FINANCIAL ASPECTS OF RAISING FOREST CROPS BY MEANS OF PLANTATIONS

by

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Ordinarily the best way of discussing the financial aspects of forestry operations is to be specific and to talk in terms of actual illustrations. Unfortunately, I know of only a few instances where the actual growing of a forest crop from planting to harvest has been carried all the way through to completions and these are not in the Nest. Therefore, I am going to take a different approach to this subject. What I would like to do is to discuss some of the more important economic trends which nave developed in American forestry during the last decade or twos and to point out the implications of these trends for the future of plantation forestry.

Twenty years ago, when I first entered the forestry professions the financial aspects of raising forest crops by means of plantations could have been summed up very simply--they were highly discouraging. A substantial amount of forest planting was being clones to be sure. Between 1937 and 1941 new plantations were being established at the rate of over 450,000 acres per year--a little higher rate than that of the last Yew years. But the took place under the influence of government unemployment relief programs and vas accomplished despite the financial outlooks rather than because of it. With the cheap stumpage prices which then prevailed It was only rarely that prospective returns from plantations could be expected to exceed the costs.

But now we are in a high-priced wood economy. Financial incentives have become a truly important stimulus to planting effort. This is indicated by the fact that planting on private land now far exceeds that on public land. Moreover, industrial plantations undertaken without any form of direct public subsidy have recently accounted for as much as a third of the total acreage being planted. The power and importance of financial incentives are attested to by the fact that in recent years a principal limiting factor in the establishment of new plantations in the West has been the shortage of planting stocks rather than lack of interest on the part of landowners.

The economic developments which have led to this revolution *in* the financial outlook for forest plantations are worth looking at more closely. Without doubt the most important change in the financial outlook is the dramatic rise in stumpage values which has taken place during the last decade. In some areas, particularly the South, this rise in values began before the War. Although it was held in check by price controls during the war-time periods the evidence in the past ten years has become unmistakable that we have moved into a new period in standards of timber value. For example, between 1942 and 1952 the average value of stumpage sold from all National. Forests rose from $3.00 per M board feet to $14.00 per M board feets almost a five-fold increase. The rise was particularly sharp in. the West with a seven-fold increase in Oregon and an almost ten-fold increase in California. Private timber values appear to have experienced only slightly less impressive increases.

The important thing about this increase in values is that it has been at, a far greater rate than the increase in costs. Therefore it has resulted in a drastic shift in the relation between the costs and the returns of forest management. It has transformed the situation from one in which the financial incentives to planting were negligible to one in which they are of very great importance on

considerable areas of forest land.

From the standpoint of the future outlook for planting the most important question is, W ill these higher price levels continue to exists or will stumpage values ultimately settle back closer to where they were two decades ago? The boom markets for wood products experienced since 1946 probably represent a somewhat higher average level of demand than may be experienced continuously in the future. There are almost sure to be short term slumps. But these should be temporary. During recent years a number of analyses of long term future timber demands have been made. Although they differ in details all of these have led to the same basic conclusion; namely, that in the absence of a major catastrophe to our economic systems wood demands are likely to continue to expand at a slow rate during the next several decades.

Against this stable demand outlooks we can look forward to a continuing decline in standing timber volumes here in the West for at least another few decades. In. the face of this sort of timber supply—demand outlook it seems highly probable that stumpage values will be maintained at present levels. They may well go somewhat higher. If this proves to be corrects the "New Look" in the economics of planting is here to stay.

Increased timber values are not the only factor which has changed the financial outlook for planting. An increasing number of landowners are now placing their forest properties under programs of permanent management. This means that the owner is committed to giving fire protection and administrative supervision to his entire property, and to paying taxes **on** it. All of these costs depend primarily on the area of land in the property, not **on** the amount of young growing stock on it. Under such circumstances there is an additional direct financial incentive to the owner to build up the stocking and yield obtainable from the forest. By planting up old burns or other unstocked or understocked areas and interplanting partly stocked stands, the ultimate productivity of the property can be increased without increasing annual expenses. Hence on a Tree Farm or similarly managed area, plantations are considerably more attractive financially than on areas where no forest management commitments have been made.

Another factor which is likely to become increasingly important as time goes on is the possible savings **in** the cost of stand establishment which forest planting may permit, even in areas where natural regeneration is perfectly feasible. We usually think of planting as a much more expensive means of getting stocking than natural regeneration. In terms of initial expenditure per acre this *is* often true. But in our present high-priced wood economy costs per acre are much less important than they used to be as a guide to what *is* wise. Costs per thousand board feet of yield have now become the critical factor. Because planting permits prompt establishment of the new stand it results in a shorter effective rotation than would be required to produce trees of comparable size and volume from naturally regenerated stands. This shortening of the rotation has very important financial effects, and the costs per M board feet of timber grown may be substantially reduced by even a few years reduction in the effective length of rotation.

For example, the savings in carrying charges and interest on investment which would result from shortening by five years the length of time required to grow a sawlog stand averaging 20 inches d.b.h. on Site II Douglas-fir land have a present value of between $10 and $15 per acre. In species such *as* sugar pine -where seed years occur only at rather long intervals, the savings on this account would be considerably greater.

