondurable woods
- Introducing labor saving devices for harvesting woods products

The principal accomplishments 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. Prior to making a farm plan, the land was inventoried on the basis of soil types, slope, erosion, and vegetative 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>
<thead>
<tr>
<th></th>
<th>Percentage of total in present use</th>
<th>Potential uses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cropland</td>
<td>Pasture</td>
</tr>
<tr>
<td></td>
<td>Per cent</td>
<td>Per cent</td>
</tr>
<tr>
<td>Cropland</td>
<td>41</td>
<td>20</td>
</tr>
<tr>
<td>Pastureland</td>
<td>20</td>
<td>13</td>
</tr>
<tr>
<td>Woodland</td>
<td>39</td>
<td>21</td>
</tr>
<tr>
<td>Totals</td>
<td>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 2,550 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 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 the products he could sell.

During the early days of the project, intensive surveys and analyses of farm woodland conditions were made. The purpose of this work 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 neither pertinent to the actual woods work needed for good silviculture, nor 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. 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.

Integration of forestry with other farm enterprises

The project's demonstration of successful farm woodland management was dependent on:

- The farmer's long-time interest
- His financial stability
- His knowledge or source of knowledge of woodland management
- Suitable markets
Other considerations of less importance are:

Kind and amount of wood products needed for use on the farm
Available labor supply on the farm
Condition of the woodland and volume available for cutting
Availability of suitable tools and equipment

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. Woods work will fit into these periods as shown in Table 3.

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 working in their woods.

Woods products needed on farms include 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 ready-sawed lumber.

Almost all farmers in the project 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
Figure 4. Three cords of fuelwood per acre were cut from this 55-year-old stand on the Chris Fisher farm near Beavercreek after thinning for car stakes. The fuelwood returned $21 per acre and the car stakes $25, a total of $46 per acre.* The stand will 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.

* Returns based on 1945 price level.
had trucks suitable for hauling light fuelwood or short logs. Lack of suitable equipment explains why farmers sell stumpage to contract loggers when heavy products are involved.

The Swedish pulpwood saw was introduced at the project and tried on ten demonstration farms in thinning operations. The saw proved its worth on trees under 8 inches in diameter and its use resulted in thinnings that would not have been made otherwise. One good example was the cutting of suppressed and intermediate trees in a 45-year-old stand of Douglas-fir on Jacob Schnack's farm near Molalla. Schnack and his son cut 4,500 hop poles that sold for $1,440 delivered. Wages earned were better than $1 an hour per man. Previous attempts at such cutting with regular tools had been discouraging 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. By 1945, the condition was changing rapidly. Land clearing had slowed down. Much of the land to be put to intensive use during the next decade already had the timber removed. Most virgin timber stands 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.

The farm forester aided in expanding the piling and pole markets for the farmers and assisted 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 previous 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 150 mills within the project area, about 125 can be classified as semi-portable, 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.
Figure 5. Ten sticks of piling per acre have been cut from this 60-year-old stand of Douglas-fir on the E. S. Kruse farm near Sherwood. Sawlogs have been cut from the butt ends of trees, and 60-to 90-foot piling from the tops. Operations returned a stumpage value of $40 an acre. The stand is still in need of additional thinning.

Following is a summary of market outlets for forest products harvested in the project area April 1947.

Sawlogs: At least fifty 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 exceeded the supply during the war years. Oil and other fuels have come back since, so the market for wood has dropped off to some extent. But considerable fuelwood was still being sold in 1947 to 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 poles and piling: Six yards were buying poles. In the early summer of 1947, demand was shifting away from the 30- and 35-foot poles that had been bought in large numbers for the R.E.A. Yards were buying the longer sizes ranging from 40 to 60 and even 80 feet. One plant in Portland buys poles with the bark on (called "barkies"). These are peeled by a mechanical peeler, or lathe. Demand for piling was strong during the war. It fell off in the immediate postwar period and has been erratic since.

Cedar poles: There is a scarcity of cedar for poles, so the demand for them is constant. All yards are taking them.

Other forest products: Two companies are purchasing cascara bark, digitalis seed and leaves, Oregon graperoot, and other native plants for use in the manufacture of drug preparations. Florists are buying some sword fern.

