PN-ACK-982

AN INVESTIGATION OF ALTERNATIVE BEAN SEED MARKETING CHANNELS IN UGANDA

Soniia David, Sarah Kasozi and Charles Wortmann

Occasional Publications Series, No. 19

April 1997

A

Correct citation:

S. David, S. Kasozi and C. Wortmann. 1997. An investigation of alternative bean seed marketing channels in Uganda. Network on Bean Research in Africa, Occasional Publications Series, No. 19. CIAT, Kampala, Uganda.

b

PREFACE

This volume is the nineteenth in a working document series that serves research on common bean (*Phaseolus vulgaris*) in Africa. This publication reports on research to test the appropriateness of bean seed distribution through four non-conventional channels: rural shops, a rural health clinic, women's groups and a non-governmental organization (NGO). Although this strategic study led by CIAT was carried out in Uganda, it was designed to support national and local organizations in countries throughout Africa in their activities aimed at disseminating seed of new bean varieties in situations where the formal seed industry serves this crop only partially or not at all. Conclusions include recommendations to improve the effectiveness of future strategies for national research programs and NGOs, for the formal seed industry, and for seed agencies, donors and other supporting institutions.

The Network on Bean Research in Africa serves to stimulate, focus and coordinate research efforts on common bean. The network is organized by CIAT in collaboration with two interdependent sub-regional networks of national programs: the Eastern and Central Africa Bean Research Network (ECABREN) and the SADC Bean Research Network (SABRN) for southern Africa.

Working documents include bibliographies, research reports and bean network discussion papers. These publications are intended to complement two associated series of Workshop Proceedings and Reprints.

Financial support for regional bean projects comes from the Canadian International Development Agency (CIDA), the Swiss Agency for Development and Cooperation (SDC) and the United States Agency for International Development (USAID).

Further information on bean research in Africa is available from:

Pan-Africa Coordinator, CIAT, P.O.Box 6247, Kampala, Uganda.

Regional Coordinator, Eastern and Central Africa Bean Research Network, P.O. Box 2704, Arusha, Tanzania.

Regional Coordinator, SADC Bean Network, P.O.Box 2704, Arusha, Tanzania.

ACKNOWLEDGEMENTS

We gratefully acknowledge the assistance of various individuals, groups and institutions without which this research would not have been possible. These include the following:

Nabongo Parish: Harriet Nafuna, Bumulaha and Bwikhonge Women's Groups and the wider community.
Bumalimba Parish: Delphine Nadunga, Bunandasa Cooperative and the wider community.
Ssii sub-county: John Kasaga, the staff of World Vision-Ssii, the various VAEFs (village agricultural extension farmers) and the wider community.
Nakifuma sub-county: Staff of the Nakifuma Health Center who assisted in this exercise.
Mpigi District: Monica Nakalema and Charles Lubega.

Many others, too numerous to list, contributed their time and effort and deserve our thanks.

The research reported here, and this publication, were made possible through support provided to CIAT by the Canadian International Development Agency (CIDA). The opinions expressed herein are those of the authors and do not necessarily reflect the views of contributing donor organizations.

PUBLICATIONS OF THE NETWORK ON BEAN RESEARCH IN AFRICA

Workshop Series

No. 1. Proceeding of the Bean Fly Workshop, Arusha, Tanzania, 16-20 November 1986.

No. 2. Proceeding of a Workshop on Bean Research in Eastern Africa, Mukono, Uganda, 22-25 June 1986.

No. 3. Proceeding of a Workshop on Soil Fertility Research for Bean Cropping Systems in Africa, Addis Ababa, Ethiopia, 5-9 September 1988.

No. 4. Proceeding of a Workshop on Bean Varietal Improvement in Africa, Maseru, Lesotho, 30 January-2 February 1989.

No. 5. Actes du Troisieme Seminaire Regional sur L'Amelioration du Haricot dans la Region des Grands Lacs, Kigali, Rwanda, 18-21 Novembre 1987.

No. 6. Proceedings of First SADCC Regional Bean Research Workshop, Mbabane, Swaziland, 4-7 October 1989.

No. 7. Proceedings of Second Workshop on Bean Research in Eastern Africa, Nairobi, 5-8 March 1990.

No. 8. Actes de l'Atelier sur la Fixation Biologique d'Azote du Haricot en Afrique, Rubona, Rwanda, 27-29 October 1988.

