Industrial Interest in Genetically Improved Forest Nursery Stock

by
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I appreciate the opportunity to speak to your group and regret that I will be present for only a portion of your meeting. I have been asked to present an example case of industrial interest in genetically improved forest nursery stock. Before presenting my example case, however, I thought you might be interested in a very simple survey I made and the responses I received.

This survey was made of five companies operating within the Central States region. These companies use hardwood to manufacture various paper products.

Question 1: Does your company have, or contemplate, a program to develop or use improved stock?

Reply 1: I could not find an economic reason to justify the use of high cost row-crop land for growing trees at the present price we can afford to pay for wood. We would have to strive for fiber content as well as growth rate. It's difficult for me to believe that the two are compatible.

Reply 2: I feel that we, in our procurement area, would have very little, if any, use for improved nursery stock. Our land here in the agricultural area has an average value of approximately $600 per acre and grows an average of 100 bushels of corn. This makes it impossible to purchase land on which to grow timber. This would automatically eliminate our company from being large landowners.

Reply 3: Our hardwood mills are concerned primarily with oak and our land management programs revolve around natural regeneration. However, the company does have an active program at those mills which use pine.

Now, having heard the debit side, let's have a look at the credit side of the ledger.

Reply 4: Our company does have .an interest in improved stock here in the Midwest. In the past 3 or 4 years, this interest has been limited to work with the University, our own small experiments, and offering free hybrid poplar stock to interested small woodlot owners.

Reply 5: Our company has a limited research program on hybrid poplar which I have been conducting over the last 5 years. We now have the following: a small 1-acre nursery for cuttings, a 10-acre commercial plantation on reclaimed strip mines, a 3-acre commercial plantation on bottomlands, and an experimental nursery to improve our stock.

Question 2: Do you think your company should have an interest in improved stock with respect to your present and future wood supply, considering (a) the increased cost of land ownership and the increased cost of growing wood, and (b) the increasing competition for woods labor?

Response: We are quite conscious of the need for growing the maximum fiber per acre because, as you state, land ownership costs and the need for maximum density per acre as it relates to harvesting are very real problems. However, it is our belief from a practical standpoint that we must rely on natural regeneration of hardwoods in the "oak" types. Therefore, any use we could make of genetically improved stock would be limited.

Response: I feel we should definitely have an interest as a company and show this by our present program. The cost of growing wood fiber is going up in respect to land values and increased stumpage prices. We must learn to reduce the rotation of our fiber crop and mechanize its procurement to the mill in order to survive our present and future competition.

Question 3: Would improved stock prompt small landowners in your area to plant more wood for industrial use?

Response: It is doubtful that any great emphasis could be given to small-ownership timber-growing stock. The economics involved in land use at the

present time demand minimal cost in forest establishment and management. Planting just does not fit in the picture for hardwoods.

Response: I do not feel we could ever interest the farmer (again strictly in our area) in large timber planting. We are by necessity working with the few people who are willing to cooperate in our program.

Response: We feel that small farm ownerships will continue to show more interest in timber management if the use of improved stock results in increased productivity of forest land.

Response: It will be difficult for trees to compete with annual farm crops on good land. However, on marginal farm land, I feel there is opportunity for forestry to "sell" itself in the future with an economical program, such as the pine industry has done in the South. We must perfect desirable tree species, proper planting techniques, and rapid, inexpensive maintenance of tree farms for short rotations before the farm owner will accept it.

Question 4: Could improved stock conceivably reduce wood harvesting and handling costs (mechanical harvesting, uniform size, etc.)?

All agreed that improved nursery stock in plantations would reduce wood handling costs and that mechanization will be necessary in future operations. This is being done in the pine region and it is not inconceivable that the same might someday be possible in hardwoods.

So much for the survey. It appears that it is going to be a rough plantation for you geneticists to hoe.

Before presenting my views as to why my company should be interested in genetically improved forest nursery stock and what we are doing to grow wood faster, I would like to make a few brief remarks concerning Crandon Mills, its operations, and its programs to provide wood in an agricultural region.

