Marketing Oregon-Produced Poles and Piling

by Robert M. Randall
Charles F. Sutherland, Jr.

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Forest Research Laboratory
School of Forestry
Oregon State University
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Robert M. Randall
Economist
Pacific Northwest Forest and Range Experiment Station
Charles F. Sutherland, Jr.
Associate Professor of Forest Economics

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Corvallis, Oregon 97331

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ABSTRACT

Among the many products of Oregon's forests are poles and piling. These products form the basis of an industry with distinctive manufacturing and marketing processes. Based on information collected through interviews with officials of the pole and piling industry, this report describes characteristics of the industry—its major markets, marketing procedures, and industry problems. Manufacturing is traced from timber harvest, through the peeling process, storage and seasoning, and finally treatment with wood preservatives before shipment. Major customers are identified as power and communications utilities, construction contractors, and the federal government. The West Coast is the major geographical market served, with sales further east meeting with stiff competition from producers in the South. The report discusses sales procedures and methods for storage, inventory control, inspection, quality control, transportation, and product promotion. Major industry problems are described as competition from steel and concrete substitutes, decreased demand for poles because of underground installation of utilities, and possible future difficulties in obtaining raw material supplies.

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INTRODUCTION

Oregon's forest products industry is of such fundamental importance to the economic health of the state that its activities are of vital concern to Oregon's citizens. Production and marketing of such products as lumber, plywood, pulp, and paper are well documented; news features about the major forest products industries appear regularly. Substantial research has focused upon problems of producing and marketing the major forest products.

The activities and problems of the smaller segments of the forest products industry, such as the pole and piling industry, often are overlooked. Although the output of the pole and piling industry is small compared to other segments of the forest industry, it still contributes to Oregon's economy. In 1972, the Industrial Forestry Association (2) estimated its contribution to be $11,340,000, on a pole and piling production of 12,600,000 lineal feet. The estimated total value of forest products produced in Oregon in 1972 was $2,716,881,000. The pole and piling industry contributed 0.4 percent of the total value and ranked eighth in value produced by forest products industries in Oregon.

The purpose of this report is to provide a better understanding of the pole and piling industry in Oregon and to describe its marketing activities and problems. Information was obtained originally by interviewing managers of firms that produce most of the poles and piling in western Oregon. The questionnaire used in the interviews will be supplied upon request to the Forest Research Laboratory, Oregon State University. Interviews were supplemented with data from manufacturer's directories and trade publications (1, 2, 3).

OREGON'S POLE AND PILING INDUSTRY

Most firms in the industry process and sell poles and piling as only two of their many products, which may include such items as posts, ties, crossarms, and lumber.

The production of poles and piling can be divided into three main activities: harvest and transportation of tree-length logs to a peeling plant; machine peeling to produce untreated poles and piling; and application of wood preservatives. The third step sometimes is omitted, and poles and piling are used directly without treatment. Often when poles and piling are treated, they must be transported between the peeling plant and the treatment plant. Emphasis in this report will be on the activities of firms engaged in peeling and treating poles and piling.

Firms that specialize in the production of machine-peeled poles and piling characteristically sell most of their output to firms that apply preservatives. Firms with facilities for wood preserving typically have peeling facilities of their own and thus operate in two of the above-mentioned activities. These firms dominate the industry; those that specialize in machine-peeled poles and piling tend to supplement the supply of raw material needed by the preserving firms.

Production of Treated Poles

In 1971 (1), of 268,619,000 cubic feet of wood treated with preservatives in the United States, 74,374,000 cubic feet, or 28 percent, were pole products. Of 33,479,000 cubic feet of wood treated on the Pacific Coast in 1971, 10,400,000 cubic feet, or 31 percent, were pole

products. Separate data were not given for Oregon. Table 1 shows the relative importance of Pacific Coast production of treated poles as a percentage of the national total from 1954 to 1971. Pacific Coast producers have shared a fairly stable 13-16 percent of national production over this period.

