A VALUE ASSESSMENT OF THE CANADIAN PRESSURE TREATED WOOD INDUSTRY

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Introduction

Heavy-duty wood preservatives are chemicals registered for use under the Pest Control Products Act. The use of these chemicals is under statutory re-evaluation by Agriculture and Agri-Food Canada. This presentation will provide the highlights of a recently completed value assessment of the Canadian pressure treated wood industry which is a requirement under the registration review process. The Study was jointly funded by the Canadian Forest Service, Department of Natural Resources Canada and the Wood Preserving Chemical Supplier members of the Canadian Institute of Treated Wood. In order to estimate the value and economic impact of the use of wood preservatives, all Canadian treating plants, their wood and chemical suppliers, as well as the major users of treated wood products, were surveyed. Production and sales data for 1992 were collected and analyzed together with extensive information from the open literature. Analysis of past and future trends indicates that 1992 may be considered as a representative year.

The Study was completed by an alliance of consulting expertise, comprising:

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Background

Wood is a preferred construction material due to its availability, structural properties, ease of manufacture and relatively low cost. However, wood suffers biological degradation in exposed applications due to attack by fungi, insects, bacteria and marine organisms. The wood preserving industry provides the solution to this problem by using special equipment and a variety of pressure treatment processes to impregnate wood products with preservative chemicals which retard the degradation process. Available data show that, in general, products using the right combination of wood species and preservative treatment, demonstrate five to ten times longer service life than if they were untreated.

The wood preservatives available in Canada are used as solutions of either water or oil. These waterborne and oilborne formulations are as follows:

- Waterborne preservatives:
  - Chromated copper arsenate (CCA); and
  - Ammoniacal copper arsenate (ACA).

- Oilborne preservatives:
  - Creosote;
  - Pentachlorophenol (PCP); and
  - Copper naphthenate.

Industry Profile

The Canadian wood preserving industry has existed since 1910, and now operates plants across the country in every province except Prince Edward Island. Of the 60 plants currently in operation, 51 specialize in consumer products for the residential market, while nine may be classified as industrial product plants.

Thirty six plants are equipped with single cylinder facilities, 17 have two cylinders and seven have three or more. The total treating cylinder volume available in Canada is estimated to be 4,025 m^3 (142,150 ft^3). Forty five plants use CCA only, one plant uses creosote only, nine plants use CCA and PCP, four plants use CCA, creosote and PCP and one plant uses ACA, CCA, creosote and PCP. The majority of the plants (55%) are located in Ontario (17) and British Columbia (16).

The industry processes approximately 13% of Canada's annual consumption of lumber and sawn timber and virtually 100% of Canada's pole production.

Preservatives

The oilborne preservatives are used to treat products for the industrial markets, such as railway ties, utility poles, posts, piling and construction timbers. Although waterborne preservatives have replaced oilborne preservatives for certain industrial applications, their main use is for the treatment of lumber and plywood products for a wide range of uses in the residential market, such as patios, decking, fencing, landscaping and Permanent Wood Foundations (PWF). This residential market, dominated by CCA, has experienced significant growth since its initial development in the early 1970's.

In 1992, 79.1% of the total production volume was treated with waterborne preservatives and 20.9% was treated with oilborne preservatives. **(Figure 1)** The long-term forecast is

that the use of oilborne preservatives, particularly creosote, will decline due to reductions in both the Canadian railroad system and new construction programs involving the use of pilings and timbers. However, growth is forecast for CCA due to increasing homeowner demand for treated wood products.

Products

The total production of treated wood in 1992 was 1.985 million m^3 (70.1 million ft^3) in actual volume or 493 m^3 of wood per m^3 of cylinder volume. The largest volume product was consumer lumber at 1.01 million m^3 (35.8 million ft^3) which is 51.1% of total industry production. The second largest product was poles at 0.423 million m^3 (14.95 million ft^3) representing 21.3% of total industry production. Industrial lumber, posts and ties totalled 0.478 million m^3 (16.87 million ft^3), equivalent to 24.1% of total production. The remaining 3.5% of total production included PWF lumber and plywood, land and marine piling and treated shakes and shingles. Total production volumes by region are shown in **Figure 2**.

