



Bean/Cowpea Collaborative Research Support Program – East Africa

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BEAN SEED SUPPLY EXPERIENCES IN MALAWI

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ABSTRACT

Strategies to make bean seed available to farmers in Malawi have been successfully implemented on a pilot scale by the Bean Improvement Program in Malawi. Farmers have shown considerable interest in purchasing seeds of newly released bean (*Phaseolus vulgaris* L.) varieties in Malawi. However, this seed is not available on a large scale to farmers at present. The private seed sector in the country is not interested in bean seed production due to low profit margins. As a self-pollinating crop, once farmers have obtained initial seed stock, it can be recycled for many generations. A strategy has been developed to focus on alternative sustainable informal seed production and dissemination systems, which build on lessons learnt from previous experiences within Malawi and other African countries. These include:

- * informal seed multiplication, using smallholder farmers;
- * informal seed distribution channels, using grocery shops, rural traders, extension agents, health clinics, and NGO's; and
- * intensified variety promotion through publicity, using posters, leaflets, brochures and radio messages. These activities are carried out in close collaboration with farmers, NGO's, extension agencies, village traders and various other institutions.

INTRODUCTION

Beans are an important food crop and are a source of protein for many Malawians and also a source of income. Smallholder subsistence farmers, most of whom are women, mostly produce the crop. It is grown throughout Malawi, but commonly in areas between 1000 and 1700 metres above sea level during the rainy season, with mean annual rainfall of 800 to 1500 mm. Farmers grow beans under several cropping systems: pure stand; mixed stand with other crops, usually maize; relay crop after maize; in 'dimba' gardens on residual moisture; under irrigation after rice in rice schemes; and in alleys of tree crops.

The total bean production in Malawi is low, although the national average bean production has been increasing from 27,500 metric tonnes in 1989, to 60,500 metric tonnes in 1998, and to 101,317 metric tonnes in 2001 (Table 1). This is mainly due to expansion of the total land area grown to beans – from 93,500 ha in 1989, to 170,000 ha in 1998, and to 207,301 ha in 2001. The yield per unit land area has also changed from 294 kg ha⁻¹ in 1989 to 356 kg ha⁻¹ in 1998, and to 488 kg ha⁻¹ in 2001. Bean yields obtained under farmer conditions are far lower than those realised under well-managed research station conditions where yields are in excess of 1,500 kg ha⁻¹. There are many factors that significantly constrain bean production under smallholder farm conditions in Malawi. These include biotic, abiotic, and socio-economic factors such as lack of seed of improved varieties (Mkandawire, 1992).

Table 1. Bean production statistics for Malawi from 1989-1998 and 2001^x.

| | Year | | | | | | | | | | |
|------------------------------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 2001 |
| Production (tonnes) | 27500 | 27600 | 38700 | 30000 | 45300 | 25100 | 30900 | 49600 | 53100 | 60500 | 101317 |
| Area (ha) | 93500 | 96500 | 116300 | 127000 | 132900 | 106300 | 112200 | 128200 | 172200 | 170100 | 207301 |
| Yield (kg ha ⁻¹) | 294 | 286 | 333 | 239 | 360 | 237 | 275 | 386 | 307 | 356 | 488 |

^xSource: Famine Early Warning System (FEWS), Ministry of Agriculture and Irrigation, Lilongwe, Malawi.

VARIETY DEVELOPMENT FOR BEAN PRODUCTION

Owing to the importance of beans in the diet of Malawians, there have been considerable research efforts to develop improved bean production technologies. Bunda College of Agriculture released six bean varieties in 1980. Out of these, four are bush types: Nasaka, Sapelekedwa, Bwenzilawana, and Kamtsilo; and two are climbing types: Namajengo and Kanzama. Breeders' seed of these varieties was provided to the National Seed Company of Malawi (NSCM) for further multiplication and distribution, but the company's interest in seed of self pollinated crops had declined at that time due to low demand because farmers saved seed from their previous crop. Farmers commonly save their own bean seed for several years before renewing their seed stocks. Unfortunately, many farmers did not have access to these improved bean varieties because insufficient seed was being produced. Bunda released three other varieties in 1993: Bunda 93 (a local accession); Chimbamba (derived from a cross between two local accessions); and Kalima (an introduced line from CIAT).