Production of Treated Piling

In 1971, of 268,619,000 cubic feet of wood treated in the United States, 5.1 percent, or 13,699,000 cubic feet, were treated piling. On the Pacific Coast, 2,191,000 cubic feet, or 6.5 percent, of the 33,479,000 cubic feet of treated wood were piling (1). Table 2 shows the relative importance of Pacific Coast production to the nation's production of treated piling. The Pacific Coast's share of treated-piling production has fluctuated much more than has its share of pole production. For example, in the last decade its share has ranged from a high of 23.3 percent in 1966 to a low of 11.8 percent in 1970.

Number of Firms and Employment

The "Directory of Oregon Manufacturers" for 1972 (4) reported that seven wood preserving firms were engaged in the production of treated poles and piling. These are two more firms than were listed in the Directory for 1966 (3). Also listed were 12 other firms that reported poles and piling as products. These firms were classified in the logging or milling sectors of the wood products industry.

Table 1. Thousands of Cubic Feet of Poles Treated in the United States and the Pacific Coast[1], 1954-71 (1).

Year	Total United States	Pacific Coast	Pacific Coast, percentage of total
1954	63,873	9,073	14.2
1955	74,766	10,644	14.2
1956	85,805	12,720	14.8
1957	84,021	11,789	14.0
1958	73,813	11,189	15.2
1959	78,277	10,803	13.8
1960	75,099	11,471	15.3
1961	76,438	12,411	16.2
1962	78,707	12,784	16.2
1963	76,993	11,578	15.0
1964	80,577	11,688	14.5
1965	83,937	11,985	14.3
1966	87,087	13,087	15.0
1967	84,322	11,533	13.7
1968	76,170	10,680	14.0
1969	74,403	10,297	13.8
1970	76,760	9,822	12.8
1971	74,374	10,400	14.0

[1] Pacific Coast includes Alaska, California, Hawaii, Oregon, and Washington. Hawaii was not included before 1959. Alaska was not included before 1962.

Employment in pole and piling production is difficult to determine, but we estimate a minimum of 280 employees in 1972.

Sources of Stumpage

Most firms doing peeling or treating largely depend upon sources of raw material not directly in their control. They generally purchase stock from gyppo loggers, who in turn obtain timber from owners of small woodlots, public ownerships, and the larger industrial tree farms. Large industrial firms, not themselves engaged in pole and piling production, often sell timber for poles and piling when prices for this market are high enough, relative to prices obtained in other forest products markets, to make outside sales profitable.

Production Operations in the Pole and Piling Industry

Manufacturing poles and piling begins in the forest where trees with the proper qualities are selected and harvested. After harvest, the logs are bucked to the length desired and trucked to the peeling plant. Trucking usually is done by contractors. Sometimes truckers are employed by the purchasing firm.

The peeling plant may be owned by a wood preserving firm with the treating facility located nearby, the plant may be owned by a preserving firm but located some distance from the treating plant, or the plant may be owned by a firm that specializes in peeling "barkie" (unbarked) poles and piling but does not have its own treatment facilities.

Table 2. Thousands of Cubic Feet of Piling Treated in the United States and the Pacific Coast[1], 1954-71 (1).

Year	Total United States	Pacific Coast	Pacific Coast, percentage of total
1954	12,318	2,626	21.3
1955	13,935	3,688	26.5
1956	16,845	3,538	21.0
1957	16,270	3,057	18.8
1958	16,188	2,872	17.7
1959	14,657	2,313	15.8
1960	16,147	2,605	16.1
1961	14,333	2,437	17.0
1962	17,849	2,908	16.3
1963	15,914	2,357	14.8
1964	16,522	3,204	19.4
1965	17,792	3,789	21.3
1966	21,108	4,910	23.3
1967	16,627	3,449	20.7
1968	17,438	3,223	18.5
1969	14,728	2,343	15.9
1970	15,128	1,779	11.8
1971	13,699	2,191	16.0

[1] Pacific Coast includes Alaska, California, Hawaii, Oregon, and Washington. Hawaii was not included before 1959. Alaska was not included before 1962.

