

WOODLOTS ON ONTARIO FARMS

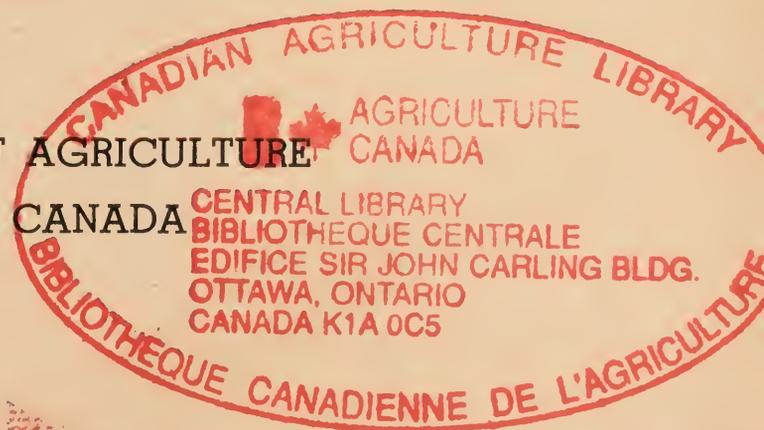
D. J. PACKMAN



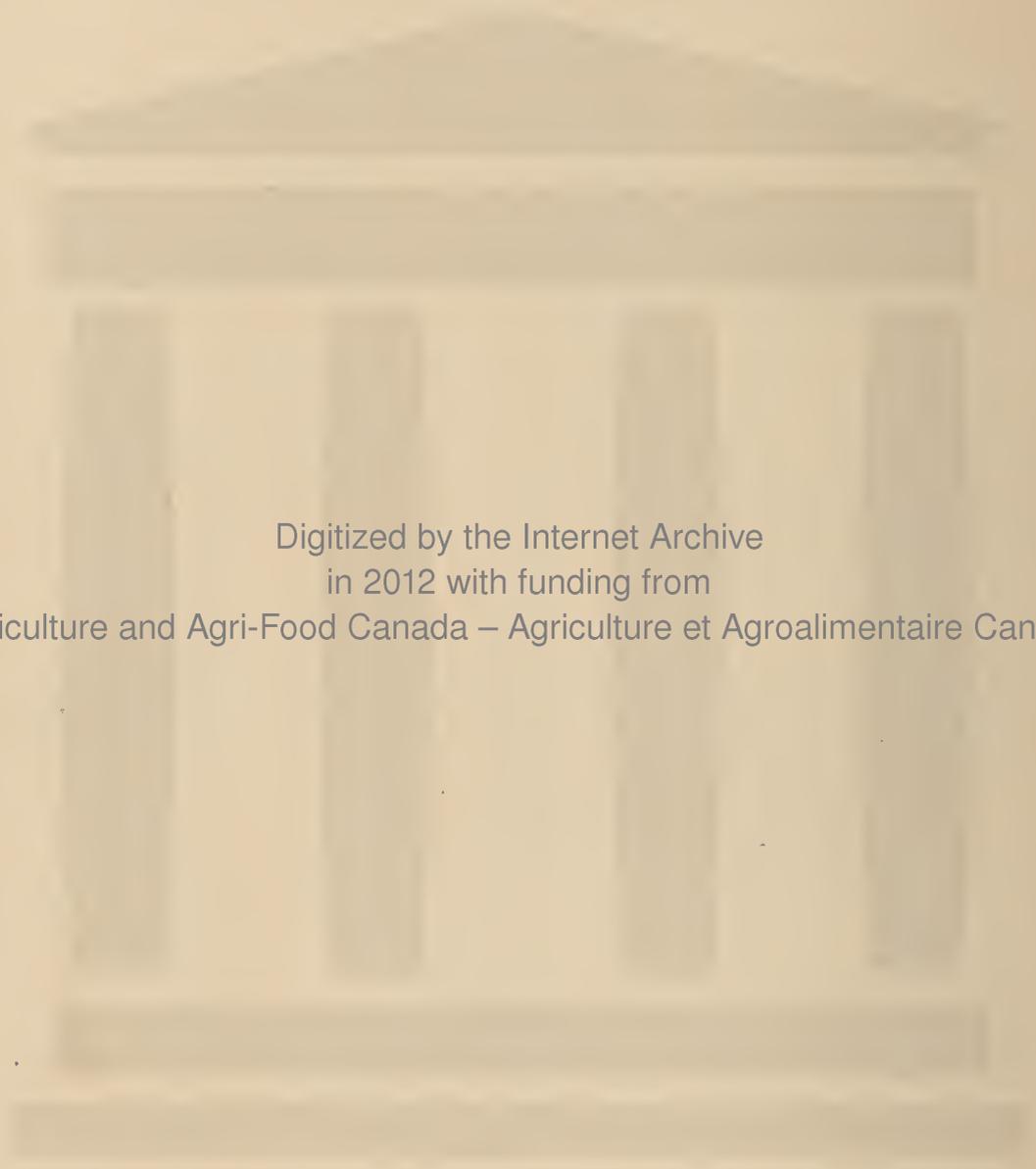
FUEL PILE NEAR FARMER'S WOODLOT (ORILLIA)

DEPARTMENT OF AGRICULTURE

OTTAWA, CANADA



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WOODLOTS

ON ONTARIO FARMS

D. J. PACKMAN

Economics Division

Marketing Service

Canada Department of Agriculture

A Co-operative Study by the Farm Economics Branch
of the Ontario Department of Agriculture
and the Economics Division, Canada
Department of Agriculture

SUMMARY

Records were obtained from 162 Ontario farms in possession of a woodlot during the year commencing June 1, 1950. Eighty-five farms were visited in the eastern part of the province and 77 in the western region. Woodland accounted for 30 per cent of the total area on the farms studied in the eastern area as compared with only 17 per cent on farms in the western district. The farms studied were considerably larger than the average Ontario farm, averaging 242 acres of which 90 were in crops. The average total capital investment was \$22,974 per farm—\$18,610 in the eastern district, and \$27,741 in the western. The average woodlot was valued at \$1,437.

The main findings of the study are as follows:

1. The average woodlot provided a harvest valued at about \$500 per year. Almost 50 per cent of the forest products were sold, making up approximately four per cent of the total farm income.

2. In terms of value, lumber accounted for 40 per cent; fuelwood 38 per cent; maple syrup, 13 per cent; posts, 2 per cent; and miscellaneous products such as Christmas trees and telephone poles, 7 per cent of the total harvest. Sawlogs were much more important in the east and accounted for about one-half of the crop.

3. Labour was the largest item of cost in woodland operations. The returns per hour of labour averaged 95 cents and varied from \$1.67 for those farmers primarily engaged in harvesting sawlogs, to 29 cents per hour on farms reporting fuelwood as the only tree crop harvested during the year.

4. The effect of grazing on the woodlot is indicated by the comparative returns obtained from grazed and ungrazed lots. Returns averaged \$10.21 per acre on 63 ungrazed woodlots and only \$5.62 on those grazed by livestock. Of the 162 farms, 99 woodlots were pastured, 34 of them on only part of the wooded area. The most significant difference between the two groups of woodlots was in the kind of forest products harvested. The ungrazed woodlots produced a large proportion of high quality sawlogs and poles, whereas fuelwood, a less valuable product, was the chief tree crop harvested from the grazed woodlots.

5. Farm woodlots were larger in eastern than in western Ontario but were given greater care in the western area where reforestation was more prevalent and the annual harvest per acre about 50 per cent greater.

6. Farm operators gave the following reasons for maintaining their bush: to serve as a cover for submarginal land; to supply a cash income and wood products for farm use; to conserve soil and water; to provide shade and wind protection; additional crop land not required; and the high cost of clearing.

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INTRODUCTION

Most of the literature on farm forestry in Ontario deals with the physical improvement of the farm woods and the measurement of farm timber. Relatively little study has been made of the economic problems of farm forestry as a continuing source of farm income.

The value of farm woods has been generally recognized as a source of wood products to meet farm needs, as a source of cash income, as a preventive of excessive soil erosion and water runoff, as a cover for game birds, as a protection to crops and farmsteads against wind and finally as an aesthetic and recreational asset. In spite of the recognition of the value of the farm woodlot, until recently, little consideration has been given to the economic problems. Even now the farm woods continue to be a neglected natural resource, undergoing gradual deterioration through excessive cutting and grazing. In war-time especially the woods were combed over for their supplies of strategic materials.

The strong demand for wood both during and after the war is making an impact on farm woodlands. If the cutting is done destructively, it will cause serious damage to the woodlands of Ontario.



Demonstration of woodlot of mixed wood.
Galt, Waterloo County, Ontario.

The forests which originally covered most of southern Ontario constituted a hindrance to agricultural progress. Settlers slashed and burned the forest to clear the land for crops. Little revenue was realized from the process and only a small fraction of the timber cut was used. Later the manufacture of

lumber and other forest products became an important source of farm activity. With exploitation of the available resource rather than harvest of a crop as the prime objective, the virgin lumber rapidly disappeared.

Now the forest resources in southern Ontario have been reduced to a minor part of the rural economy. Forest industries have declined rapidly as forest depletion became more acute. In many sections processing facilities are no longer available to provide satisfactory outlets for farm woodland products.

Farmers have long utilized their woodlots as a source of firewood and occasional income in time of need without considering forestry as part of the farm business. Many have striven to achieve and maintain high production per acre or per animal in agricultural enterprises; few have extended comparable attention to the productivity of their woodland.

Many farm woodlot owners manage their forests very well. However, as stated by the Ontario Royal Commission on Forestry "There is urgent need for the inauguration of immediate restorative measures, as well as for the control of the exceedingly destructive methods practised by so many operators who purchase and remove timber from Ontario's woodlots. In general, all species and all sizes are included in the purchase of such stands. The material suitable for sawing is usually removed first and the remainder is sold to a firewood dealer. If, as is usually the case, the lot is then used for pasture, the cycle of devastation is complete and instead of a forest which, wisely utilized, could continue to pay good dividends to its owner in perpetuity, there remain a few acres of indifferent pasture which will rarely yield a noticeable return".¹

The lack of economic data relating to the value of farm woodlots has been a serious handicap to farmers and extension workers in promoting better woodlot management. There is, of course, no practical way of rating statistically the importance of farm woodlands as shelter and source of food for wildlife, as a holder of soil against the erosive forces of the weather, as a conserver of water, and as a source of aesthetic gratification to the community. But the value of products yielded for home use and for sale can be calculated.

Forest trees possess certain characteristics, some of them not too well understood, which distinguish them as a crop from other agricultural production. Most important is the fact that a tree does not grow into a marketable crop in a single growing season. It may take 50 to 75 years to produce a tree of sawlog size and this fact has undoubtedly discouraged many landowners who might otherwise be interested in growing trees. Although a long time is required to grow a sawlog from seed, less time is required in existing woodlands because some of the trees may already be large enough to produce logs. Furthermore, other products such as fence posts and pulpwood can be grown in much shorter periods. Therefore, the majority of existing woodlands already contain some trees ready to be harvested. Consequently, light annual cuts covering all or part of the farm forest can often be undertaken immediately. It is important in thinking of tree crops to realize that the period between seed and sawlog harvest is not the important time element but rather the time to the first harvest of any product.

Bare land on which a forest is to be established requires the longest time before harvest, but with such short rotation crops as Christmas trees, the working time will generally be less than 15 years. Other products such as pulpwood require a minimum of 40 years, cedar posts 35 years, and merchantable timber about 75 years from the date of planting to harvest.

Trees possess both quality and size characteristics that influence their value. Quality is not so well understood as size, but is actually more important. Quality is the reason that one tree may be worth more than \$100 and another tree of the same size and species may be worth only \$10.

¹ Report of the Ontario Royal Commission on Forestry, 1947.

