

AGRINEWS



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Agrinews

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**The Editor-in-Chief,
Agrinews,
Ministry of Agriculture Headquarters,
P.O. Box 30134,
Capital City,
Lilongwe 3.**

Phone No. 784 299
Fax No. 784 656
Telex No. 144 648

Editorial

Editor-in-Chief	Dr. J.H.A. Maida
Editor (ACB)	Ms. N.L. Msiitka
Production Advisor	C.J. Kharupwa
Graphic Design	S.J. Kasakula
Design Assistant	Ms E. Kazembe
Cover Design	S.J. Kasakula
Photography	W.C. Wakhutamoyo

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A note from the Secretary for Agriculture

It is widely accepted that in the absence of improved technologies appropriate to conditions prevailing in any country and adapted to its socioeconomic and environmental conditions, little can be achieved from any efforts made with a view to bringing about improvements in the process of agricultural production. What is implicit in this is the fact that appropriateness is not an intrinsic quality of any technology, but is derived from the surroundings in which it is to be utilised and also from the objective functions used for evaluation. Technological appropriateness is a dynamic concept whose relevance is a function of time and locality as well as environmental and socio-economic conditions.

It is in the light of the foregoing context that agricultural research and extension are two pivotal elements recognised in any programme that is designed to increase food supplies and raise rural incomes. Elements characterizing an environment that is conducive to a sustained agricultural development are good communication amongst researchers, planners and policy makers; strong links amongst research, extension and the farming community; appropriate price and marketing structures; and adequate extension and input supply services.

The Ministry of Agriculture is so structured that such an environment prevails. The extent to which the environment is productive is contingent upon several factors prominent amongst which is the effective dissemination of research results whose economic benefits and compatibility with farmers' practices have been confirmed through on-farm testing. This calls for the endogenous development of technologies

or the adaptation of exogenous technologies not only to social, economic and environmental conditions but also to edaphic variables.

It has been observed, however, that the number of donors and non-governmental organisations engaged in activities that are aimed at assisting the smallholder farmers has increased with time. While welcoming this support, the Ministry of Agriculture wishes to use the observations made above as a basis for its reminder that the utilisation of foreign agricultural technologies by farmers in any given country is successful only after the technologies have been adapted to the aforementioned local conditions. The Malawi Government has established an infrastructure and developed a local expertise which can be used collaboratively by the organisations to the benefit of the target group.

Smallholder farmers who are the target group can benefit from the external funds invested in the agricultural projects only if the agricultural technologies being disseminated are those whose economic benefits and compatibility with the farmers' cultural practices have been demonstrated to perform well under local conditions. Effective collaboration between those carrying out the externally-funded agricultural projects and this Ministry's personnel can serve to enable the farmers benefit from the funds, to avoid fragmentation and duplication of efforts the express purpose of which is to increase agricultural production and raise rural incomes, and to ensure continuity of the projects. The Ministry of Agriculture is willing and prepared to work at tandem with other organisations in the noble endeavour to sustain increased smallholder agricultural production.

Cover Photograph

Plant and equipment donated by Japanese International Cooperation Agency to the Government of Malawi

Farmers' evaluation of newly released maize varieties in Malawi: A comparison of local maize, semi-flint and dent hybrids

By/Smale,¹Z.H.W. Kaunda, H.L. Makina, M. M. M. K. Mkandawire*

Introduction

A major factor that has limited the popularity of denty hybrid varieties in Malawi is the preference of farmers for the consumption of the flinty, open-pollinated varieties which they call "local" maize. With on-farm methods, flinty varieties can be processed more efficiently into white flour (*ufa woyera*) Malawians prefer to use in preparing their staple food *nsima*. Both flinty and the denty varieties can also be milled to produce a coarser and less prestigious whole-grain flour called *mgaiwa*. Hammer-mills are now common in most rural areas, but most rural women still prefer to produce *ufa woyera* by hand-pounding methods, milling the flour only in the final stages of processing. The hard flinty varieties are also more resistant to weevils in storage than the denty hybrids that have been introduced or released in the past. The insecticide for storage treatment is relatively cheap, but is not yet widely distributed in rural areas.

Given their preferences and the uncertainty of obtaining local maize for consumption through the marketing system, smallholder farmers in Malawi have typically grown local maize for home consumption. The higher-yielding denty hybrid varieties have been grown for sale. To encourage farmers to use fertilizer with hybrid maize, hybrid seed has largely been diffused through credit clubs as part of a seed-fertilizer package of a fixed size and composition. By

contrast, about half of the smallholder farmers apply fertilizer to their local varieties, and much of this fertilizer is purchased with cash. Until recently, the extension program also emphasized pure stand cultivation of hybrids. In some regions of the country, most of the local maize crop is intercropped. Even where it is less frequently practiced, intercropping is a potential source of nutritional and economic benefits.