Species

Figure 3 shows production volumes by species for 1992. The Spruce-Pine-Fir (SPF) species group accounted for 31.3% of total production while the domestic pine species represented 49.3%.

Employment

Total direct industry employment for 1992 was estimated at 1,317. The majority of jobs, 1,047, were in operations, with 188 in administration and 82 in sales.
(Figure 4) On average, the larger industrial product plants had 43 employees, while the smaller consumer product plants had 18 employees. An indirect employment multiplication factor of three demonstrates that the industry is responsible for providing employment for approximately 4,000 Canadians. The average labour cost in 1992 was \$ 21.68/m^3 (\$ 0.614/ft^3) of treated product and overall productivity was 1,516 m^3 (53,520 ft^3) per employee.

Economic Impact

The total volume of treated wood products currently installed in Canada is estimated at 32.111 million m^3 (1.134 billion ft^3). Many of these products have been installed for 30 to 40 years. The estimated value of the total installed volume is in excess of \$ 10 billion (1992 \$), as shown in **Table 1**.

It should be noted that the product values represent the estimated replacement costs and do not include associated installation costs.

The total value of treated wood produced in Canada in 1992 was $ 547 million. The value of the wood used by the industry was $ 301 million in lumber and timbers and $ 52 million in poles, posts and pilings. In addition to this direct contribution to Canada's forest industry, chemical purchases represented $ 41 million and total direct wages amounted to $ 43 million.

Based on total wood costs of $ 353 million and total sales revenue of $ 547 million, the wood preserving industry added $ 194 million in value to Canadian forest products in 1992. However, if the industry did not exist, Canadian wood supplier revenues would be reduced by at least $ 35 million (10%) due to a combination of reduced prices from other Canadian users and increased shipping costs to U.S. treating plants. Therefore, in reality, the total added value contribution of the wood preserving industry is in excess of $ 229 million.

The industry exported 165,425 m^3 (5.842 million ft^3) of treated wood products with a total value of $ 46.43 million in 1992. The US and offshore markets accounted for 75% and 25% respectively of total volume. Export products included poles (71.7%), consumer lumber (17.6%), posts (5.7%) and industrial lumber and timbers (5.0%).

The estimated total book value of treating plant fixed assets is $ 153.76 million. Reported values ranged from $ 780,000 to $ 15 million with an average value of $ 2.563 million. The average plant replacement value is estimated at $ 4.5 million for a total industry replacement value of $ 270 million.

Industry Growth

The market for treated wood products increased by 250% for the period 1970 to 1990, largely as a result of the promotional activities of the CCA suppliers in the consumer lumber sector. **(Figure 5)** No growth was recorded for the period 1990 to 1992, but an annual growth of six percent is predicted for the near future for CCA.

Export products, currently at only 8.3% of total volume, represent a significant opportunity for growth in view of specific markets that are developing in Europe, the Middle East and Asia. However, these markets use not only the preservatives available in Canada, but also others that are not yet registered in this country. Lack of availability of new preservatives will limit access to export markets and also expose the industry to import threats. For example, there are preservatives available in the US which have not yet been registered in Canada. Products treated with these preservatives can be readily imported from the US, as the preservatives concerned are included in Canadian standards.

Impact of Preservative Restriction

Restriction of the use of the currently available wood preservatives will result in the following scenarios or various combinations thereof:

- Conversion to untreated wood
- Conversion to imported treated wood
- Conversion to alternative materials

Untreated Wood

As wood preservation generally increases the useful life of wood between five and ten times, the ultimate scenario would be that five times more untreated wood would be required to replace the 67 million ft^3 of treated wood consumed each year in Canada. This would require a 12.5% increase in the annual log harvest, equivalent to approximately 66 million trees. The area of forest land required to sustain this increased level of production would be 1.5 million acres, roughly the area of Prince Edward Island.