Plants in the second category can be up to 100 miles or more from the treatment plant. These concentration yards, besides providing peeling facilities, serve as collection and storage points for the supplies of stock available to a firm in a given area. Concentration yards typically are located on rail lines so that the most economical transportation is available for hauling untreated poles and piling to the preserving plant. Concentration yards, combined with rail transportation, extend considerably the potential supply for a preserving firm. Plants in the third category have the same characteristics and perform many of the functions of concentration yards, except that they are owned independently.

After the barkie poles and piling have been hauled to the peeling plant, processing begins. First, the bark is removed by a peeling machine. Next, an incising machine makes a series of small cuts over the outer surface to increase the surface area, improve penetration, and ensure uniformity of treatment. The products then are sorted by various grades and size classes for storage and seasoning in the yard.

Occasionally, poles and piling are sold untreated to end users. Usually, however, products are treated with preservatives before they are sold. Seasoning, usually by air drying, is desirable before treatment. Seasoning promotes fast, effective preservative treatment, and allows the manufacturer more flexibility in meeting the demands of his customers. If the manufacturer has anticipated the needs of buyers correctly, orders can be filled quickly and efficiently from products in storage.

Products are treated with preservatives after various storage times. The customer determines the type of treatment given and the dryness of the product determines the time required. As a rule, the drier the product, the less time is required to treat it—72 hours is usually maximum for green products.

In general, poles and piling are stored and air-seasoned until an order is received. Then the product is treated with preservatives and immediately delivered to the buyer. Even when the products are ordered in advance, treatment is delayed until almost time for delivery.

One advantage to storing poles and piling untreated is that prolonged air seasoning makes the product drier and preservative treatment more effective. Another reason is that customers' requirements for types and intensities of treatment vary. Still another advantage is that many orders for utility poles require them to be precut and drilled before treatment for installation of crossarms and spikes.

Kinds of Wood Used

Only two species of trees, Douglas-fir and western redcedar, are used commonly for poles and piling in western Oregon. Douglas-fir usually is pressure treated to assure a deep penetration of preservative chemicals. Nonpressure treatment is much less common because the chemical penetration is inadequate for most uses.

Western redcedar commonly receives nonpressure treatment such as butt-soaking to increase the durability of the end of the pole that is buried—or soaking the entire length of the pole to enhance its natural durability. Pressure treatment is less common because cedar tends to become oversaturated with oils and this leads to handling problems.

MARKETS FOR OREGON-PRODUCED POLES AND PILING

Some important characteristics of the pole and piling market are outlined here, with emphasis on the market situation for Oregon-based firms. Some of the principal buyers and users of poles and piling are identified. The geographical sources of demand are located and discussed. Finally, the competitive situation of Oregon producers relative to others is evaluated.

Purchasers of Poles and Piling

The major purchasers of Oregon-produced poles and piling can be classified into three groups: power and communications utilities, construction contractors, and the federal government.

Power and communications utilities depend heavily on poles to support the network of wires needed for delivery of most of their services. Additional poles are needed to replace those that deteriorate in service and to accommodate expanding population and industry. Poles added to or replacing existing ones generally require preservative treatment.

Construction contractors are an important source of demand for piling. They typically use large quantities on projects such as building foundations, dams, bridges, highways, and waterfront installations. Piling used for these projects usually require preservative treatment. Occasionally, untreated piling are used where they are naturally protected against attack by destructive agents, for example, where they are driven below the permanent water table. Untreated piling also may be used where only temporary foundation support is needed.

The impact of purchases by the federal government can be large. In 1965-66, many firms cited the federal government as their single most important customer. Purchases sometimes ranged from 50 to 75 percent of total sales. Federal demand (in 1965-66) was attributed largely to the highway program and defense expenditures.

A minor component of the demand for Oregon-produced poles and piling in 1965-66 was the foreign market. Export sales, principally to Canada and Japan, were reported as comprising 5 percent or less of total sales for each firm interviewed.