No. 9. Actes du Quatrieme Seminaire Regional sur L'Amelioration du Haricot dans la Region des Grands Lacs, Bukavu, Zaire, 21-25 Novembre 1988.

No. 10. Proceeding of a Workshop on National Research Planning for Bean Production in Uganda, Kampala, Uganda, 28 January-1 February 1991.

No. 11. Proceeding of the First Meeting of the Pan-African Working Group on Bean Entomology, Nairobi, Kenya, 6-9 August, 1989.

No. 12. Progress in Improvement of Common Bean in Eastern and Southern Africa. Proceedings of the Ninth SUA/CRSP and Second SADCC/CIAT Bean Research Workshop, Morogoro, Tanzania, 17-22 September, 1990.

No. 13. Proceeding of a Working Group Meeting on Virus Diseases of Beans and Cowpea in Africa, Kampala, Uganda, January 17-21, 1990

No. 14. Proceeding of the First Meeting of the SADCC/CIAT Working Group on Drought in Beans, Harare, Zimbabwe, May 9-11, 1988.

No. 15. Proceeding of the First Pan-African Working Group Meeting on Anthracnose of Beans, Ambo, Ethiopia, February 17-23, 1991.

No. 16. Actes du Cinquieme Seminaire Regional sur l'Amelioration du Haricot dans la Region des Grands Lacs, Bujumbura, Burundi, 13-18 Novembre, 1989.

No. 17. Actes du Sixieme Seminaire Regional sur l'Amelioration du Haricot dans la Region des Grands lacs, 21-25 Janvier 1991.

No. 18. Actes de la Conference sur le Lancement des Varietes, la Production et la Distribution de Semaines de Haricot dans la Region des Grands Lacs, Goma, Zaire, 2-4 Novembre 1989.

No. 19. Recommendations of Working Groups on Cropping Systems and Soil Fertility Research for Bean Production Systems, Nairobi, Kenya, 12-14 February 1990.

No. 20. Proceeding of First African Bean Pathology Workshop, Kigali, Rwanda, 14-16 November, 1987.

No. 21. Soil Fertility Research for Maize and Bean Production Systems of the Eastern Africa Highlands - Proceedings of a Working Group Meeting, Thika, Kenya, 1-4 September 1992.

No. 22. Actes de l'Atelier sur les Strategies de Selection Varietale dans la Region des Grands Lacs, Kigali, Rwanda, 17-20 Janvier 1991.

No. 23. Proceeding of the Pan-African Pathology Working Group Meeting, Thika, Kenya, 26-30 May 1992.

No. 24. Proceeding of a Bean Research Planning in Tanzania: Uyole Research Centre, 18-24 May 1992.

No. 25. Second Meeting of the Pan-African Working Group on Bean Entomology, Harare, 19-22 September 1993.

No. 26. Bean Improvement for Low Fertility Soils in Africa: Proceedings of a Working Group Meeting, Kampala, Uganda, 23-26 May 1994.

No. 27. Third SADC/CIAT Bean Research Workshop, Mbabane, Swaziland, 5-7 October 1992.

No. 28. Proceedings of Third Multidisciplinary Workshop on Bean Research in Eastern Africa, Thika, Kenya, 19-22 April 1993.

No. 29. SADC Working Group Meeting of Bean Breeders, Lilongwe, Malawi, 26-29 September 1994.

No. 30. Regional Planning of the Bean Research Network in Southern Africa, Mangochi, Malawi, 6-8 March, 1991.

No. 31. Fourth SADC Regional Bean Research Workshop, Potchefstroom, South Africa, 2-4 October 1995.

No. 32. Alternative Approaches to Bean Seed Production and Distribution in Eastern and Southern Africa: Proceedings of a Working Group Meeting, Kampala, Uganda, 10–13 October 1994.

No. 33. Eastern Africa Working Group Meeting on Bean Breeding, Kampala, Uganda, 30 May 1994.

No. 34. Pan-Africa Working Group on Bacterial and Viral Diseases of Bean, Kampala, Uganda, 13-16 June 1994.

No. 35. Seminaire Regional Restreint du RESAPAC tenu a Bukavu du 25 au 27 Janvier 1995.

No. 36. VIII[e] Seminaire Regional du RESAPAC tenu a Mukono, Uganda, du 5 au 8 Novembre 1995.

Occasional Publications Series

No. 1. Agromyzid Pests of Tropical Food Legumes: a Bibliography.

No. 2. CIAT Training in Africa.