Imported Treated Wood

If the existing preservative chemicals are banned under the Pest Control Products Act, and no further regulatory action is taken, Canadian users will be able to readily import wood products, treated with the same preservatives, from the US. The ultimate scenario involving complete conversion to imported products would cause the loss of 4,000 jobs, $ 229 million in added value, $ 46 million in exports and $ 154 million in fixed assets. In addition, Canadian users would pay at least $ 55 million more for the same products, and Canada's balance of trade could be impacted by as much as $ 600 million.

Alternative Materials

In the event that further regulatory action is taken to prevent the use of treated wood products in Canada, alternative materials will have to be employed. Industrial markets such as railways, utilities and federal and provincial highways, parks and public works construction authorities will all face significant cost increases. The most popular alternative materials for industrial applications will be steel and concrete. Users estimate that concrete will increase their material costs by 100%, while steel will add 200%. Therefore, industrial product costs will increase by an estimated $ 250 to $ 500 million per year. Furthermore, as currently installed treated wood products approach the end of their useful life, they will have to be replaced by alternative materials. This means that over the next 20 to 30 years, an

additional $ 6 to $ 12 billion will have to be spent on materials for recreation, agriculture, telecommunications, transportation, construction and power distribution systems in Canada. This additional level of cost will not result in any measurable benefits or improvements in efficiency. It will simply result in increases in the cost of goods and services to the Canadian consumer. These cost estimates are undoubtedly conservative as they do not include the increased installation and maintenance cost that users claim they will face with materials such as steel and concrete.

The residential market for treated wood products is driven by the homeowners' desire to improve the value of his investment. If alternative materials meet the cost and appearance requirements of this market, Canadians will simply pay more for their patios, decks, fences and landscaping systems. However, prohibiting the future use of treated wood will have a serious impact on the thousands of homeowners who have already installed these products. Due to concerns related to safety, health, life-style disruption, property depreciation and additional expenditure, homeowners' will, no doubt, expect that government will provide financial assistance for the removal and replacement of treated wood products. Homeowners' costs for removing and replacing the $ 3.5 billion of treated residential wood products, already installed in Canada, would be well in excess of $ 5 billion and could be as much as $ 10 billion.

The situation for Canadians who own houses with PWF would be even more serious. The major issue would be the significant reduction in market value of houses which are identified as having a hazardous product as an integral part of the actual structure. To maintain market value, the existing 100,000 PWF's would have to be replaced by finished concrete basements. Actual experience with this type of major conversion, indicates that the total cost of PWF replacements would be in the order of $ 5 billion. Temporary accommodation and other costs, such as landscaping, would increase this estimate significantly.

The banning of treated wood products for either industrial or residential uses would create a disposal problem of enormous magnitude, involving the safe removal, handling, transportation, storage and treatment of more than one billion ft^3 of waste materials. This volume is equivalent to the total amount of lumber and timber that would be consumed in Canada over a three year period.