FARM FORESTRY IN ONTARIO

Description of the Forests

The species of trees found in the agricultural areas of southern Ontario are outlined in "A Forest Classification for Canada",¹ as follows:—

"The Great Lakes-St. Lawrence Forest Region.—This Region, centering on the Great Lakes system, and extending eastward down the St. Lawrence Valley, is of an irregular character. It occupies a middle position between predominantly coniferous forests to the north and deciduous forests to the south. Precipitation varies from an annual average of 25 inches in the west to 45 inches in the east, and the growing season is from 100 to 150 days. Good forest soils of sedimentary origin are common, but southward extensions of the granitic areas of the Canadian Shield are within the boundaries of the Region.

"The characteristic species are white pine, red pine and hemlock, associated with the maples, yellow birch and, in some sections, beech and basswood. Aspen cedar and jack pine are widely distributed, and spruce and balsam fir are common in certain localities. Among the less widely distributed hardwood species are white birch, elm, hickories, white and black ash, bur, red and white oak, ironwood and butternut. The pine forests of the Ottawa Valley and Algonquin Park have been famous as one of the greatest of Canada's lumbering areas. Elsewhere in the Region forests of mixed type predominate, with a considerable proportion of pure hardwood stands in the more favoured locations towards the south.

"The Deciduous Forest Region.—This Region in Canada consists of a small northerly intrusion from the great forest of the same type in the United States, and occupies the southwestern portion of what is commonly referred to as the Ontario Peninsula. It enjoys very favourable soil and climatic conditions that permit of the growth of a number of tree species not found elsewhere in Canada. The area is completely settled because of its fertile soil, and the forests are represented now only by woodlots, parks and small wooded areas on the lighter soils".

"The characteristic trees of the Region are beech and sugar maple, together with basswood, red maple and several oaks. Coniferous species are represented largely by scattered specimens of white pine, hemlock and red juniper."

"Among the less common hardwoods, which occur singly or in small groups, are hickories, black walnut, chestnut, tulip tree, magnolia, mulberry, sycamore, sassafras, black gum, Kentucky coffee tree and a number of other species that find their northern limit in this region".

Farm Income from Forest Products

The cash farm income from the sale of forest products including maple syrup in Ontario has been increasing rather steadily from an average of \$3,658,000 during the period 1935-1939 to \$14,272,000 in 1950. Only 55.2 per cent of the farms reported wood products during the year 1940 and only slightly more than one per cent were classified in the agricultural census as deriving their main income from forestry. In other words, the cash farm income from woodlot products was of considerable importance on more than one-half of the farms in Ontario but only a few farms secured the major share of their income from forestry. Likewise, only about 7 per cent of the farms reported income from the sale of maple products during 1940, and these sales amounted to \$660,000 or approximately 0.3 per cent of the total farm cash income.

A gross annual harvest of \$7,393,816² for the 42 southern Ontario counties during 1940 looks in the aggregate like a substantial contribution to farm income. When it is remembered, however, that this sum is obtained from the

¹W. E. D. Halliday. *A Forest Classification for Canada*, Canada Department of Resources and Development, Forest Research Division, Bulletin No. 89, 1937, Reprinted 1952.

²Census of Canada.

products of 2,647,828 acres of farm woodlands, the return is rather low, only \$2.79 per acre during 1940. The value of the annual harvest varied from \$1.63 per acre from farms in Frontenac County to \$5.44 per acre of woodlot in Dundas County.



Hardwood fuelpile on edge of farmer's woodlot. Orillia, Ontario.

The sale of woodland products is not an annual item of farm income but varies considerably with economic conditions. In depression years such as 1938, when prices were low, farmers offered \$2,960,000 worth of wood products for sale, whereas during 1950 woodland products valued at \$12,930,000 were sold from Ontario farms (Table 1). On the average, the sale of farm forest

Table 1.—Cash Income From the Sale of Forest Products, Ontario, 1926–1950

SOURCE: Dominion Bureau of Statistics

| Year | Maple Products | | Forest Products | | Total Woodland Products | |
|-------------------------|----------------|------------------------------------|-----------------|------------------------------------|-------------------------|------------------------------------|
| | Sale Value | Per Cent of Total Farm Cash Income | Sale Value | Per Cent of Total Farm Cash Income | Sale Value | Per Cent of Total Farm Cash Income |
| | \$000 | per cent | \$000 | per cent | \$000 | per cent |
| 1926–29 | 1, 117 | .43 | 4, 970 | 1.91 | 6, 087 | 2.34 |
| 1935–39 | 624 | .31 | 3, 034 | 1.53 | 3, 658 | 1.84 |
| 1943–45 | 746 | .18 | 6, 215 | 1.50 | 6, 961 | 1.68 |
| 1947 | 1, 882 | .34 | 9, 199 | 1.94 | 11, 081 | 2.28 |
| 1948 | 999 | .15 | 10, 512 | 1.90 | 11, 511 | 2.05 |
| 1949 | 1, 043 | .15 | 12, 089 | 1.78 | 13, 132 | 1.93 |
| 1950 ^a | 1, 342 | .20 | 12, 930 | 1.90 | 14, 272 | 2.10 |

^a Preliminary

products constituted 1·8 per cent of the total farm cash income from the province during the period from 1926 to 1950 inclusive, and varied from 1·3 per cent in 1942 to 1·9 per cent of the total farm income in 1947.

The total value of forest products from farms, excluding maple syrup and sugar, increased from 11·2 million dollars in 1910 to 18·3 million in 1920, decreased to 12·8 million in 1930 and finally to 9·4 million dollars in 1940. (Table 2).

During the period 1920 to 1940 the greatest proportion of the farm woodlot products, about 66 per cent in terms of value, was consumed on the farm. There appears to be, however, a slight variation in the percentage of the total value of production which is sold during periods of varying levels of prosperity. For example, during the prosperous year of 1920, 36·4 per cent of the cut was sold off the farm, 28·7 per cent in 1930 when the general price level was on the decline and 36·6 per cent during the year 1940 when the economy was on the upswing.

Table 2.—Forest Products of Farms, 1910–1940, Ontario

SOURCE: Census of Canada

| Item | Unit | 1910 | 1920 | 1930 | 1940 |
|------------------------------------------|------|------------|------------|------------|-----------|
| | | \$ | \$ | \$ | \$ |
| VALUE OF ALL FOREST PRODUCTS..... | \$ | 11,205,220 | 18,336,015 | 12,762,589 | 9,403,806 |
| Firewood..... | cord | 2,584,298 | 2,855,675 | 2,307,018 | 1,884,221 |
| | \$ | 5,654,171 | 12,229,550 | 9,142,355 | 7,400,980 |
| Used on the farm..... | cord | a | 2,481,360 | 1,934,105 | 1,479,781 |
| | \$ | | 10,373,611 | 7,443,386 | 5,701,789 |
| Sold..... | cord | a | 374,315 | 372,913 | 404,440 |
| | \$ | | 1,855,939 | 1,698,969 | 1,699,191 |
| Pulpwood..... | cord | 109,149 | 249,237 | 283,533 | 179,553 |
| | \$ | 436,151 | 2,686,933 | 1,745,853 | 885,227 |
| Other forest products ^b | \$ | 5,114,898 | 3,419,532 | 1,874,381 | 1,117,599 |
| Used on the farm..... | \$ | a | 1,295,504 | 725,047 | 248,277 |
| Sold..... | \$ | a | 2,124,028 | 1,149,334 | 859,322 |

^a Not available.

^b Includes fence posts, rails, railway ties, logs for lumber, pit props, etc.

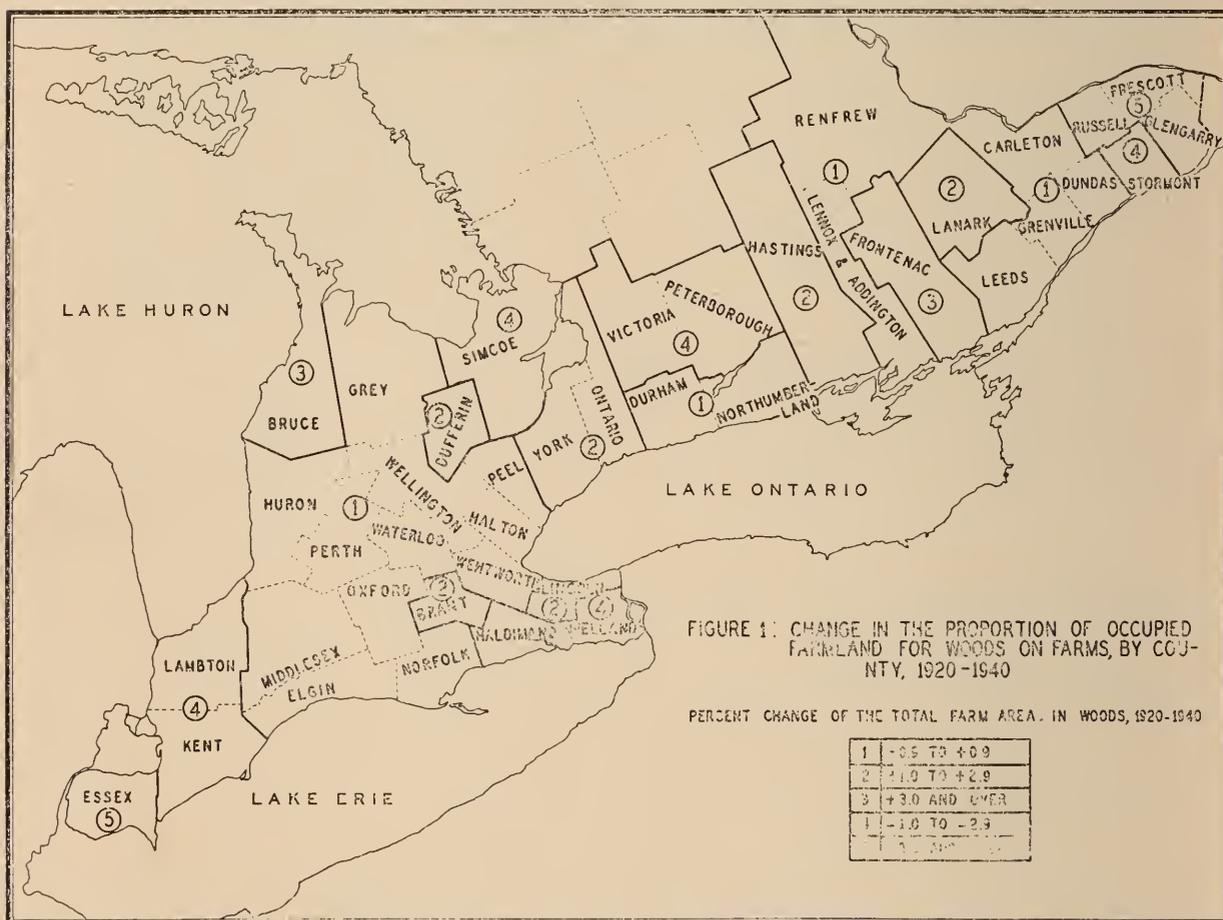
The most important woodlot product cut on the farms during the period under study was firewood. While the volume of fuelwood sales has remained relatively constant during the census years beginning 1920, there has been a decline in the amount of firewood cut, and a decline in the amount of firewood used on the farm. Other forest products, including fence posts, rails, railway ties, logs for lumber, pit props, etc., ranked second in terms of value during the census years 1910 to 1940 inclusive, followed by pulpwood.

On the average 53 per cent of the farms in southern Ontario reported woodlot products in 1940. In the eastern region all counties except Carleton, Russell, Prescott and Dundas were above average in the percentage of the farms reporting forest products, Renfrew being the highest with 80·6 per cent. In western Ontario, only ten of the 24 counties were above average, with a large concentration of the farms reporting forest products in the northern area.

Land Use

In 1940, 34·2 per cent of the farm land in the agricultural areas of Ontario¹ was classified as unimproved with 14·0 per cent in woods, 16·0 per cent as natural pasture and 4·2 per cent as marsh and waste land. The heavily wooded areas lie in the central portion of the eastern region and the northern area of western Ontario. Renfrew was the most heavily wooded county with 36·8 per cent of its land in woods, whereas Essex County with only 4·4 per cent of its land in woods, was the area most heavily denuded of trees.

