



FACTORS INFLUENCING FARMER'S WILLINGNESS TO ADOPT KALIMA BEANS IN MALAWI

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INTRODUCTION

Kalima is a bean variety that was released by the Bean/Cowpea Collaborative Research Support Program (CRSP) in Malawi in 1993. Action Aid and Self Help International were the main NGO's that initiated seed multiplication programmes for the variety with smallholder farmers beginning in the 1995/96 season. The Action Aid programme was active in Mzuzu, Kasungu, Machinga and Blantyre ADD's, while the Self Help International programme was active in Lilongwe ADD. In both cases, seed multiplication was done through smallholder seed multiplication groups.

The main objectives of this study were to:

1. Assess whether smallholder farmers in the areas where Kalima was introduced were growing it.
2. Assess whether farmer perceptions regarding performance of Kalima in terms of the following characteristics influenced their willingness to adopt the variety: a) yield potential, b) disease/pest tolerance, c) palatability, d) cookability, e) marketability, f) physical characteristics of the seed including colour, shape and size, and g) growth characteristics such as height, number of pods per plant and time to maturity.
3. Assess the problems and constraints farmers were facing in growing Kalima.

METHODOLOGY

The study was conducted in Ntchisi and Dowa East Rural Development Projects (RDP's) of Kasungu Agricultural Development Division (ADD), and Thiwi Lifidzi RDP of Lilongwe ADD from June to August 1998. The study used two approaches: 1.) an interview questionnaire, and 2.) focus group discussions. A total of 476 respondents were interviewed, of which 163 were male and 313 were female. The majority of the respondents were from Thiwi Lifidzi RDP (282), while 140 respondents were from Ntchisi and 54 were from Dowa East RDP's. About 48% of the respondents belonged to seed multiplication groups.

The focus group discussions were conducted with 13 village groups: 5 in Ntchisi RDP; 3 in Dowa East RDP; and 5 in Thiwi Lifidzi RDP. The groups were drawn from different villages with one group per village. Each village focus group was separated into male and female groups; therefore there were a total of 26 focus group discussions. Men were separated from women in order to allow the respondents to interact freely since previous experience has shown that women sometimes fail to express themselves in the presence of men. Male research assistants were used to lead discussions with male groups while female research assistants led discussions with female groups.

All thirteen focus groups were from within the areas where seed of Kalima had been introduced. Seven groups represented seed multiplication groups that had grown Kalima for at least one year under a seed multiplication programme, while the other six groups were from villages where Kalima had not been officially introduced. Focus groups from villages where Kalima had not been

introduced were included so that we could assess whether the seed had spread into such villages.

RESULTS

The major crops grown in the areas of the study included maize, tobacco, beans, groundnuts, soybeans, sweet potatoes, European potatoes and vegetables. Maize was regarded as the most important crop and it was mainly grown for food. Beans were regarded as the second most important crop in Thiwi Lifidzi RDP, and fourth most important crop in both Ntchisi and Dowa East RDP's. While farmers in all three project areas indicated that beans were grown for food, beans were also considered a good source of income in Thiwi Lifidzi and Dowa East RDP's.

Results of the focus group discussions showed that the respondents grew a wide variety of bean cultivars and types. Thiwi Lifidzi RDP seemed to have a greater diversity of bean cultivars and types than the other two project areas. The respondents indicated that they experienced the following problems with bean production in general: a) high incidence of web blight; b) high infestation by aphids; c) snails; d) lack of pesticides; e) heavy rains destroyed flowers; f) unstable bean prices affected the profitability of the crop; g) seeds of improved varieties were expensive; h) leaf eaters were a problem.

All the focus group respondents who came from villages where Kalima had not been officially introduced said they had never grown the variety. This result was reconfirmed by the results of the interview questionnaire where out of 170 respondents who grew Kalima, only 11 of them (7%) were not from seed multiplication groups. The main reason for this seems to be that the seed had not yet spread to farmers outside seed multiplication groups. Farmers were, in other words, still experiencing shortage of seed for the variety. Most of the respondents who were actively involved in the smallholder seed multiplication programmes had grown the variety for about two years.

Summaries of the results of the focus group discussions are presented in [Table 1](#). The respondents indicated that Kalima was large seeded, making it easy to handle when harvesting it. The shape of the seed was acceptable to most farmers, while the colour of the bean was notably different from all other varieties grown in the areas. The cream with red mottles is particular to this variety in Malawi, is very attractive to farmers, and it cannot be confused with other varieties which were grown in the areas at the time of this study.

The respondents indicated that the major disadvantages of Kalima beans were:

- The variety did not seem to perform well as compared with other varieties when interplanted with maize. Beans grown in the main growing season are normally interplanted with maize, which is the primary crop. The potential of pure stand bean production is limited due to land shortage. This problem is, therefore, a major disadvantage of Kalima.
- The leaves of Kalima did not taste good when prepared as a vegetable as compared to other varieties. Respondents indicated that Kalima leaves were hard and hairy, which made them not taste good when cooked.
- Respondents also perceived Kalima as being very susceptible to web blight.