Crandon presently uses about 300 tons a day of mixed hardwoods to manufacture 9-point corrugating medium. For the past 10 years we have purchased wood within 50 to 75 miles of our mill from small woodland owners whose timber acreage averages approximately 30 acres. Our staff of three foresters have been active in promoting tree farm management and our success has not been all that we had hoped.

We have been active in land purchase and to date have acquired about 6,000 acres, some of it quite marginal and some of it good for growing timber crops. Even when good bottomland is available, the price often cannot be justified.

Our research has centered more on the "how" to grow wood crops faster rather than on the use of improved stock. However, we are interested in superior strains of cottonwood and hybrid poplar. And we have even worked with tree-of-heaven *(Ailanthus).* *We* have planted native cottonwood using different methods. Our trials include Wisconsin No. 5 and we have contracted for several strains of cottonwood and poplar. We are continuing to work with a local cross between *Populus alba* and *Populus grandidentata.*

Our efforts include cooperation with the U. S. Forest Service on experiments with various levels of fertilizer to increase the growth on the species we have. We are working on clean cultivation and I believe clean cultivation in the early stages of a plantation is necessary for maximum fiber production. We can no longer plant trees in the ground and forget them until harvest. We are beginning to find ways to cultivate within a reasonable cost figure.

To date we have approximately 60 acres of commercial plantations which include cottonwood, sycamore, hybrid poplar, and silver maple. Our planting procedure involves deep planting with a post-hole auger and one-direction cultivation, using a disk and a side-mounted grape hoe. This has resulted in almost 100 percent mechanical weed control at a reasonable cost. It may be necessary for foresters to become orchardists but I believe we will eventually get the job done.

The biggest problem is: How do you plant hardwoods and what cultural treatments are necessary which can be justified from the cost standpoint to produce the maximum fiber per acre? Emphasis in the past has been on conifers which are not native to our area. Various pine species are easily planted and cared for and they will grow. But we aren't particularly interested in pine, except for Christmas trees. I doubt that pines will produce the volume of wood in the time we want.

To varying degrees, I am in agreement with most of the responses I received to my survey, both positive and negative. We are not going to convince the farmer to grow wood on "corn ground." On most farms, however, there are small acreages of good ground which can grow trees at a profit—areas too small to economically farm with mechanized equipment, areas separated from the home place, and areas which perhaps produce a row crop infrequently because of flooding. These lands might produce wood if the use of inexpensive improved forest stock were available, if they would return a reasonable profit to a landowner, and if he could be shown a minimal investment in establishment and culture. We need short-rotation wood crops, which genetically improved

stock could possibly give us. And we need to develop inexpensive means of growing the improved wood-producing tree for future wood requirements.

Inasmuch as my company will probably never be a large landowner, it is necessary to have an interest in improved stock to provide to the small woodland owner. Each acre we own must produce the greatest amount of fiber in the shortest possible time, for time is a cost factor in producing wood. The availability of improved stock will, I am certain, convince management that a higher investment in land will be cheaper in the long run than marginal land. If wood can be grown in a third of the time with the same or less planting investment, then you are dollars ahead.

As I see it, the hardwood users need species of trees with uniformity of size and growth rates, a minimum of limbs , resistance to disease and insects, suitable fiber, rapid growth, adaptability to a variety of sites, and which are easily planted and managed. This is quite a big order !

But in addition and concurrently with the development of these superior trees, increased research is required in the mechanics of site preparation and in the planting and culture of trees. The improved stock will be of little value if we cannot afford to plant and care for it.

How do we go about clearing cut-over land? How much cultivation is necessary? Is mechanical or chemical cultivation the most economical? How do we do it if mechanical cultivation is the best? How can row-crop trees be grown on other than flat land? And how do you convince the small landowner that trees are a crop which can be grown at a reasonable profit? We need these answers, and many more, if we are to make the fullest use of genetically improved stock.

This will give the chain-saw manufacturers little comfort but I envision the time when we won't need to take the chain saw into the woods. It may be possible someday to enter a hardwood plantation with a machine which will sever the tree below the ground, process it completely, and leave the site prepared for the next crop. The best rewards through such procedures cannot be realized unless genetically improved nursery stocks are available.