No. 3A. First African Bean Yield and Adaptation Nursery (AFBYAN I): Part I. Performance in Individual Environments.

No. 3B. First African Bean Yield and Adaptation Nursery (AFBYAN I): Part II. Performance across Environments.

No. 4. Assessment of Yield Loss caused by Biotic Stress on Beans in Africa.

No. 5. Interpretation of Foliar Nutrient Analysis in Bean - the Diagnosis and Recommendation Integrated System.

No. 6. The Banana-Bean Intercropping System in Kagera Region of Tanzania - Results of a Diagnostic Survey.

No. 7. Bean Stem Maggot Research Methods: A Training Course at Bujumbura, Burundi, 1-8 November, 1991.

No. 8. On-Farm Storage Losses to Bean Bruchids, and Farmers' Control Strategies: A Travelling Workshop in Eastern and Southern Africa.

No. 9. A Training Manual for Bean Research.

No. 10. Bean Germplasm Conservation based on Seed Drying with Silica Gel and Low Moisture Storage.

No. 11. African Bean Production Environments: Their Definition, Characteristics and Constraints.

No. 12. Intensifying Production among Smallholder Farmers: The Impact of Improved Climbing Beans in Rwanda.

No. 13. Analysis of Bean Seed Channels in the Great Lakes Region: South Kivu, Zaire, Southern Rwanda, and Select Bean-Growing Zones of Burundi.

No. 14. Second African Bean Yield and Adaptation Nursery (AFBYAN II).

No. 15. Enhancing Small Farm Seed Systems: Principles derived from Bean Research in the Great Lakes Region. L.Sperling, U. Scheidegger and R. Buruchara. 30p.

No. 16. Les Recherches Multienvironmentales sur Haricots Effectuees au Rwanda de 1985 a 1990. P. Nyabyenda.

No. 17. Point de la Recherche Multienvironmentale sur Haricot au Rwanda jusqu'en 1993. P. Nyabyenda.

No. 18. Synthese des Rapports Preliminaires et Definitifs des Sous-projets de Recherche Regional du RESAPAC pour 1994-1995. P. Nyabyenda.

Reprint Series

No. 1. D. J. Allen, M. Dessert, P. Trutmann and J. Voss. Common beans in Africa and their constraints. P.9-31 in: H. F. Schwartz and M. A. Pastor-Corrales (eds.), Bean Production Problems in the Tropics, 2nd Ed. CIAT, Cali, Colombia.

No. 2. A. K. Karel and A. Autrique. 1989. Insects and Other Pests in Africa. P.455-504 in: H. F. Schwartz and M. A. Pastor-Corrales (eds.), Bean Production Problems in the Tropics, 2nd Ed. CIAT, Cali, Colombia.

No. 3. J. B. Smithson, O. T. Edje and K. E. Giller. 1993. Diagnosis and Correction of Soil Nutrient Problems of Common Bean (*Phaseolus vulgaris*) in the Usambara Mountains of Tanzania. 1993. J. Agric. Sci. 120: 233-240.

No. 4. C. S. Wortmann, T. Sengooba and S. Kyamanywa. 1992. Banana and Bean Intercropping Research: Factors affecting Bean Yield and Land Use Efficiency. Expl. Agric. 28: 287-294; and
C. S. Wortmann and T. Sengooba. 1993. The Banana-Bean Intercropping System - Bean Genotype x Cropping System Interactions. Field Crops Research 31: 19-25.

No. 5. C. S. Wortmann. 1993. Contribution of Bean Morphological Characteristics to Weed Suppression. Agron. J. 85(4): 840-843.

No. 6. L. Sperling and M. E. Loevinsohn. 1993. The Dynamics of Adoption: Distribution and Mortality of Bean Varieties among Small Farmers in Rwanda. Agric. Systems 41: 441-453.

No. 7. M. S. Nahdy. 1994a. Bean Sieving, a Possible Control Measure for the Dried Bean Beetles, *Acanthoscelides obtectus* (Say)(Coleroptera: Bruchidae). J. Stored Prod. Res. 30 (1): 65-69; and
M. S. Nahdy. 1994b. An Additional Character for Sexing the Adults of the Dried Bean Beetle *Acanthoscelides obtectus* (Say)(Coleroptera: Bruchidae). J. Stored Prod. Res. 30 (1): 61-63.