Moreover, wherever silvicultural conditions require that seed trees be

reserved from cutting in order to obtain natural regenerations planting permits some important immediate economies. At present stumpage values for pines it costs $10 to $20 per acre in interest charges alone to leave good trees as seed sources for an additional five years after the major cut. Thus s under many circumstances virtually the entire cost of planting an area might 'be covered by consequent savings in other costs of management resulting from the shortened rotation and elimination of seed tree costs.

A moment ago I mentioned the fact that it is cost per M board feet of yield rather than cost per acre that is of greatest importance to the financial success of a planting venture wherever wood is high priced. It is a rather unfortunate thing that up until now emphasis in much of our forestry thinking has been on per acre costs rather than on costs per unit of product. The fact that under current conditions it may cost $3 to plant an acre of timberland tells us little about whether such a planting is financially feasible. In comparison with costs of a few years ago the figure looks pretty high. But if the plantation is to be established on a good site and if good survival can be obtained, the expected yield may be in the vicinity of 50 M board feet per acre at 90 years of age. After charging interest on the investment at 2.5 percent annually this amounts to a regeneration cost of about $6.50 per M board feet of yield. This is certainly not excessive in the light of prospective stumpage values. It indicates that, where productivity is goods even higher levels of planting cost could be incurred without undue financial strain.

On the other hands if the same $35 per acre investment were incurred on Site III Ponderosa pine land with a prospective yield of 25 M board feet per acre 120 years hence, the costs would exceed $30 per M board feet of yield. In comparison with stumpage values this is clearly too much to pay for regeneration alone.

This illustration shows that per acre costs of planting are of very little direct help in appraising financial aspects of the problem. Only when costs can be estimated in relation to prospective yield do we get a. fair picture of the economics of artificial regeneration Moreover, as soon as we start to think in terms of costs per M board feet, it becomes apparent that forest productivity is the most fundamental factor influencing financial, aspects of the planting situation. If productivity is high, comparatively large investments per acre may be profitable because the high productivity means low cost,. per M feet of yield. Buts if productivity is lows even small investments per acre may be unwise because per M costs cannot help but be excessive where yields are small.

This emphasis on productivity leads to two practical conclusions. The first concerns selection of planting areas. Immediately after World War II both public and private forestry agencies advocated greatly expanded planting programs with the stated objective of ultimately reforesting all or most of the forest land which was unstocked or poorly stocked. This area has been estimated at between 60 and 75 million acres, roughly one seventh of the commercial forest area of the country. At recent rates of planting it would take 150 years to accomplish this objective of planting up all our unstocked areas. In addition to being unrealistic in terms of present planting capabilities it seems to me wholly unsound thus to think of planting programs in terms of trying to restock every idle acre. The fact that there is such a large area without adequate stocking emphasizes the importance of using what planting stock we have to reclaim only the most productive types of land. This means planting only on high site areas and letting the less productive land remain unstocked, unless considerations other than timber values require a different treatment. This principle of using the limited supply of available planting stock only in those places where high productivity is

possible is equally applicable to individual forest properties and to nationwide planting policies.

I do not think we can afford any longer to take the position. that any unstocked forest area which can be planted with a fair chance for survival is automatically a place that should be planted.

Of more direct concern to nurserymen is a second conclusion to be drawn from this matter of productivity. If favorable, financial results are to be obtained from planting, the quality of the planting stock as it affects survival and future growth is just as important as the quality of the site. In the example I used a few minutes ago, $35 per acre planting costs led to a cost of $6.50 per M board feet of yield. However, if because of poor planting stock the rate of survival had been low so that actual yields fell short of those potentially obtain, able from the site, costs would have been far higher. If survival were only 50 percents the regeneration cost would be increased to $13 per M. Moreover, because cf the reduced yields, almost every other item of forest management cost including taxes, fire protection, and general administration would be in effect doubled as a direct result of the poor stock.

Usually, when financial aspects of planting are being considered s the emphasis is on getting lower costs per thousand trees and lower planting costs per acre. As a result there has been a tendency to overlook the financial significance of planting stock quality. I am sure that every nurseryman can think of a number of ways in which better stock could be produced. Much of your discussion today has dealt with just such matters. Perhaps you have tended to write some of these possibilities off because they would involve some increase in. your costs of production. BA the important financial, aspect is that these increases in quality will actually result in lowering costs, when the latter are measured in relation to final yield.

The quality of stock is in fact often a more important financial consideration than its cost. This is so because the cost of planting stock usually represents only 20 to 25 percent of the total cost of producing the final crops while the quality of the stocks through its effects on yields, has an indirect influence on almost all costs of production. For examples if you can produce stock sufficiently improved so that ultimate yields will be raised by 10 percent, the resulting stock is worth not just 10 percent more but probably 40 to 50 percent mores because of this favorable effect of the yield increase on all classes of management costs.

In effect, there is a great deal of financial leverage attached to this matter of planting stock quality, particularly in areas such as California where survival rates have often been disappointing. There seems little doubt that both research and nursery practice can make substantial contributions to quality improvement. In the face of the expanding opportunities which planting now seems to present, the financial stakes to be gained from better quality are far more important now than they ever have been before.