Although the national maize breeding program has long recognized the importance of flint character to smallholder farmers, the key maize breeding challenge has been to develop flintier hybrids with the processing and storage characteristics appreciated by smallholder farmers while maintaining the yield advantages of the previously released, denty hybrids. In recent years, the Department of Agricultural Research (DAR), Agricultural Extension and Training (DAET), National Seed Company of Malawi (NSCM), and Agricultural Development and Marketing Corporation (ADMARC) have intensified a joint effort to breed and diffuse Malawi hybrids that appeal to farmers who both consume and sell their maize. The International Maize and Wheat Improvement Center (CIMMYT) has assisted the national maize breeding program by providing some of the parent plant material. One result of this process was the release of two new semi-flint hybrids in 1990.

Objective of the Farmer Evaluation Survey.

The Farmer Evaluation Survey (FES) reported here was initiated by the National Seed Company of Malawi and Department of Agricultural Research (DAR), and implemented by field researchers from the Ministry of Agriculture (MOA) in Malawi and the International Maize and Wheat Improvement Center (CIMMYT). The survey findings presented in this report summarize (150) farmers' comparisons of how local maize varieties, denty hybrids, and semi-flint hybrids perform in their own fields, mortars and storage bins.

The FES follows several years of CIMMYT/MOA survey research about adoption of hybrid maize by smallholder farmers. The purpose of the research is to provide information that can be used in research, marketing and extension program development. The FES presents timely information, drawn from a subset of the original survey farmers about the semi-flint hybrid varieties most recently released by DAR. To expand and clarify the FES results, data drawn from the National Maize Variety Trials (NMVT) and the Fertilizer Demonstration Program of the Ministry of Agriculture/Food and Agriculture Organization of the United Nations (MOA/FAO) are added to the analysis.

¹ Dr. Smale (Ms) is a Research Associate with the International Maize and Wheat Improvement Centre (CIMMYT) in Malawi.

² Messrs Kaunda, Makina and Mkandawire are Evaluation Field Officers in Dowa West RDP, Mzuzu ADD and Blantyre ADD, respectively.

The views expressed in this document are those of the authors and do not necessarily reflect those of the Ministry of Agriculture in Malawi or CIMMYT

Varieties Distributed

Each farmer participating in the FES during the 1991/92 growing season was given a 5 kg sample of two hybrids and asked to grow the seed under his or her own conditions, without specific management instructions. Three combinations of varieties were distributed: NSCM41 and MH18, MH12 and MH18, and MH17 and MH19. NSCM 41 (Ciba-Geigy 4141), first imported and sold in Malawi around 1983, is one of the more popular denty hybrids because of its relatively short growing season. MH18 is one of the semi-flint hybrids recently released by DAR, and requires about a week longer than NSCM41 to mature. MH12 is the Malawian version of SR52, the high yielding Zimbabwean variety so popular throughout Southern Africa. MH12 is a denty hybrid that is particularly popular in parts of the Northern Region of Malawi, where it is a cash crop. MH17 is the other semi-flint hybrid recently released by DAR with the length of its growing season falling between that of MH18 and MH12. MH19 is a semi-flint hybrid that has not yet been officially released.

Highlights

Farmers harvested higher yields with MH18 than with either NSCM41 or MH12 this season (1991/92). Their yield rankings for MH17 and MH19 were fairly close. Local maize yields were generally lower than hybrid maize yields.

Farmers stated that, in a normal season, with equal fertilizer, they would generally expect to harvest more MH18 than NSCM41, more MH12 than MH18, and less with local than with hybrid varieties. The yields they expected to obtain with MH17 and MH19 were again fairly close.

Some farmers planted unfertilized hybrid maize. They concluded that, in a normal season, they would expect to harvest more unfertilized hybrid maize than unfertilized local maize, regardless of the hybrid variety. This surprising view is supported by on-farm demonstra-

tion results for the past three years (MOA/FAO).

Partial budget and stochastic dominance analysis indicates that for small, maize deficit farm households, changing from growing unfertilized local maize to growing unfertilized semi-flint hybrid maize will often be economically attractive. This result is, however, somewhat sensitive to pricing assumptions, and may not hold in a very poor year.

Most farmers believed that, in a normal season, they would harvest more fertilized local maize than unfertilized hybrid maize, regardless of the hybrid variety. Based on their own experience in the 1991/92 season (a very dry year), some found that unfertilized hybrid maize can yield more than fertilized local maize under some conditions. MOA/FAO data confirm that although fertilized local maize yields are, on the average, higher than unfertilized hybrid maize yields, the yield distributions are similar. Depending on management and agro-climatic conditions, unfertilized hybrid maize may sometimes yield more than fertilized local maize.

Compared to NSCM41, farmers ranked MH18 close to local maize with respect to processing efficiency (*mphale* yield from the mortar) and cooking efficiency (*nsima* yield from the cooking pot), and higher than local maize in the taste of green maize. When MH12 and MH18 were compared, MH18 was ranked the same as local maize for processing efficiency, slightly lowering cooking efficiency, and higher for taste of green maize. MH17 and MH19 were ranked close to local maize in processing efficiency, slightly lower in cooking efficiency and slightly better for taste of green maize.