No. 8. C. S. Wortmann, M. Isabirye and S. Musa. 1994. *Crotalaria ochroleuca* as a Green Manure Crop in Uganda. African Crop Science J. 2(1):55-61.

No. 9. L. Sperling, M. E. Loevinsohn and B. Ntabomvura. 1993. Rethinking the Farmer's Role in Plant Breeding: Local Bean Experts and On-station Selection in Rwanda. Expl. Agric. 29: 509-519.

No. 10. K. E. Giller, F. Amijee, S. J. Brodrick, S. P. McGrath, C. Mushi, O. T. Edje and J. B. Smithson. 1992. Toxic Concentrations of Iron and Manganese in Leaves of *Phaseolus vulgaris* L. growing on Freely-drained Soils of pH 6.5 in Northern Tanzania. Communications in Soil Science and Plant Analysis, 23 (15&16), 1663-1669.

No. 11. Overcoming Bean Production Constraints in the Great Lakes Region of Africa: Integrating Pest Management Strategies with Genetic Diversity of Traditional Varietal Mixtures. *[A set of seven publications]*

No. 12. A. F. Opio, J. M. Teri and D. J. Allen. 1993. Studies on Seed Transmission of *Xanthomonas campestris* pv *phaseoli* in Common Beans in Uganda. Afr. Crop Science J. 1(1): 59-67; and
A. F. Opio, D. J. Allen and J. M. Teri. 1996. Pathogenic Variation in *Xanthomonas campestris* pv. *phaseoli*, the Causal Agent of Common Bacterial Blight in *Phaseolus* beans. Plant Pathology 45: 1126-1133.

No. 13. O.Z. Mukoko, N.W. Galwey and D.J. Allen. 1995. Developing Cultivars of the Common Bean (*Phaseolus vulgaris* L.) for Southern Africa: Bean Common Mosaic Virus Resistance, Consumer Preferences and Agronomic Requirements. Field Crops Research 40:165-177; and
O.Z. Mukoko and N.W. Galwey. 1995. Breeding the Common Bean (*Phaseolus vulgaris* L.) for Resistance to Bean Common Mosaic Virus: Alternatives to Backcrossing. Euphytica 82:91-104.

No. 14. C.S. Wortmann, H.E. Gridley and S.M. Musaana. 1996. Seed Yield and Stability of Bean Multiline. Field Crops Research 46: 153-159.

TABLE OF CONTENTS

ABSTRACT	1
INTRODUCTION	1
MATERIALS AND METHODS	2
Distribution through shops	3
RESULTS	
Seed Sales	5
Distribution through markets, women's groups, clinics and NGOs	3
Farmers' response to the new varieties	7
EVALUATION OF DISTRIBUTION METHODS	8
Promotion issues	8
Access issues	9
Cost and organizational issues	11
CONCLUSIONS	13
Guidelines for bean seed dissemination	13
APPENDIX	15
REFERENCES	16

AN INVESTIGATION OF ALTERNATIVE BEAN SEED MARKETING CHANNELS IN UGANDA

Soniia David, Sarah Kasozi and Charles Wortmann[1]
CIAT, Pan-African Bean Research Alliance, P.O. Box 6247, Kampala, Uganda

ABSTRACT

The distribution of newly released bean seed is often a weak link in the technology transfer process. To assist national commodity programs to devise cost-effective delivery systems, research was conducted in Uganda to test the appropriateness of bean seed distribution through four non-conventional channels: rural shops, a rural health clinic, women's groups and an NGO. The findings confirm the feasibility of distributing seed packets through market and non-market channels and show that each delivery system has advantages and disadvantages which must be assessed by seed suppliers in a country-specific context. The paper offers guidelines for the distribution of new bean varieties by formal institutions.

INTRODUCTION

In the small farm systems operating in Eastern and Southern Africa the formal seed industry[2] plays a limited role in supplying bean (*Phaseolus vulgaris L .)* seed due to severe market constraints that make multiplication of seed of this self-pollinating crop uneconomical. In countries where the organized seed sector does supply certified bean seed (e.g. Ethiopia, Uganda, Tanzania), the output is often irregular or limited to a few varieties which have commercial value, particularly for emergency relief work. Access by smallholders to certified bean seed is often restricted by the high price of the seed and untimely and ineffective delivery mechanisms (Sperling, 1994).