In 1995, the DFID funded Bean Improvement Project (BIP) at Chitedze Agricultural Research Station, released six new bean varieties: Napilira, Maluwa, Nagaga, Sapatsika, Mkhalaria, and Kambidzi (Chirwa et. al, 1997). These new BIP varieties represent two gene pools: (i) the first four are of the Andean type and are large seeded, (ii) the last two are of Mesoamerican origin and are small seeded. All of them originated from CIAT in Colombia.

STRATEGIES FOR SEED MULTIPLICATION IN BIP

The BIP has developed strategies and mechanisms that can support and accelerate the transfer of technologies to farmers in a sustainable manner. These are described in Chirwa and Aggarwal (2000). Two of the strategies under use are:

1. Breeder and basic seed production where the BIP uses one or both of the following channels to produce bean seed:

- i) Research station farms, mostly to produce breeders' seed; and
- ii) Contracted large-scale and small-scale farmers to produce basic seed.

The system has successfully operated since 1996 and all contracted seed growers have sold their seed to BIP. The quantities of seed realized over the years are as follows: 18 tonnes (1996); 40 tonnes (1997); 25 tonnes (1998); 50 tonnes (1999); and 95 tonnes (2000).

2. Commercial or non-commercial seed multiplication. Although the on-station and contract farmers systems for seed production are working well through the project (Phiri et. al; 2000), the quantities of seed produced are far too small to meet the bean seed requirement for the nation. The national bean seed requirement was projected at over 2000 tonnes in 1999 alone. Thus there is need to produce large quantities of seed to meet the national requirement. As such, there is need to add other mechanisms to supply large quantities of seed. The ultimate success of the seed system

will depend on secondary seed multipliers who work closely with farmers or have easy access to farmers. Already such mechanisms exist both at the government (Action group II of the Maize Productivity Task Force) and the non-government level (various NGO's), and their involvement in seed multiplication is important for a steady and sustainable seed supply system. The BIP has already initiated activities of bean seed multiplication with the Action group II for certified seed and with NGO's for approved seed.

EXPERIENCES IN SEED DISSEMINATION

The BIP has participated in a number of alternative methods for bean seed provision. Apart from the seed that was sold to NGO's for their own local-level seed projects, the BIP also used some of this seed for small packs that were sold through agricultural stations, rural grocery shops, NGO's, schools, maize mills, and village groups, as a way of introducing new bean varieties (Phiri et. al; 2000). The seed packs were of three sizes: 100 g, 250 g, and 500 g. The seed was packed in small polythene bags that contained a simple printed label with the name of the bean variety. The BIP contacted grocery shop owners who could be interested in selling the seed. The packs were delivered to the shop and a retail price was suggested. The shopkeeper could keep 20 percent of this sale price; the receipts and unsold seed were collected at the end of the season. The merchants decided the types of varieties to sell, the bag size to sell, and the quantities they could handle based on their knowledge of their customers. The BIP sold approximately 15 tonnes of seed in small packs over three years, 1996-98.

The BIP utilized several promotional strategies for the new varieties. Posters were developed and printed on 4A paper size, showing a color photo of the variety and describing its basic characteristics. Other posters were on 3A paper size, showing color photos of all six new varieties and highlighting their characteristics. Both posters were in two local languages, Chichewa and Chitumbuka. Radio announcements also described the new varieties and the availability of the small seed packs. There were two types of radio programs. One was a commercial advertisement with jingles, which was aired three times a day for four weeks, just before planting. The other was through the agricultural extension radio programs. This covered a wide range of new agricultural technologies including bean varieties and their seeds. The program ran throughout the year, and featured different technologies depending on the time of year.