Agriculture over the years has gone through many changes. Southern Ontario is one of the oldest farming regions of Canada and is an area in which, in the early days, a type of highly diversified agriculture based primarily on production for home use was developed. As city markets have grown, the type of farming of the region has shifted more and more to a commercial basis, concentrating on the production of items which have the greatest advantage when produced close to the consuming market.



Many people travelling the back roads of Ontario hill areas have seen the abandoned farms and fields, the numerous one-time farmsteads that remain only as overgrown cellar holes, and have concluded from this evidence that Ontario agriculture has gone into a period of decadence. This is certainly not a true statement of fact.

The number of persons engaged in farming and the acreage devoted to crops have declined over the past decade, nevertheless those who remain are producing much more agricultural produce than before. Each new development in agriculture, such as new and improved varieties of crops, and new implements and machinery, makes it more difficult for farmers in the "poorer"

¹ The agricultural areas under study are delineated in Figure 1.

lands to remain in agriculture. Thus it is safe to assume that while these improvements continue, much of the land presently devoted to agriculture will revert to other uses such as forestry.

During the period from 1920 to 1940 the acreage in farms in southern Ontario declined from 19,146,389 acres to 18,895,195 acres, a reduction of 251,194 acres or 0.1 per cent of the total acres in farms over this period. In 1940, there were 1,898 idle or abandoned farms and 159,424 acres of idle land in the agricultural areas of Ontario. In other words, about 92,000 acres ceased to be worked as farm land or held as farm units. Much of this land was purchased by county and provincial authorities for forestry purposes.

The decline in the acreage in woods over this period has not been uniform throughout the area (Figure 1). Frontenac County has increased the proportion of farm land in woods by 4.4 per cent, Bruce by 3.0 per cent while Carleton, Grenville, Leeds, Renfrew, Hastings, Northumberland, Durham, Ontario, York, Peel, Dufferin, Huron, Brant and Lincoln have increased to a lesser degree. Russell County showed the sharpest decline with 6.3 per cent while Prescott, Glengarry, Dundas, Lennox and Addington, Prince Edward, Peterborough, Victoria, Simcoe, Wellington, Halton, Waterloo, Lambton, Middlesex, Essex, Kent, Elgin, Norfolk, Haldimand, Welland and Wentworth, declined by a smaller proportion.



Demonstration woodlot of mixed wood.
Galt, Waterloo County, Ontario.

Price of Wood Products

The price of wood products, like the price of farm products generally, has followed the general price level rather closely (Figure 2). However, for the period from 1925 to 1949, wood products in general have been more favourably priced than farm products in 15 of the 25 years from 1926 to 1950 inclusive, and have been considerably higher than the general level of wholesale prices for most of this period.

The price of wood products, especially lumber, is largely dependent upon building activity, the investment in which has increased rapidly from 323 million dollars in 1939 to a record high of 1,921 million dollars in 1951. The long-time trend in the price of wood has been rather steadily upward. The average wholesale price of eastern white pine, for example, has advanced from \$21 in 1908 to \$68 per thousand feet, board measure, in 1948. Other wood products, including fuelwood, have followed this general pattern.

During the spring of 1952, good quality veneer logs in 9- to 16-foot lengths, with a minimum diameter of 12 inches, were selling on cars, in carload lots, for the following prices per thousand feet, board measure, in the Ottawa Valley: birch \$80, basswood \$70, ash, oak, elm and maple \$65, poplar \$60, butternut \$70 and beech \$65.

During the same period, pulpwood was selling for the following prices: rough poplar \$13, peeled poplar \$19, rough spruce or balsam \$18, and peeled spruce or balsam \$25 per cord, f.o.b. mill. Softwood peeled slabs were selling for \$11 per cord f.o.b. mill.

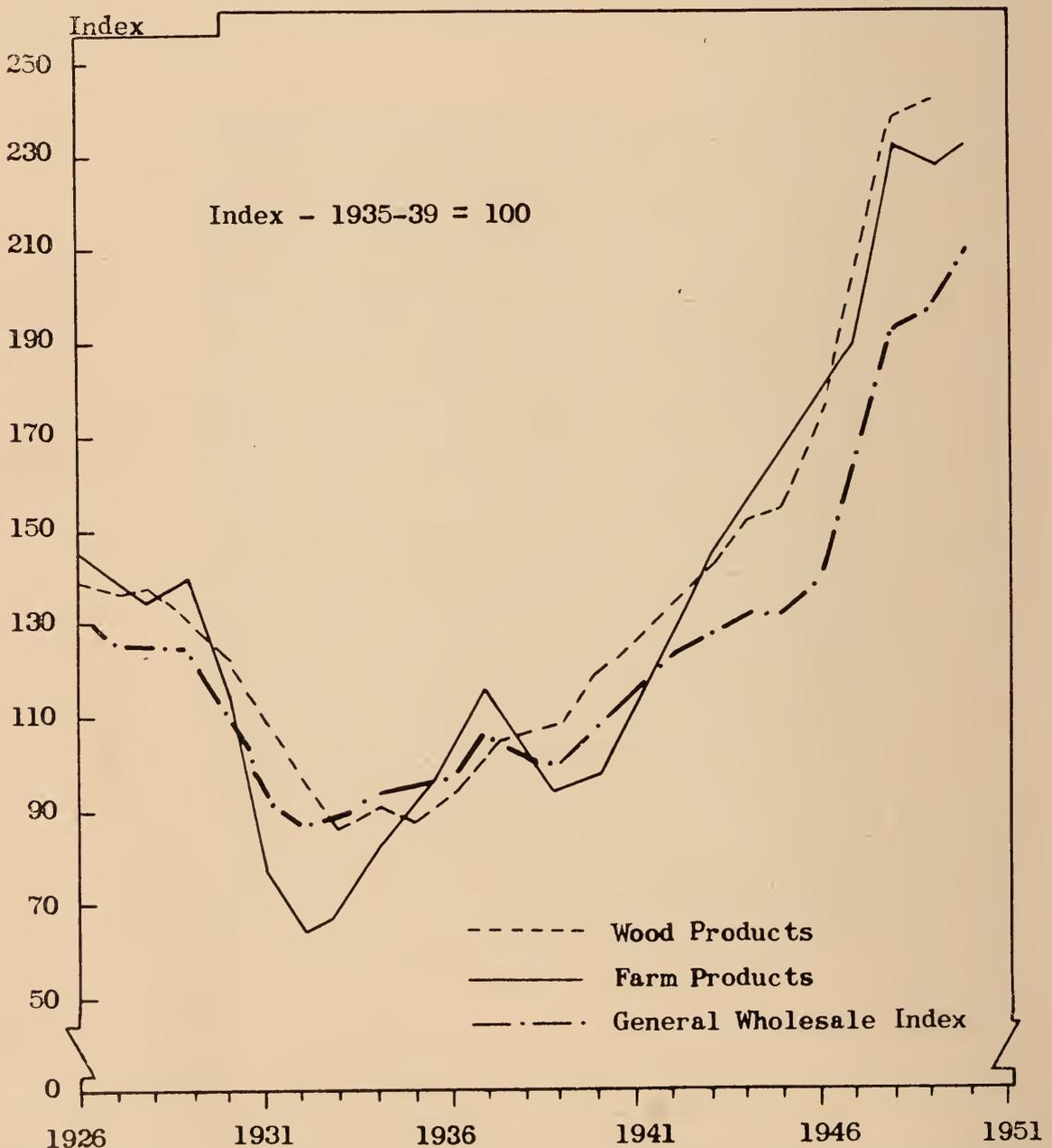


FIGURE 2—Average wholesale price indexes of wood products, farm products and the general level of wholesale prices. Canada—1926-1950. Source: "Wholesale Price Indexes"—Dominion Bureau of Statistics.

THE PRODUCTION OF WOOD PRODUCTS ON 162 SELECTED FARMS

Method of Study

Information was obtained on 162 farms throughout Ontario during June and July, 1951, by the field survey method. One visit was made to each farm and information obtained on the organization of the farm with specific reference to the farm woodlot.

The field work was conducted by the Economics Division, Canada Department of Agriculture, with the assistance of the Farm Economics Branch of the Ontario Department of Agriculture and the Ontario Department of Lands and Forests. For the purposes of this study, the farming areas of southern Ontario were divided into two rather distinct areas by a line running north of the western boundary of Durham and Victoria counties (Figure 3). These areas are designated eastern and western regions.

With the assistance of the Ontario Department of Lands and Forests, four representative townships were selected in each of the regions namely: Roxborough, Lanark, Hungerford and Hope townships in the eastern region and Tecumseh, Arran, North Dumfries, and Lobo townships in the western region. Within each township approximately twenty full-time commercial farms were visited and enumerated.

The full-time commercial farm was defined as a farm whose operator spent most of his time on the farm, received more than one-half of his income from the sale of farm products, excluding forest products, and owned a farm

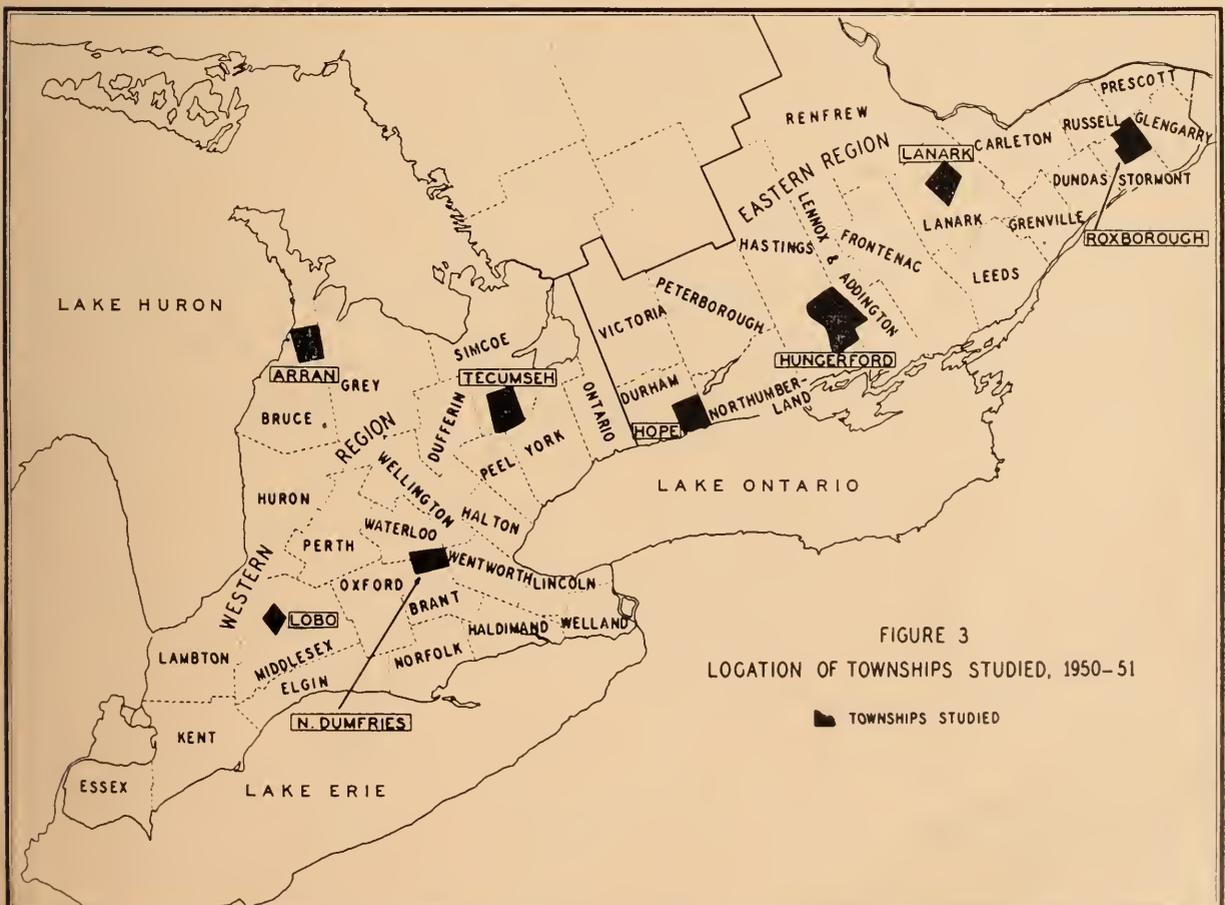


FIGURE 3
LOCATION OF TOWNSHIPS STUDIED, 1950-51

■ TOWNSHIPS STUDIED

woodlot in the year 1950. In this way, it was possible to study farm forestry from the point of view of farmers who are primarily engaged in producing farm products and to obtain information on the production and management practices followed on their farm woodlot.

