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Research Paper

Evaluation of tree borne oilseeds for dryland areas of Karnataka

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ABSTRACT

A field experiment was conducted from 2005-06 to 2009-10 at Regional Agricultural Research Station, Bijapur, Karnataka, India to evaluate the promising oil yielding tree species for dryland areas of Karnataka. In present investigation six oil yielding tree species were tried. Looking to all the silvicultural parameters *viz.,* tree height, clear bole height, diameter at breast height (DBH) and crown spread, *Pongamia pinnata, Simarouba glauca* and *Azadirachta indica* were found most promising to fast growing nature which are suitable for the dryland areas of the Karnataka for oilseed purpose.

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Key words : Annual increment, DBH, Dryland, Tree species

INTRODUCTION

India has the fifth largest vegetable oils economy in the world next only to USA, China, Brazil and Argentina. Oilseeds account for about 1.5 per cent GDP and 8 per cent of value of all agricultural products. Among different oilseed crop; groundnut, rapeseed-mustard and soybean account for about 80% of oilseeds area and 88% of oilseeds production in the country. They are cultivated in every state particularly in Madhya Pradesh, Rajasthan, Gujarat, Andhra Pradesh, Maharashtra, Karnataka, Tamil Nadu and Uttar Pradesh. Besides, a wide range of other oilseeds of forest and wild origin, including Simarouba, Neem, Jojoba, Karanja, Mahua, Wild apricot, Jatropha, Cheura, Kokum, Coconut, Oilpalm and Tung are growing in the country. The diverse agro-climatic conditions of the country are favourable for growing all the tree borne oilseeds. Tree borne oilseeds (TBO's) have considerable oil potential which needs to be fully tapped. There is limited scope to bring additional area under oilseeds as the demand for land will continue to rise due to urbanization and industrialization. Hence, the tree borne oilseeds may play an important role in self-sufficiency of vegetable oils production in near future.

Annual crops are the major contributors for almost all sources of food and fodder. The declining per capita cultivable land poses limitation to meet the increasing demand for agricultural production in general and the improvement in standard of living and expansion of utilization of oil as industrial raw material calls for increased oilseed production in particular. The search for alternatives to all the usual sources of food, fodder and fuel wood has indicated that trees can play an important role in subsidizing the production of many of important commodities. Many oilseeds of tree origin have potential for utilization in varied commercial products and can supplement the consumption of annual oil to the extent of 2 million.

The country has vast potential of more than 50 lakh tones of tree borne oilseeds (TBO's). However, only 8-10 lakh tones is being collected resulting in 1.5 to 2.0 lakh tones of oil from tree origin resources. The oil extracted from some of these sources not only from an essential part of human diet but also serve as an important raw material for manufacturing soap, paints, varnishes, cosmetics, medicines, hair oil, lubricants, textile, auxiliaries and also potential substitute of diesel and kerosene. Oil cakes are used as cattle feed and organic manures (Anonymous, 2010). The growth and productivity of different tree borne oilseeds, various as per their natural

adaptation of growing wild in forest. The performance of these species as a plantation has not been evaluated. Keeping these points in view, the present investigation was carried out to evaluate the promising tree borne oilseeds for dryland areas of Karnataka.

MATERIALS AND METHODS

The field experiment was laid out in Randomized Block Design with three replications from 2005-06 to 2009-10, having six oil yielding tree species *viz., Azadirachta indica*, *Melia azedarach*, *Jatropha curcas*, *Pongamia pinnata*, *Erythrena indiaca* and *Simarouba glauca* planted in each pit (1 cu. ft) with a spacing of 2 x2 m. In each replication the treatment was represented by 25 plants of same species, of which only the middle 9 plants were used for recording observations on various silvicultural parameters, *viz.,* tree height (m), clear bole height (m), diameter at breast height (DBH)(cm) and crown spread (m) were recorded at last three years by using standard techniques and the at the end of 4th and 5th year of plantation (2008-09 and 2009-10) was taken for interpreting results. The total height of the tree was measured from the base of the tree upto the top of the main stem by using marked pole and expressed in meters. The clear bole height was measured from ground level upto the point where stem is free from branches by using marked pole and expressed in meters. The collar diameter measured by marking plant at 0.5 m from ground level with white paint and measurement were made by using tree calipers and expressed in centimeter *i.e.*, known as diameter at breast height (DBH). The collar diameter at base was avoided because of swelling caused by wind pressure on plants in field condition. The crown spread of seedlings in North-South and East-West directions was measured and expressed in meter. The data recorded on various characters during the course of investigation were subjected to Fisher's method of analysis of variance and interpretation of data was made as per the procedure given by Gomez and Gomez (1984).

The study area is located at latitude 16^0 49' North, longitude 75^0 43' East at an altitude of 593.6 m above mean sea level and mean annual rainfall of 586 mm with 39 rainy days.

