PERFORMANCE OF EXOTIC AND LOCALLY DEVELOPED SWEETCORN VARIETIES UNDER LOCAL CONDITIONS

Ghizan B. Saleh and A. Wahab Abdul Hamid

Faculty of Agriculture
Universiti Putra Malaysia, 43400 UPM, Serdang, Selangor, Malaysia, and MARDI

Keywords: sweetcorn, varieties, germplasm, evaluation, and performance.

Introduction

In Malaysia, small-scale farmers commonly grow sweetcorn. Commercially acceptable sweetcorn production started in 1981 after the introduction and recommendation of Thai Supersweet for local planting (Lee et al. 1981). Since then several other varieties were released. (Lee et al. 1986; Rafii et al. 1994; Saleh et al. 1994). However the limited yielding capability of these open-pollinated composites, and their inconsistent yields, necessitated the development of new improved sweetcorn varieties to replace the existing ones.. This paper reports performance trials on imported as well as locally developed sweetcorn germplasm. Emphasis was placed on identifying superior ones for their direct use for production or their possible use in hybridisation programmes for varietal development and improvement.

Materials and Methods

Evaluations were conducted separately and independently by at Serdang by UPM, and at Bertam by MARDI on diverse sweetcorn germplasm sources, mainly composites and hybrids, both developed locally as well as imported. Generally, two types of experimental trials were employed. Most were replicated yield trials, in which yield data were recorded and analysed. The others were general observational nursery trials, in which field scores were taken on varietal performance and quality, but detailed yield data were not taken. In addition some inter-population crosses among promising varieties possessing the same gene for sweetness (sh_2) were also established and evaluated for performance. Characters evaluated in the trials included fresh cob yield, days to harvest, plant characters, kernel quality, ear characters and general pest and disease resistance.

Results and Discussion

Results obtained from the trails are summarised based the characters evaluated as follows:

Fresh Cob Yield: From evaluations in Serdang, two promising imported hybrids, Hybrid 368 and Hybrid SSC 240 was found to have given cob yields comparable to those of the local composite, Manismadu (average yields from various trials were 12,641 and 12,733 kg/ha for the two hybrids, respectively, compared to 12,301 kg/ha of Manismadu). *Days to Harvest:* Sweetcorn varieties reached 50% tasseling 40 to 54 days after planting in Serdang, while they were 28 to 56 days after planting in Bertam. Early hybrids were usually unacceptable in Malaysia, as they do not give high yield because of the short grain filling period. A general guide, days to harvest for more acceptable varieties to the Malaysian environment are usually between 65 to 70 days. The number of days to 50% tasseling, and hence days to harvest, can vary depending largely on temperature and other growth conditions. The Malaysian temperature and daylength particularly affected the imported hybrids. *Plant Characters:* Plant height of the varieties ranged from 92 to 170 cm in Serdang, and from 98 to 200 cm in Bertam. Evaluations in Serdang also recorded cob heights ranging from 34 to 92 cm. From evaluations in Bertam, it was indicated that the adapted hybrids were usually above 170 cm in height and beard cobs half way up the plant while the unadapted ones were usually short, being less than 150 cm in height and cobs were often borne very low down the stem. Tillering is common among temperate hybrids, as in the case of corn-grass type of tillering mutant occurring in SIN 79 and SIN 134. *Kernel Quality:* Evaluations in Bertam indicated that Masmadu was the sweetest variety (Brix reading of kernel sap). However, Manismadu was found to have the highest Brix reading (18.8%) from evaluations in Serdang. Evaluations in Bertam have indicated that certain delicate aromas occurred in some lines, as in Taiwan Supersweet. Some other lines, such as Thai Supersweet were sweet but tasteless. *Ear Characters:* Ear measurements are important indicators of market acceptability of the cobs produced by the varieties as they give a good reflection of adaptability of the variety. In Serdang, Hybrids 368 and SSC 240 gave highest cob weight and length among the imported hybrids, while in Bertam, Supersweet Batangas produced the heaviest cobs. The Columbian varieties were found to produce numerous cobs at the same plant nodes. *Pest and Disease Resistance:* Resistance to leaf blight, curvularia leaf spot and maize rusts occurred only in a few sweetcorn varieties. Similarly few hybrids showed convincing ear-worm and maize stalk borer resistance. In general, the imported hybrids were more prone to the prevailing pest and disease incidence.

Conclusions

Yielding capabilities, desirable plant and cob characteristics, kernel qualities and pest and disease resistance are important traits to be possessed by sweetcorn varieties to make them acceptable for local growing. Evaluations in Serdang have identified Hybrids 368 and SSC 240 as two imported hybrids that have potential for local growing. However, refinement on specific cultural practices is still required on the varieties. From results of evaluations in Bertam, Thai Supersweet and to some extent, Taiwan Supersweet are recommended for direct planting by farmers.

References

Lee, C.K., Ramli, M.N. and Zamberi, A. 1981. Gambaran kultivar dan pengeluaran bijibenih jagung Thai Supersweet. *Teknol. Pelbagai Tanaman*, MARDI. 4: 169-174.

Lee, C.K., Hashim, O. and Subramaniam, C. 1986. Supersweet Kuning - a new selection of sweet corn. *Teknol. Pelbagai Tanaman*, MARDI. 2: 1-3.

Rafii, Y.M., Saleh, G.B. and Yap, T.C. 1994. Response to simple and full-sib reciprocal recurrent selection in sweet corn varieties Bakti-1 and Manismadu. *J. Malays. Applied Biology.* 22:173-180.

Saleh, G.B., Rafii, Y.M. and Yap, T.C. 1994. Inbreeding depression and heterosis in sweet corn varieties Manismadu and Bakti-1. *Pertanika J. Trop. Agri. Sci.* 16: 209-214.

Supported by IRPA Grant 01-02-04-0041