Farm Organization

The commercial farms enumerated were considerably larger in area than the average for Ontario as a whole, having 242 acres of which 90 were in crops (Table 3). Farms in the eastern region averaged 273 acres as compared with 208 acres in the western region. The greatest difference in the land-use patterns between the regions was in the amount of non-tillable land. Whereas the farms in the eastern region had an average of 161 non-tillable acres, the western farms devoted only 61 acres to this use.

Table 3.—Summary of Land Use by Region, 162 Farms, Ontario, 1950-51

| | Eastern Region 85 Farms | Western Region 77 Farms | Total 162 Farms |
|-----------------------|----------------------------|----------------------------|--------------------|
| | —acres— | | |
| Cropland..... | 79 | 103 | 90 |
| Pasture—tillable..... | 33 | 44 | 39 |
| non-tillable..... | 64 | 16 | 41 |
| Woods—pastured..... | 53 | 10 | 33 |
| not pastured..... | 28 | 25 | 26 |
| Other..... | 16 | 10 | 13 |
| Total..... | 273 | 203 | 242 |

The larger woodlots were found in the eastern region, averaging 81 acres, of which about 53 acres were pastured. Farms in the western region had an average of 35 acres with only 10 acres pastured by livestock. On the basis of townships, the farms visited in Lobo, with an average of 25 acres, had the smallest wooded area per farm; the largest woodlots were in Lanark and averaged 133 acres per woodlot.

On the whole, the livestock program on the two groups of farms did not differ very much. The typical commercial farm studied in both regions maintained about 11 cows, and 13 head of heifers and steers along with 7 calves, about 2 brood sows, and a flock of approximately 95 hens.

The total capital investment averaged \$22,974 for the 162 farms. It averaged \$18,610 for the eastern Ontario group and \$27,741 for the western

Table 4.—Farm Investment, 162 Farms, Ontario, 1950-51

| Item | Eastern Ontario | Western Ontario | All Farms |
|-----------------------------------|-----------------|-----------------|---------------|
| | —dollars— | | |
| Cleared land..... | 3,374 | 7,272 | 5,225 |
| Woodlot..... | 1,359 | 1,522 | 1,437 |
| Buildings..... | 5,279 | 6,832 | 6,017 |
| Total real estate..... | 10,012 | 15,626 | 12,679 |
| Machinery and equipment..... | 2,984 | 5,034 | 3,985 |
| Livestock..... | 5,614 | 7,081 | 6,310 |
| Total Farm Investment..... | 18,610 | 27,741 | 22,974 |

Ontario farms. (Table 4). On the average, real estate amounted to 55 per cent of the total investment for all farms, with relatively little variation between groups. The eastern region had 54 per cent, and the western region 56 per cent of the total capital invested in real estate.

The average farm woodlot was valued at \$1,437 or 11.3 per cent of the total real estate value on the 162 farms studied. It constituted, in terms of value, 13.6 and 9.7 per cent of the total real estate on farms in the eastern and western areas respectively. Real estate values were considerably higher in the western than in the eastern area because of the larger cropland acreage, more favourable location with respect to markets and a more intensive type of agriculture. The average woodlot in the western region was valued at \$43 per acre as compared with \$17 in the eastern region and \$24 for all farms.

The average gross income per farm from the sale of farm products, including forest products, was estimated to be about \$7,020 for the eastern region and \$15,578 for the farms in the western region. The largest source of income in both regions was from the sale of livestock, eggs, and wool which was 54 per cent of the total cash farm income for the eastern and 55 per cent for the farms studied in the western group (Table 5). The sale of woodlot products including maple syrup averaged 4.6 and 2.5 per cent of the total farm income in the eastern and western areas respectively.

**Table 5.—Percentage Distribution of Income from the Sale of Farm Products,
152 Farms, Ontario, 1950-51**

| Item | Average per Farm | | |
|--------------------------------|------------------|----------------|--------------|
| | Eastern Region | Western Region | All Regions |
| | —per cent— | | |
| Crops..... | 8.5 | 14.6 | 11.6 |
| Milk and cream..... | 33.2 | 28.0 | 30.5 |
| Livestock, eggs, and wool..... | 53.7 | 54.9 | 54.3 |
| Woodlot products..... | 4.6 | 2.5 | 3.6 |
| Total..... | 100.0 | 100.0 | 100.0 |

Size of Woodlot

Whereas the average farm woodlot on the 162 farms studied was 59 acres, there was considerable variation in the number of acres in woods within and between the two regions. The typical farm enumerated in the eastern region had more than 44 acres in woods and the typical western woodlot had from 20 to 44 acres, with 33 of the 77 farms visited falling within this group (Table 6). Of the woodlots on eastern Ontario farms, 56 per cent were larger than 44 acres, whereas only 23 per cent of the farms in the western region fell within this category.

**Table 6.—Frequency Distribution of Woodlots by Size and Region,
162 Farms, Ontario, 1950-51**

| Size of Woodlot | Total, Eastern Region | Total, Western Region | Total, All Farms |
|-------------------------|--------------------------|--------------------------|---------------------|
| | —number of farms— | | |
| Less than 20 acres..... | 19 | 26 | 45 |
| 20 to 44 acres..... | 18 | 33 | 51 |
| 45 or more..... | 48 | 18 | 66 |
| Total..... | 85 | 77 | 162 |

Production 1946-50

The average southern Ontario farm studied harvested an average annual cut of 2,150 board feet of sawlogs during the five-year period from 1946 to 1950 from an average of 59 acres; the eastern farms harvested an average of 2,820 board feet from 81 acres, and the western farms averaged 1,411 board feet of sawlogs from 35 acres of woods during this period (Table 7).

During the 1950-51 crop year, there was an extra heavy cut of sawlogs in southern Ontario. This is attributed in part to higher prices and partly to the heavy windthrow caused by a northeasterly gale in November, 1950. A great many mature trees were uprooted or broken and it appears that the majority of them were salvaged during the winter.

Other woodland products such as fuelwood, fence posts, pulpwood, and maple syrup were harvested in greater quantities on the larger woodlots of eastern Ontario. Only during the 1950-51 crop year did the production of poles, principally hydro and telephone, in western Ontario exceed the average for southern Ontario.

Despite the fact that there has been a tendency for farmers to use more coal and oil during recent years, the production of fuelwood on most farms has increased slightly since 1946. The situation may be explained by the fact that fuelwood is a by-product of sawlogs, the production of which has increased since 1946.

Table 7.—Annual Woodlot Production^a Per Farm, 162 Farms, Ontario, by Region, 1946-50

| Crop Year | Eastern Ontario—85 Farms | | | | | |
|---------------|----------------------------|----------|-------------|--------|----------|-------------|
| | Lumber | Fuelwood | Fence Posts | Poles | Pulpwood | Maple Syrup |
| | f.b.m. | cord | number | number | cord | gallon |
| 1946-47 | 2,485 | 14.4 | 37.6 | .4 | .5 | 25.4 |
| 1947-48 | 1,782 | 14.8 | 41.5 | .8 | .5 | 28.5 |
| 1948-49 | 2,174 | 16.6 | 44.6 | .4 | .4 | 27.6 |
| 1949-50 | 2,160 | 14.0 | 33.8 | .6 | .4 | 23.0 |
| 1950-51 | 5,497 | 15.5 | 34.2 | 1.5 | .2 | 19.8 |
| Average | | | | | | |
| 1946-50 | 2,820 | 15.1 | 38.3 | .7 | .4 | 24.9 |
| | Western Ontario—77 Farms | | | | | |
| 1946-47 | 2,130 | 12.5 | 27.1 | b | b | 17.7 |
| 1947-48 | 1,005 | 12.0 | 16.5 | b | b | 17.0 |
| 1948-49 | 1,012 | 12.0 | 15.9 | b | b | 15.5 |
| 1949-50 | 1,191 | 13.5 | 20.0 | .1 | b | 13.6 |
| 1950-51 | 1,719 | 13.6 | 25.8 | 8.4 | b | 12.5 |
| Average | | | | | | |
| 1946-50 | 1,411 | 12.7 | 21.1 | 1.7 | b | 15.3 |
| | Southern Ontario—162 Farms | | | | | |
| 1946-47 | 2,316 | 13.5 | 32.6 | .2 | .2 | 21.7 |
| 1947-48 | 1,413 | 13.5 | 29.6 | .4 | .2 | 23.0 |
| 1948-49 | 1,622 | 14.4 | 30.9 | .2 | .2 | 21.8 |
| 1949-50 | 1,699 | 13.8 | 27.2 | .3 | .2 | 18.6 |
| 1950-51 | 3,702 | 14.6 | 30.2 | 4.8 | .1 | 16.0 |
| Average | | | | | | |
| 1946-50 | 2,150 | 14.0 | 30.1 | 1.1 | .2 | 20.2 |

^a Not including Christmas trees, nursery stock and the like.

^b Less than 0.1.

The production of fence posts and poles has remained relatively constant, while the harvest of pulpwood and maple syrup declined during this period. The heavy demand for lumber coupled with favourable prices during the period, has permitted farmers to sell such species as spruce, balsam and poplar

for use as lumber rather than to the pulp and paper industry. Many farmers used these species for normal farm construction and repairs. The production of maple syrup declined during this period not only because of the unfavourable weather conditions but also because of the increased price of hired labour.

Annual Cut Per Acre

During the year commencing June 1, 1950, the average farm harvested 34 cubic feet of wood products per acre of bush.¹ The farms in western Ontario obtained a considerably higher cut per acre, or 45 cubic feet as compared with 30 for the eastern region during the year. As previously stated, there was an extra heavy cut of woodlot products during the winter of 1950-51. For the five-year period from 1946-50 the average woodlot on the 162 farms studied cut 27 cubic feet of wood products annually per acre of woods. The 77 farms in the western region harvested 38 cubic feet of wood products per acre compared with an average annual harvest of only 22 cubic feet per acre for the 85 farms located in the eastern area.

The present production of the average Ontario farm woodlot has been estimated at 25 cubic feet per acre per year and it is suggested that if sound silvicultural methods are developed and implemented, in thirty years' time the annual growth will equal 36 cubic feet and 48 cubic feet at the end of about 75 years.²

Woodlot Production—1950-51

The average woodlot on the farms studied produced wood products valued at \$446, and \$70 worth of maple syrup making the total value of woodland production \$516 (Table 8). In terms of value, the cut of logs for lumber was about equal to that of fuelwood or an average of about \$200 per farm. Veneer logs, pulpwood, posts, and miscellaneous wood products were of lesser importance on the average, although of considerable value on several farms. The production of maple syrup which averaged \$70 per farm will be dealt with later in this report.

Table 8.—Average Woodlot Production per Farm, 162 Farms, Ontario, 1950-51

| | Eastern Region 85 Farms | | Western Region 77 Farms | | Total 162 Farms | |
|-------------------------------|----------------------------|------------|----------------------------|------------|--------------------|------------|
| | Units | Value | Units | Value | Units | Value |
| | | \$ | | \$ | | \$ |
| Lumber.....(f.b.m.) | 5,497 | 284 | 1,719 | 120 | 3,702 | 206 |
| Pulpwood.....(cord) | .2 | 3 | .. | .. | .1 | 1 |
| Fuelwood.....(cord) | 15.5 | 198 | 13.6 | 199 | 14.6 | 198 |
| Posts.....(no.) | 34.2 | 10 | 25.8 | 11 | 30.2 | 11 |
| Miscellaneous..... | .. | 25 | .. | 37 | .. | 30 |
| Total wood products .. | .. | 520 | .. | 367 | .. | 446 |
| Maple Syrup.....(gals.) | 19.8 | 79 | 12 | 57 | 16 | 70 |
| Total Value..... | .. | 599 | .. | 424 | .. | 516 |

The eastern region, with its larger woodlots, harvested the greatest quantity of woodlot products averaging \$599 per farm compared with \$424 for the western region. The average value of fuel wood production was about

¹Conversion Factors obtained from *Operations in the Woods*, Dominion Bureau of Statistics, 1949.

