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Mill Residues

in Jackson and Josephine Counties
in 1962



by Stanley E. Corder

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Forest Products Research
FOREST RESEARCH LABORATORY
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Corvallis

FOREST RESEARCH LABORATORY

The Forest Research Laboratory is part of the Forest Research Division of the Agricultural Experiment Station, Oregon State University. The industry-supported program of the Laboratory is aimed at improving and expanding values from timberlands of the State.

A team of forest scientists is investigating problems in forestry research of growing and protecting the crop, while wood scientists engaged in forest products research endeavor to make the most of the timber produced.

The current report stems from studies of forest products.

Purpose . . .

Fully utilize the resource by:

developing more by-products from mill and logging residues to use the material burned or left in the woods.

expanding markets for forest products through advanced treatments, improved drying, and new designs.

directing the prospective user's attention to available wood and bark supplies, and to species as yet not fully utilized.

creating new jobs and additional dollar returns by suggesting an increased variety of salable products. New products and growing values can offset rising costs.

Further the interests of forestry and forest products industries within the State.

Program . . .

Identify and develop uses for chemicals in wood and bark to provide markets for residues.

Improve pulping of residue materials.

Develop manufacturing techniques to improve products of wood industries.

Extend service life of wood products by improved preserving methods.

Develop and improve methods of seasoning wood to raise quality of wood products.

Create new uses and products for wood.

Evaluate mechanical properties of wood and wood-based materials and structures to increase and improve use of wood.

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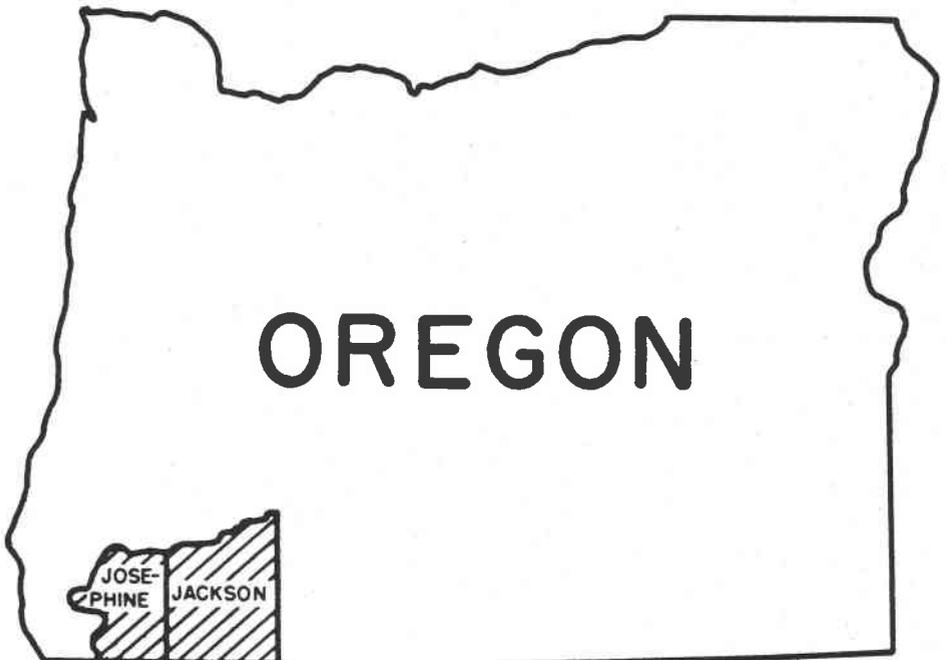
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Fred Sterk helped obtain information and drew figures.



Counties in Oregon where wood residue was measured.

MILL RESIDUES
in JACKSON and JOSEPHINE COUNTIES

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INTRODUCTION

Purposes of the present study were to determine quantity and present disposition of mill residues in Jackson and Josephine Counties, and to compare present disposition to disposition in 1953, as determined from a previous study (1)*. To promote utilization of residues, their locations and quantities should be known.

In manufacturing lumber and plywood, about one-half of a log entering the mill ends as desired primary product. The residue is bark, slabs, edgings, lumber trim, sawdust, and shavings from sawmills; and bark, log trim, spur trim, round-up veneer, cores, veneer trim, panel trim, and sander dust from plywood plants.

