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Office of the Chief Conservator of Forests, A.P.Hyderabad.

Sri Munawar Hussain, I.F.S.,
Chief Conservator of Forests.

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CIRCULAR NO.37/SF.81.

Sub: Raising of Fuelwood plantations - through afforestation of degraded forests under various Social Forestry programmes - suggestions for improving the nursery and plantation techniques- Reg.

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Fairly large scale fuelwood plantations are being raised through afforestation of degraded forests or of village waste lands etc. under D.P.A.P., N.R.E.P., Rural Fuelwood Plantations Programme or Social Forestry programmes, in most Divisions in the state, The Eucalyptus, Casuarina and Su-babul, with Sissoo, Acacia auriculiformis etc., also used to some extent. While clearfelling and burning of the existing scrub growth iscommon in all such afforestation efforts, only in a few cases uprooted of the stumps with ploughing of the land thereafter either using heavy duty tractors or through wheeled tractors is done. In all cases where ploughing of land after the uprooted of stumps is not taken up, planting is usually done in one foot cube pits. The spacing adopted for raising these plantations also varies considerably, with Casuarina planted close even at 1.2 x 1.2 metres. while Eucalyptus is generally planted at 2½ x 2½ metres, and Kubabul at 3 x 3 metres. Invareably only Polythene bag plants of varying ages are used for raising such plantation (3-4 months old seedlings in case of Su-banul and 6 to 7 months old seedlings in case of Eucalyptus and Casuarina etc.). In case of Casuarina, bag plants are used, only where planting is done in red soils under the dry technique. Planting is done mostly in July-August in the South-West monsoon zone, and in September-October in the North-East monsoon zone. The planted seedlings are weeded 2 to 3 times and one soil working is usually done around each surviving seedlings with the last weeding, following conventional weeding and soil working techniques developed earlier for Teak plantation raising mostly confined to the higher rain fall zones. The plantations are usually protected with a barbed wire fence stretched between stone pillars fixed at 3-5 metres apart, with usually 4 strands of barbed wire in addition to employing a plot Watcher for all plantations of and above 30-40 Hectres each.

Except in cases where the seedlings are planted after the soil is deep ploughed after uprooted of stumps the results are generally not encouraging and most fuelwood plantations raised in the dry and semi-arid zones of our state without such deep ploughing of soil, are ending up as complete or partial failures within 2 to 3 years after planting. The most important reason for failure of such plantations raised in areas receiving annual rainfall of below 1000 mms. (but usually around 700-800 mms only) is due to prolonged dry conditions, a result of the irregular, uncertain and meggre rainfall usually confined to hardly 3 months in a year. This is because the moisture available in the root zone of the planted and still to be well established seedlings is not adequate to sustain and keep them alive, during the long dry summer months following the short monsoon with the planted seedlings experiencing clear moisture stress right from January till the end of June next (spread over about 6 months). Atleast for about 4 months (March to June) the day temparatures are also very high with very low relative humidity in the air, causing

increased evapotranspiration losses which the delicate seedlings are not able to withstand.

Other reasons for failure of such plantations could be, choice of unsuitable species for the soils, improper nursery and plantation techniques including late planting, damage to seedlings particularly the roots stem in transport and while planting, and lack of adequate protection from cattle and fires after the plantation is raised particularly in the 2nd and 3rd years.

Even in plantations raised after uprooted of stumps and deep ploughing, the initial response of planted seedlings is almost lost by end of the first growing season. Thereafter the growth of the seedlings is therefore comparitively slow. Such plantations usually are however fairly well stocked due to the more favourable moisture conditions well loosened (soil with good moisture absorption capacity) prevailing at the time of planting for rapid establishment of the seedlings. Conditions for continued rapid growth of the planted seedlings in such areas could be brought about by ploughing of the soil atleast once every year (preferably using country ploughs) to keep the soil loose and friable for absorbing the sandy and irregular rainfall, and making in available to the plants for their survival and continued growth. One important change is however required in the spacing adopted for raising such plantations, to facilitate annual ploughing, by keeping the planting lines about 5 metres apart, the seedlings in the lines can be kept at about 2 metres apart. It is therefore advisible to keep the planting lines wide apart and plough the intervening space every year once or even twice at the begining and end of the short raising season. Such ploughing done with locally hired coutry ploughs should not cost more than about Rs. 100 to 150 per hectere but worth incurring considering the tremendous benefits in increased survival and growth, of the planted seedlings.