²Report of the Ontario Royal Commission on Forestry, 1947.

\$198 per farm in both regions. However, the value of logs cut for lumber averaged \$284 per farm in the eastern region compared with \$120 for the western group. Only four of the farms sold veneer logs and three cut pulpwood; all of these were located in the eastern region. Eight farms reported no activity in their woodlots during the 1950-51 crop year and three reported no woodlot production except from the maple syrup enterprise. In other words, eleven farm woodlots reported no wood cut during the year.

In terms of value, lumber was the most important woodlot product on the eastern Ontario farms amounting to 54.6 per cent of the total value of wood products harvested. On the western region farms, lumber accounted for 32.7 per cent of the value of wood products and was second only to fuelwood. About 49 per cent of the farms in both regions cut logs suitable for sawing into lumber. The vast majority of the logs sold for this purpose were elm, spruce, white, red and Scots pine, hemlock, beech, ash, oak and maple with a few farms reporting the sale of hickory, tamarack and other species of trees less common in Ontario.



Demonstration woodlot—Trees marked for cutting.
Galt, Waterloo County, Ontario.

Pulpwood was not produced on the majority of farms studied. During the 1950-51 crop year, three farms cut an average of about six cords; however, with the increased prices paid to farmers for pulpwood during the summer of 1951, several farmers expressed an intention to cut more pulpwood in the winter of 1952.

Fuelwood was cut on 91 per cent of the farms in the 1950-51 crop year. On the majority of these farms, fuelwood was the most important forest product in terms of value. An average of 14.6 cords of fuelwood was cut, valued

at \$198 or \$13.65 per cord. About one-third of the farms maintained two or more houses, thus the cut of fuelwood per farm is higher than might be expected on many Ontario farms. A considerable number of farms visited burned coal or oil but nevertheless cut some wood for home use.

The production of posts was confined to the 52 farms having a cedar bush. The average production was 30 posts per farm and these were valued at 37 cents each, at the farm. As might be expected, the larger farms in the eastern region utilized more posts than those in the western area.

Other farms produced a considerable quantity of hydro poles, telephone poles, beams and Christmas trees, which averaged \$30 per farm and \$448 per farm reporting.

Sale of Wood Products

The average farm enumerated received \$212 from the sale of wood products, \$52 from maple syrup sales and a total of \$264 from the sale of woodland products (Table 9). On the average, \$145 or 69 per cent of the total income from the sale of woodland products was derived from the sale of lumber. Fuelwood sales amounted to an average of \$31, posts \$4, pulpwood \$1, and miscellaneous products \$30 per farm.

Table 9.—Summary of Woodlot Product Sales per Farm, 162 Farms, Ontario, 1950-51

| | Eastern Region 85 Farms | | Western Region 77 Farms | | Total 162 Farms | |
|--------------------------|----------------------------|---------------|----------------------------|---------------|--------------------|---------------|
| | Units | Value | Units | Value | Units | Value |
| | | \$ | | \$ | | \$ |
| Lumber..... (f.b.m.) | 4,133 | 207.48 | 1,092 | 77.25 | 2,688 | 145.58 |
| Pulpwood..... (cord) | .2 | 2.71 | .. | .. | .1 | 1.42 |
| Fuelwood..... (cord) | 2.2 | 27.03 | 2.0 | 35.86 | 2.1 | 31.23 |
| Posts..... (no.) | 13.8 | 4.24 | 8.4 | 3.44 | 11.2 | 3.86 |
| Miscellaneous..... | | 24.39 | | 36.08 | | 29.94 |
| Maple syrup..... (gals.) | 15.1 | 59.35 | 9.2 | 43.19 | 12.3 | 51.67 |
| Total Value..... | .. | 325.20 | .. | 195.82 | .. | 263.70 |

Sawlogs for lumber were by far the most important forest products sold in both the eastern and western areas on the average farm recorded. In the eastern section, 33 farms or 39 per cent reported sales of sawlogs for lumber amounting to an average of \$534 for the equivalent of 10,008 board feet of lumber per farm reporting sales. Likewise, the average for the 19 farms reporting the sale of sawlogs in the western region was \$313 covering 4,425 board feet equivalent of lumber.

Whereas fuelwood was cut on 148 farms, only 27 reported having sold it, at an average of \$187.37 for the 12.7 cords sold per farm. Only four of the farms in the eastern region reported the sale of veneer logs and three the sale of an average of 6.3 cords of pulpwood, whereas no farm enumerated in the western region sold these products. Two farms sold an average of 1,641 Christmas trees.

The total gross cash income received from the sale of forest products, including maple products, by the 162 farms during the period June 1, 1950 to May 31, 1951 was \$42,720 (Table 10). Nine per cent of the farms received 52.7 per cent of this total. Fifty-one per cent of the farms made no sales of forest products.

Table 10.—Distribution of Farms According to the Sale of Forest Products, 162 Farms, Ontario, 1950-51

| Sale of Forest Products | Farms Reporting | | Forest Product Sales | | |
|-------------------------|-----------------|------------|----------------------|--------------|------------------|
| | Number | Per Cent | Total | Per Cent | Average per Farm |
| dollars | | | dollars | | dollars |
| Nil | 83 | 51 | .. | .. | .. |
| 1— 250 | 37 | 23 | 4,489 | 10.5 | 121 |
| 251— 500 | 14 | 8 | 5,369 | 12.6 | 384 |
| 501— 750 | 9 | 5 | 5,263 | 12.3 | 585 |
| 751—1000 | 6 | 4 | 5,082 | 11.9 | 847 |
| 1001—1500 | 7 | 4 | 8,730 | 20.4 | 1,247 |
| Over 1500 | 6 | 5 | 13,787 | 32.3 | 2,298 |
| Total | 162 | 100 | 42,720 | 100.0 | 264 |

The group with individual income from the sale of forest products amounting to more than \$1,500 was composed of operators of large farms. The smallest income reported by any of the six operators was \$1,584 while the largest income reported from the sale of forest products was \$3,500.

There are several reasons for the unequal distribution of income. Possibly the most important is the length of period for which data were collected. Cuttings of any one farm are usually periodic and several years apart. Had it been possible to get information covering a longer time, the distribution might have been different. There would still be a number with very small incomes from this source, however, because of the lack of woodland, poor conditions of growing stock, unwillingness to sell at existing prices, and alternative employment opportunities during 1950-51.

Wood Products Used on the Farm, 1950-51

The majority of the wood products used on the farm had their origin in the farm woodlot on the 162 farms studied. The average value of wood products consumed on the farm was \$231 of which only \$20 or 8.6 per cent was purchased (Table 11).

On the average, 12.2 cords of fuelwood were used on the farm, valued at \$165 or 71 per cent of the total value of wood used. Only one farm reported the use of coal and fuel oil exclusively, although many of the farmers, particularly in the western region, burned some coal or fuel oil in the farm home.

Table 11.—Average Annual Farm Use of Forest Products on 162 Farms, Ontario, 1950-51

| — | Eastern Region 85 Farms | | Western Region 77 Farms | | Total 162 Farms | |
|-------------------------------|----------------------------|------------|----------------------------|------------|--------------------|------------|
| | Units | Value | Units | Value | Units | Value |
| Lumber | (f.b.m.) | | | | | |
| Fuelwood | (cord) | | | | | |
| Posts | (no.) | | | | | |
| Miscellaneous | .. | | .. | | .. | |
| Total wood products .. | .. | 244 | .. | 218 | .. | 231 |
| Maple syrup | (gals.) | | | | | |
| Total value | .. | 255 | .. | 231 | .. | 243 |

Excluding used lumber, the average farm utilized 777 board feet valued at \$53, of which 170 board feet were purchased for an average of \$15. The typical farm used 26 wooden fence posts of which 3.4 were purchased. Iron fence posts appear to be gradually replacing the wooden type especially in western Ontario where 12 farmers reported purchasing them during the 1950-51 crop year.

Reforestation

There are many thousands of acres once farmed in Ontario that in recent years have dropped out of farming. Many of these acres did very well in the days of subsistence farming, but under ordinary management they cannot meet the challenge of today's high investment. Successful use of high quality seed and fertilizer is difficult on low quality land which returns only a fraction of the yield potential in the seed. While agricultural science is improving, farm abandonment will continue. Much of this abandoned farm land is admirably suited for the production of forest crops.

The free distribution of trees for planting in Ontario began in 1905, and the following year a statute was passed which enabled a township council to exempt a part of the woodland of the farms from taxation. This provided that exemption be extended to:

“Any part of a farm used for forestry purposes or being ‘Woodlands’; provided that such exemption shall not be greater than one acre in ten acres of such farms and not more than twenty acres held under a single ownership”.¹

“‘Woodlands’ for the purpose of this paragraph shall mean lands having not less than 400 trees per acre of all sizes, or 300 trees measuring over two inches in diameter; or 200 measuring over five inches in diameter (all such measurements to be taken at 4½ feet from the ground) of one or more of the following kinds: white or Norway pine, white or Norway spruce, hemlock, tamarack, oak, ash, elm, hickory, basswood, tulip (white wood), black cherry, walnut, butternut, chestnut, hard maple, soft maple, cedar, sycamore, birch, black locust, or catalpa or any other variety that may be designated by Order in Council, and which lands have been set apart by the owner with the object solely of fostering the growth of the trees thereon and which are *not used for grazing livestock*”.

The program which began in 1905 has expanded until in 1946, eight million trees were distributed and some 350 million trees were planted in southern Ontario up to and including 1946. In 1949, 9.8 million trees were shipped to private land owners and a total of 373 million trees planted to the end of the 1949 fiscal year.

Fifty-one farms or 31 per cent of the farms enumerated planted an average of 6,027 trees supplied by the Department of Lands and Forests during the period 1930 to 1950, and the average farmer interviewed planted 1,897 trees during the period. About one-half of the farms visited in the western region planted trees whereas only 14 per cent of the farms in the eastern area reported this activity.

Why Keep a Farm Woodlot?

When the 162 farmers were asked the question: “What is the main purpose of keeping your woodlot?”, about 93 per cent of the answers implied that the land was more suitable for the production of tree crops than for any other use. Thirty-eight per cent of them claimed that because of stoniness, slope, or drainage problems, the land had no agricultural value. Twenty-eight per cent of the replies were directly related to cash income from forestry.

¹R.S.O., 1927, S 4, Para. 25; 1934, C 1, 54 (3).

The most important reason given was to supply wood products for the farm. Others considered the woodlot a good investment for future generations and a readily available cash asset. Fourteen per cent of the replies were directly related to conservation of water, soil and wildlife, and six per cent considered protection from the wind and sun to be the most important reason for keeping their woodlot. Seven per cent replied that under existing economic conditions it would be too costly to clear the woodland.

Six per cent claimed that they had sufficient land under cultivation and although their woodlot soil was suitable for agriculture they did not plan to utilize it for that purpose. The remaining one per cent of the answers were rather general in nature.



Poplar plantation holding back blowsand. Durham county, Ontario.

Pasturing Farm Woodlots

Grazing is harmful to the farm woodlot. The average return per acre of woods was much higher on the 63 ungrazed woodlots. Farmers harvested an average of \$10.21 per acre of woods from the 63 ungrazed woodlots compared with only \$5.62 per acre for the 65 farm forests grazed during the year. Ninety-nine of the farm woodlots were pastured by livestock and 65 of these were grazed in their entirety, while the remaining 34 lots were partly pastured and partly kept free of stock. Only 63 farms studied kept livestock out of the woods.

Probably there is no more obvious difference between grazed and ungrazed woodlots than the almost complete absence of reproduction in the forests. The cover of grass in a woodlot of medium stocking is at best scanty and the animals quickly turn to the young broad-leaved trees for food. Livestock

compact the soil and seriously disturb its physical structure. A forest soil should be permeable to moisture and air, and when it is continuously packed into a solid condition the natural state of cultivation is completely lost.