COSTS OF PRODUCTION OF SMALL PACK SEED

One of the principal challenges for a small seed pack strategy is to produce and deliver the seed at a reasonable cost. Because the BIP must finance the process, it wanted to recover as many of the costs as possible. In addition, they wanted to be able to demonstrate that it is commercially feasible to produce and sell small seed packs of new varieties. Costs of producing and distributing the seed were calculated and it was found that in order for the BIP to recover all the costs of the small packs it should charge a retail price of about MK62 per kg (US\$1=MK26 in 1998) (Phiri et. al, 2000). The actual seed retail price in 1998 was MK40 per kg. Thus the bean packs were being sold at a price that was not sufficient to recover all of the costs. However, the pricing strategy seemed a reasonable way to introduce the small seed packs and the new varieties they contained to merchants and farmers. The exceptional volatility in bean prices makes it difficult to set bean seed prices. The price of beans at planting time may in fact be as high as MK 40 per kg, but bean prices may drop to one-third this level during the major harvest (MK 25 per kg). One of the major elements of the cost of seed is the cost of delivery, which is relatively high, and it is not reasonable to expect that this could be lowered. This is one of the costs that will likely be higher than expected in a conventional commercial seed operation. The purpose of the small pack strategy, after all, is to deliver relatively small quantities of seed to dispersed and isolated communities.

Some savings might be realized by reducing the amount of unsold seed. This could be partly accomplished by establishing a policy of no returned seed from the merchants or by more accurately estimating the demand for the seed. Another strategy could be to lower the margin received by the merchants. Merchants currently keep 20 percent of the subsidized price, i.e., MK8 per kg. It may be that merchants could sell the seed at a higher price and still retain only MK8 per kg. Whichever strategy is adopted, care must be taken to maintain sufficient merchant interest in the program.

RESULTS OF THE FOLLOW-UP STUDY ON THE SMALL-PACKS

A follow-up study was conducted in 1999 to survey merchants and farmers regarding acceptable prices for seed in small packs (Table 2).

| Table 2. Relative seed price, and farmers', and merchants' opinions regarding farmers' willingness to buy small packs. | | |
|---|---|----------------------------------|
| Ratio of seed price to grain price | Proportion of farmers willing to buy | |
| | Farmers' opinion (N=150) | Merchants' opinion (N=13) |
| 1:01 | 96% | 92% |
| 2:01 | 69% | 62% |
| 3:01 | 43% | 23% |
| 4:01 | 35% | 0% |

The merchants and the farmers are in close agreement when bean seed price is the same as or twice the price of the bean grain price; both estimates indicate that about two-thirds of farmers would be willing to buy the packs. The merchants are more cautious than the farmers as the price rises, however. In farmers' opinions, there would be significant interest even if the seed price were 3 or 4 times the grain price. It is interesting to note that there was no difference in these estimates between farmers who had experience with small packs and those who had never purchased them (data not shown, Phiri et. al, 2000).

CONCLUSIONS

The strategy of producing seed of new bean varieties and selling it in small seed packs in Malawi has been quite successful. In areas where the packs are available, many farmers have purchased the seed. The majority of these farmers are satisfied with the new varieties that they acquired and they are interested in purchasing other small seed packs. The merchants who have participated in the scheme are enthusiastic and wish to continue to sell the packs. Part of the success of the program is due to a well-organized promotion campaign. Extension agents helped inform farmers about the availability of the small packs and in some cases sold the packs at their offices. Announcements on the radio also helped raise awareness. Perhaps the most effective element in the promotion campaign was the color posters that described the new varieties. These were widely distributed. Merchants speak very positively of these posters and would like access to additional material of a similar nature. Farmers' limited awareness of new crop varieties is one of the principal problems limiting variety diffusion. The interest in the posters points to the possibility of producing additional descriptive material that could be distributed directly to farmers for their reference.

Even if widespread commercial uptake of the small pack strategy is not immediately feasible, small

packs can be used in the interface between agricultural research and NGO or donor seed projects. There are many projects that either distribute seed to client farmers or that try to organize local-level seed multiplication. There is often no standard procedure for these projects to acquire the seed that they use. It would be useful if such projects became accustomed to buying small packs (or, where appropriate, larger bags) of seed for their activities. This would help to organize and rationalize what is often a last-minute rush for seed. It would also establish the tradition of paying a fair price for seed and would help build the critical mass of seed demand that is required for a more sustainable system of seed provision.

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