Some residues are used for fuel, pulp chips, soil mulch, farm litter, or are remanufactured into small wood items. There are, however, large quantities of residue without apparent economical outlet that are burned. These unused residues offer a ready source of raw material if practical uses can be found for them.

PROCEDURE

In a survey during the summer of 1963, all known sawmills and veneer or plywood plants in Jackson and Josephine counties were contacted. Their locations are shown in Figure 1. Secondary manufacturing operations, such as planing mills and plywood lay-up plants, were not included in the map of Figure 1. Information was obtained from mill operators on production of lumber and veneer or plywood during 1962, and percentage disposition of the various kinds of residue was estimated.

Total quantity of residues developed at each mill was determined by conversion factors (Tables 1, 2; Figures 2, 3) developed from previous studies (1).

*Numbers in parentheses refer to similarly numbered references.

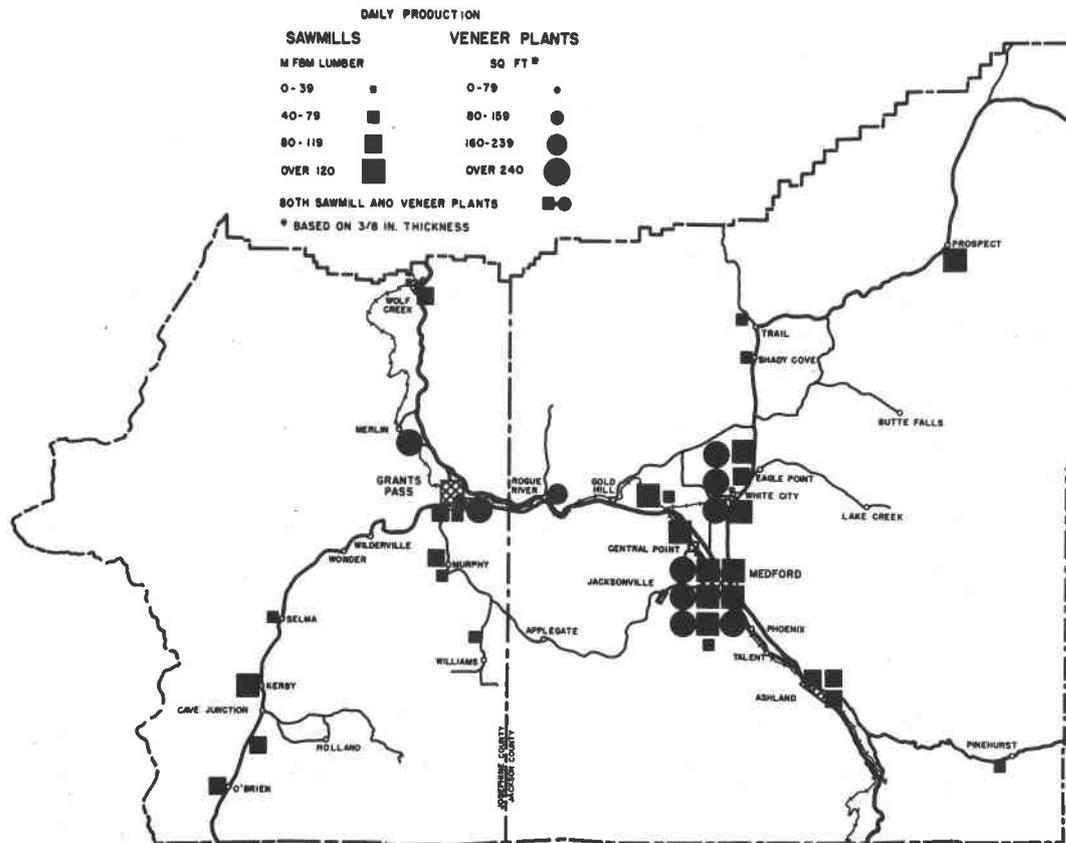


Figure 1. Size and location of sawmills and veneer-producing plants in 1962 in Jackson and Josephine counties.

Table 1. Average Weight, Dry, of Residues Developed When Producing a Thousand Board Feet of Lumber.

Item	Species		
	Douglas fir	True firs, cedars	Pines
	Tons	Tons	Tons
Coarse residue ¹	0.45	0.35	0.31
Sawdust	.28	.22	.26
Shavings	.21	.16	.11
Bark	.29	.22	.28

¹Slabs, edgings, and lumber trim.