The soils of the experimental site were analyzed for various physico-chemical properties. The study area was shallow black in nature, sand 25%, silt 23%, clay 52%, bulk density 1.43 g/cc, pH - 8.5, EC - 0.34 dSm^{-1}, $CaCO_3$ 18.5% and also these soils were low in nitrogen and phosphorus and medium in available potassium. Depth of the soils is 30-35 cm; the infiltration rate is moderate to high (2 to 3 cm/h).

RESULTS AND DISCUSSION

The data on tree height (m) and clear bole height (m) of the last two years *viz.,* 2008-09 and 2009-10 (4th and 5th year of plantation) of different oil yielding tree species are presented in Table 1. Tree height among the different oil yielding tree species, the *Pongamia pinnata, Simarouba glauca, Melia azedarach* and *Azadirachta indica* species were shown superior performance in both the years. Whereas, the *Erythrena indica* shown highest rate of growth with an annual increment of (0.50 m) compared to the other tree species, which was closely followed by *Simarouba glauca* (0.42 m). The clear bole height among the different oil yielding tree species, the species like the *Pongamia pinnata, Simarouba glauca, Melia azedarach* and *Azadirachta indica* species were shown superior performance in both the years but the annual increment of the clear bole height was not significant.

The data on diameter at breast height (cm) and crown spread of last two years *viz.,* 2008-09 and 2009-10 (4th and 5th year of plantation) of different oil yielding tree species are presented in Table 2. The diameter at breast

Table 1 : Plant height and clear bole height of oil yielding tree species under dryland condition

Treatments	Plant height (m)			Clear bole height (m)		
	2008-09	2009-10	Annual increment	2008-09	2009-10	Annual increment
Azadirachta indica	4.21	4.62	0.41	1.64	1.69	0.05
Melia azedarach	4.90	5.19	0.29	1.76	1.82	0.06
Jatropha curcas	2.13	2.36	0.23	-	-	-
Pongamia pinnata	3.64	3.95	0.31	0.79	0.83	0.04
Erythrena indica	3.37	3.87	0.50	1.06	1.10	0.04
Simarouba glauca	3.78	4.20	0.42	0.89	0.95	0.06
S.E.±	0.16	0.20	-	0.05	0.04	-
C.D. (P=0.05)	0.48	0.59	-	0.16	0.12	-

Table 2 : Diameter at breast height (DBH) and crown spread of oil yielding tree species under dryland condition

Treatments	DBH (cm)			Crown spread (m)					
	2008-09	2009-10	Annual increment	2008-09		2009-10		Annual increment	
				E–W	N–S	E–W	N–S	E–W	N–S
Azadirachta indica	6.55	9.62	3.07	2.48	2.31	3.27	3.13	0.79	0.82
Melia azedarach	5.73	8.10	2.37	2.52	2.47	2.78	2.74	0.26	0.27
Jatropha curcas	10.45	11.95	1.50	2.02	2.03	2.40	2.39	0.38	0.36
Pongamia pinnata	4.78	7.97	3.19	3.11	2.98	3.71	3.64	0.60	0.66
Erythrena indica	6.91	10.38	3.47	1.24	1.22	1.74	1.75	0.50	0.53
Simarouba glauca	6.87	10.25	3.38	2.60	2.69	3.37	3.44	0.77	0.75
S.E.±	0.59	0.50	-	0.17	0.18	0.19	0.19	-	-
C.D. (P=0.05)	1.77	1.51	-	0.51	0.56	0.58	0.56	-	-

height among the different species the *Pongamia pinnata, Simarouba glauca, Melia azedarach* and *Azadirachta indica* species were shown superior performance in both the years and also the annual increment of diameter at breast height higher in the *Erythrena indica, Simarouba glauca* and *Pongamia pinnata* species as compared to other tree species. The rate of crown spreading of the tree species among the six tree species the *Azadirachta indica* and *Simarouba glauca* were shown the good results and annual increment of crown spreading was also more in these two species of oil seed trees.

Considering the all these parameters, it may be inferred that the tree borne oilseed tree species *viz., Pongamia pinnata, Simarouba glauca* and *Azadirachta indica* species were the most promising to fast growing nature which are suitable for the dryland areas of the Karnataka for oilseed purpose (Devaranavadgi *et al.,* 2005).

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LITERATURE CITED

Anonymous (2010). 5th R&D report on tree borne oilseeds 2009-10. NOVOD Board, Gurgaon (Haryana). pp. 1-3.

Devaranavadgi, S.B., Patil, S.B. and Ashvathama, V.H. (2005). Cultivation of oil yielding tree species (Kannada). *Tree borne oilseeds,* pp. 1-15.

Gomez, K.A. and Gomez, A.A. (1984). Statistical procedure for agricultural research. John Willey and Sons. New York. pp. 680.

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