Aid to woodlot owners

Requests for assistance from the farm forester are often received from farmers who are not owners of demonstration farms. The farm forester makes every effort to aid all farmers who ask for assistance in managing their woodlands. Assistance he gives includes estimates of forest products available from conservation cutting, outlines of farm forest management practices, market information, and logging techniques.

The U. S. Forest Service reports farm forester Alvin L. Parker was able to attend to 313 requests for information from forest products operators from July 1945 to April 1947. An estimated 3,625,000 board feet were harvested because of his marketing assistance.

The farm forester makes available current information about markets and prices for woodland products. A circular of information about farm forestry markets is distributed from his office. The circular is revised periodically.

Education in farm forestry

The farm forestry demonstration project carries out its educational activities under the direction of the Clackamas County Agent. Youth education is considered of primary importance. The farm forester gives talks to 4-H Clubs, high school biology and agricultural classes, and grade school children. Since the project has been underway, a number of informative talks have been given and motion pictures on farm forestry shown to County Grange meetings and other farmers' gatherings.
Progress on the project is being fully reported in newspapers throughout the state. Items of special public interest about the project or individual cooperative farms are reported in county agent J. J. Inskeep’s column “Notes by the Wayside,” which is carried in most local Clackamas County papers.

V. Results

When the Clackamas County Farm Forestry Demonstration Project was first set up in 1940, the first objective was to center the farm forester’s work on a limited number of farms. Demonstration farm owners were assisted in preparing complete farm plans for all their lands. The farm forester continued to assist them in their woodland activities and obtain yearly records of their timber work. While the farm forester did work with other farmers, the essential thing was to help the demonstration farms to be good examples and leaders.

Since July 1945, when the Forest Service took over direction of the project from the Soil Conservation Service, complete farm plans have not been made. The demonstration woodlands have been continued as mainstays in the program. The farm forester now operates more on a service basis, reaching as many farmers as he can. From July, 1945, to April 1947, 408 farmers were given woodland management assistance. In carrying out their woodland plans they harvested 925,000 board feet of sawlog material, 1,835 cords of fuelwood and pulpwood, and 5,600 poles, piling, and posts. The 5,600 poles, piling, and posts were divided about as follows:

- 4,000 poles (large and small) with a total of 150,000 lineal feet.
- 600 piling with a total of 5,400 lineal feet.
- 1,000 fence posts.

These products had an approximate gross return of $70,300 and a stumpage value of $20,327.

When need arises and more information on soils is needed, help is obtained through the county agent’s office. If he is unable to give the advice needed in this respect, the Soil Conservation Service assists.

VI. 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 cropland and pastureland do. The five-year demonstration period was
enough 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.

Figure 6. Mature and overmature stands of Douglas-fir often contain a high percentage of defective material. Russell Scramlin, who owns this stand, is close to a good fuel market and this condition does not present a serious problem. Each acre of his stand yielded 30 cords of fuelwood from defective trees. The fuelwood returned $90 an acre as stumpage. Sound trees were removed as sawlogs.
Records of the cooperators, however, indicated that the average 30-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 would be sold as stumpage for $6, while in others, farmers would cut and yard it to the road for $17 or saw it into lumber which might sell for $45. Stands ranged from seedling stage up to 80 years old with a few overmature groves.

Most operations the farmers carried out during the five-year period were pointed toward getting their woods to produce a year-to-year profitable return later. Depending on the relative maturity of the woods, the farmers were engaged largely in thinning or clear-cutting.

Relatively high wartime prices for low-grade material, such as firewood and rough sawlogs, encouraged the farmers to harvest those trees that ordinarily are left to rot in the woods. This enabled them 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¢ per acre per year. Thus, annual income from the farm woods in excess of that amount is a return on investment and to management.

Does it pay the farmer to harvest the timber himself, or should he market it as stumpage? The answer will depend on two things. First, what can the farmer get from the sale of his stumpage and from his labor off the farm? Second, how would that compare with the returns for his own labor and management when used to harvest his woods crop?

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.