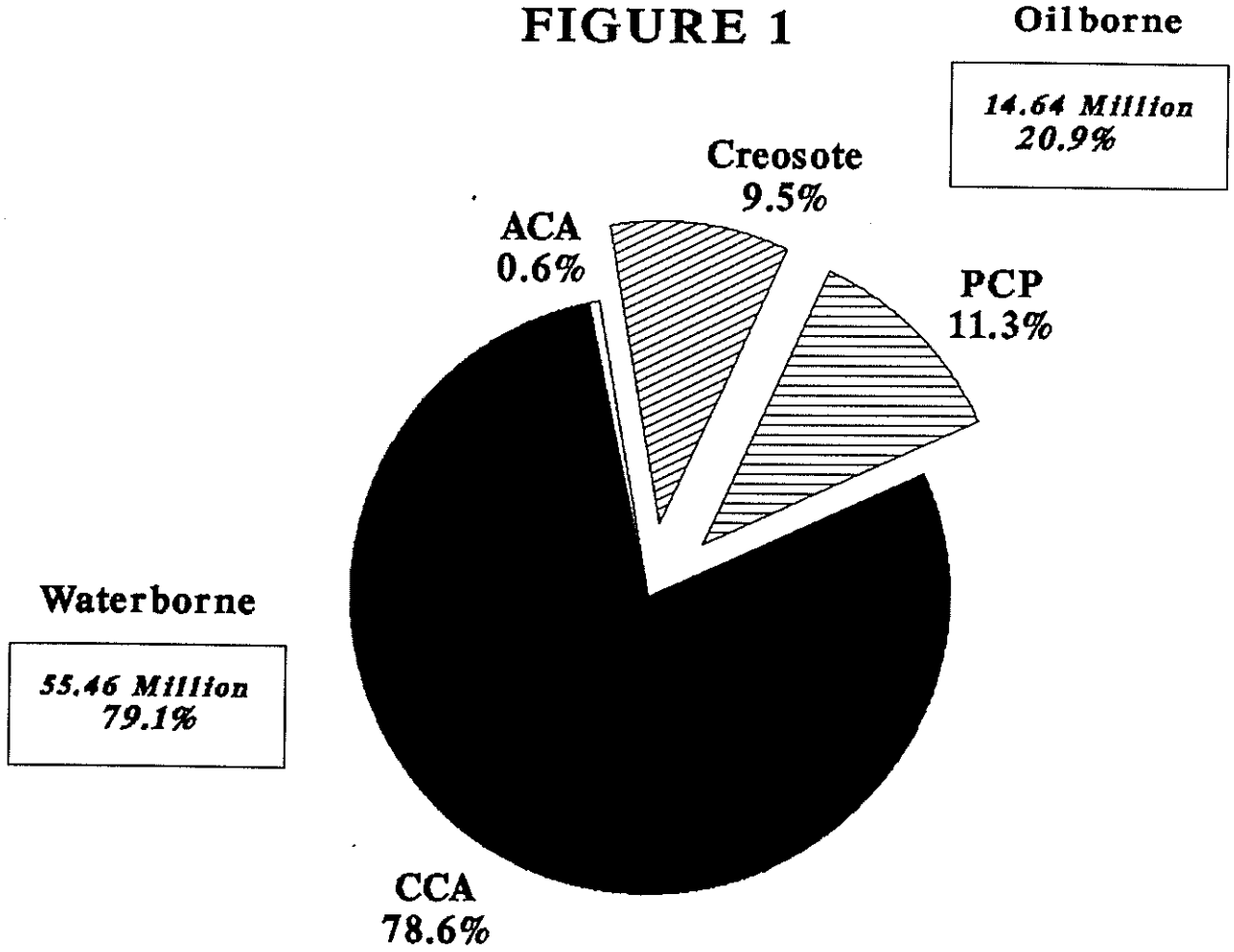
The wood preserving industry has a commitment to product quality and safe operation. For example, wood preservative formulations, treatment processes, product requirements and quality control procedures are carefully developed and regularly reviewed in conjunction with the Canadian Standards Association (CSA). In the CSA process, a new wood preservative must satisfy a comprehensive range of tests designed to establish efficacy and leach resistance before being accepted for use. Also, treatment process limits are established to prevent damage to the wood and treatment results are specifically designed for individual preservatives, species, end uses and exposure hazards. The industry, in conjunction with

Environment Canada has participated in the development of codes of practice which are now used for the design and operation of treating plants. These measures are designed to reduce or eliminate the release of wood preservatives to the environment and also minimize exposure of workers to wood preservatives. This commitment to product quality and safe operation reinforces the contribution that the wood preserving industry makes to the economy of Canada and the sustainability of Canada's forest resource.

Table 1: **Total Installed Volume of Treated Wood Products in Canada**

Product	Volume (millions m^3)	Value (1992 $ Millions)
Ties	7.929	2,625
Poles	8.495	3,000
Consumer Lumber	12.459	3,500
Other	3.228	910
TOTAL	**32.111**	**10,035**