Even in cases where costly soil preparation (with uprooted of stumps and tractor ploughing) is not undertaken before plantations raising and the seedlings planted only in pits, the planting and plantations maintenance techniques need considerable modification, to provide for adequate loose soil around each seedlings for better moisture absorpition, retention and conservation during the short rainy season and the suceeding long dry period. In all the dry and semi-arid zones of our state, it is thus desirable to plant the seedlings using the sunken mound technique instead of in 30 Cm. cube pits. The sunken mound technique of planting is to dig trenches of one meter length and of 30 Cms. cross section, at the required spacing (say 2/2 x 2/2 metres) and filling up the central 1/3rd part of the trenche utilising the dug-up soil from either and to form a mound of about 20-25 Cms. above the general ground level, and the seedlings planted in the center of this-mound The andilws parts trench at either end, act as water storage regions lying close to the planted seedlings. The advantages of such sunken mound technique of plantings, are very obvious in that the planted seedlings have upto 50 Cms. depth of loose soils for the root to derelop and grow fast, and such soil is also kept, fairly moist if not well saturated from water absorbed from the adjoining unfilled parts of trench on either side. To further improve the soil moisture regime in such plantations, contour trenching of about one chain length, interupted for half a chain but staggered in alternate rows could be dug up, to

facilitate conserving and absorption of most of the rain that falls in the area, and making it gradually available to the planted seedlings through underground seepage. The cross section of such contour trenches could be about 45 Cms. width at the top 30 Cms. at the bottom, and about 30 Cms. deep. Such trenches could be spaced at about one to two chains(20-40 Mts) apart along the slope depending on the degree of slope. The dug up trenches could also be used to plant seedlings of the same species at the normal spacing adopted in between the trenches. There such planting in the trenches is adopted, it will be necessary to form a seed bed by half filling the trench at the planting points, utilising the top soil from the dug up trench, to form there could be about 8 planting points at 2½ meter splacing. In between the trenches on the same contour in the 10 meter strength whwre the trench is not dug, sunken mounds could be formed at the normal spacing to provide for fall & even stocking in the plantation.

Even after having provided adequaye soil and moisture conservation devises as described above, for quick establishment and survival of the seedlings during the short rainy season, necessary that adequate moisture conservation measures are taken around the established seedlings to help them during the suceeding long dry season. This could be achieved by forming a saucer upto one meter in dia meter, around each planted seedlings, and the soil in the saucer worked upto a depth of about 15 Cms. The rim of the saucer should be raised about 10 Cms. above the general ground level with on inward slope towards the centre of the saucer and with a small mound (15 Cm diameter and 10 Cm height) as the base of each seedling. Each saucer is to be kept open at one point along the periphery on the upnill side saucer from any casual rains that may occur during the off-season. Such deep soil working with formation of saucers, is to be completed with the end of the monsoon rains, to get full benefit to the seedlings from the same. Such soil working including formation of saucers around the seedlings may not cost more than 25 paise per plant, and can replace the second and third weeding and soil working normally done in such plantations.

By changing the existing techniques through adopting the improvements in planting and maintenance techniques suggested above, fairly satisfaction results can be achieved in the fuelwood plantation raising programme through afforestation of degraded forests even which taken up in the semiarid zones of the State, with wastly improved stocking and volume production. Soil and moisture conservarion measures described above must therefore be considered as on essential and integral part of fuelwood plantation raising programmes in the dry and semi-arid zones of our state and should be provided for (without thinking of economy in expenditure which is usually a false economy). In the overall cost of raising and maintaining the plantations has to be limited to certain amount only economy in expenditure can be brought about by adopting the modified nursery techniques etc. as indicated in earlier circulars.

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All the Divisional Forest Officers are requested to adopt the improved soil working technique suggested above, with slight alternations if any to suit purely local conditions. however always keeping in mind, that adequate soil and moisture conservation measures should form an internal part of all fuelwood plantation raising afforestation) programmes in the dry and semi-arid tracts of the state to ensure success of these plantations. The Conservators of Forests and Divisional Forest Officers are at liberty to suggest further improvements or modifications in the techniques suggested above, if they feel such are required to suit their local conditions. The C.Fs. are requested to prepare and approve following the procedure already prescribed for revision of Forest Schedule of Rates a revised schedule of rates for raising and maintaining fuelwood plantations through the programmes of afforestation of degraded forests, incorporating the modifications suggested above, for each of their circles, and submit copies of the same to the Chief Conservator of Forests within the next 3 months.

All the Conservators of Forests and Divisional Forest Officers are requested to acknowledge receipt of this circular letter atonce.

Sd/- A.L.Rao.
Addl.Chief Conservator of Forests,
(S.F).

/True copy/.

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DEPARTMENTAL TEST-OFFICE PROCEEDURE & ACCOUNTS

SHORT NOTES

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FOREST SCHEDULE OF RATES:-

In the Forest Department, to facilitate the preparation of estimates, a schedule of rate from each kind of work, commonly executed shall be kept up in each Divl.Forest Officer. Such rates will be approved by the CF of a Circle and may vary from place to place according to the local canditions and availability of labours. The rates so approved by the CF will be uniform until a revision is made and these rates will be termed as Forest Schedule of Rates.

(Vide Section 126 of A.P. Forest Department Code ).