Perhaps the most significant difference between the two groups of woodlots was in the quality of the products harvested. The ungrazed woodlots produced a large proportion of high-quality sawlogs and poles whereas fuelwood, a low-grade product, was the predominant tree crop harvested from the grazed woodlots.

Why do you continue to graze your woodlot? This was a question asked of farmers who followed the practice. Forty per cent of the replies obtained suggested that the livestock did little harm whereas about two per cent claimed that livestock were good for the woodlot and four per cent stated that the woods acted as a protection for livestock.

The high price of fence wire and labour was claimed by 25 per cent of the farmers to be the main reason for allowing cattle in the woodlot. About 16 per cent of the farmers suggested that in order to keep the woodlot free of cattle, additional pasture land must be found. The vast majority of the farmers who replied in this manner were located in Lanark and Hungerford townships. Three per cent of the replies came from farmers who planned to fence their woods in the near future and the remaining ten per cent gave miscellaneous reasons for following this practice.

LABOUR IN THE FARM WOODLOT

From a labour standpoint, the farm woodlands play an important role. Considering farming as a business, the farmer has labour and equipment which is used on the land. It is good business to use that labour and equipment where it will bring him the greatest returns per hour. But in the farm woodland areas of Ontario there are months when it is impossible to work on the land. In this respect, farmers with woodlots are fortunate in being in a position to employ labour, either their own or hired, between chores.

Labour is the largest single item of expense in woodland operations. If the cost of farm labour is estimated at 60 cents per hour then labour accounted for about 70 per cent of the total cost of harvesting wood products and 47 per cent of the total cost of making maple syrup on the farms enumerated.

The comment is often heard: "It doesn't pay to work in the woods. All I get out of it is my fuelwood". But this ignores the fact that woods work, as here conceived, is not competing with agricultural work; it simply utilizes slack time whenever available. It is not a question of woods work or barn work, woods work or field work—it is often a question of woods work or no work. In fact the farmer without a woodlot in which to carry on winter work is often operating under a distinct handicap.

The average farmer interviewed who worked in the woods during the crop year of 1950-51 utilized 342 hours of productive labour in the woods, of which 48 hours were used for the production of maple syrup and 294 hours on wood products. Included in the total of 294 hours was the time required to go to and from the woodlot. The typical farmer began his woodland operation after the morning chores, returned home for lunch, and again in time for the evening chores. For this reason, it is not possible to compare the labour requirements for the farm woodlot with those of the lumbering industry.

Labour Requirements.

Since most of the products of the woodlots are harvested jointly, such as sawlogs and fuelwood, information relating to the labour requirements for harvesting each type of woodland product could not be obtained. It was possible, however, to obtain the labour requirements for the following; farms harvesting only fuelwood, predominantly fuelwood, and predominantly sawlogs. (Table 12).

**Table 12.—Per Cent Distribution of Labour, by Main Type of Product Harvested,
140 Farms, Ontario, 1950-51^a**

| Operation | Type of Product Harvested | | | Average All Farms |
|---------------------------|---------------------------|---------------------------|--------------------------|----------------------|
| | Fuelwood only | Predominantly Fuelwood | Predominantly Sawlogs | |
| | —per cent— | | | |
| Cutting..... | 45 | 44 | 34 | 41 |
| Skidding and hauling..... | 23 | 26 | 48 | 32 |
| Sawing..... | 16 | 12 | 8 | 12 |
| Other..... | 16 | 18 | 10 | 15 |
| Total..... | 100 | 100 | 100 | 100 |

^a Includes the time getting to and from the woods.

The 140 farms for which useful labour information was available made use of an average of 294 hours of labour in woods operations, excluding maple syrup. About 41 per cent of the labour was utilized in felling and cutting the trees, 32 per cent in skidding and hauling, 12 per cent for sawing and 15 per cent for miscellaneous labour such as splitting wood and preparing machines for use. Chain saws were used on only 21 farms while the remainder felled their timber by other methods.

Forty-five of the 140 farmers harvested an average of 12·4 cords of fuelwood during the year and utilized 193 hours of labour in the process. In other



Erosion on the top of a hillside. Bolton, Lake Simcoe district, Ontario.

words, 15·6 hours of labour were used in harvesting one cord of fuelwood¹ while the requirements ranged from 6 to 31 hours per cord. The greatest portion or 45 per cent was utilized for felling the trees, trimming the branches and cutting into lengths suitable for skidding and hauling.

The 67 farms which harvested principally fuelwood, as well as a few sawlogs, posts and poles, utilized an average of 299 hours of labour, the distribution of which did not differ greatly from those farms which harvested only fuelwood. Only 28 of the 140 farms were primarily occupied with harvesting sawlogs and some fuelwood, posts and poles, and employed an average of 441 hours of labour for this work. The task of skidding and hauling was the most time-consuming job and required an average of 48 per cent of the labour, while cutting required only 34 per cent of the total labour used on these woodlots

¹ Includes the time getting to and from the wood lot.

FINANCIAL RETURNS FROM FORESTRY OPERATIONS

Information relating to the expenses involved in forestry operations was obtained on all farms enumerated. Useful data were available for 140 of the 162 farms, while the remaining farms were eliminated either because they did not work in the woods, or because maple syrup was the only woodlot product harvested during the 1950-51 crop year. The data contained in this section are not presented necessarily as being typical of all commercial farms, but rather to describe the woodland operations on the farms studied during the 1950-51 crop year.

The items of expense listed in Table 13 were calculated in the following manner. The charge for custom work which averaged \$27 per farm was made on the basis of the actual cash outlay involved. The greatest portion of this cost was for hiring chain and circular saws. The hourly rates for machinery and horse use were based upon the total hours of use during the year ended May 31, 1951 and included charges for depreciation, fuel, repairs, interest on investment and housing. Hourly rates were applied to all machinery and horses used in forestry operations. The average charge for this purpose on the 140 farms was \$35 per farm.

The cost items grouped as miscellaneous include a nominal charge for depreciation, repairs and interest on investment in axes, saws, chains and other items not included in the machinery charge. It also includes the cost of a few meals supplied to labour hired on a custom basis. The charge for this purpose averaged \$15 per farm. The total operating cost of woodland operations, excluding labour, amounted to \$171 per farm, on the average.

Returns per Hour of Labour

On the average, the 140 farms enumerated harvested woodland products, excluding maple syrup, valued at \$450 during the year and produced an average of 4,432 board feet equivalent of sawlogs, 15.7 cords of fuelwood, 35 posts, as well as \$33 worth of miscellaneous products.

Table 13.—Summary of Operating Returns per Hour of Labour from Established Woodlots, by Type of Product Harvested, 140 Farms, Ontario, 1950-51

| Item | Kind of Woodland Product Harvested | | | |
|-----------------------------------------------|------------------------------------|---------------|------------------------|-----------------------|
| | All Types | Fuelwood only | Predominantly Fuelwood | Predominantly Sawlogs |
| Number of farms..... | 140 | 45 | 67 | 28 |
| | —dollars— | | | |
| Sales..... | 262 | 91 | 167 | 763 |
| Home use..... | 188 | 84 | 243 | 227 |
| Value of harvest..... | 450 | 175 | 410 | 990 |
| Custom work..... | 27 | 15 | 29 | 43 |
| Machinery and horse..... | 35 | 18 | 33 | 66 |
| Miscellaneous..... | 15 | 13 | 14 | 21 |
| Taxes..... | 37 | 27 | 37 | 57 |
| Interest on investment at 4%..... | 57 | 45 | 61 | 67 |
| Total operating costs ^a | 171 | 118 | 174 | 254 |
| Net returns from forestry ^a | 279 | 57 | 236 | 736 |
| Returns per hour of labour ^b | 0.95 | 0.29 | 0.79 | 1.67 |

^a Excluding labour and change in inventory.

^b Excluding change in inventory.

Operating costs, other than labour and change in inventory, amounted to \$171 per farm, leaving a net return of \$279 per farm from forest activities (Table 13). The average woodlot employed 294 hours of labour and supplied a net return of 95 cents per hour of labour.

The most common woodlot activity for 91 per cent of the farmers was the harvest of an annual crop of stove-wood. On 45 of the farms, fuelwood was the only wood product cut during the year. The average value of production on these farms was \$175 for 12.4 cords of wood, or an average of \$14.11 per cord, at the farm, during the 1950-51 crop year. Operating costs averaged \$118 per farm leaving a net operating return, excluding labour, of \$57 from the year's forestry operations. An average of 193 hours of labour were employed giving a return of 29 cents per hour of labour.

Sixty-seven of the 140 farms reported the main woodland product harvested to be fuelwood, although some sawlogs, posts, etc., were cut. In other words, fuelwood was partly a by-product of the trees cut for sawlogs and poles. Eighteen cords of fuelwood and 1,850 board feet equivalent of sawlogs, 43 posts, and miscellaneous products valued at \$28 were harvested and valued at an average of \$410 per farm. The average hourly return to labour was estimated to be 79 cents for an average of 299 hours of labour employed for woodlot work.

Only 28 of the 140 farms were primarily engaged in harvesting sawlogs during the 1950-51 crop year. These farms produced an average of 12,690 board feet equivalent of sawlogs, 15.7 cords of fuelwood, 71 posts, and \$86 worth of miscellaneous products, the total value of which averaged \$990 per farm. Operating returns were considerably higher than on farms engaged in any other type of woodland activity and averaged \$1.67 per hour for the 441 hours of labour employed on the average farm.

Other Values of the Woodlot

In addition to their value as revenue producers from the sale of forest products and lumber for domestic consumption, the farm woodlot has many values that cannot be accurately measured in dollars and cents.

Where woodlands exist, the problems of soil erosion are greatly minimized. Loss of soil does not occur in areas covered with a thrifty tree growth. On hilltops and steep slopes, woodlands hold back the flow of surface water to the lower lying lands and by slowing up the force of these waters greatly reduce their eroding power when they finally reach the cultivated farmlands.

As a protective influence, forest growth affords shelter from the wind and sun. Not only are homes benefited, but great protection is given to farm animals that spend most of their time outdoors. The woods also serve as a home for wildlife, and keep streams clear and cool for fish.

Although it is neither possible nor necessary to attempt an economic appraisal of these values, it is recognized that they greatly enhance the beauty of the countryside and make attractive the conditions of living in rural areas.

MARKETING

Woodland products, and the process by which they are distributed and manufactured, possess a number of characteristics distinguishing them from many agricultural products. There are said to be over 4,000 commercial and industrial uses for lumber and wood products, and the number is constantly increasing. Just as there is a variety of timber products, so there is a variety of markets for each product. However, all producers cannot avail themselves of all types of markets. The location of sawmills and manufacturers of wood products are widely scattered and it is not economically feasible for farmers to sell all woodlot products in all types of markets.

The majority of the woodland products were purchased on an "at the farm" basis. In other words, farmers were paid for their products on the skidway and their responsibility ended at that point. Fifty-seven per cent of the sawlogs, 59 per cent of the fuelwood, 61 per cent of the fence posts, and all the Christmas trees and pulpwood were sold in this manner (Table 14).

Other farmers sold their products on a "delivered" basis at the mill. Thirty-two per cent of the sawlogs, 41 per cent of the fuelwood and 96 per cent of the poles were sold on this basis. One farmer who supplied 33 per cent of the posts sold on a "delivered" basis at the railway, and still another sold 11 per cent of the total lumber "on the stump" basis.

Table 14.—Methods of Selling Wood Products, 162 Farms, Ontario, 1950-51

| Item | Unit of Sale | No. of Farms Reporting | Basis of Sale | | | |
|------------------------------|--------------|------------------------|---------------------|-----------|----------|--------------------------|
| | | | At Farm | Delivered | On Stump | Delivered to Railway Car |
| | | | —per cent of total— | | | |
| Lumber and sawlogs | f.b.m. | 51 | 57 | 32 | 11 | .. |
| Fuelwood | cord | 27 | 59 | 41 | .. | .. |
| Posts | no. | 9 | 61 | 6 | .. | 33 |
| Christmas trees | no. | 3 | 100 | .. | .. | .. |
| Pulpwood | cord | 3 | 100 | .. | .. | .. |
| Poles | no. | 5 | 4 | 96 | .. | .. |
| Maple syrup | gal. | 27 | 59 | 39 | .. | 2 |

There was considerable variation in the distance of haul for farmers who transported their products to the mill. The average distance to the sawmill was 11.4 miles, for farmers who transported their logs, but the distance ranged from one-half mile to 90 miles. The farmer who transported his logs 90 miles sold high-quality veneer logs. Fuelwood, a low-quality product, was shipped an average of only 5.7 miles.