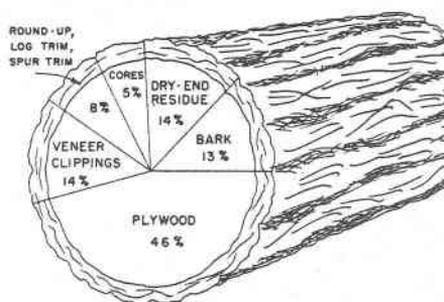
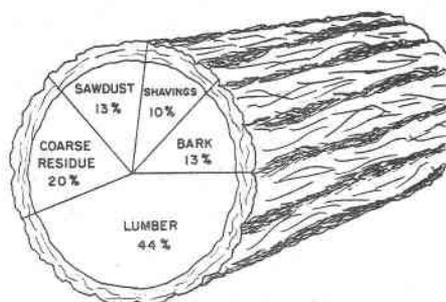


Figure 2. Products from lumber manufacturing in western Oregon. Figure 3. Products from plywood manufacturing in western Oregon.

Table 2. Average Weight, Dry, of Residues Developed When Producing a Thousand Square Feet (3/8-inch equivalent) of Plywood.

Item	Weight
	Tons
Cores	0.05
Undried ¹	.21
Dried ²	.13
Bark	.13

¹Veneer trim, spur trim, round-up veneer, and log trim.

²Panel trim, veneer rejects, and sander dust.

RESULTS

For the study, sawmills were grouped arbitrarily as large or small, if they cut more or less than 80 thousand board feet daily. Plywood and veneer plants were not separated according to size.

Sawmills

In 1962, of 29 sawmills operating in the two counties, 20 were classified as large, and 9 as small. Lumber produced in both counties in 1962 was 674 million fbm, of which 85 per cent was from large mills and 15 per cent was from small mills. In 1953, lumber produced amounted to 823 million board feet, of which 59 per cent was from large mills and 41 per cent was from small mills. Lumber production had decreased 18 per cent in the 9-year period since 1953, and an increased proportion of the lumber was from large mills in 1962.

Lumber produced in 1962 was reported to be 54 per cent Douglas fir, 25 per cent white fir, 18 per cent pine, and 3 per cent cedar. Five sawmills had log barkers and were selling pulp chips in 1962, contrasted with no mills with log barkers in 1953.

Coarse residue

Coarse residue produced had changed from 364 thousand tons in 1953 to 265 thousand tons in 1962 (Table 3). There was no significant difference between 1953 and 1962 in amount of coarse residue used for fuel and for small wood items. A marked difference was use of 73 thousand tons of coarse residue for pulp chips in 1962 (Figure 4); no pulp chips were produced from sawmill residue in 1953. Amount of coarse residue not used decreased from 314 thousand tons in 1953 to 141 thousand tons in 1962 (Figure 5).

Fine residue

Sawdust and shavings decreased from about 400 thousand tons in 1953 to 285 thousand tons in 1962 (Figure 6). Use in agriculture increased slightly; other uses declined. About 45 per cent of the shavings was produced from dried lumber.

Bark

Bark at sawmills amounted to 175 thousand tons, of which 23 per cent became fuel, .6 per cent went into soil mulching, and 76 per cent was not used. About 30 per cent of the bark came from mills that had barkers. The remaining 70 per cent of the bark came from mills without barkers, so would have been associated with slabs and edgings.

Table 3. Production and disposition of residue from sawmills and veneer-plywood plants in Jackson and Josephine counties in 1962; in thousands of tons, dry.

Kind of residue	Disposition					
	Production	Pulp chips	Fuel	Small items ¹	Agricultural ²	Not used
<u>Sawmills</u>						
Coarse residue ³						
Large mills	223	73	28	12	0	110
Small mills	<u>42</u>	<u>0</u>	<u>8</u>	<u>3</u>	<u>0</u>	<u>31</u>
All	265	73	36	15	0	141
Sawdust						
Large mills	149	0	63	0	0	86
Small mills	<u>28</u>	<u>0</u>	<u>5</u>	<u>0</u>	<u>4</u>	<u>19</u>
All	177	0	68	0	4	105
Shavings						
Large mills	95	0	37	0	7	51
Small mills	<u>14</u>	<u>0</u>	<u>2</u>	<u>0</u>	<u>1</u>	<u>11</u>
All	109	0	39	0	8	62
Bark						
Large mills	147	0	35	0	1	111
Small mills	<u>28</u>	<u>0</u>	<u>5</u>	<u>0</u>	<u>0</u>	<u>23</u>
All	175	0	40	0	1	134
<u>Veneer and plywood plants</u>						
Undried ⁴	147	55	24	0	0	68
Cores	34	1	1	30	0	2
Dried ⁵	148	0	67	0	0	81
Bark	88	0	32	0	4	52

¹Includes such material as laths, car strips, broom handles, and studs.