FIGURE 1



1992 Volume 70.1 Million Cu.Ft.

FIGURE 2

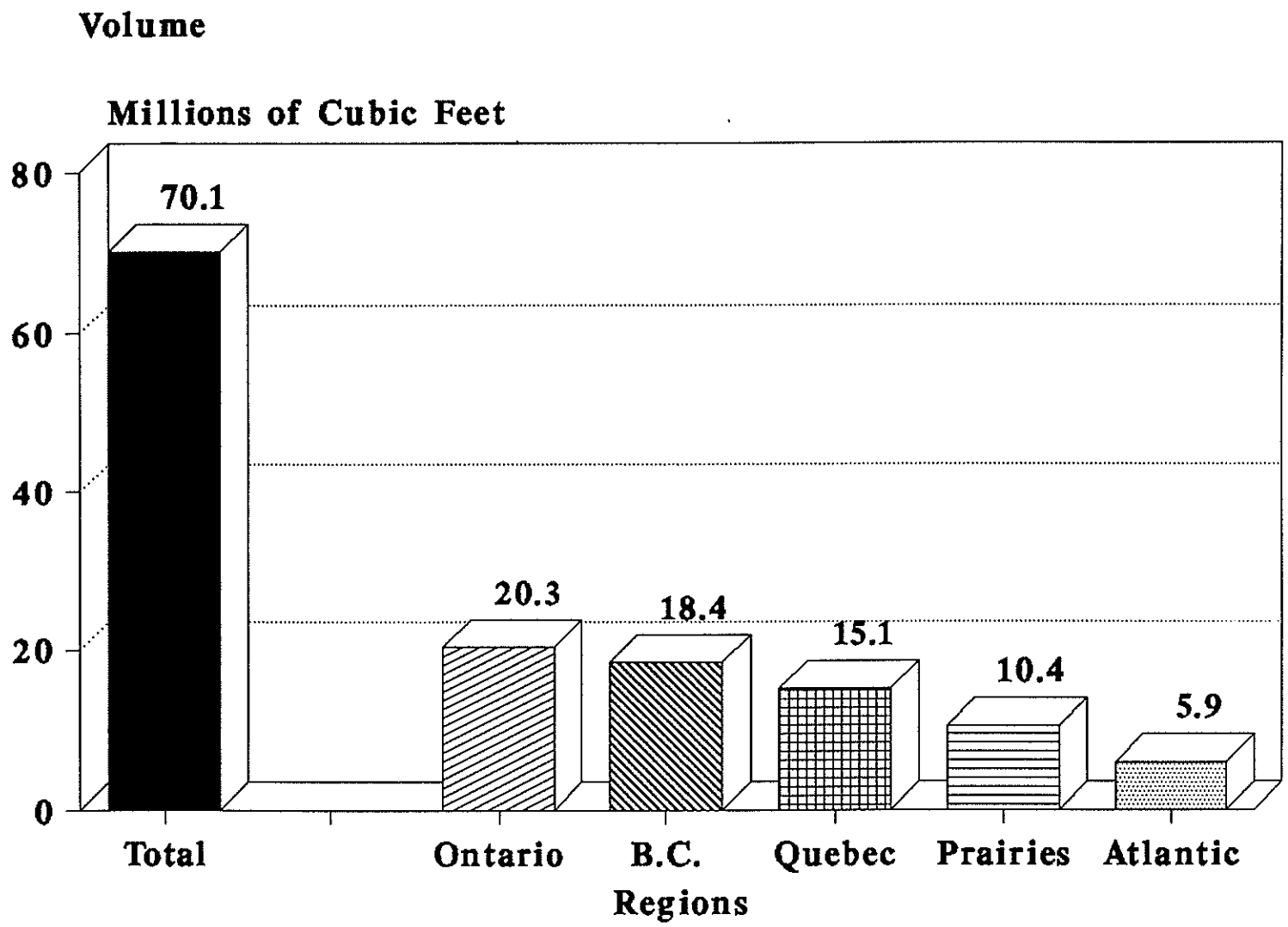

Volume
Millions of Cubic Feet
80
60
40
20
0
70.1
20.3
18.4
15.1
10.4
5.9
Total
Ontario
B.C.
Quebec
Prairies
Atlantic
Regions

