

SOME IMPROVED TECHNIQUES FOR RAISING OF FOREST NURSERIES

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INTRODUCTION

Importance of forest nurseries in any afforestation and agroforestry programme cannot be over-emphasized because planting stock is the basic and most important ingredient of tree plantation. Shisham (*Dalbergia sissoo*) is the most important multipurpose tree species in Punjab which is extensively cultivated on public as well as private lands. It is propagated with root shoot cuttings. Prevailing technique of raising of shisham nursery consists of broadcasting sowing of shisham pods on raised beds and keeping the beds moist with water through trenches till the seed germinates. Although the seed germinates very profusely and the density of seedlings in "good" nurseries varies from 100 to 160 per sq. metre of nursery area, yet the average number of standard size planting stock seldom exceeds 100,000 per ha. Because of congestion, seedlings suffer from adverse competition and most of them remain whippy and weak and do not attain proper size in one growing season. This practice is going on since long in most of the nurseries of Forest Department and has hardly changed over the period of time. Thus there is a great need to improve the nursery raising technique in order to

obtain maximum number of healthy and standard size planting stock per unit of area. Some improved techniques have been tested in the nursery of Faisalabad Forest Division for this purpose and this paper describes the results.

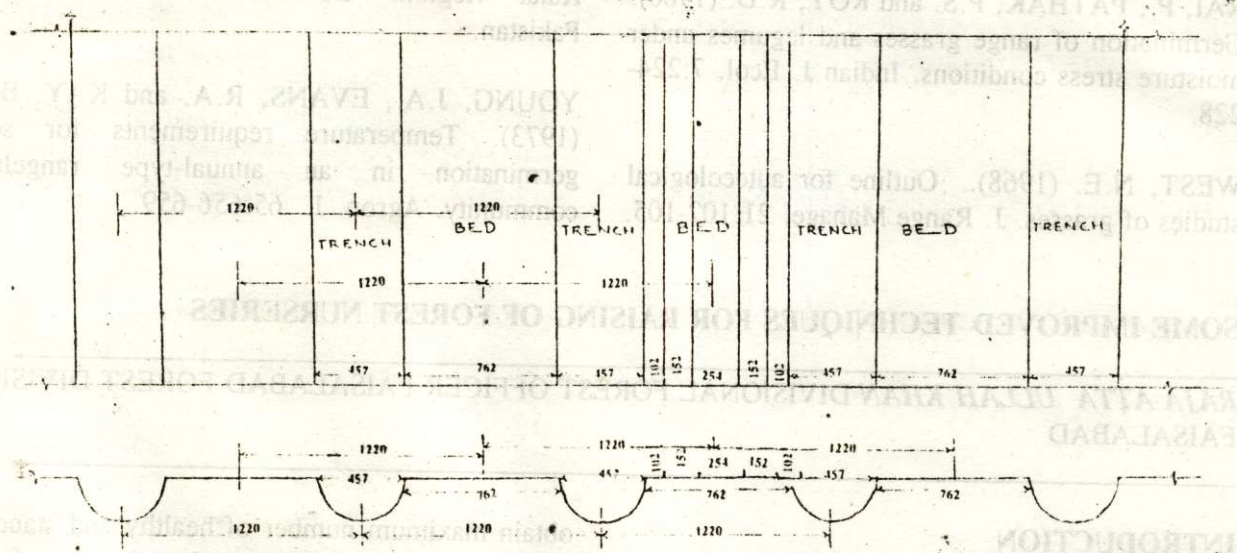
MATERIAL AND METHOD

The shisham pods from phenotypically superior trees were collected in February and March 1993 by climbing trees as well as by clipping their small branches. The pods were cleaned and broken into seed segments. The soil preparation for nursery consisted of working the land with discplough and disc harrow. As the soils are deficit in nitrogen and phosphorus, therefore, DAP fertilizer at the rate of 125 Kg. per ha was applied before making the beds and trenches. The seed segments were sown in May, 1993 in four lines on 75 cm wide raised beds (Fig-1) and the seed beds were kept moist with water. There were 125 raised beds per ha and each bed was 61 m. long and 0.8 m wide. The lines for sowing the seed segments were formed with the help of a specially designed rack which had four tines (Fig-2). The pods were sown at the rate of 150 kg. per

(all measurements in mm)

