

**COMPARISON OF DIFFERENT ESTABLISHMENT METHODS
OF FINGER MILLET (*ELEUSINE CORACANA* L) IN
DIFFERENT LAND FORMS IN
LOW COUNTRY DRY ZONE (LCDZ)**

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Finger millet (*Eleusine coracana* L.), locally known as Kurakkan, is one of the highly adaptable cereal crops for dry zone. Kurakkan is mainly grown in chenas with the on set of rains particularly during *maha* season. However, finger millet can be successfully grown during *yala* with *yala* rains and supplementary irrigation during later stages of crop growth, particularly at flowering for high yield. Although, farmers cultivate new improved finger millet varieties, poor yields are obtained due to traditional methods of crop establishment such as broadcasting of seeds, improper management practices, etc. Thus the average yield ranges from 1.0 to 1.75 t/ha depending on the season and cultural practices adopted by farmers in LCDZ.

Farmers grow finger millet on highlands during *maha* and *yala* with supplementary irrigation. Two other land types namely *Deniya* and uncultivated paddy fields can be utilized for millet cultivation during *yala*. However, research evidence for selection of best land type(s) with improved method(s) of planting for growing finger millet during *yala* is lacking. Therefore, feasibility studies of growing finger millet during *yala* under different farming situations were carried out by the regional agricultural research center, Angunakolapelassa and a field investigation was started during *yala* 1996.

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The main objective of this investigation was to determine the most suitable land type(s) and method(s) of plant establishment to be recommended as improved technologies by DOA for finger millet cultivation in different land types in the LCDZ.

MATERIALS AND METHODS

Due to wide adaptability and farmers preference, variety Ravi was selected for this study. This experiment was conducted in farmers fields where finger millet was grown in different land types particularly during *yala* season. The 03 locations selected at Galpothth-ara, Wagolla and Gonagan-ara represented high land, Deniya and paddy field respectively. Four methods of planting viz. row planting, random planting, row seeding and broadcasting were tested at all 03 locations. The methods of planting were replicated twice at each location. Broadcasting was used as the standard as the farmers used this method to grow finger millet traditionally.

In row and random planting, 20 day old seedlings were planted at the rate of one plant per hill. For each treatment (establishment method), 4 x 3 sq. m plot was used. Row planting was done at the spacing of 30 cm between the row and 7.5 cm within the row. Seedlings were planted at about 8 cm apart in random planting. After planting, plants were watered twice a day until they were established. Row seeding and broadcasting were done at the seed rate of 2 and 6 kg/ha respectively. About a week after seeding, excess seedlings were removed in row seeded plots. About 06 weeks after planting weeds were removed manually. NPK mixture recommended for finger millet at the rate of 45 kg N/ha, 25 kg P_2O_5 /ha and 30 kg K_2O /ha was applied at planting. 3-4 weeks after planting additional dose of urea was applied at the rate of 75 kg/ha.

At harvest, a net plot of size 4.4 x 2.4 m was taken for yield determination by removing 30 cm border around the plots. The panicles collected from different treatments were sun dried separately before the grains were removed from panicles. Then the grains were further sun dried before weighing.

Statistical analysis was done using RCBD for individual land type. Subsequently, interaction between land type and method of planting was also analyzed by combining yield data obtained from different land types to determine the efficiency of different methods of planting over the tested land types. The results are presented in tables 1 & 2.

RESULTS AND DISCUSSION

GENERAL OBSERVATION

Plant height at maturity did not significantly differ among the different methods of planting (data not presented). However, crop lodging ranging from 70 to 80% was observed in broadcast plots depending on the stage of crop growth. Further, high degree of lodging was observed at crop maturity stage. It was found to be the main problem in broadcast crops in all land types. In row seeded crop, lodging at maturity was comparatively low but it ranged from 45 to 60%. However, slight lodging, ranging from 10 - 15% was observed at maturity in row and random planted plots. Therefore, it is clear that crop lodging can be minimized in finger millet by row or random transplanting.

YIELD PERFORMANCE

Yield data analyzed individually for different land types indicates that substantial yield increase could be obtained in high land and *Deniya* with row and random planting over the row and direct seeding. However, no significant yield variation was observed among different methods of planting in paddy field. Furthermore, comparatively low yields were recorded in paddy field compared to other two land types *Deniya* and high land (table 1).

Table 1: Finger millet yield (t/ha) in different planting methods at three different land types

Planting method	Land type			planting method mean t/ha
	Highland	Deniya	Paddy field	
Row planting	2.91 a	4.39 a	1.42 a	2.90
Random planting	2.64 a	3.41 b	1.44 a	2.49
Row seeding	1.96 b	2.69 c	1.32 a	1.99
Direct seeding	1.77 b	1.87 d	0.86 a	1.50
Land type mean	2.31	3.09	1.26	-

Means followed by a common letter are not statistically significant at 5% probability level tested by DMRT

Combined analysis shows that there is a significant interaction between the method of planting and land types. This further indicates that yield obtained under different methods of planting vary significantly with the land types (table 2). Therefore, both row and random planting are found to be the best methods for getting significantly higher yield over the other two methods of planting under *Deniya* and high land conditions (table 1).

Table 2. Analysis of variance of yield data obtained from three land types under four planting methods

Source	df	ss	ms	F value
Replicate	01	0.175	0.175	2.42 ns
Land type (L)	02	13.506	6.753	95.15 **
Planting method (P)	03	6.740	2.247	30.99 **
L X P	06	2.398	0.400	5.51 **
Error	11	0.797	0.072	

ns - not significant

** - significant at 1% probability level

CV% - 12.1

The method of random planting has also given significantly higher yield in *Deniya* but row planting is the most superior method of planting for *Deniya*. According to table 1, results further show that regardless of planting methods, *Deniya* could be identified as the best land type for growing finger millet during *yala* season as this land type has recorded highest location mean yield compared to other land types.

CONCLUSIONS

- a. Higher yield from finger millet was obtained by adopting row and random planting compared to present farmer practice of broadcasting in both *Deniya* and high and conditions.
- b. Row planting is found to be the best method for growing finger millet under *Deniya* condition.
- c. Regardless of the methods of planting *Deniya* is the best land type to grow finger millet during *yala* season.

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