²Primarily mulch and litter.

³Slabs, edgings, and lumber trim.

⁴Log trim, spur trim, round-up veneer, and veneer clippings.

⁵Reject veneer, panel trim, and sander dust.

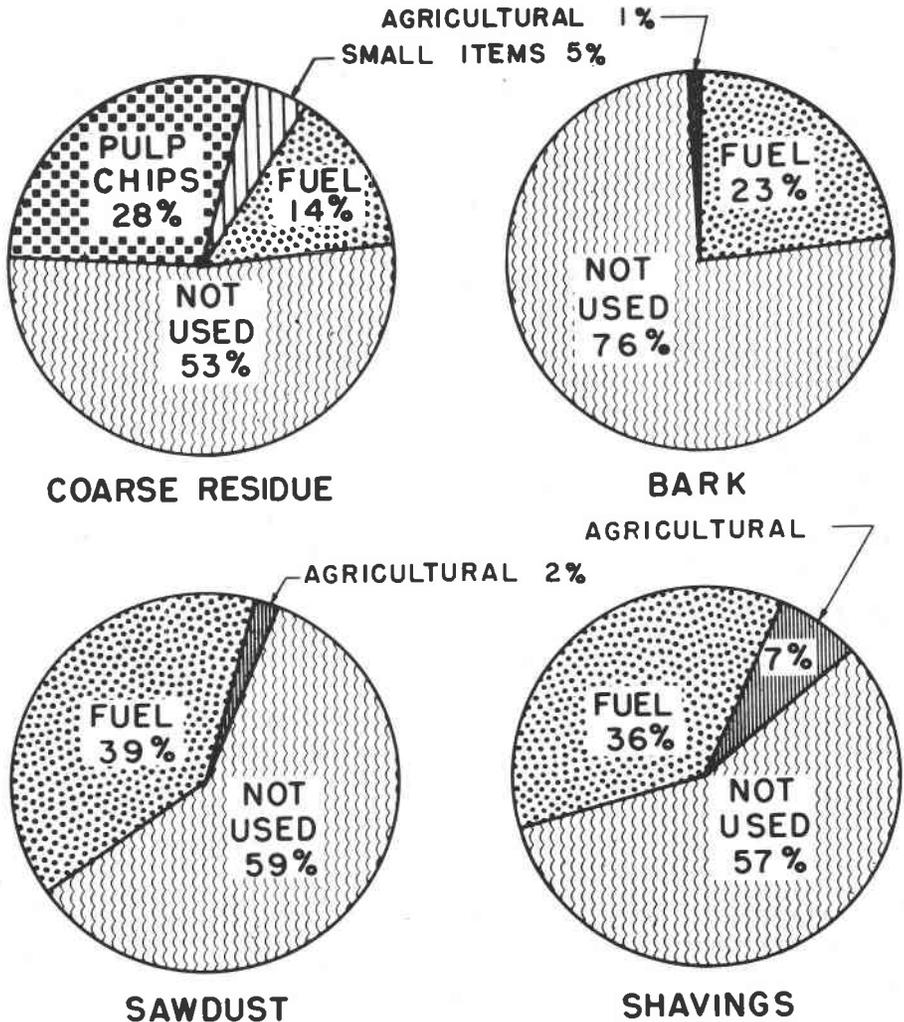


Figure 4. Disposition of residues from sawmills in Jackson and Josephine counties in 1962.