Geographical Markets

Most poles and piling produced in Oregon are marketed in California, Oregon, and Washington. Sales opportunities decrease with markets located further east. Although a market exists in the sparsely populated Rocky Mountain area, sales of poles and piling in the Midwest, East, and South are negligible, except for special orders.

Special orders from the East for Oregon-produced poles and piling generally come in response to the needs of large construction projects. For example, a heavy demand for transmission poles over 65 feet in length arose recently. The Pacific Northwest is essentially the sole supplier, because poles in these lengths generally are not available from other regions.

Local markets in Oregon account for up to 25 percent of total sales of most firms. Poles and piling sold locally usually are treated with wood preservatives before sale; however, a small market exists for untreated stock. Generally, sales of untreated poles and piling are in small lots, and for this reason many firms do not cater to this market because of higher handling costs.

Some firms were oriented heavily to local markets, but others sold mostly to more distant customers—largely dependent upon their past sales practices and patterns. If its past sales were mostly out of state, a firm had difficulty competing against companies already established in the local market. Likewise, firms with established local trade connections generally found less profit in trying to cultivate out-of-state markets.

Market Trends

Poles. The market for poles was generally stable, but with some potential for decline attributed to the substitution of steel and concrete poles for some uses, and to the growing trend toward underground installation of utilities, particularly in urban areas.

The market for poles was considered less subject to fluctuations than for piling. The primary market for poles derives from the steady replacement needs of a large national utilities network and from the needs of a steadily growing population.

Piling. Market trends for piling are less clear than trends in the pole market. The piling market has the potential for greater fluctuation than has the pole market because of its dependence on large, one-time projects. Examples of some special projects requiring large amounts of piling are the construction of the New York World's Fair, reconstruction efforts after the Alaskan earthquake, construction of military bases in Vietnam, and the federal highway system.

Some respondents believed that the piling market was growing, relative to the pole market, because of industry efforts to educate engineers and architects in the uses and advantages of wood piling. Nevertheless, the piling market tends to be oriented to large, individual projects, and the stability of the market depends on these projects coming along at fairly frequent intervals. Stability also depends upon heavy construction activity in the private sector, which in turn is correlated closely with trends in national economic growth.

Competition for Markets

The major pole and piling producing region of the nation is the South. The American Wood-Preservers' Association (1) showed that in 1971, 81.8 percent of poles treated and 82.7 percent of the linear feet of piling treated were southern pines. The South's dominance in the production of treated poles and piling apparently is not because of any inherent superiority in physical characteristics related to preservative treatment or reliability in service. The South's dominance is explained best in terms of distance to market and cost of the finished product.

Because of shorter hauling distances to East Coast and Midwest markets, southern producers have distinctly lower transportation costs than do western producers. The line shown traversing the United States in Figure 1 represented the approximate zone where freight rates per hundred-weight from Portland, Oregon, and from Hattiesburg, Mississippi, were equal. To the west of the line, freight rates favored poles and piling from Portland, and, east of the line, those from Hattiesberg.

The cost of the finished product at its point of manufacture also is an important competitive factor. Besides having the advantage of shorter hauling distances, southern producers also could quote lower fob prices for poles and piling under 60 feet in length. This advantage would have the effect of shifting the cost-equality line shown in Figure 1 even further west.

Several respondents noted that despite higher transportation costs, Douglas-fir poles and piling were competitive in the East, the Midwest, and even in the South itself when product length exceeded 65 feet because timber of this size is scarce in the South.

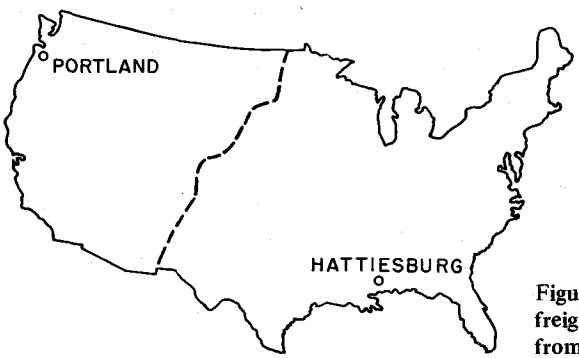

Figure 1. Line of approximately equal freight rates for poles and piling hauled from Portland and Hattiesburg in 1974.

