SINGLE PLOT OBSERVATION AND YIELD TRIAL ON MAIZE AT ABA'ALA, NORTH AFAR

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1. INTRODUCTION

Aba'ala is one of the seven *weredas* of Zone Two, Afar National Regional State. It is situated between $13^0$15' and $13^0$30' N, and $39^0$39' and $39^0$55' E longitude, about 55 km east of Mekelle. It is semi-arid receiving bi-modal rainfall averaging 422 mm per annum (Aba'ala station record, 1972-79). The main rain starts in mid-June and ends in mid-September while the short rain starts in March and ends in April.

The people are predominantly agro-pastoralists. Crop production is practised in the Aba'ala Valley plains under rainfed condition and flood irrigation. Sorghum is the most widely cultivated food crop followed by maize in Aba'ala. However, the average production of maize is very low, that is, 28 qt/ha (Addis 1998). The reason is lack of improved varieties that are plastic in their last formed yield components (Rowland 1993).

Improving the productivity of crops is one of the objectives of Dryland Husbandry Project (OSSREA/MUC), which has been operating in Aba'ala since 1996 (DHP-Ethiopia 1999). The project in collaboration with the Dryland Crop Science Department of Mekelle University College has designed a trial to identify improved maize varieties with good potential for adaptation and yield.

2. MATERIALS AND METHODS

In the 1998 rainy season, three officially released varieties namely, ACV 3, ACV 4 and ACV 6 which are recommended for dryland farming because of their early maturity and one unidentified early maturing variety were grown. This was done with

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supplementary irrigation on 2500m^2 plots with no replication using recommended spacing of 75cm x 25cm at the Dryland Husbandry Project (DHP) demonstration and trial site. The local variety, *Anjo*, was also grown for comparison.

All the necessary agronomic data were collected, and the materials were evaluated for earliness and other desirable agronomic traits and were demonstrated to the ultimate users at their transition from vegetative to reproductive phase.

3. RESULTS AND DISCUSSION

The site was ploughed twice and the seeds were sown from late July to early August 1998. The sowing time was late due to shortage of seeds. All varieties were sown in rows using a seeding rate of 20 kg/ha. DAP at 100 kg/ha during sowing and urea at 100 kg/ha during the first inter-row cultivation were applied. All the plots were kept weed free through intensive hand weeding done twice. Harvesting was done manually, but threshed by a sheller, which required manual support. All other farm practices were similar to what is commonly used by the farmers.

The overall performance of the three test varieties was impressive. Germination and seedling vigour were good. However, the local variety (*Anjo*) gave more yield than the test varieties did. The local variety gave 69.4qt/ha whereas the test varieties namely, ACV 3, ACV 4 and ACV 6 gave 40.0qt/ha, 50.2qt/ha and 63.86qt/ha, respectively. The unidentified early maturing variety gave 36.57qt/ha.

The higher yield of the local variety was because the trial was conducted under supplementary irrigation. The improved test varieties are well adapted to the area's agro-climatic conditions, where the growing condition is shorter and the temperature is higher.

The test varieties matured 20-27 days earlier than the local variety. Thus, they have improved productivity as they could complete their life cycle before serious soil and plant deficits develop. The farmers were satisfied with the performance and other agronomic traits of the varieties during demonstration from vegetative to reproductive stages.

Finally, the three improved test varieties, based on their agronomic performance (days to 50% heading and 1000 seed weight) and well adaptation to the agro-climatic conditions of the area, have been recommended for further evaluation on farmer managed trials, in the next cropping season. Mean yield and some agronomic characteristics of the test varieties are given in table 18.

Table 18. Performance of the test varieties in observation trial at Aba'ala, 1998

Variety	Grain Yield (qt/ha)	Per-cent* Yield	DHED	DMAT	Cobs per plant	Plant height (m)	1000 seed weight (gm)
ACV 3	40.88	58.9	47	108	1	2.03	310.8
ACV 4	50.16	72.3	50	114	1	2.26	299.5
ACV 6	63.86	92.0	48	110	1	2.15	300.5
Early maturing**	36.57	52.7	50	115	1	2.27	313.2
*Anjo****	69.40		63	134	2	2.78	301.5

*Percent yield = $\frac{\text{Yield of a variety}}{\text{Yield of local land race}} \times 100$

** Unidentified

***Local variety

DHED = Days to 50% Heading

DMAT = Days to Maturity.

4. CONCLUSION

Maize production in Aba'ala at present is low-input and low-output system. Maize is produced primarily for subsistence using traditional farming practices. Therefore, there is little scope or incentive for increasing maize production.

In addition, the late start and early cessation of the rains lead to the reduction of yield of the late maturing local varieties, emphasising the need for locally adaptable early maturing varieties. However, due to lack of access to improved varieties, the farmers are cultivating local landraces of maize. Thus, the extension system has to design ways of exposing the farmers to the improved and adaptable maize varieties.

The observation and yield trial on maize is useful for introducing improved maize varieties, increasing the biodiversity and increasing maize productivity in the area. The three improved test varieties have been identified as well adapted. Therefore, efforts should be made to incorporate these varieties into the farming system.

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