Veneer and Plywood Plants

In 1962, 6 plants were producing both veneer and plywood, 3 plants were producing only veneer, and 8 plants were making finished plywood from veneer produced elsewhere. Four of the plants producing

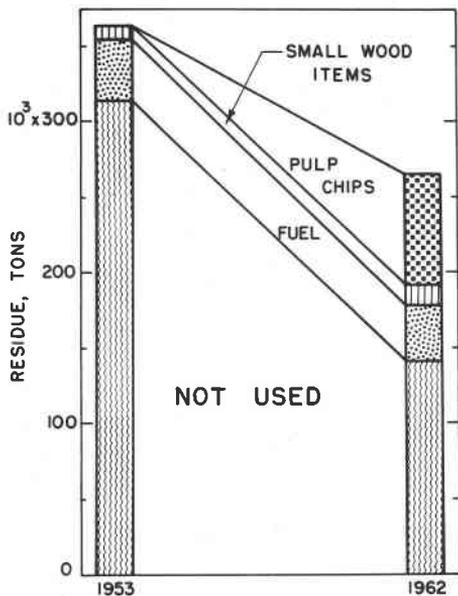


Figure 5. Disposition of coarse residue from sawmills in Jack and Josephine counties.

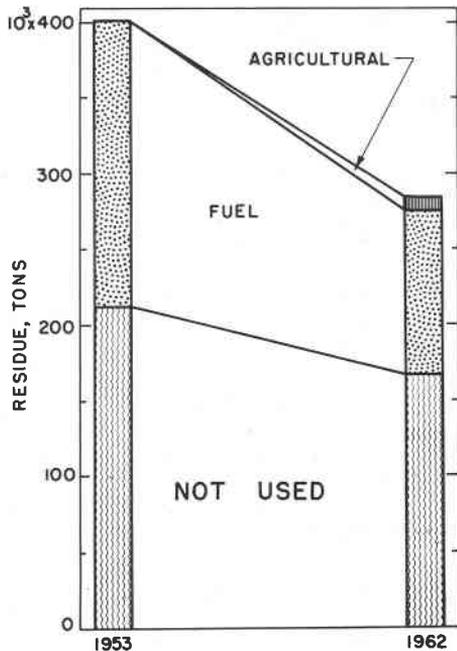


Figure 6. Disposition of sawdust and shavings in the two counties.

vener or plywood also had sawmills at the same locations. Five of the veneer plants were producing pulp chips.

Plywood produced in the 2 counties in 1962 amounted to 1100 million square feet (3/8-inch basis) from 14 plants. Plywood production had increased over 8 times in 9 years; Jackson and Josephine counties produced about 7 per cent of plywood made in Oregon in 1953 and about 17 per cent in 1962. About 11 per cent of the United States' plywood production came from Jackson and Josephine Counties in 1962 (5). About one-third of the veneer required for plywood assembled in the 2 counties was peeled elsewhere (Figure 7).

Figure 7. Veneer produced outside the 2 counties being unloaded for assembly at a plywood plant.



Undried residue

The undried residue consists of log trim, spur trim, and veneer clippings. About two-thirds of the undried residue was veneer clippings, which was the residue most easily converted to pulp chips (Table 3, Figures 8, 9).