To strengthen this weak link in the technology development and transfer process, several national bean research programs and non-governmental organizations (NGOs) in the region have become involved in the production and/or dissemination of newly released bean varieties. These efforts typically involve distributing relatively small quantities of seed of newly released bean cultivars free of charge through the extension system or directly to farmers (see David, 1996a; Wiggins and Cromwell, 1995; Cromwell and Wiggins, 1993). Distribution by national agricultural research systems (NARS) is usually on a one-time basis in any given locality. NGOs may use a variety of distribution channels and mechanisms for various crops, including support of farmer seed enterprises and seed exchange schemes (Wiggins and Cromwell, 1995).

---

[1] Rural sociologist, research assistant and agronomist, respectively.

[2] As used in this paper, the formal or organized seed industry refers to public or private agencies involved directly in the large-scale production and marketing of seed. It excludes the agricultural research system.

The involvement of commodity research programs in bean seed multiplication, while often necessary, is not economically feasible nor sustainable. The conventional, linear research-extension-farmer approach to the distribution of bean seed is expensive and often fraught with logistical and other difficulties, usually resulting in untimely delivery to a few farmers. The well documented tendency for extension staff to have contact with mainly better-off, male farmers suggests that dependence on this, or any other single, seed delivery channel may not be the most effective strategy for promoting rapid and widespread adoption of new bean cultivars.

Moreover, where farmers find it difficult to retain seed of new cultivars due to adverse agro-environmental conditions (drought, poor storage, etc.) and socio-economic constraints, repeated seed delivery through the extension system is unlikely to be cost-effective. There is also the potential problem of conflict between using the extension system for both varietal testing and diffusion since, in some cases, due to disappointing experiences with test varieties, farmers have shunned improved seed distributed by extension agents (Cromwell, 1990). The rationale for promoting multiple seed/technology dissemination channels and flexibility in technology diffusion systems is thus twofold: 1. to reduce the cost of delivery to seed suppliers and, 2. to ensure access to new bean cultivars by a wide cross-section of the farming population, particularly poorer farmers, smallholders in marginal areas and women farmers, the principal bean growers in most of Eastern and Southern Africa.

This paper presents results of research conducted in Uganda between 1993 and 1995 to test the appropriateness of bean seed distribution through four non-conventional channels: rural shops, a rural health clinic, women's groups and an NGO. While the system of distributing seed of new bean varieties through small packets was first explored in the Great Lakes Region of Central Africa (Rwanda, Zaire) (Sperling et al, 1992), its appropriateness to other countries in the region has not been systematically investigated. Other objectives of the studies conducted in Uganda were to determine whether farmers are willing to buy seed of unknown bean varieties, in what quantities and at what price. The discussion focuses on approaches to the initial dissemination of new varieties rather than on routine seed replacement, although clearly, strategies for these two distinct activities may overlap.

Following this introduction and a section on methods, results on the movement of the seed and farmers' response to the new varieties are presented. The next section evaluates the distribution methods used. We conclude by proposing some general guidelines for designing effective seed delivery strategies and systems. While this paper focuses on the dissemination of bean seed, many of the findings are relevant to other self-pollinating or vegetatively propagated crops.

MATERIALS AND METHODS

The bean varieties distributed in the studies conducted were CAL 96 (released as K132) and MCM 5001 (K131), both released by the Uganda National Bean Program (UNBP) in April 1994. CAL 96 is a determinate bush type (Type I) characterized by dark red mottled, large seeds of the Calima type highly appreciated in Uganda. This variety is often mistaken in Uganda for the widely grown K20, released in 1968. MCM 5001, a small seeded Carioca type, previously unknown in Uganda, has an indeterminate growth habit (Type II). The seed was produced at Kawanda Agricultural Research Institute, near Kampala. In all seed

distribution exercises, seed was packaged in heat-sealed clear plastic packets containing an informational leaflet in the appropriate local language. The name of the variety, number of days to maturity, resistance to disease, yield and cooking time relative to popular bean varieties were described in the leaflet. Seed was delivered directly to the distributing agent at the start of the planting season and unsold seed was returned the same season or later.

Distribution through shops

In February 1993, seed of MCM 5001 (then in pre-release stage) was packaged in 500 gram amounts and made available to one to three purposively selected shopkeepers in five trading centers, respectively, in four districts in the east and central region of the country (Masaka, Mukono, Pallisa and Jinja) (Figure 1). Each shop received 15 packets of seed. Shopkeepers were advanced the seed and asked to sell it for Ush 400/kg (US$0.44), roughly 150% of the lowest farmgate price for local bean varieties at planting time following a "normal" season. They kept 25 percent of the proceeds, while 75 percent was returned to the UNBP. Shopkeepers were requested to record the names and addresses of people who purchased the seed. No limitation on the amount of seed that could be sold to individual buyers was specified.