VII. Case Histories

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, 90¢ for 1944, and $1.00 for 1945 and 1946.
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 material, 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: 5½-year period, 1942 to spring 1947. 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:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross receipts from sale of products</td>
<td>$3,366.10</td>
</tr>
<tr>
<td>Cost of harvesting</td>
<td></td>
</tr>
<tr>
<td>Cash expense (hired labor, equipment rental, and materials)</td>
<td>$617.75</td>
</tr>
<tr>
<td>Value of own labor (2,278 hours)</td>
<td>1,789.40</td>
</tr>
<tr>
<td>Total</td>
<td>2,407.15</td>
</tr>
</tbody>
</table>

Net returns to land and management $958.95

Annual returns per acre:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross income</td>
<td>$20.40</td>
</tr>
<tr>
<td>Cash expense</td>
<td>3.74</td>
</tr>
<tr>
<td>Wage income (work by owner and his hired labor*)</td>
<td>10.81</td>
</tr>
<tr>
<td>Income to land and management</td>
<td>5.81</td>
</tr>
<tr>
<td>Wood volume cut</td>
<td>2.7 cords</td>
</tr>
</tbody>
</table>

It was estimated that Marshall's woodland will produce 1 ½ cords continuously. This was less than actual cut and would indicate overcutting. A good bit 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.

* Used 65¢ per hour for 1,936 hours (from 1942 through 1944), and $1.00 per hour for 882 hours (from 1945 to April 1947).
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 re-stocked 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: Five-year period 1942 through 1946. Operations have consisted of clearcutting part of mature stand for fuelwood, shakes, and logs for sawing lumber for farm use and thinning the younger stands for posts, poles, piling, pulpwood, and fuelwood.

Financial returns:
Gross receipts from sale of products ................................................. $2,386.20
Gross value of products for farm use including lumber sawn at $40 per thousand board feet ................................................. 2,240.00

Total gross value of products harvested ........................................ $4,626.20
Cash expense—hired labor, tools, equipment operation and rental, and materials ............... $1,378.40
Value of own labor (709 hours) ............................................... 587.20

Total expense including own labor and equipment ........................................... 1,965.60

Net return to land and management in five years on 22 acres .......... $2,660.60
Average net annual return per acre ................................................. $24.19

Earnings were increased by the cutting of lumber on the farm for farm use from larger logs cut from older trees. Mr. Fisher later cut his own shakes from fir logs after efforts to buy them failed. This item does not enter the above calculations because they were cut in 1947.

Mr. Fisher has made forestry pay on 22 acres. He had a good stand to begin with, and he has been able to find fairly good markets for his timber. He is determined to maintain a good forest and harvest from it each year. His operations have done no harm to the woods; on the contrary, through thinnings and removal of old and decadent trees he has improved the mixture of trees in his woodlot and has increased its growth rate.

Figure 7. Cris Fisher cuts shakes from some of his fir logs.
3. Russell 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 400 small poles 14 feet long. Removing only defective

Figure 8. A pile of 14-foot hop poles cut on the Russell Scramlin 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 stumpage. 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 thinning measures on 7 demonstration farms.
trees, 1½ acres of mature fir was partly cut for fuel. Since 1945, the only work has been the clearing of one acre of oak. It produced 22 cords of fuelwood.

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. Timber prices generally were higher in 1947 than at the time of this work.

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

Clearing of the oak from one acre produced an estimated value of $330 (22 cords @ $15.00). Estimated labor cost was $176.00 (176 hours @ $1.00). However, the costs could be charged to the land clearing.

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.

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: Job No. 1 was begun in 1944. Over thirty acres of the 45-year-old fir were selectively cut up to May 1947 removing 5,400 poles 14 feet long, 4 to 8 inches in diameter which were sold to hop growers. These harvests did not remove "crop" trees, but only overcrowded and surplus trees.

Job No. 2 was more thinnings in the second growth. 275 cords of four-foot fuelwood were cut, including many misshapen trees, as well as tops and limbs. The fuelwood was sold delivered in Marquam and at other points within 10 miles. This work was done from 1945 to May 1947.

Job No. 3 was to get good lumber for farm buildings. The two men cut and hauled 6,000 board feet of sawlogs to Yoder sawmill 5 miles away. They brought the lumber back to the farm.