FIGURE 3

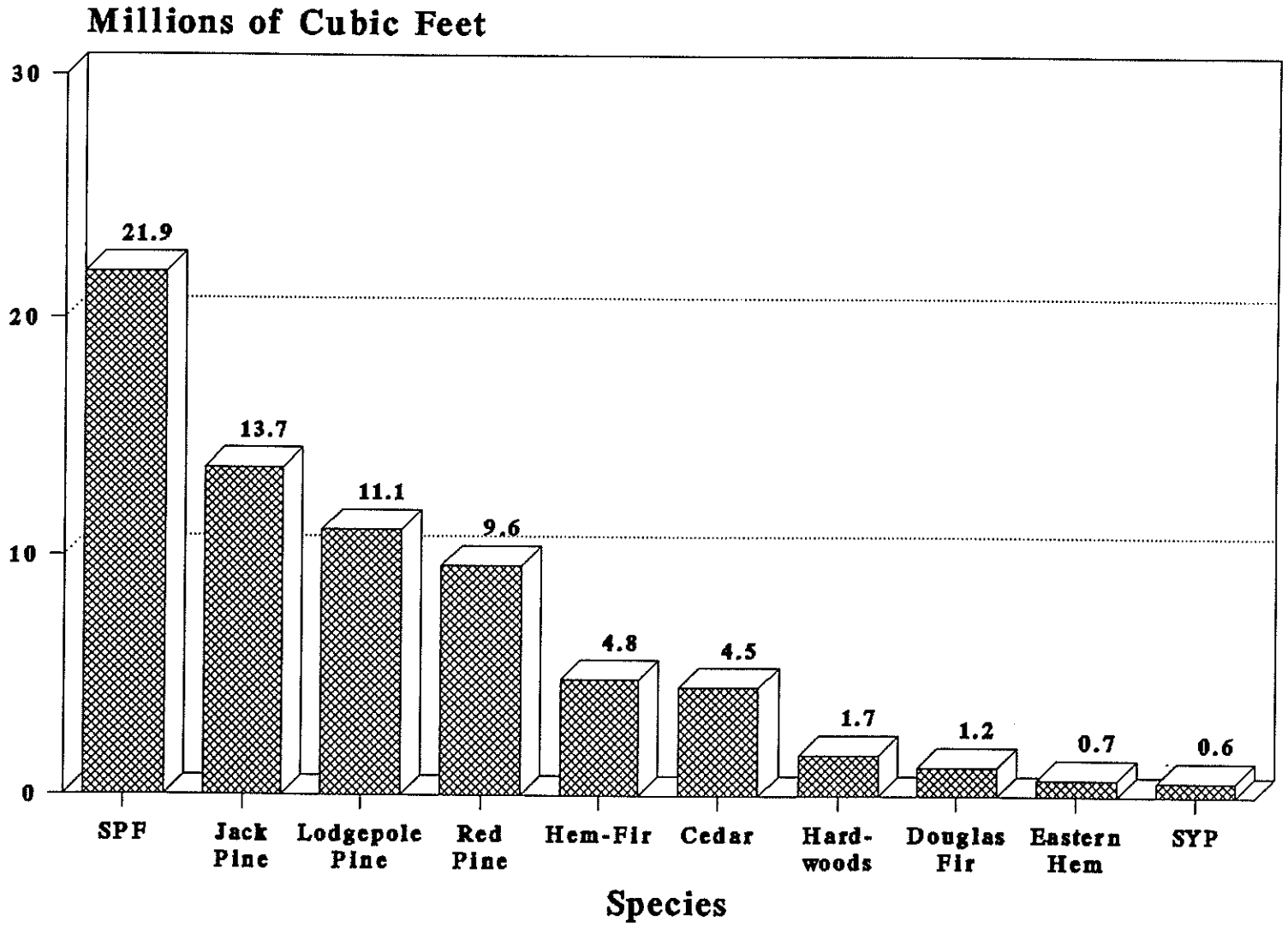

Millions of Cubic Feet
30
20
10
0
21.9
13.7
11.1
9.6
4.8
4.5
1.7
1.2
0.7
0.6
SPF
Jack Pine
Lodgepole Pine
Red Pine
Hem-Fir
Cedar
Hard-woods
Douglas Fir
Eastern Hem
SYP
Species