MARKETING ACTIVITIES

Sales Procedures

Terms of Sale. The typical terms on most domestic sales are "net 30 days"—that is, full payment within 30 days of the invoice date. Discounts for early payment commonly are not given, and, as in most industries, sales to customers considered poor risks may call for full payment at the time of sale.

Pricing. Poles and piling are sold both on a delivered price and on an fob-at-origin price. Truck-hauled poles and piling usually are sold on a delivered price if the company owns or contracts its trucks and on an fob-at-origin price if the buyer arranges delivery. On rail shipments, poles and piling typically are invoiced on a delivered-price basis.

Payment procedure. Delivered prices are composed of the fob product price at the place of origin, plus an addition for freight charges, which is computed on the basis of established weights for the product being sold. Payment of the delivered price usually follows one of two procedures. The usual practice is to prepay the freight. Prepayment means the seller pays the freight bill and charges the customer the product price, plus freight charges. In the other, the buyer pays for the freight charges, deducting that amount from the total charge (based on a delivered price) and remits the balance to the seller.

Overweights and underweights. On rail shipments, sellers may try to negotiate for fob-at-origin prices if the poles or piling to be delivered have been seasoned for only a short time. Insufficient seasoning may result in excessive weight and, thus, extra charges for overweight shipments. Sellers are anxious to avoid being billed for overweight shipments, which reduce the profitability of the sale. Underweight shipments increase the profitability of the sale, thus sellers are anxious to sell on a delivered price if the products have been seasoned well.

Although respondents recognized the additional earnings possible from underweights, most thought that gains were small, especially if compared to gains experienced by the lumber industry. The smaller gains in the pole and piling industry were attributed to intense competition from other regions, especially for more distant markets where advantages from underweights really might be significant. Competition forces producers to estimate weights very closely for accurate quotation of delivered prices to buyers. Prices often must be net of any underweight gain if they are to be competitive. Gains from underweights are most significant when demand is unusually high. Buyers may require products in large quantitities over a short period. When quantity and speed are prime requisites and price secondary, money can be made from underweights; however, under normal conditions competitive forces tend to eliminate this advantage.

Export sales. A pole and piling firm doing business with a foreign buyer uses different terms of sale than when dealing with domestic buyers. Canadian buyers commonly are granted the same terms as domestic buyers, however.

Normally, payment for export sales is made in United States dollars in advance to avoid the risks associated with currency instability. The payment procedure is for the seller to bill the foreign purchaser for the full amount and then for the purchaser to make this amount available in United States currency in a United States bank. The bank sends a letter of credit to the seller, indicating that the required sum is on deposit. The money then is held in escrow by the bank, commonly for 90 days.

After the order has been filled, the seller makes out a bill of lading for each rail car or truckload sent to a port for loading on a ship. From these bills of lading, a mate's receipt will be prepared. A copy of the receipt is given to the loading superintendent, who checks what is loaded aboard ship against the receipt. When the poles or piling reported on the receipt are

safely aboard, a copy of the receipt is sent to the seller, the buyer, and the bank. If everything is in order, payment is made by the bank to the seller.

Middlemen. Commonly, in the pole and piling industry, producers negotiate sales directly with buyers without middlemen. Producers of untreated poles and piling negotiate directly with preserving firms and preserving firms deal directly with end users. To facilitate the marketing of their products, some large preserving firms maintain their own sales offices in prime market areas.

Occasionally, buyers with special orders will ask wholesalers to seek out the kinds of poles and piling desired. Wholesalers, as a rule, do not stock poles and piling, so they must shop around to find a firm that can satisfy the buyer's requirements. The buyer can shop around himself, if he has enough time, and thus eliminate the middleman. Usually, wholesalers are included only on rush orders or on orders where the buyer does not have easy access to the sales representative of a producing firm.