Financial returns: Job No. 1, thinning for hop poles, showed good returns. Gross returns (5,400 poles delivered @ 35¢) $1,890.00
Costs:
Cutting, loading, and hauling required 1 man day for each 50 poles, so total labor is estimated at 108 man days.
108 man days @ $8 ($1.00 per hour) .......................... $864.00
Truck operation cost ........................................ 108.00
Cost of harvesting ........................................... 972.00
Returns to land and management ..............................$ 918.00

These figures show that the Schnacks, father and son, were able to earn $1,782 because they had this timber and harvested the products themselves. Their returns for labor, land, and management were over $40 per acre, while the main crop of trees was left growing on the land.

Job No. 2 shows what can be done if there are good markets for fuelwood:
Gross receipts from sale of products (275 cords @ $12.50, the average sale price) ..........................$3,437.50
Estimated cost of entire operation:
Cutting the fuelwood is estimated to have taken 1,467 man hours, or 1 1/4 cords per man day of 8 hours.
1,467 man hours @ $1.00 per hour ...........................$1,467.00
Delivery required 458 hours @ $1.00 ................... 458.00
Equipment operation and truck haul ..................... 400.00
Total cost ..................................................... 2,325.00
Returns to land and management ..............................$1,112.50

Job No. 3 was the 6,000 board feet cut for farm building use. What is it worth to have 6,000 feet of lumber on the farm?
Let’s assume $50 per thousand feet ..............................$300.00
Cash outlay for sawing ($12 per thousand) and for hauling to and from mill ..............$90.00
Noncash expense (54 hours, labor @ $1.00 per hour).... 54.00
Total cost ..................................................... 144.00
Returns to land and management ..............................$156.00

From all their woods jobs between 1944 and 1947, the Schnacks earned $5,029.50, after cash expenses were deducted. The $5,029.50 included $2,843.00 as labor income, and $2,186.50 as income to land and management. The costs of taxes and fire patrol have not been figured in. It is important to remember that the main crop of timber has not been harvested where cutting was done.

5. Mrs. H. Bostrom, Oregon City
Size of farm: 95 acres.
Type of farm: Subsistence 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: First forestry job planned was to remove over-story of mature trees. No other harvesting was to be done until sons returned from the army.

Farm labor available for woods work: None.

Woods work: From 1943 to 1945, 100 cords of fuelwood stumpage were sold to townspeople on a "cut-it-yourself" basis. Another 20 cords were cut for home use. Only mature Douglas-fir trees were cut. One son returned from the army in 1945. It was decided to sell stumpage to a logger and in 1946 and 1947, 800,000 board feet were logged.

Financial returns: From 1943 into 1947:

100 cords fuelwood sold as stumpage on “cut-it-yourself” basis, @ $3.00 per cord ...........................................$ 300.00
20 cords fuelwood cut for home use, value about $10.00 per cord after preparation ............................................. 200.00
800,000 feet of sawtimber sold as stumpage, @ $5.00 per thousand ...... 4,000.00

Gross receipts from sale of products ..................................$4,500.00

Cost of harvesting—cutting the fuelwood, 14 man days @ $8 (estimated) .................................................. 112.00

There were no other costs of harvesting, since all the other timber was sold as stumpage.

Returns to land and management ..................................$4,488.00

Actually, taxes are another cost, but there are a number of considerations in figuring tax costs on farm woodlands. Taxes on this property ran $40 to $45 per year.

This farm has followed the example of many others in western Oregon since second growth prices increased. The main timber crop was disposed of in a single stumpage sale. Income was fairly good, especially since it was mostly "clear" money with little expense to be deducted.

If they have the time and the know-how, the "timber farmers" would probably choose to cut and yard second-growth timber themselves, because the gross income would be over 3 times that received for stumpage. They would hesitate before "cashing in" well-stocked 60- to 70-year-old fir. That sort of stand is "laying on wood" at a real money-making rate. It is desirable to receive an income from thinnings and improvement cuttings in such stands. Yet the main stand of crop trees can be left to DOUBLE ITS VOLUME, AND MORE THAN DOUBLE ITS VALUE, IN 20 YEARS.