In the first season of 1994, three seasons after the initial seed distribution, a survey of buyers was conducted. Due to poor record keeping by shopkeepers and difficulties in locating buyers, a convenience sample of 47 farmers was interviewed. Farmers were asked to evaluate the new variety and questioned about its performance over two seasons (first and second seasons of 1993) and the exchange and sale of seed (see David, 1996b).

Distribution through markets, women's groups, clinics and NGOs

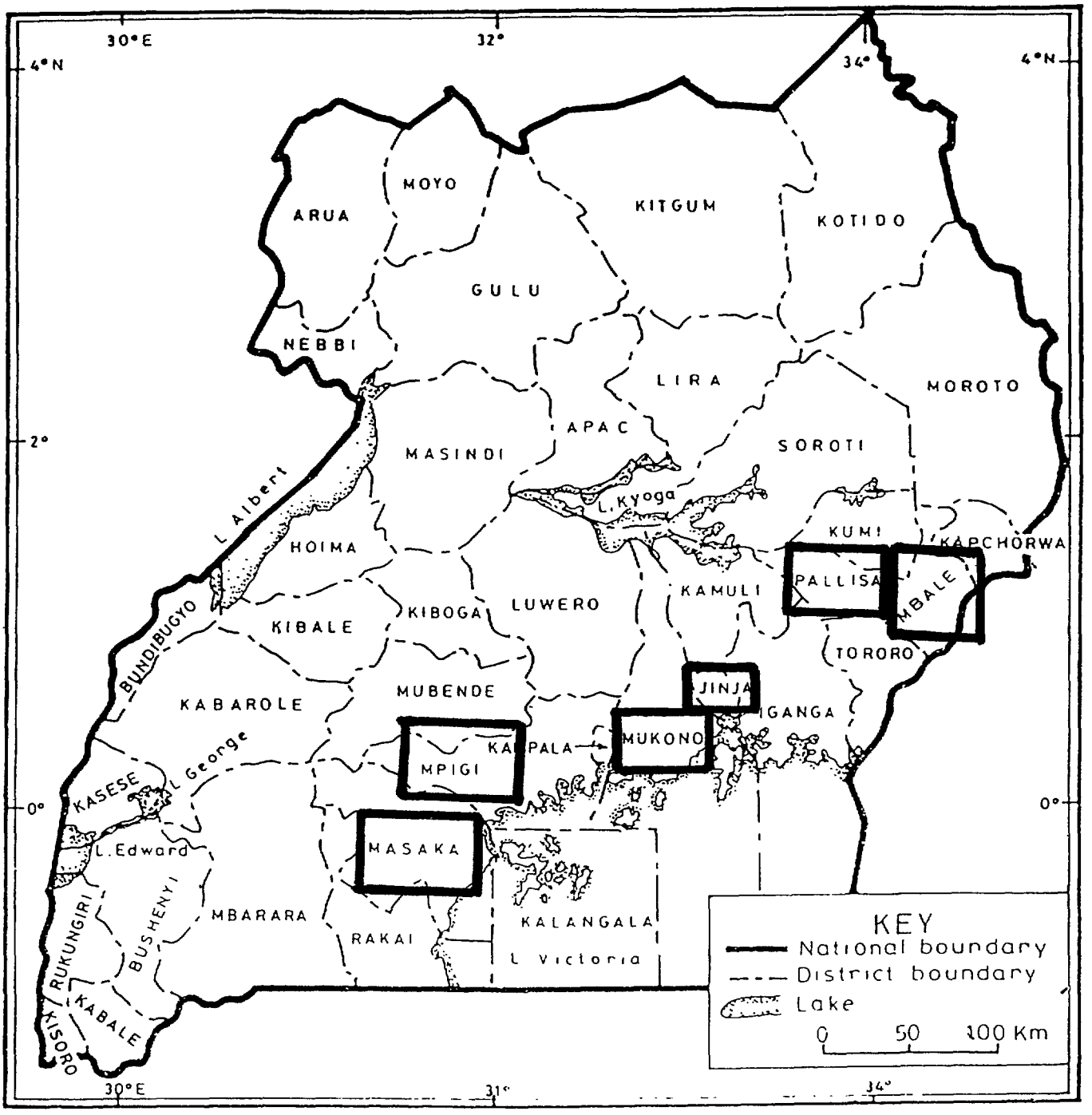
At the start of the second planting season of 1994, seed was given to two extension agents in Mpigi District. The seed was sold in five rural markets. At the start of the first season of 1995, seed was distributed in Nakifuma and Ssii Sub-Counties, Mukono District through a rural health clinic and an NGO (World Vision-Ssii) and through women's groups in Bumalimba and Nabongo Parishes in Mbale District (Figure 1). A second NGO in Luwero District withdrew from its commitment to distribute seed at the last minute[3]. The seed was packaged in two quantities: 250 and 500 grams. All distributors were requested to sell the seed at Ush 800/kg (US$0.87), about three times the lowest price of seed of local bean varieties at planting time following a "normal" season. Each distributor was given a technical bulletin describing the characteristics of the new varieties.