In the field, MH18, MH17 and MH19 were as resistant to weevils as local maize. In storage, they appear to be less so. With respect to storage, results are

not conclusive yet. Farmers' responses were affected by interview timing, storage practices, storage time and drought conditions.

Farmers' comments and the planting intentions they expressed are most illustrative of the potential popularity of semi-flint hybrids. Farmers called the semi-flint hybrids "the local maize you gave us" and the dent hybrids "the real hybrid maize you gave us." One farmer said "you have given us back the local maize we used to grow." Only about half of the farmers said they would continue to grow local maize if they had a hard, weevil-resistant improved variety. Most frequent explanations were that they wanted to respect tradition, they are still learning about hybrids, and that they can not always rely on the market for seed. Ninety-eight (98) percent of farmers called MH18 hard and weevil-resistant. Over 90 percent called MH17 and MH19 hard and weevil resistant.

Caveats

FES farmers managed the hybrid seed distributed to them similarly to other hybrid seed they grew in the past. The frequency, timing and rate of fertilizer application were somewhat affected by season-specific rainfall patterns and the fact that fertilizer was not provided with the seed distributed.

The 1991/92 drought affected absolute, but not relative yield rankings. Drought conditions also appear to have affected flint character in the most stricken of the survey zones. Additional evidence from MOA/FAO and the NMVT suggests that FES yield and processing comparisons are likely to hold for other seasons and a broader sample of farmers.

Because of weather conditions in 1991/92, variation in storage practices and interview timing, additional testing for varietal performance under controlled conditions and in on-farm storage seems advisable.

Recommendations

Varieties should be promoted with a popular name that emphasizes how semi-flint hybrids differ from other hybrids but also how they differ from local maize. Because the new hybrids are similar to local maize in consumption characteristics, some farmers want to retain them as seed.

Extension messages need to be more innovative to encourage wider adoption. In particular, messages could include

statements about the suitability of certain crops for interplanting with hybrids, and when it is appropriate to grow hybrid maize with lower fertilizer application rates or no fertilizer at all.

Seed distribution mechanisms need to be more flexible to accommodate new extension messages. Farmers must be able to buy seed only, fertilizer only, or both seed and fertilizer on cash as well as on credit. As more seed is produced, club meetings and broader fora should be

used to assess farmer demand for varieties and how that demand may vary by location.

Pricing mechanisms should be reevaluated. Small packets should also be marketed in rural areas with prices that are consistent with the rural pricing schedule rather than urban rates. A large part of latent demand may be among the smallholder farmers for the smallest packets. ■

Using lessons of the past as a basis for treading the path of crop diversification

By Dr. J.H.A. Maida
Ministry of Agriculture

Introduction

From 1964 it has hitherto been the desire of this country's leadership that the national agricultural strategy should be oriented towards, among other things, increasing farm incomes, with particular attention focused on agricultural production by smallholder farmers, in order to achieve such national goals as food self sufficiency and sustained provision of basic necessities of life such as food, clothing and shelter to all Malawians.

To achieve these goals, smallholder farmers in Malawi have since 1964 been encouraged to diversify their agricultural production base by permitting them to grow high value export crops such as spices, tea, flue-cured tobacco and burley tobacco. Researchers in Malawi have demonstrated that spices such as chillies, turmeric, ginger, cardamom, pepper, coriander and cinnamon can be grown successfully in the country. Prior to 1964 the growing of burley and flue cured tobaccos was restricted to European settlers. After the country gained independence, it was directed that Malawians be permitted to grow these crops.

Following this directive, tobacco schemes were established and estates were designated as centres at which Malawians would be taught the correct tobacco growing methods. For flue-cured tobacco, the Kasungu Flue-Cured Tobacco Authority was established in Kasungu District and Mpherembe Flue-Cured Tobacco Scheme was launched at Kabwafu, in Mzimba District.

Regarding burley tobacco, the Smallholder Burley Scheme was established under which four areas were selected for the growing of burley tobacco by smallholder farmers. Mulomba in Mulanje District and Sopani in Ntchisi District were the first two areas that were established in 1977, while Kafulu in Dowa District and Kasama in Chitipa District were the two additional areas that were established for use during the 1982/83 cropping season. As farmers in Malawi are eager to diversify production from traditional crops, it is important to understand well the utility of the lamp of the past and to learn from the lessons of those who took the first step in treading the path of crop diversification.

Effects of overproduction on world market prices

Known to have been grown as early as 3000 years BC when it was used to preserve and season meat, black pepper is now the world's most heavily traded spice. It was one of the spices such as cloves, vanilla, cardamom and ginger whose growth potential in the world spice market was fully exploited from the 1960s up to the mid-80s when more and more new growers were tempted by high prices offered for the spices to try out the high value crops. While black pepper sold for US\$2 438 per tonne on the US market in 1989, the value had fallen to US\$1 000 per tonne by mid-1992. Overproduction has been one of the factors that have contributed to the decline in world market prices. If the prices are allowed to continue falling, the crops may turn out to be of low value.

The smallholder farmers in Malawi have been keen to try out high value crops. They have tried out coffee and tea. The world market prices of each of these crops have, however, been declining over the past several years. Between April, 1991