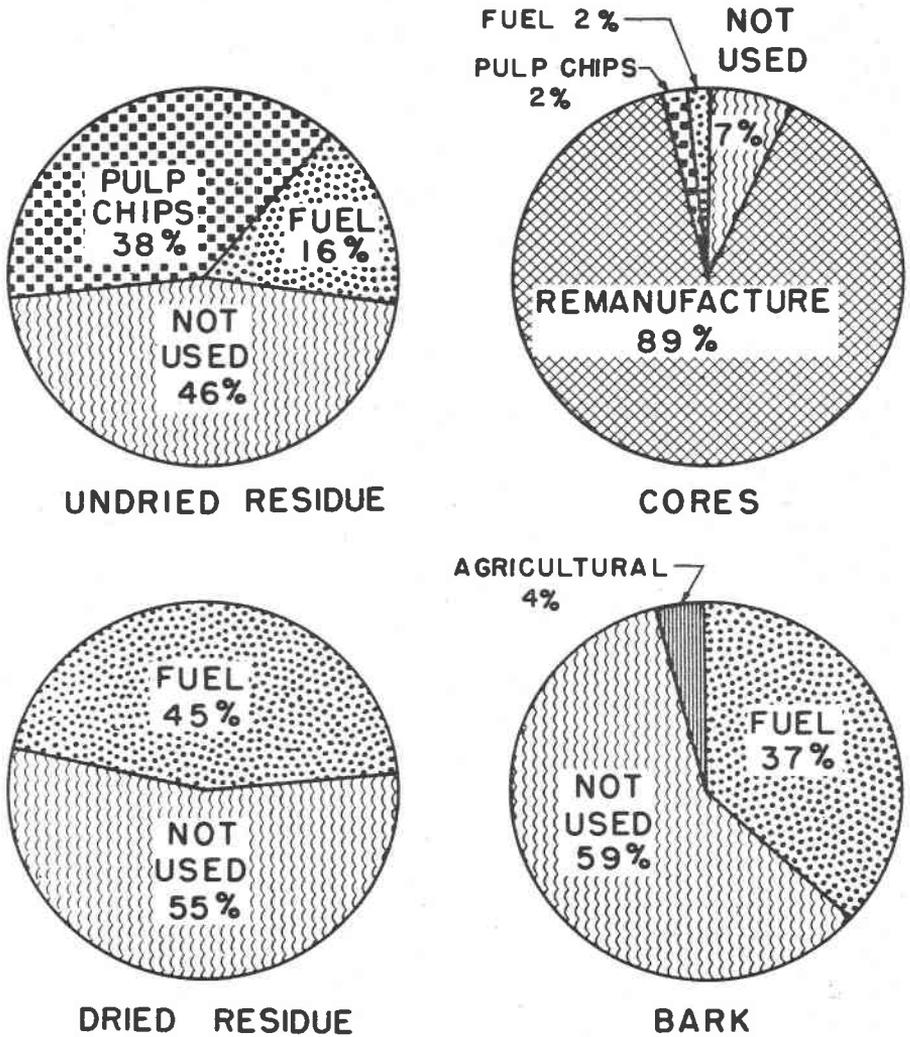


Figure 8. Disposition of residue from veneer and plywood plants in Jackson and Josephine counties in 1962.

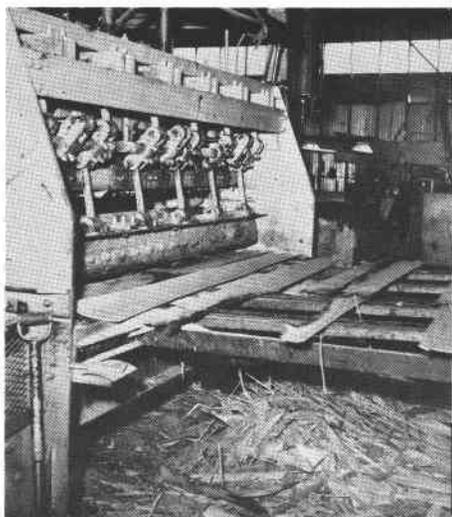
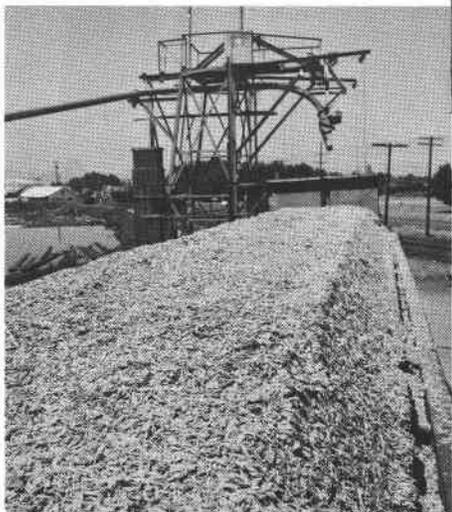
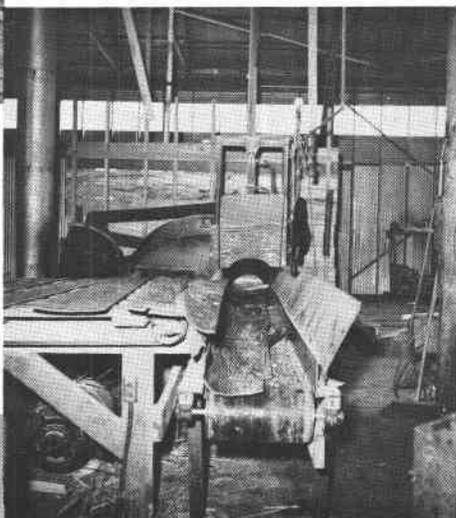


Figure 9. Veneer clippings
not suitable for plywood---

go to a chipper to be
cut into chips---



for transportation to a pulp
mill to be processed into
paper products.

