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Economics of Raising ETPs of *Populus deltoides* in Nursery Condition

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A B S T R A C T

The study was conducted at Forest Nursery of Research Centre (School of Forestry and Environment) of Sam Higginbottom Institute of Agriculture, Technology and Sciences, Allahabad. The cost of production of ETP was estimated to give a clear picture on poplar nursery. The present market rate was taken for costs of fertilizers and other inputs and rupees per hectare is the unit. The viability of investment made in rising *Populus deltoides* ETPs increase with increase in size of the nursery. Instead of one-acre nursery, large nursery of more than two acre is the preferable size as at that size economies of scale become operative. Instead of initio nursery site already tilled agriculture land taken on lease reduce the cost and hence nursery raising should preferably be done on farm land.

Introduction

Agroforestry systems are capable of meeting the demands of raw materials of several agricultural and forest based industries. Some of the industries, e.g., paper and pulp mills, sport goods, furniture, sawmill, etc. located in Haryana, Punjab, Uttar Pradesh, etc., are meeting their total raw material requirements from agroforestry produce. Serious adverse ecological manifestation, increase of CO_2 in the atmosphere, global warming, serious soil losses, repeated droughts and floods, serious pollution problems, etc., are the results of deforestation. There are concerted efforts to check the process of ecological degradation by increasing the tree cover of the earth. Trees protect us from different kinds of pollutants. They protect us from dust, dirt and other physical air pollutants. One hectare of a close forest can filter about 50 tonnes of dust and dirt (Durk, 1966). Some of the chemical air pollutants are also absorbed by the trees, protecting human beings from their adverse effects. Noise pollution is also checked considerably by the trees. Forests help to protect the environment, not only by reducing soil erosion but also by helping to keep the atmosphere free of pollutants, moderating temperature etc. Nowadays, increasing emphasis is being laid on the environmental benefits of forests and extensive plantations are being raised so as to mitigate the air pollution.

Poplar was introduced to India in the 1950s, from the United States of America. It is widely grown all over northern India and is

considered as one of the important Agroforestry tree because of its desirable characteristics and multiple uses. The species is found promising for large scale cultivation in the plains for meeting the increasing need of wood based industries (Chaturvedi, 1982). Commercial scale plantations of poplar have been expanding since the WIMCO-sponsored Farm Forestry Project was launched in 1984. Because of its deciduous nature, poplar can support the growth of agricultural crops beneath it without adversely affecting yield. During the winter season, wheat can be grown. Ten million trees used to be planted annually in 0.02 million ha with an average density of 400-500 trees per hectare. The advantages of integrating poplar trees in farms are having faster biomass & growth, more compatible with agricultural crops. The leaves decompose and help to maintain soil nutrients.

It can be easily sold and fetches better price. In several countries, poplar is principally used for environmental purposes, including soil and water protection, providing valuable services rather than forest products. With increased public awareness of environmental policy issues such as air and water pollution, global climate change and soil erosion, several countries have been developing new knowledge, technologies and techniques for the cultivation of poplars for environmental uses. In the United States, for example, hundreds of small poplar plantations are used as riparian buffers, in wastewater treatment and reuse and in phytoremediation, and some are used for carbon sequestration. In China, poplars are used extensively for shelterbelts. In the United Kingdom, they provide shelter and ground cover for free-range chickens whose produce is sold as "woodland eggs". In Bulgaria and Chile, willows are planted along river banks to stabilize them and reduce sedimentation. In Canada, the Forest 2020 programme is establishing fast-growing plantations, of which poplar is a major component, on previously non-forested lands (primarily agricultural lands) for carbon storage.

Materials and Methods

The experiment was conducted at Sam Higginbottom Institute of Agriculture, Technology and Sciences which is 7 km away from Allahabad city. All the facilities, which are necessary for the normal cultivation of crops and trees, were readily available. The cost of production of ETP was estimated to give a clear picture on poplar nursery. The present market rate was taken for costs of fertilizers and other inputs and rupees per hectare is the unit. The experiment was laid out in Randomized Block Design having 5 treatments with each replicated thrice time. The data was recorded during the course of investigation were subjected to statistical analysis as per method of analysis of Variance, (ANOVA) as suggested by Fisher, 1950. The significant and non-significant of the treatment effect were judged with the help of 'F' variance ratio test. Calculated 'F' value (Variance ratio) was compared with the tabulated value of 'F' at 5% levels of significance. If calculated value exceeded the tabulated value, the effect was considered to be significant, otherwise the effect is considered non-significant

Results and Discussion

ETPs of Populus initially produced only by forest department are now being raised by enterprising persons also. The expenditure involved in raising and initio nursery. The financial return expected out of the sale of ETPs have been analysed and scenario of larger nursery 1.0 ha which has brings economy of scale into operation that has been analysed. It is concluded that nursery activity by resident formers already practicing agriculture on not less than 1.0 ha is

economically a better proposition. Novices are advised to raise not less than one ha of nursery. The estimation of the economics of raising ETPs of Populus deltoids are written below:

Assessment of estimating the economics of raising ETPs of Populus deltoids in the nursery stage

The market for sale of ETP is generally liquid and cannot be termed as stable from year to years. The price varies along with the current ruling price of Veneer logs prevailing in the market. The farmers bring the material after harvesting their agriculture crop as the felling of tree during season when crop is standing damages the agricultural yield. The price situation is ethier stable or marginally on the decline owing to market preference for *Populus deltoides.* The sale price of ETPs during previous three years has varied between Rs. 10 to Rs. 25 depending upon quality, clonal purity and also the credibility of the organization selling ETPs. Higher price more than Rs. 15 gives the profit in nursery. Whereas with assumed investment scenario on one hectare or more nursery are the break even cost worked out is Rs 7.50, i.e. where economic of scale begin to operate. Thus when there is step decline in price, the larger nursery owner can still afford to sell their produce at reduced price. Thus a large nursery is found economically more viable than a smaller nursery and gives the owner greater latitude in scale price fixation.

Table.1 Estimation of the economics of raising ETPs of Populus deltoids in the nursery

Item of Expenditure	Unit	P/ha Assumed	Remark
A) Rent, land preparation, fencing and irrigation: Rent for 12 calendar months beginning from January 20013-14	Acre/ha	25,000	Linear increase
Ploughing harrowing leveling preparation of beds water channels	$100m^2$	6,000	Some Economy of scale
Fencing, using barbed wire and iron angles cost Rs. 8,000/acre with life of 4 years.	$4000m^2$	5,000	Linear scale
Cost of irrigation including fuel	Acre	10,000	Economy Increase
Cost of irrigation including material: Stem cuttings	Nos. @of Rs.2/- per stem cutting	50,000	Linear scale
B) Cost of labour: Planting of cuttings	1000 nos. per acre	5,000	Linear scale
Watch and Ward	Year	24,000	
Cost of Management: Skilled labour	Area	6,000	Economy of scale
C) Opportunity Cost : Cost of Supervision (Management)	Area	9,000	Economy of scale
D) Opportunity cost	Rate of interest 10%	14,300	Linear
Total Expenditure (a+b+c+d)		1,49,300	
Gross Income	No. of ETP @ RS.20	20x20,000 = 4,00,000	Economy of scale
Actual Expenditure		1,49,300	

The viability of investment made in rising *Populus deltoides* ETPs increase with increase in size of the nursery. Instead of one-acre nursery, large nursery of more than two acre is the preferable size as at that size economies of scale become operative. Instead of initio nursery site already tilled agriculture land taken on lease reduce the cost and hence nursery raising should preferably be done on farm land.

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