The requirements of users are so varied and unpredictable that buying treated products in advance of orders with any assurance of their quick resale is difficult. A wholesaler who buys poles and piling without firm orders easily could find himself unable to sell the products except at considerable loss. Lack of product standardization and the variety of specific needs of so many buyers are reasons why buyers deal directly with producing firms rather than through wholesalers.

Other types of middlemen are used besides wholesalers. Occasionally, brokers bring the producer and user together. These middlemen earn commissions for their services, in contrast to wholesalers who actually take title to the product and then resell it, they hope, at a profit.

The services of middlemen are more common on out-of-state than on local sales. Export sales usually are made between the producer's sales representative and an export agent representing the foreign buyer.

Storage and Inventory

Inventories of poles and piling normally are stored untreated at the point of origin, either at a concentration yard or in the storage yard of a treatment plant.

Problems with storage and inventory arise from the need to have sufficient poles and piling of various sizes and varieties to fill orders quickly as they come in. But excessive inventories require too much storage space and may lead to overdrying, a condition that may render products valueless after a few years.

The job of predicting future needs is made more difficult by the highly specialized needs of users of poles and piling. Stocking large inventories of particular sizes or grades of poles and piling in advance of orders is dangerous, especially if the customer is not known.

Reduction of market uncertainties arising from the highly variable needs of users is still another reason why producers and users deal directly with one another. Once the producer has established a clientele, he can predict future demands more confidently and is thus in a better position to control his inventory and use his storage space efficiently. The customer also benefits by being able to fill his needs rapidly.

Storage areas at some of the large firms in Oregon ranged from 25 to 40 acres. These areas included facilities for handling and rail shipment. Some of the firms also operated concentration yards at various locations in western Oregon.

Transportation Methods

Most Oregon-produced poles and piling sold in the United States are moved by rail and truck. Water shipments are used on some domestic deliveries to California and, of course, on all deliveries to Hawaii. Water transportation is used for all foreign shipments with the exception of Canadian deliveries, which typically are made by rail.

The two major factors influencing the choice of transportation method are the cost and speed of delivery. On rush orders, the most rapid method of transportation often is selected, even if it is more costly.

In general, rail shipments are cheaper than truck deliveries to any point that can be reached by rail. Often, deliveries must be made to off-rail sites where trucks are required to supplement rail service. Direct truck delivery often can be cheaper and quicker than a rail-truck combination. Even if rail-truck shipments to off-rail sites are cheaper, trucking may be much speedier.

Trucks are used widely for local deliveries, but rail shipments become more economical as distances increase. Trucks are sent from western Oregon as far as Utah to make off-site, rush deliveries, but this is about their limit. Trains are used on most out-of-state and on many in-state deliveries; to compare, for example, rates per hundred pounds between Ashland and Eugene in March 1973 were 47 cents by rail and 94 cents by truck.

Advertising and Promotion

Large-scale advertising is not widespread in the pole and piling industry. Most firms depend on the activities of their sales representatives to reach customers. Such advertising as does take place usually appears in trade magazines or in the form of mailed circulars to potential customers.

Much of the industry's promotional work is done through the American Wood Preservers Institute (AWPI), a nonprofit corporation that serves as the consulting and educational branch of the wood preserving industry. The AWPI advertises in various trade journals reaching engineers, architects, designers, contractors, and builders, because these professionals judge the technical merits of alternative construction materials and make recommendations on the types of materials that should be used on given projects.

Quality Control and Inspection

Quality standards and specifications for the industry were reported as being well established and enforced. Two associations establish and publish standards for product quality, workmanship, and measurement. Pole standards are published by the American Standards Association, and piling standards originate with the American Society for Testing and Materials.

The standards for preservative treatment of poles and piling are specified by the American Wood-Preservers' Association (AWPA), a nonprofit corporation of individual engineers, architects, scientists, and industry representatives. The Association publishes annual proceedings, as well as a "Book of Standards" for preservative materials and procedures for their use.