Most of the respondents indicated they were planning to grow Kalima for various reasons including: high yield potential, good taste and flavor, early maturity, and fast cooking time and hence less fuel

wood consumption. Very few of the respondents said they chose it just because it had been given to them for seed multiplication

Table 1. Farmer's perceptions presented at focus group discussions regarding certain characteristics of Kalima as compared to other varieties.

| Characteristics | Farmer Perceptions |
|---|--|
| Yield potential | Kalima are high yielding compared to other varieties |
| Disease tolerance | Fairly resistant to most diseases but suffers substantially from web blight |
| Cooking time | Cooks much faster than most varieties |
| Amount of firewood or charcoal required to cook the beans | Kalima is among one of the few varieties in Malawi which cook very fast and consumes less firewood and charcoal |
| Taste of the bean | Kalima has a very good taste and flavor; it also makes good thick soup |
| Taste of bean leaves | The leaves of Kalima do not taste good as compared to the leaves of other varieties |
| Time to maturity | Kalima is early maturing and this was an advantage as it is ready when other food stocks are low, becoming a major food source at that time; it also allows farmers to grow a second crop in the growing season while also escaping diseases and pests which come late in the growing season |
| Seed size | Kalima is large seeded making it easy to handle when harvesting |
| Shape of seed | Kalima has a good shape as compared to other varieties which look like soybeans |
| Growth characteristics | Kalima is a bush type and produces a good number of pods per plant; one of the focus groups estimated that the variety produces about 22 pods per plant |
| Easiness to interplant with other crops | Kalima is not easy to interplant; it performs best when grown in pure stand |

Hypotheses Testing Using Logistic Regression Models

Two logistic regression models were used to investigate the factors that may have influenced (a) respondents' decision to grow Kalima in the previous season, and (b) respondents' willingness to grow Kalima in the next growing season.

Results of a logistic analysis test showed that membership in a seed multiplication group and previous experience growing beans were significantly related to whether respondents had grown Kalima in the previous season ($p < .01$). Respondents who belonged to seed multiplication groups were more likely to have grown Kalima than respondents who did not belong to seed multiplication groups. This was most likely due to increased opportunity to access Kalima seed. Respondents who did not belong to seed multiplication groups did not have access to the seed and therefore could not grow it. Respondents who had previous experience growing beans were also more likely to have grown Kalima in the previous season. One likely explanation is that respondents who had

experience with growing beans had more knowledge about the advantages of Kalima and were therefore more interested to try this new variety.

Gender was also significantly related to farmer's willingness to grow Kalima. Women were more willing to grow Kalima than men. One possible explanation for this is that beans are mainly grown by women in Malawi, and women are therefore more likely to have more knowledge about the advantages of the variety than men.

DISCUSSIONS AND CONCLUSIONS

Beans are a very important crop to most Malawian smallholders and are considered as the second most important crop following maize in the main bean growing areas such as Dedza District. Beans are a critical source of protein in Malawian diets, as well as a source of income for most farmers. Most of the bean growing areas such as Dedza tend to be unfavorable to maize, the main food staple. Beans are therefore a good complementary crop in these areas because they mitigate against the effects of food shortage through direct consumption or through sales (income is used for buying food). The importance of beans becomes more conspicuous at harvest, between February and April, when farmers suffer most from the effects of food shortage. This is the time when most food reserves are depleted and most labour-demanding field activities are completed, limiting the opportunities for these households to sell their labour in exchange for food. Crops such as beans which mature during this period provide needed food or income which is used to buy maize for food. Beans are also less capital demanding, as they require minimal if any additional soil fertility.

The Bean/Cowpea CRSP has as its major objective the development of bean varieties that are high yielding, disease/pest resistant and acceptable to farmers. Kalima is one product of this research work, it was released in 1993, and farmers have had only a limited exposure to it. However those few who have been exposed are generally satisfied. One characteristic the respondents liked most about Kalima was its high yield potential. Most farmers in Malawi have very small land holdings and limited resources. They therefore need high yielding crops in order to produce enough grain for their food needs and to sell for cash. Farmers who tried Kalima also liked it for its good taste and flavor, both major factors influencing a farmer's decision to adopt a particular variety. Experience from maize shows that consumption preferences of Malawian farmers play a major role in their decision to adopt high yielding varieties (Smale *et al.*, 1990). It is therefore very important that scientists consider farmer's consumption preferences when developing new bean varieties.

Another characteristic of Kalima that farmers liked was its fast cooking time that resulted in a reduction of fuelwood consumption. In Malawi, women are predominantly responsible for food preparation including fetching of firewood – the main source of energy for cooking. With the high rate of deforestation (estimated at 3.5% per annum), the forest area is diminishing and the distances that women travel to collect firewood are increasing (Masangano, 1997). This has a direct impact on the labour demands placed on women, and one observable consequence has been a substantial reduction in the amount of firewood that is collected (Coote *et al.*, 1993). Women are switching to foodstuffs and ingredients that require less cooking (Agarwal, 1983), and therefore they prefer crops and varieties that are faster cooking.

Early maturity was another characteristic of Kalima that farmers liked. The rainfed Kalima crop tends to mature as early as February or March, a time when many farmers experience major problems of food and cash shortage. Kalima is therefore a very good variety for the mitigation of those problems. Another advantage of early maturity is that it allows farmers to grow more than one crop of beans per growing season.

The major concern that farmers expressed about Kalima was its unsuitableness for interplanting with maize. With the land pressure problem, Malawian smallholder farmers tend to interplant most of their crops with maize, their main food staple. Beans are either planted in the same planting hole with maize or in between maize planting holes, depending on the growth characteristics of the bean variety. Another concern was that the leaves of Kalima were not palatable. Apart from the bean itself, Malawian farmers consume the green leaf as a boiled vegetable. Bean leaves are normally eaten together with Nsima, the staple food throughout Malawi that is made from boiled maize flour. Unfortunately, Kalima bean leaves do not make a good vegetable, and most of the farmers described them as too hairy.

The final concern was more of a logistical nature in that farmers did not have adequate seed available to them. While most farmers expressed an interest in growing Kalima, they did not have a good source of seed. The seed appeared to be only available to those farmers who were originally selected to be seed multipliers. This was because in most cases only small quantities of seed were distributed with the intention that it would be grown on one communal piece of land, and that at harvest the farmers would have more seed to share amongst themselves. This approach meant that it would normally take more than two seasons before the seed went to non-seed producers.

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