Total quantity of veneer clippings increased from 7 thousand tons in 1953 to 93 thousand tons in 1962. While there was no use of veneer for pulp chips in 1953, 55 thousand tons, or about 60 per cent of the total, were diverted to pulp chips in 1962 (Figure 10).

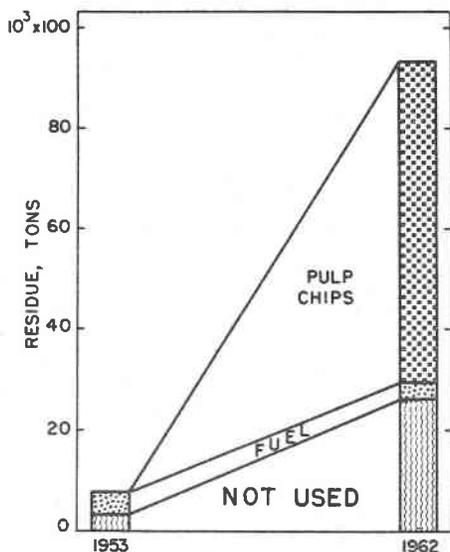


Figure 10. Disposition of clippings from undried veneer in Jackson and Josephine counties in 1962.

Cores

About 34 thousand tons of cores were developed from veneer plants in 1962. Most of these cores, 89 per cent, went to small sawmills, where they were sawed into 8-foot studs (Figure 8). A stud mill at White City with peeler cores in the pond is shown in Figure 11, with studs produced at the mill, packaged, and ready for shipment.

Some of the cores split and break while being peeled so that they are not suitable for sawing into studs. Some of the split cores become fuel (Figure 12).

Dried residue

About 148 thousand tons of dried residue were produced in 1962, consisting of panel trim, sander dust, and rejected veneer. Of the total, almost half was used for fuel; the rest was not used (Figure 8).

Bark

Bark produced at veneer plants totaled 88 thousand tons. Fuel accounted for 37 per cent, soil mulch 4 per cent, and 59 per cent was not used (Figure 8).

Bark is removed from the log before peeling veneer, so bark from all veneer plants was produced separated from the wood.



Figure 11. Peeler cores (left) are sawed at White City into 8-foot studs (right), a popular item for residential construction.



Figure 12. Split peeler cores (left) become fuel (right).

DISCUSSION

Based on data of the West Coast Lumbermen's Association (4), lumber production reached a peak at about 900 million fbm in 1955 that tapered to 674 million fbm in 1962 in the 2 counties (Figure 13). Plywood production increased eight times from 1953 to 1962.

In 1953, 3 per cent of the logs processed were peeled for plywood. Clearly, the recent trend has been increasing production of plywood and decreasing production of lumber (Figure 14).

About 663 million board feet, Scribner scale, were reported by the U. S. Forest Service as produced in the 2 counties in 1962 (3). Since more logs were processed in the 2 counties than were produced, some of the logs processed must have come from adjacent counties. A study by Henderson (2) of forest products industries in Oregon included estimates of logs produced, by counties, in 1975. Estimated production for