Logs are bulky and expensive to haul long distances. Whenever a commodity like forest products has both bulk and low value, transportation charges become important. When value is low, transportation charges on a relatively short haul may offset the price paid at the mill for the product. Thus, for economical transportation, low-value logs can be shipped only short distances—the lower the value of logs the shorter the haul. Transportation charges for sawlogs do not vary appreciably with the value of the product, but depend largely upon volume and weight. Therefore, it becomes economically possible to transport high-quality, high-value logs much greater distances than low-value logs.

Prices

The complexity of the markets for farm wood products and the numerous species and grades of timber sold make it extremely difficult to present price information of much significance. The typical farmer enumerated sold his winter cutting of various species and grades of sawlogs to a local buyer for a lump sum. The best timber was generally sold, and small quantities of the lower grades of logs were used on the farm after being sawn into rough lumber.

The average price received by farmers per 1,000 board feet, log scale, was \$54 while the prices ranged from \$30 to \$100 and the typical or most common price received was about \$45. (Table 15). A considerable number of the sawlogs sold were good quality hardwood such as maple, ash, elm, basswood and walnut, going to industries engaged in the manufacture of furniture,

cabinets, plywood, flooring and the like, for prices considerably above the average. Others sold such species as spruce, white, red and Scots pine, tamarack, cedar and hemlock for prices ranging from about \$30 to \$65 per 1,000 board feet, log scale, at the farm.

Table 15.—Price of Wood Products, 162 Farms, Ontario, 1950-51

| Item | Average Price | Range | |
|----------------------------------|---------------|--------------|--------------|
| | | Highest | Lowest |
| Sawlogs (log scale).....(f.b.m.) | \$54.16 | \$100.00 | \$30.00 |
| Pulpwood (rough).....(cord) | 12.11 | ^a | ^a |
| Fuelwood.....(cord) | 14.87 | 20.00 | 8.00 |
| Posts.....(no.) | .34 | .50 | .20 |
| Poles.....(no.) | 4.08 | 16.00 | 3.00 |
| Christmas trees.....(no.) | .58 | ^a | ^a |

^a Less than five farms reporting.

There was a wide variation in the prices received per cord of fuelwood, or from \$8 to \$20 priced at the farm, in lengths of from 12 to 18 inches. The average price received per cord was considerably higher in the western region or about \$18 as compared with \$12 in the eastern area and about \$15 for the farms studied. On the average, cedar posts sold for 34 cents at the farm. The majority of the posts sold were eight feet in length with a top diameter of six inches or more, for which farmers were paid 30 cents. Cedar posts ten feet in length sold for about 50 cents while 12-foot posts averaged 60 cents at the farm.

Telephone and hydro poles were reported to be in good demand and sold for an average of about \$4.08 at the farm. A few very large poles were sold to the building trade for an average of \$16. Rough or unpeeled pulpwood sold for an average price of \$12.11 per cord, on the skidway at the farm. Christmas trees, largely Scots pine, sold for an average of 58 cents on the stump.

Problems

Since the production of timber is carried on by many farmers, the sellers in the lumber market are therefore numerous and their offerings small. This situation is similar to that of other farm products except that selling on a group basis is less common in the case of wood products. This creates a characteristic situation with respect to sellers' bargaining position in the market. United action on the part of farmers in pooling their woodlot products and selling them on a group basis to buyers of lumber is suggested as a possible method of improving their bargaining power and, at the same time, increasing their net income. No investment in equipment would be involved.

The general situation with regard to the marketing of farm woodlot products has been described by the Woodlot Management Committee of the Canadian Institute of Forestry as follows:

"Too often woodlot owners suffer from, and are discouraged by poor marketing. Some buyers tend to take advantage of woodlot owners' frequent ignorance of markets and sound marketing practices for various woodlot products. Bad bargains through lump sum purchase, followed by destructive cutting, are fairly frequent in some regions. The problem needs to be dealt with from both ends—selling as well as buying—to promote fair and reasonably stable arrangements that would favour sustained yield operating. Improvement of marketing prospects with regard to prices, however desirable in itself, is apt to lead in many cases to even greater abuse of woodlots, unless preceded by, or carried on jointly with, an effective educational campaign on sound forestry".¹

¹A. Koroleff, Chairman, Woodlot Management Committee, Canadian Institute of Forestry, *Action Needed for Woodlot Management Promotion*, Processed Bulletin.

Published current price information relating to various kinds and grades of lumber is virtually non-existent. Current prices are available only by direct application to buyers of such wood products as pulpwood, poles, posts, veneer logs and fuelwood. It is necessary for sellers to check several markets before making a sale in order to obtain the best price for their products. If the quantity the farmer has to offer is small, the process of checking current market prices is costly. It would seem desirable, therefore, to have current price information relating to lumber prices at selected points in southern Ontario made available to farmers to strengthen their position as sellers in the market.

Whereas the Ontario Department of Lands and Forests uses one log rule in scaling timber, there is no one official rule used by the many buyers of timber. This is confusing to farmers who, as a group, are not trained forestry men. One log rule may have an over-run of up to 100 per cent, and instead of being credited with 2,000 board feet, a farmer might possibly be paid for 1,000 board feet. The use of one official log rule in scaling farm timber would permit farmers to sell their products with a greater degree of confidence.

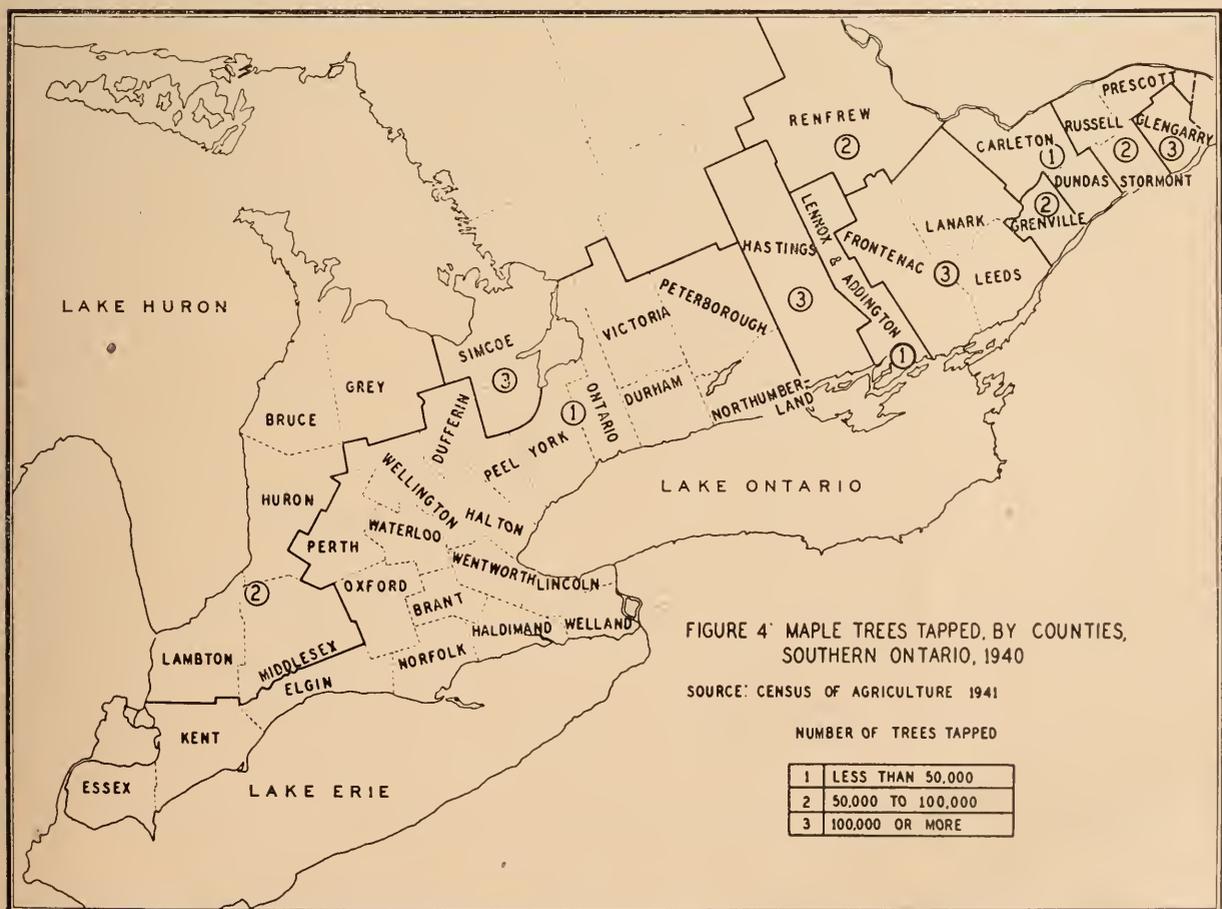
THE PRODUCTION OF MAPLE SYRUP

Most of the sugar bushes of Ontario are remnants of the old hardwood forests which have been reserved for maple syrup production, because of the predominance of maples in the stand. The intermingled trees of other species have been gradually cut out or have died.

The maple crop is produced in a limited area although a few sugar maples may be found on almost all Ontario farms. The production of maple products is concentrated in eastern Ontario and the areas of western Ontario adjacent to Georgian Bay and Lake Huron, where large concentrations of sugar maple may be found (Figure 4). In terms of number of trees tapped and value of production during 1940, Leeds County was the most important followed by Lanark, Glengarry, Hastings, Frontenac and Simcoe counties.

The farm production of maple products declined rather steadily over the years (Figure 5). Perhaps the most important limiting factor in the production of maple products is the weather. The production of sap depends upon the weather at sap time. A long period of relatively warm days and cool nights from early March into mid-April gives the maximum yield. The interruption of such a period by either long cold spells or early warm spells reduces the output. Once the buds are opened, the harvest is over. The low production during the years 1946, 1948, 1949 and 1951 may be largely attributed to unfavourable weather conditions during harvest.

It will be noted in Figure 5 that the year to year price changes for maple syrup followed the general level at wholesale prices and not the year to year fluctuations in production. The price of maple syrup in Ontario declined fairly steadily from 1925 to 1938 and has been increasing since that time with the exception of the war years when price controls were placed upon the product.



Of the 162 farms enumerated, only 38 produced maple syrup during the crop year ended May 31, 1951. These farmers hung an average of 449 buckets and produced 67.7 gallons of maple syrup valued at \$289.16. The largest concentration of maple syrup producers enumerated was in Lanark Township, in the northern part of Lanark County, with 15 farms and in Lobo Township, in the western region, where eight farms reported its production. In the remaining townships, the number of farms reporting production of maple products ranged from one to four.

Returns from the Maple Syrup Enterprise

Information relating to production requirements such as equipment, labour, fuel and containers was obtained from 30 farmers producing maple products. Eight farms were excluded because of incomplete information or because the enterprise was so small that the manufacture of maple syrup was almost entirely a hand operation.