All distributors, except extensionists, were requested to limit the amount of seed sold to individual buyers to no more than 500 grams per variety.In the case of the clinic, extension agents and women's groups, sellers kept 25-30% percent of the proceeds; World Vision simply acted as a distributor by returning sale proceeds.

---

[3] The management of this small, local NGO expressed several reservations about the seed distribution exercise, including what it considered as the excessively high price of the seed and uncertainty about the performance of the varieties (despite having conducted its own demonstrations the previous season).

UGANDA DISTRICTS



Sellers kept record, using prepared forms, of the name, sex and address of people who purchased the seed and amounts sold. Besides instructions to limit the amount of seed sold per customer to no more than 500 grams of each variety, no other advice was given on promotion and sales. A poster in Luganda, the local language, accompanied the seed taken to the health clinic.

World Vision designated farmer agricultural extension agents in four villages as distributors. Sales by women's groups were made from the chairwoman's home, although a few packets were sold from a shop owned by one of the groups. In the clinic situation, the seed was sold from two points: the out-patient department (OPD) and bi-weekly maternity clinics. A few sales were made through the clinic's outreach program, but this venture was abandoned due to difficulties faced by staff in transporting the seed.

RESULTS

Seed Sales

Through the six distributing agencies, 279.25 kg of seed (96% of the total delivered) was sold to 441 farmers[4] (Table 1). As Table 2 shows, the movement of the seed was fairly rapid even though farmers were not expecting to make seed purchases in those venues and often did not have enough money to cover this unbudgeted expense. Most of the seed delivered to the clinic, women's groups and World Vision was sold during a two week period. Over a period of approximately 27 marketing hours, 29.75 kg of MCM 5001 and 30.5 kg of CAL 96 were sold in markets. Due to a misunderstanding, the remaining seed was sold through farmer groups or from the extension agents' homes.

Table 1: Dissemination of seed of MCM 5001 and CAL 96 through various channels

Distribution Channel	Quantity of seed delivered (kg)	Quantity of seed sold (kg)	No. of farmers who purchased seed
Extension agents selling in markets	100	92.75	160
World Vision-Ssii	50	48.5	81
Nakifuma Health Center	50	50	77
Bunandasa Co-operative	40	40	50
Bumulaha Women's Group	25	23	33
Bwikhonge Women's Group	25	25	40
Total	290	279.25	441

[4] No data are available on total amount of seed distributed to shops.

Some seed had not been sold when we returned to monitor the exercise (usually mid-season) (Table 1). In the case of the extension agents, this was due to the time limit set for the exercise (two weeks), while World Vision was unable to sell all of the seed due to its late delivery resulting from the difference in seasons between the targeted location (Lugala Parish, Ssii Sub-county) and Kampala, where the seed was produced[5].

Table 2: Rate of seed sales two, four and six weeks after delivery*

Delivery Channel	Seed sold 2 weeks after delivery (%)		Seed sold 4 weeks after delivery (%)		Seed sold 6 weeks after delivery (%)	
	CAL 96	MCM 5001	CAL 96	MCM 5001	CAL 96	MCM 5001
World Vision - Kimbugu Village	67	67	33	33	-	-
World Vision - Ssii Village	100	100	-	-	-	-
World Vision - Lwala Village	100	100	-	-	-	-
World Vision - Nakawali Village	79	71	21	29	-	-
Nakifuma Health Center	100	72	-	28	-	-
Bunandasa Co-op	28	37	44	33	28	30
Bumulaha Women's Group	39	30	21	13	17	13
Bwikhonge Women's Group	100	100	-	-	-	-

* Note: The figures refer to the proportion of seed actually sold rather than the amount delivered.