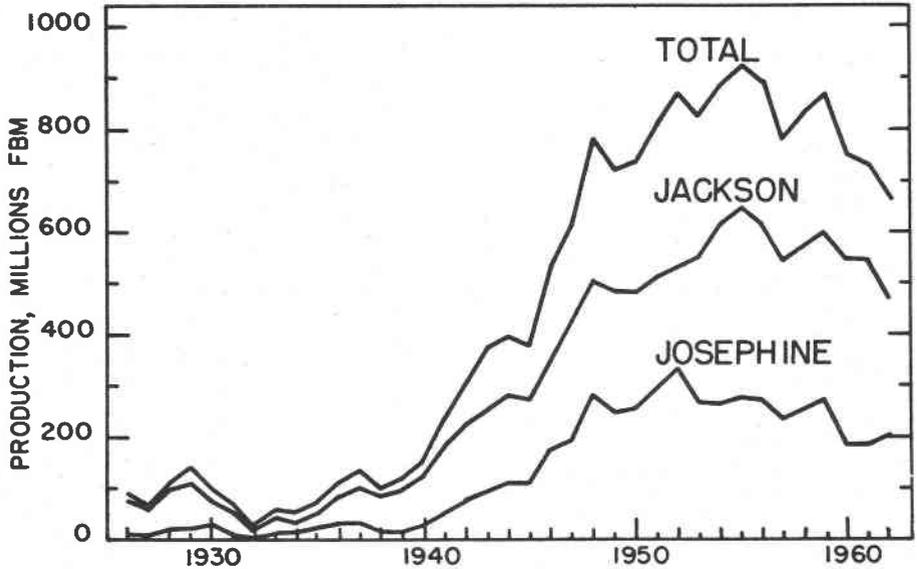


Figure 13. Annual lumber production in Jackson and Josephine counties.

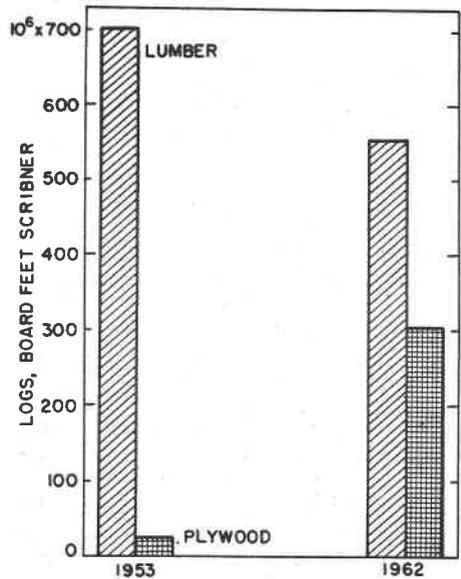


Figure 14. Disposition of logs processed in Jackson and Josephine counties.

Jackson and Josephine counties in 1975 was 650 million board feet, or about the same as reported for the counties in 1962 (3).

The closest market for pulp chips was more than 200 miles from Medford, and 75 per cent of the pulp chips sold were being transported to Antioch, California--nearly 400 miles from Medford. Costs for transporting pulp chips from Medford to Antioch were \$12.34 a unit. Closer markets for pulp chips would stimulate further use of coarse residues and veneer trim.

Residues suitable for pulp were produced in sufficient quantity during 1962 to support production of about 500 tons of pulp a day, if completely utilized.

Fine residue (sawdust and shavings) was used mainly for fuel, with some use for animal and poultry litter. Shavings could be made into particle board. Oregon now has 10 particle-board plants; most are using undried planer shavings for all or part of their raw material.

Most of the plywood cores were being used for manufacture of studs.

Bark was used mainly for fuel, with some used as a soil mulch. Since there are large acreages of orchards in the Rogue River valley, use of bark for a soil mulch could be greatly increased. Some studies seem desirable to evaluate the economics, possible benefits, and effect of bark when applied to orchard soils.

The largest quantity-use of wood residues was fuel. Some residues could be converted into items of increased value, such as pulp chips or studs, but such material as bark and sawdust had only one economical large-volume use, and that was for fuel. Use of wood for domestic heating and cooking has been decreasing and probably will continue to do so, except for use in fireplaces, where material such as bark and sawdust is not suitable unless manufactured into briquets.

Wood fuel is frequently at an economic disadvantage at small steam plants unless automatic equipment can be installed economically to lower costs of labor.

At large steam plants, wood residue usually will be the least expensive fuel if it is available near costs of disposal. Further expansion in use of wood fuel, therefore, probably will be in large steam plants. Wherever there is a large and concentrated demand for energy, wood residue--if readily available--might be the most economical fuel.

CONCLUSIONS

Total amount of wood and bark residues developed in Jackson and Josephine counties increased slightly in the past 9 years before 1962. Quantity of sawmill residues has decreased, but residues from plywood operations have increased.

There has been rapid increase in the amount of residues used for pulp chips. About one-third of the coarse residue from sawmills and more than one-half of the undried veneer trim from veneer plants was used for pulp chips in 1962, although no pulp chips were produced in 1953. This use for residue was achieved despite the long distance to pulp plants.

At many large mills, coarse residue was being used for pulp chips, so the residue still available is in particles such as sawdust, shavings, and bark. Economical uses for fine residues would help solve the problem of disposing of them.

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