Inspections of poles and piling usually are made by the manufacturers themselves, as well as purchasers. Often, independent agents will be hired to carry out inspections. Rules of inspection are published by the American Wood Preservers Bureau, Inc. (a subsidiary of AWPI), AWPA, and by the federal government.

INDUSTRY PROBLEMS

Underground Installations

Most producers believe the movement toward underground installation of utilities is the industry's greatest problem because it could reduce seriously the demand for poles. The federal government, in directives issued by the Rural Electrification Administration and Federal Housing Administration, requires underground installation of utilities on many projects. Some segments of the public believe that above-ground installations of utilities—poles, wires, and wire supports—are esthetically displeasing, but some think the appearance of above-ground

installations could be improved through design. Others believe that the attitude favoring underground installations might change if the public knew the true costs.

Competing Materials

Poles and piling can be manufactured from steel or concrete. For example, at the time of the study, concrete piling was being used increasingly in the federal highway program, and concrete and steel poles were being used widely in urban areas and along major highways.

Concrete and steel poles and piling find favor because of their natural resistance to insect and pathogenic agents--they are more durable and have lower maintenance costs. Their installation costs are higher, however. For example, steel and concrete piling have from two to three times the in-place cost of treated wood piling. Preservative treatments of wood poles and piling also reduce the margin of advantage in durability of steel or concrete.

Respondents suggested two major ways by which the competitive position of wood poles and piling might be maintained, if not enhanced. The first was for the industry to increase educational and promotional efforts on the advantages of wood poles and piling over steel or concrete substitutes. These efforts would be aimed primarily at architects and engineers, perhaps as part of their training in school. The other suggestion was to increase efforts at product improvement. Application of more rigid quality controls to eliminate product failure was cited as an example of an area where improvement was needed.

Raw Material Supply

Lack of reliable sources of raw material was mentioned by several respondents as an important problem. As most firms do not have extensive holdings of their own timber, they rely in large part on outside purchases. Furthermore, they rely heavily on harvests from young stands.

When abundant old-growth timber was available as raw material for lumber and plywood, young timber was little valued for these uses, and the pole and piling industry could easily get the material it needed. With old-growth timber becoming scarce in many areas, many lumber and veneer firms are converting their factories to handle smaller logs from young stands. Greater competition for young-growth stumpage makes obtaining it more difficult and expensive for pole and piling firms. Respondents thought that a substantial increase in thinning programs on federal lands could improve the supply of raw material.

Development of New Markets

Two factors may contribute toward expansion of markets--or the maintenance of current levels of consumption, if the trends toward underground utilities and wood substitutes continue. One of these factors is the development of new uses for poles and piling, for example, in the construction of residential and commercial buildings. These uses are being explored and promoted by the industry. Another may come from expansion of overseas markets, particularly in the Pacific area. Many of the Pacific rim countries can be classified as underdeveloped. Economic growth in these nations could open markets for poles and piling for a wide variety of uses. Foreign markets also might be expanded by increasing promotion, education, and market research.

CONCLUSIONS

Given a continuing market for wooden poles and piling, the industry's future in Oregon will rest on its ability to compete with other regions for markets and on its ability to compete with other industries for raw materials.

In terms of technological capabilities, Oregon-based firms should be able to continue to compete. Research information from AWPA, AWPI, and the government is generally available to those firms interested. Furthermore, many firms have plants located in several regions including the Northwest. This means that those barriers that do exist to the flow of technical information exist more between firms than between regions.

Perhaps a more critical factor affecting Oregon's future output of poles and piling is the supply of raw materials. With the transition of Oregon's forests to young-growth timber, increased competition for available supplies of timber can be expected. What this increase will mean in terms of the competitive position of the pole and piling industry remains to be seen.

Finally, markets for Oregon-produced poles and piling may improve because of population and economic growth in areas nearer to Oregon than to other regional producers. The West is growing in population more rapidly than the rest of the nation. Further, the economic development of Alaska and the potential for growth in many countries of the Pacific rim encourage belief that a substantial and perhaps growing market will exist in the future for Oregon-produced poles and piling.

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