

## [測定経営研究室]A. Some aspects of Japanese and Australian Forestry

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(A) Some aspects of Japanese and Australian

Forestry

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1. Introduction

At the present time, Japanese Universities are in a very serious situation. I have heard that more than half the University students are making demonstrations or strikes against government and University. They contend with three main points:

One is the University Administration Law; the second is the U.S.A. and Japan Safety Defence Agreement; the third is the return of Okinawa. I must go back into the storm of student struggles. Compared with these conditions, your University seems to be quite peaceful. I hope that it will remain so.

2. Met with Prof. Schumacher

I graduated from Kyushu University in 1939, so I am quite old. After that I worked as forester in Japanese Crown Forests and served as a soldier during war time. This period was 10 years. During this period I did no study but had some practical forestry experience and physical training. In 1946, I came back to my school as an assistant professor to teach and research forest mensuration.

Before World War II, Japanese forestry did not use sampling method in the modern sense. When I was a student in Department of Forestry, I got accidentally one book. It was Bruce and Schumacher's Forest Mensuration. The technique was quite different from the mensuration we had learned. So I decided to change the method of mensuration from old German style to methods depending on sampling. During the last twenty years I have tried many sampling

methods in forestry and taught forest mensuration to students. These reports total more than one hundred, mainly written in Japanese, but several in English. Fortunately, in 1956-1957 I met Prof. Schumacher at Duke University, N.C. I have learned more from him.

### 3. University Forest

Now I am directing the research of the University forests and additionally teaching students about Statistics in Forestry ( one year course ) and also photogrametry in Forestry. My main subjects are now the study of volume estimates by densitometer and experimental designs in forestry, but I am not progressing rapidly with them because of so much work involved with the University forests. Our University Forests are now 17,500 acres in total area, 9,000 acres in Hokkaido and 8,500 acres in Kyushu. Plantation areas are about 4,000 acres, about 25% of total area.

Main species are Cryptomeria, Chamaecyparis and Pinus in Kyushu, and Larix in Hokkaido.

Annual cutting volume is about 10,000 cubic meters, or 350,000 cubic feet. Income is about \$125,000. Total average volume is about 1500 cubic feet per acre, so total volume is 26,250,000 cu.ft. The cutting ratio is 1.3% or a little more. The natural broadleaved forests are mainly converted into coniferous plantation.

Cryptomeria japonica is the most common plantation tree and its regeneration is done by cuttings. We are at present establishing a tree improvement research center in one of our University forests near the University in Kyushu so I am hoping to see as much tree improvement work as I can while in Australia.

Japan now has 24 Universities with a Department of Forestry. The "big four" are Hokkaido University, Tokyo University, Kyoto University and Kyushu University. They all have a doctoral degree course.

The total area of University forests in Japan is about 100,000 ha ( 250,000 acres ).

#### 4. Japanese forestry

To compare Japan and Australia

	Japan	Australia
Total area (hectares)	40 million	800 million
Forest land	25 " (62%)	200 " (25%)
Population	100 "	12 "

Australia has about 70 times as forest land per head of population as Japan.

A few details of Japanese forestry:-

50% of forest land is located at more than 400m (1200 feet), and also has more than 30° slope.

30% of forest land is located at more than 1 mile from road.

Unexploited forests are now about 36% in area,

48% in volume and 40% in increment.

However, there are a lot of problems associated with the presently unexploited forest. To reduce costs of logging and transportation, large areas must be clear cut and cables used for extraction. This is dangerous to erosion control and wind, snow and cold damage.

In the Japanese forest area, National forest is 32% and non-government forest is 68%, which is divided into private forest, 57%, and public forest, 11%. This situation is quite different from Australia. Forest policy and management are complicated for historical reasons.

#### 5. Japanese timber demand and plantation shortage

Japanese total forest area, 62,000,000 acre with 20,000,000 acre plantation about 32%. Forest total volume is 60,000,000,000 cubic feet and plantation forest volume is about 20,000,000,000 cubic

feet, about 30%. The average volume in Japan is  $76\text{m}^3/\text{ha}$  or roughly 1,000 cubic feet per acre.

Total growth rate and cutting rate nearly equal at about 3%, but cutting is a little higher. Total average growth rate is  $2.9\text{m}^3/\text{ha}$  or roughly 40 cubic feet per acre. In plantations MAI is about  $4.0\text{m}^3/\text{ha}$  or 60 cubic feet per acre the largest plantations sometimes have a volume per ha of  $2800\text{m}^3$  or 40,000 cubic feet per acre. But such high stocking is very rare and usually the stocking is very low now in Japan. We must improve Japanese forest stocking much more.

Japanese timber demand is about 3,000,000,000 cubic feet annually; 65% for sawtimber, 30% for pulp and plywood: 60% of demand is supplied by domestic timber and 40% is supplied by imported timber. About 50% of imported timber comes from tropical countries, 27% from America, 16% from Soviet Russia and 7% from New Zealand, Australia, South America and Africa.

According to our 50 year-planning plantation area would be 23,000,000 acre or 56% of total forest area, and its volume would be 10,000,000,000 cubic feet and annual production will be 3,000,000,000 cubic feet. The supply volume in 50 years ahead will, thus, meet with the present demands. However, the demand will also have increased about 2 times in that time so there will still be a shortage of wood material. The demand for imports will be a maximum in 1980 and then will gradually decrease. Unfortunately the extension of private plantations is decreasing for various reasons such as the likely decrease in revenue for wood, competition from imports, cost and shortage of labour and the complicated ownership system.

We have so many problems. Japanese forestry must be improved.

## 6. Australian forestry

Compared to Japanese forestry situation, Australian forestry in quite hopeful condition, I think. I have seen several forest districts. Tumut in New South Wales, Traralgon in Victoria and Mt. Gambier in South Australia and also A.C.T. Forests. Moreover, Beerwah and Imbil in Queensland. Pinus radiata plantations are very large scale and growth is so rapid. Compared to Japanese Cryptomeria, Pinus radiata plantation yield is more than twice, as the following table shows:-

Age	SQI		SQIII		SQV	
	PR	<u>Cryptomeria</u>	PR	<u>Cryptomeria</u>	PR	<u>Cryptomeria</u>
10	3,800	1,260	2,500	830	1,000	420
20	9,400	4,200	7,000	2,800	4,500	2,100
30	13,700	7,700	10,700	4,200	7,700	2,800
35	15,000	12,000	12,000	4,900	8,800	3,500

From N.B. Lewis, Management for Sustained Yield of State Pinus radiata Plantations in S.A. 1957. (cubic feet per acre)

Australian forestry is characterised by an abundance of natural forest, especially Eucalyptus, rapid growth rate, flat or undulating country, plantations based on industrial considerations, modern mechanised systems in nurseries, planting and logging. Thinning is well developed. Tree improvement is very systematic. In Kyushu, Crptomeria plantations are established from cuttings and there are many varieties but we do not have a very systematic experimental programme.

Finally, I saw many good designed forest experiment areas, especially lattice design which I have never tried. I would like to try this method for cryptomeria plantations. My stay in Australia was only three months but I was given much more knowledge about Australian Forestry. Japan has many steep lands we must be encouraged to keep and to improve our forests with learning your wise way to treat your

forests.

At last I must express many thanks to Dr. Carron who encouraged me to come to Australia and Professor Ovington and many of the staff and students of the Department who gave me many precious gifts in Australian forestry.

Kenkichi Kinashi

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