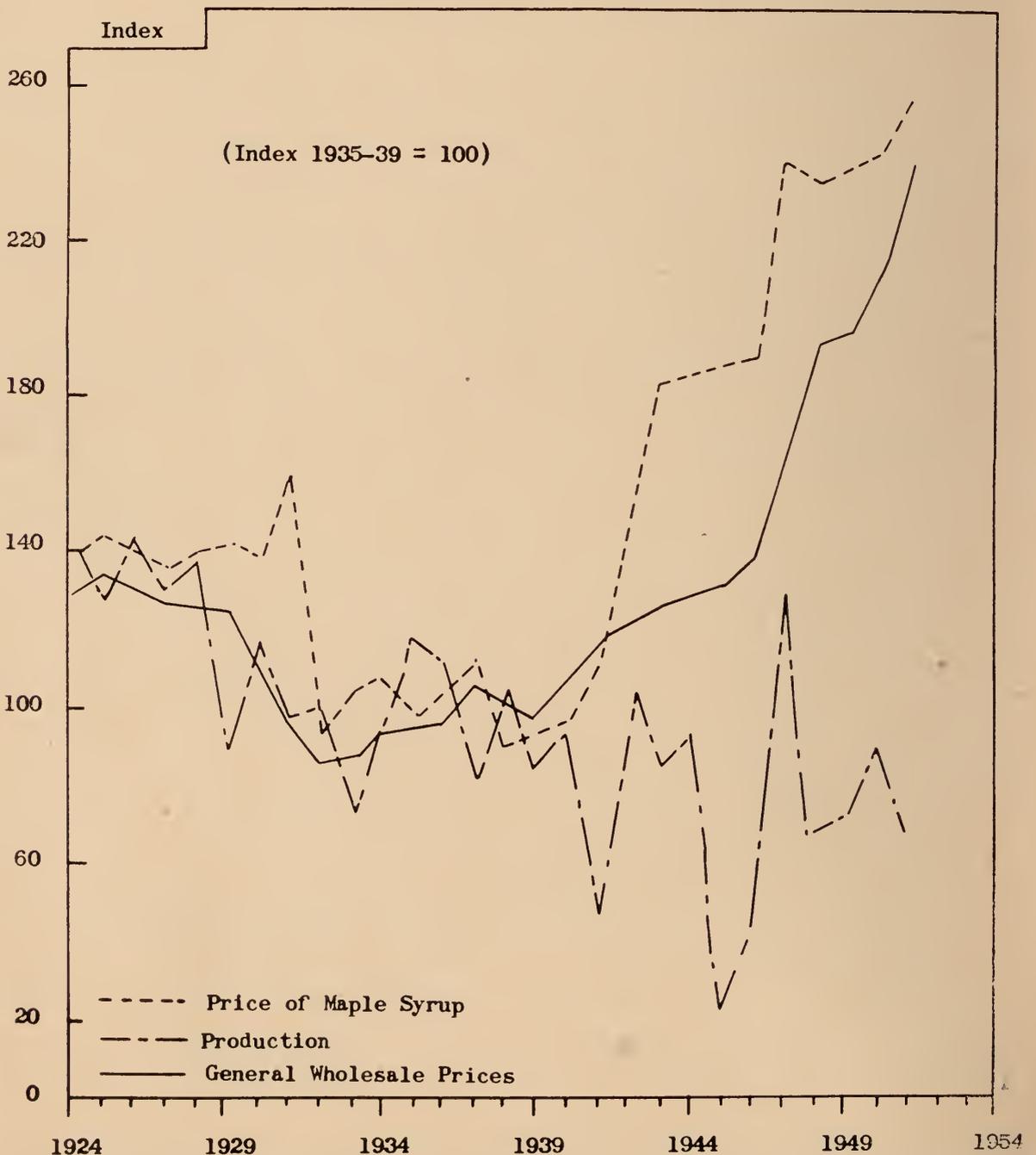


FIGURE 5—Relationship of the price of maple syrup to production and to the general level of wholesale prices. Ontario, 1921-1951.

The largest single expense item was a \$50 allowance for maple syrup equipment, depreciation and repairs (Table 16). The average investment in maple syrup equipment on farms producing maple syrup was \$402 on June 1, 1950. The evaporator accounted for \$180, an average of 449 buckets on hand made up \$140, and miscellaneous items, including a maple syrup house \$82. An allowance for interest on investment in equipment amounted to \$20. This, together with depreciation, gave an average charge of \$70 for the use of maple syrup equipment for the 1951 maple syrup crop year.



Maple syrup evaporating house. Maple, Ontario.

Fuel was an important item of expense on most of the farms studied and averaged \$38 per farm. Two farms reported the use of coal but most of the remaining farms made use of low-quality non-saleable wood which would otherwise be wasted. A charge was made for the use of machinery, including tractors, sleighs, stone-boats, and power saws, together with horse labour, amounting to about \$27 per farm. Since much of the maple syrup was sold to neighbours and friends in adjacent towns who supplied their own containers, the average cost of this item was not large. The average farm utilized about 45 one-gallon containers valued at 35 cents each.

Excluding labour, taxes, and interest on the investment in the maple bush, the total cost involved in the production of maple syrup averaged \$150.28 per farm. The value of the 78.4 gallons of syrup produced per farm was \$335.37, leaving a net income of \$185.09. An average of 221.6 hours of labour per farm was required in the production of maple syrup. The net returns to labour from the maple syrup enterprise, therefore, averaged 84 cents per hour.

Table 16.—Summary of Maple Syrup Costs and Returns, 30 Farms, Ontario, 1950-51

| Item | Average | |
|------------------------------------------|---------------|-----------------|
| | Per Farm | Per 100 Buckets |
| | \$ | \$ |
| Costs^a | | |
| Equipment, depreciation and repairs..... | 50.03 | 11.14 |
| Interest on investment in equipment..... | 20.09 | 4.47 |
| Fuel..... | 37.79 | 8.42 |
| Machinery and horse labour..... | 26.54 | 5.91 |
| Containers..... | 15.83 | 3.53 |
| Total | 150.28 | 33.47 |
| Returns | | |
| Value of production..... | 335.37 | 74.69 |
| Returns per hour of labour..... | .84 | |
| Returns per 100 buckets..... | | 41.22 |
| Hours of labour..... | 221.6 | 49.4 |

^a Excluding taxes, labour and interest on investment in the maple bush.

Based on an average of 449 buckets hung per farm, the production of syrup in 1951 amounted to 17.4 gallons per hundred buckets. The average expenses of production were \$33.47 per hundred buckets hung, while the net return for the use of labour and maple bush averaged \$41.22.



Collecting maple sap in a sugar bush. Maple, Ontario.

On the basis of 1.2 buckets per tree, the average tree tapped produced about 0.21 gallons of syrup or a net return of about 49 cents per tree.

Relation of Returns to Size of Enterprise

In order to determine the relationship of size of enterprise to returns, the farms were divided into three groups of ten on the basis of volume of production, and the costs and returns per hour of labour calculated (Table 17). The group producing more than 90 gallons of maple syrup had a return of \$1.04 per hour of labour as compared with 65 cents for the group producing 41 to 90 gallons and 53 cents for the farms producing from 12 to 40 gallons.

The average enterprise studied utilized 449 buckets, but the number of buckets ranged from 50 to 2,200 per enterprise. Farms producing from 12 to 40 gallons of syrup used 139 buckets, those producing 41 to 90 gallons used 365 and farms producing 91 gallons or more made use of an average of 842 buckets per farm.

The greatest savings in large-scale production may be attributed to the more efficient use of labour. Only 2.3 hours of labour were required per gallon of syrup on farms making more than 91 gallons. Farms producing between 41 and 90 gallons of syrup required 3.2 hours while those producing less than 40 gallons required 5.1 hours. This phenomenon may be explained by the fact that the farms which produced small quantities of syrup tended to utilize more old-fashioned equipment and conducted their operations in a more leisurely manner than did the larger producers. It is important to appreciate that the typical maple syrup producer is the small-scale operator. These farmers generally have a certain amount of leisure time during this period, and their efficiency in the use of labour and equipment is not necessarily the most important consideration which they must make in planning their operations.

Some savings, however, do come about through more efficient use of machinery and equipment. Investment in machinery and equipment amounted to \$6.38 per gallon of syrup produced on farms making from 12 to 40 gallons as compared with only \$4.22 per gallon on farms producing more than 91 gallons.

Table 17.—Relation of Size of Enterprise to Costs and Returns per Farm from Maple Syrup Operations, 30 Farms, Ontario, 1951

| Item | Average Production of Maple Syrup per Farm—gallons | | |
|------------------------------------------|----------------------------------------------------|--------|------------|
| | 12—40 | 41—90 | 91 or more |
| Number of buckets hung..... | 139 | 365 | 842 |
| Investment in maple syrup equipment..... | \$166 | \$405 | \$634 |
| Hours of labour..... | 133 | 195 | 336 |
| Costs^a | —dollars— | | |
| Equipment: Depreciation and repairs..... | 21.61 | 49.13 | 79.36 |
| Interest on investment in equipment..... | 8.31 | 20.27 | 31.67 |
| Fuel..... | 19.20 | 32.14 | 62.03 |
| Machinery and horse labour..... | 9.17 | 26.09 | 44.35 |
| Containers..... | 1.44 | 11.31 | 34.76 |
| Total..... | 59.73 | 138.94 | 252.17 |
| Returns | | | |
| Value of product..... | 122.00 | 274.00 | 610.00 |
| Returns per hour of labour..... | .53 | .65 | 1.04 |

^aExcluding labour, taxes and interest on investment in the maple bush.

Labour Requirements

There were wide variations in the labour requirements in maple syrup production. The average farm for which information on costs was available produced 78·4 gallons of syrup requiring 222 hours of labour, or 2·8 hours per gallon of syrup. The task of evaporating the sap into maple syrup took the largest amount of labour or 89 hours per farm. This job included the cleaning of the evaporator, starting and stoking the fire, and attending to the task of evaporating the sap. The second most time-consuming job was the gathering of sap which required 83 hours. Other labour requirements were as follows: 20 hours for tapping, 25 hours for cleaning up and putting away the equipment and 5 hours for miscellaneous work.

BIBLIOGRAPHY

1. Burns, Paul Y., Value of Woodlot Management in Missouri, University of Missouri Agricultural Experiment Station, Circular 349, July 1950.
2. Carter, R. M., Woodlot Economics on Vermont Dairy Farms, Vermont Agricultural Experiment Station, Bulletin 554, January 1950.
3. Chandler, John M., The Place of Woodland in the Farm Organization in Coos County, New Hampshire. New Hampshire Agricultural Experiment Station, Bulletin 337, June 1942.
4. Duerr, William A., The Economic Problems of Forestry in the Appalachian Region, Harvard University Press, 1949.
5. Guise, Cedric H., The Management of Farm Woodlands, 1st Edition 1939. McGraw-Hill Co. Inc., New York.
6. Halliday, W. E. D., A Forest Classification for Canada, Canada Department of Resources and Development, Forest Research, Bulletin No. 89, 1937, reprinted 1952.
7. Johnson, Hugh A., Irving Fellows, and Donald Rush, Bureau of Agricultural Economics, and C. R. Lockard and C. E. Behre, Forest Service, United States Department of Agriculture. Woodland Opportunities on Dairy Farms in New York, published by the United States Department of Agriculture and the Charles Lathrop Pack Forestry Foundation, Washington, D.C., 1944.
8. Koroleff A., Practical Woodlot Management, 3rd Edition, Canadian Forestry Association, 679 Belmont Street, Montreal, 1948.
9. Lattimer, J. E., The Farm Woodlot in Nova Scotia. Mimeographed Bulletin, Nova Scotia Department of Agriculture and Marketing, 1949.
10. MacLeod, Allan, and John Chandler, The Marketing of Farm Woodland Products in Carroll County, New Hampshire. New Hampshire Agricultural Experiment Station, Bulletin 318, December 1939.
11. Ontario Department of Lands and Forests, Toronto, Report of the Ontario Royal Commission on Forestry 1947.
12. Ontario Department of Lands and Forests, 1947, Forest Tree Planting.
13. Ontario Department of Lands and Forests Bulletin, 1947, The Farm Woodlot.
14. Richards, E. S., Farm Woodlots in Eastern Canada. Prepared under the direction of the Associate Committee on Forestry of the National Research Council of Canada, Ottawa, 1939.
15. United States Department of Agriculture, 1949 Yearbook, Trees.
16. Westveld, R. H., and the late Ralph H. Peck, Forestry in Farm Management, 2nd Edition 1951. John Wiley and Sons Inc.
17. West Virginia Agricultural Experiment Station, Circular 82, Christmas Trees—Their Profitable Production in West Virginia.

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