

Farmer Participatory Varital Evaluation of Finger Millets in the Monaragala District of Sri Lanka

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Abstract

Farmer participatory varietal evaluations are important to select varieties with more adaptable characteristics for a given environment. Ten varieties including three DOA recommended varieties namely Ravi, Rawana and Oshada, four pipe line varieties namely, AD 1, AD 2, AD 3 and AD 4 and three farmer grown varieties namely, Galmora, Maha Galmora and Kiri Kurakkan were evaluated in twelve mother trials at villages of Kahakuruñanpellella, Mahawewa and Sooriya Ara. Varieties in best mother trial of each village were voted at the ripening stage with participation of farmers and officials. Length of maturity period of tested varieties ranged from 26 days to 33 days. Maha galmora was the latest maturing variety while Oshada and Galmora were close to it. The best yielder was AD 1, while the Galmora gave the lowest yield. Rests of the varieties were comparable in yielding ability. Kirikurakkan received the highest preference of farmers with a mean rank of 9.7. Oshada was the second preferred variety with 8.67 mean ranks. AD 1 and AD 3 also were preferred by farmers with 6 and 5.3 mean ranks, respectively.

Key words: Finger millet, Participatory varietal evaluation, Mother trials

Introduction

Breeding varieties suitable for the existing farming conditions is the main objective of participatory breeding. Participatory varietal selections are important to select varieties with comparatively more adaptable characteristics for a given environment. Participatory plant breeding/selection (PPB/PPS) has

shown success in identifying more number of preferred varieties by farmers in a shorter time than that of the conventional system and in accelerating their dissemination and increasing cultivar diversity (Kamara et al. 1996). The mother trial is an on-farm trial in which a set of new lines or introduced varieties is compared with local checks using farmers'

Table 1: Performance of finger millet varieties evaluated in mother trials

Variety	Days to 50% flowering	Length of maturity (days)	Days to Maturity	Plant height (cm)	Yield kg/ha
Oshada	48.9 ^a	32.4 ^a	81.2 ^{ab}	89.7 ^a	2465.0 ^{ab}
Ravi	42.1 ^b	26.2 ^b	69.6 ^d	60.2 ^d	2437.3 ^{ab}
Rawana	42.0 ^b	25.6 ^b	67.6 ^d	68.5 ^{cd}	2360.9 ^{ab}
Kiri kurakkan	51.5 ^a	27.1 ^b	78.6 ^{abc}	84.4 ^{ab}	2517.8 ^{ab}
Galmora	48.4 ^a	32.8 ^a	81.2 ^{ab}	81.5 ^{ab}	2277.6 ^b
Mahagalmora	50.0 ^a	32.0 ^a	82.0 ^a	89.2 ^a	2610.9 ^{ab}
AD-1	50.0 ^a	28.1 ^b	78.1 ^{bc}	79.5 ^{ab}	3298.3 ^a
AD-2	49.9 ^a	26.4 ^b	76.2 ^c	73.9 ^{bc}	2548.4 ^{ab}
AD-3	50.6 ^a	27.9 ^b	77.5 ^c	89.2 ^a	3015.6 ^{ab}
AD-4	48.0 ^a	28.8 ^b	76.8 ^c	88.0 ^a	2698.2 ^{ab}
CV %	6.27	9.94	3.933	11.47	27.82

management conditions. Hence with the objective of comparing farmer grown varieties with the Department of Agriculture (DOA) released varieties and the pipe line varieties of finger millets using farmer participatory approach, 12 mother trials which were consisted of ten varieties were conducted at three villages of Tahanamalvila Divisional Secretariat area in the Monaragala district, namely Kahakurullanpellesa, Mahawewa and Sooriya Ara.

Methodology

Twelve mother trials, each consist of ten varieties in 3m x 3m plots were conducted to evaluate the performance of three DOA recommended varieties namely Ravi, Rawana and Oshada, DOA pipe line varieties AD 1, AD 2, AD 3 and AD 4 along with farmer grown varieties Galmora, Maha Galmora and Kiri Kurakkan as non replicated trials. In each village 4 farmers in 4 locations were selected to conduct the mother trials and one trial of each village was carried out in a Chena. Days to flowering, length of maturation, days to maturity, plant height at maturity and final yield were recorded in each trial. Due to wild animals damage only data of 8 trails were available for the final evaluation.

Voting for good varieties was carried out by Agriculture Instructors and officers of the Department of Agriculture with the participation of farmers, at the maturity stage. Three voting's were held with respect to

each village. Farmers were informed to vote with "√" sign for preferred varieties and "x" for less preferred varieties. After the cancellation of negatives with positive votes final number of votes, for each variety was declared at the place of voting.

Analysis of variance was preformed for the data of mother trials considering each farmer location as a replicate. Duncan Multiple Range Test (DMRT) was carried out for separation of means (Table 1). Votes of each variety further analyzed with Friedman test. Mean ranks were obtained by using Friedman test for each variety based on the total votes received by each variety in three votings. (Table 2).

Results and Discussion

According to the analysis of variance there were significant differences for days to flowering, length of maturation period, days to maturity, plant height and yield, among the tested lines. Ravi and Rawana were early flowering and early maturing varieties. Length of maturation period of tested varieties ranged from 26 to 33 days. Maha galmora was the latest maturing variety while Oshada and Galmora were close to it. The best yielder was AD 1 while the Galmora gave the lowest yield. Rests of the varieties were comparable in yielding ability (Table 1).

Table 2: Mean, stranded deviation, minimum, maximum and mean rank of voting of varieties tested in the mother trials

Variety	Mean	Std. Deviation	Minimum	Maximum	Mean Rank
Oshada	9.3	2.5	7	12	8.7
Ravi	-8.3	6.8	-16	-3	2.8
Rawana	-6.3	7.4	-12	2	3.3
Kiri Kurakkan	12.3	3.2	10	16	9.7
Galmora	-7.0	6.0	-13	-1	2.7
Maha galmora	-2.0	6.1	-6	5	5.2
AD-1	1.7	9.1	-8	10	6
AD-2	-4.7	6.0	-11	1	4
AD-3	1.7	7.5	-7	6	5.3
AD-4	4.7	5.9	-2	9	4

Chi-Square 17.524

Significance 0.041

Means with the same letter are not significantly different at $p > 0.05$

According to the Friedman test there was significant difference among the tested varieties on the votes received based on visual observation of farmers and officers (Table 2). Kirikurakkan received the highest preference of farmers with a mean rank of 9.7. Oshada was the second preferred variety with 8.67 mean ranks. AD 1 and AD 3 also preferred by farmers with 6 and 5.3 mean ranks, respectively. The active participation of farmers in the selection process through mother trail approach has increased the awareness of different finger millet varieties among the farmers within a short time period. According to Sperling et al. (1993) PPB is improving communication between farmers and breeders, farmers' concerns and preferences are incorporated earlier in the research process; thereby accelerate research; and improves the adoption rate.

Conclusion

AD 1 was the best yielding variety while Galmora recorded the lowest yield. Rests of the varieties were comparable in yielding ability under the studied farmer managed conditions.

References

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