FIGURE 4 - EMPLOYMENT

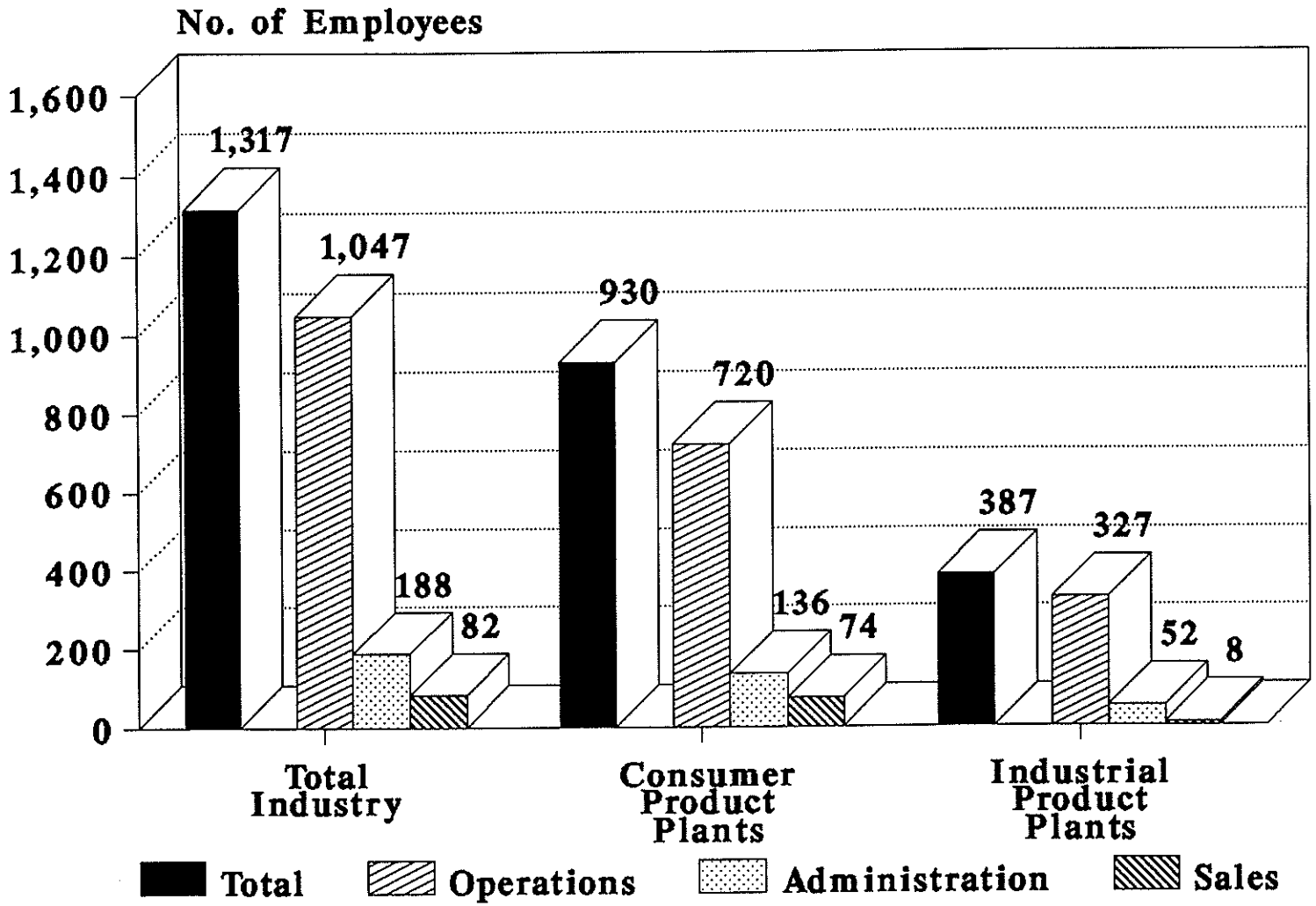
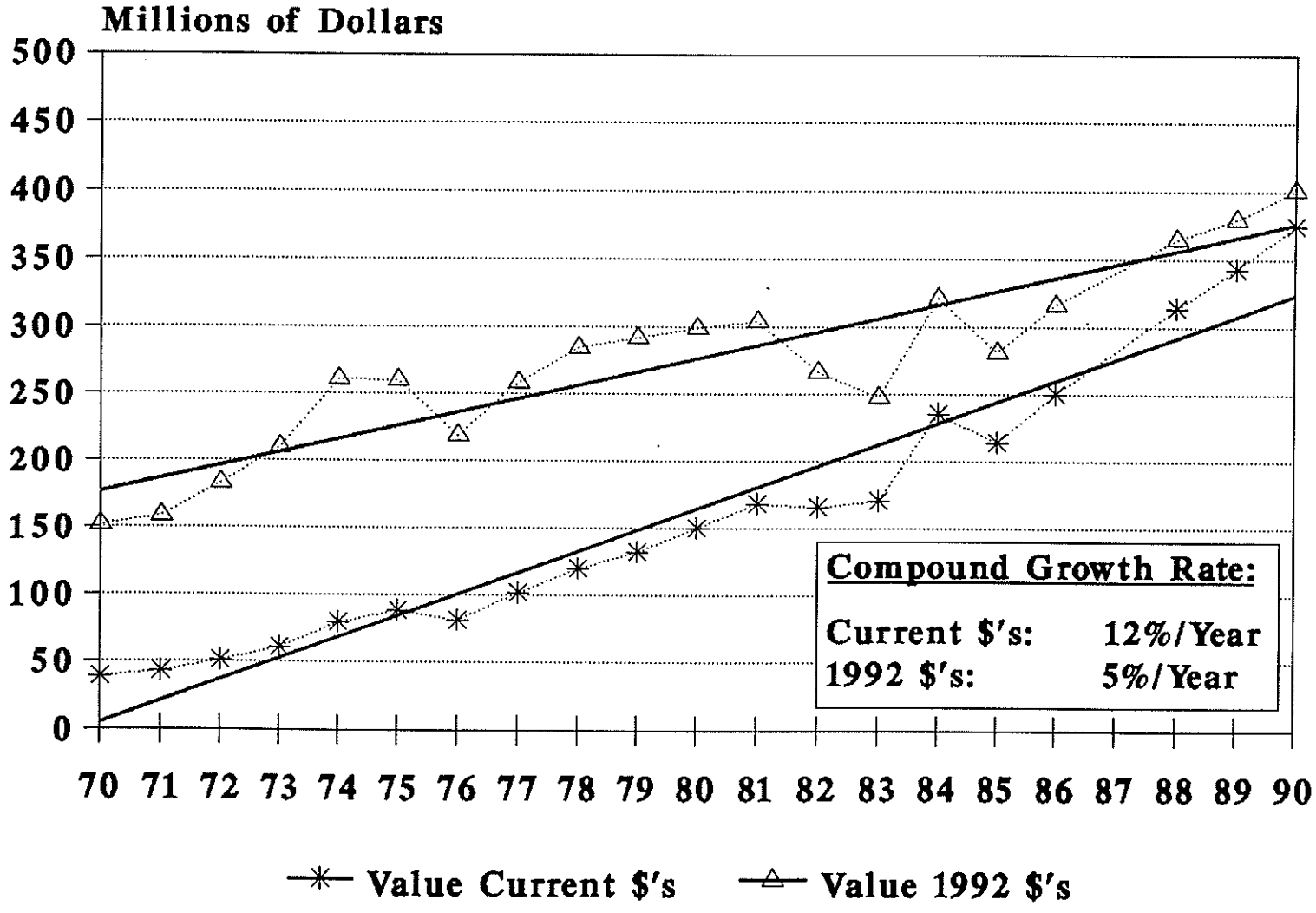


FIGURE 5


Millions of Dollars
500
450
400
350
300
250
200
150
100
50
0
70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90
Compound Growth Rate:
Current $'s: 12%/Year
1992 $'s: 5%/Year
Value Current $'s
Value 1992 $'s