Figure 1

PLAN

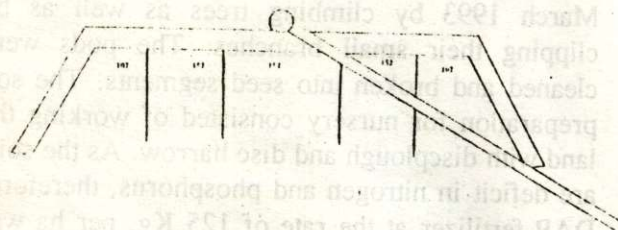


X-SECTION OF SHISHAM NURSERY

DESIGN OF A RACK

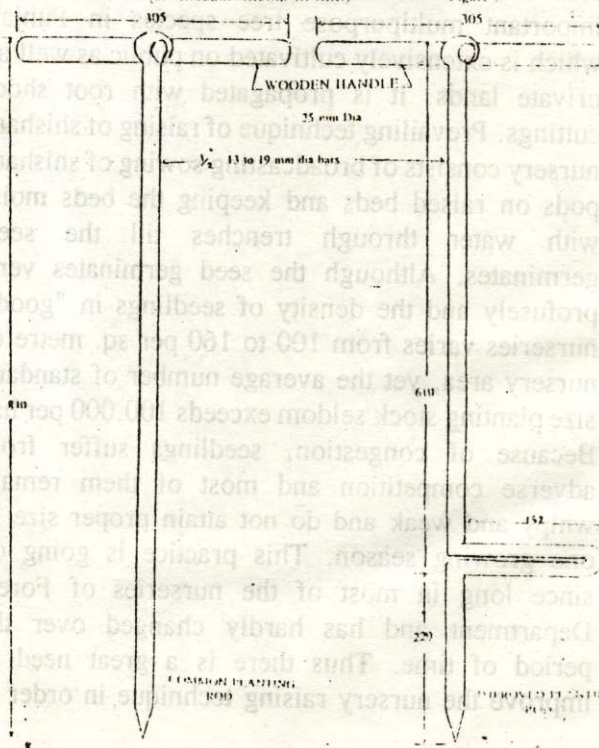
(all measurements in mm)

Figure 2



PLANTING RODS
 All measurements in mm)

Figure



ha instead of 1125 kg. per ha as is the usual practice in Forest Department. After germination, the seedlings were properly spaced in lines by culling when these were nine inches tall. The second doze of fertilizer i.e. Urea at the rate of 125 kg. per ha was applied after culling operation when the nursery plants had attained a height of more than 0.3 m.

RESULTS AND DISCUSSION

Since the seed was sown in straight lines and the seedlings were properly spaced (about 20 seedlings per running metre of line) after culling, therefore, the growth of plants was uniform and they did not face competition from each other. In some plants, top pruning of seedlings was done and it helped in their uniform growth. Most of the seedlings had attained plantable size before the end of first growing season i.e. by November, 1993. Thus it was possible to extract all the seedlings at one time from one end to the other end of the nursery without the need for extraction of stumps at different times to obtain standard size root shoot cuttings. The average number of seedlings at the end of growing season was 50 to 60 per square metre of nursery area. Thus after allowing for culls, a minimum yield of 375,000 to 500,000 standard size plantable stumps were obtained from one ha of nursery area as compared to 100,000 root shoot cuttings per ha under the existing technique of raising of nursery. The same technique equally applies to simal (*Bombax ceiba*) and siris (*Albizia lebbek*) nurseries.

IMPROVEMENT IN ROOT SHOOT EXTRACTION TECHNIQUE

At present the method of extraction of stumps consists of applying copious irrigation to the nursery, till the soil is fully saturated and becomes thoroughly soft. The seedlings are then pulled manually by nursery workers. Thus a tiny seedling is extracted from the soil with the full

force of a worker. This process of applying force and pulling out a tiny and tender plant causes bark ruptures and injuries to the epidermis and cortex layers of roots. This results in strains and stresses and causes shock to the young plant. It affects the plants adversely in establishment. Moreover, such stumps are prone to attack by insects and pests. Under the improved technique of raising of nurseries, it would not be necessary to pull out selected plants singly by applying force, but instead all the seedlings will be uniformly cut nine inches below the surface of soil with the help of sharp spade. The plants will thus suffer minimum initial damage. Such plants, therefore, will get a good start and their growth will be high and they will soon over-come the problem of weeds competition. These plants will be thus more vigorous and fast growing.

IMPROVED PLANTING ROD

An improved device for planting of root-shoot cuttings has been evolved (Fig-3). This improved planting rod will make it possible to control the depth of hole made for planting of the stump to the desired extent. Moreover, it will increase the efficiency of work because the worker will be able to apply the force of his leg together with his hands, which will make the work easy and increase his out-out.

CONCLUSION

With above procedure, it is possible to produce large number of planting stock from unit area of nursery raised under improved techniques, without raising cost of nursery which is equivalent to 500 man days per ha. Moreover, the sandard size stumps will be produced at 20% to 25% of the existing cost.