The timber crop is there to serve the farm, and it can be turned into money if necessary. Although portions of the stand were cut too heavily on this farm, there was provision for future timber crops. Cutting was confined to old-growth and larger second-growth. A fair reserve was left, consisting of 200,000 board feet of 60-70-year-old fir. Income from fuelwood could be continued, as 400 to 500 cords of old-growth and logging waste were available.
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: Some thinning was done 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 the material harvested (in 1943, 1944) amounted to $489.25. Cash costs, including hired labor, were $150.00. Returns to owner for his labor and from his woods, $339.25.

Figure 9. This is the new portable sawmill called the Lumber Harvester. It is able to "set down" in less than two hours and is economical to hire for as little as 10,000 board feet. In 1947 farmers paid about $16 per thousand board feet to have logs sawed on their farms. To use this mill the farmer must have his logs yarded and help with the sawing operations.

Labor available on the farm for woods work was not sufficient to harvest current annual growth.

In 1947 a thinning project was begun in the young fir. Poles, both the 30 to 40 foot poles for R.E.A. market and the larger type power poles, were to be removed from one part of the area.
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: The harvesting operation had not been completed in 1945 when this bulletin was first prepared, nor in mid-1947 when it was revised. The following values are estimates of the logging and sawing done up to 1945.

Gross returns per thousand board feet from sale of lumber..............$34.50
Cost of logging and sawmilling per thousand board feet—
Cash cost of mill operation..............................................$ 6.66
Paid labor ................................................................. 11.17
Total cost per thousand board feet ..................................... 17.83

Balance left as wages for the farmer, and for his stumpage and management per thousand board feet.............................$16.67

Since the farmer was harvesting at the rate of 30,000 board feet per acre, his estimated returns for his labor, stumpage, and management were $500 per acre. No calculation was included for depreciation of machinery or for taxes.

In the spring of 1947 later information was obtained on this operation. During 1945 and 1946, 125,000 board feet had been logged to the mill. Both costs and selling prices showed considerable change.

Costs
Cost of logging .....................................................$12.50 per thousand board feet
Cost of sawmilling and planing
Labor, @ $2 per man hour ..............................$10.67 per thousand board feet
(Two men operate the mill and planer. They can put out 3 thousand board feet per day)
Electric power .................................................$ .35 per thousand board feet
Gas, oil, engine operation ............................$ 1.33 per thousand board feet
Depreciation, breakdowns, and lost time are not figured, but do add to costs. Investment in sawmill and planer is $1,500.

Selling prices, 1946
Rough 1" and 2" lumber retail at mill..............$45 per thousand board feet
Planed shiplap lumber retail at mill..............$55 per thousand board feet
Other types lumber retail at mill..............$41 per thousand board feet
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, Clackamas farm woods are of a younger age class and not growing on land suited to annual crop cultivation.

Figure 10. The timber farmer learns to look up. He has to study the crowns of his trees to see whether or not they would be helped by thinning. These 70-year-old Douglas-firs are a little crowded and a few of them should be removed. Partial cutting would produce income from sawlogs or poles, but would not greatly reduce the final harvest cut. When trees with healthy crowns are left well spaced, their growth will increase and make up for the trees that are taken out in thinning.
VIII. Conclusions

- 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 weighted in the light of land capability and the cost of clearing.

- 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. 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.

- Most farm timber holdings could be the source of an immediate profitable income. After 1941, 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.

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

- 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.

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

- 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.

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

- Need for continual and additional demonstration in farm forest management practices became apparent.
IX. 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 man days 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.
They're growing houses down on the farm!

All framing materials for this attractive farm home, including sills, joists, sheathing, studding, sub-flooring, were cut from the farm woodland in the background. The 2 x 4's were hauled away and planed, but other framing lumber was used rough, after several months seasoning. Siding and interior trim were purchased. A portable Lumber Harvester sawmill (picture on page 27) came to the farm and sawed out the framing lumber. Trees were logged by the owner's son. The house has 3 bedrooms, a large basement with playroom and fireplace. Picture is of rear of house where living will be centered. A fine view is framed by large windows in living room and basement playroom.