Distributing agents concurred that the small test quantities made available mitigated the high price of the seed, although some buyers complained about the price, especially when CAL 96 was confused for K20. Tables 3 and 4 confirm our expectations that farmers will buy larger quantities of a familiar seed type, such as CAL 96, and smaller quantities of an unfamiliar seed type i.e., MCM 5001. This behavior should be considered by seed agencies in making packaging decisions.

[5] The difference in planting seasons between Kampala and Ssii sub-county, which led to late delivery, points to the need for careful planning by centralized seed suppliers.

Table 3: Quantities of CAL 96 seed sold (percent)

Seed purchased (kg)	Markets (n=91)	Clinic (n=57)	Women's groups (n=91)	World Vision (n=61)	Total (N=301)
0.25	42	25	22	43	33
0.50	38	75	73	57	59
0.75	3	0	2	0	2
1.00	12	0	2	0	5
>1	4	0	1	0	2

Table 4: Quantities of MCM 5001 seed sold (percent)

Seed purchased (kg)	Markets (n=89)	Shops (n=47)	Clinic (n=60)	Women's groups (n=98)	World Vision (n=67)	Total (N=314)
0.25	47	0*	30	55	61	50
0.50	39	51	60	37	39	44
0.75	2	0	0	4	0	2
1.00	10	26	0	4	0	4
>1	1	24	0	0	0	<1

* seed was sold in packets of 500 grams only.

Farmers' responses to the new varieties

It can be assumed that the majority, if not all, of the seed buyers were first exposed to the new varieties through the seed distribution exercises, since both varieties had only been released for a short time and had not been widely distributed. In this regard, the importance of the informational leaflets was evident, as most buyers first read the leaflet before making their purchase. They frequently questioned the distributor about the new varieties, notably concerning the resemblance of CAL 96 to K20 and the marketability of the small-seeded MCM 5001.

All distributors who sold both varieties reported a strong buyer preference for CAL 96. Yet, of the 441 farmers who purchased seed from markets, the clinic, women's groups and World Vision, 39% bought both varieties, 32% bought only MCM 5001 and 29% bought only CAL 96. Due to the restrictions imposed on the amount of seed a buyer could purchase from the clinic, World Vision and women's groups, our data do not depict a totally realistic picture

of market demand for the two varieties. Nevertheless, the data show that farmers bought larger quantities of CAL 96 compared to MCM 5001, and in situations where there was a difference in the rate of sales by variety, for the most part, CAL 96 moved more quickly (Tables 2, 3, 4). Farmers expressed concern about the lack of market for MCM 5001 due to its unfamiliar seed type, the belief, due to its seed size, that it has a semi-climbing growth habit, and in Mbale, confused the variety with a local one.

EVALUATION OF DISTRIBUTION METHODS

Despite the diversity of experiences in the seed distribution exercises in terms of methodology and approaches to evaluation, some general lessons and tendencies were apparent. These will be reviewed by examining promotional efforts made by each distributor, accessibility of the seed, costs and organizational issues.

Promotion issues

Because the varieties being sold were unknown, various promotional efforts were initiated by distributors (Table 5). As Table 5 shows, the type and number of promotional strategies used varied by distributor, with women's groups and clinic staff using multiple promotional methods. The women's groups advertised the seed through shops, drinking places, churches and village leaders, while health personnel used various points of contacts through clinics to create a clientele. It is likely that group members were largely motivated by expected financial returns, whereas the efforts of clinic staff probably reflect more altruistic concerns[6].

Table 5: Promotional methods used by seed distributors

	Markets	Shops	Clinic	Women's groups	World Vision
Persuasion at point of sale	X	X	X	X	
Door-to-door sales			X	X	
Group meetings	X		X	X	X
Posters*			X		
Informed village authorities				X	

* provided by CIAT

An assessment of the effectiveness of promotion is important for evaluating each delivery channel, although, with the exception of seed sold through shops, this aspect was not monitored. Survey results allow us to conclude that shopkeepers effectively promoted the new variety, since 36% of respondents bought the seed as a result of these efforts. While both shopkeepers and extension agents appear to be capable promoters of new bean varieties, their

[6] Remuneration was only given to one clinic staff member, whereas several participated in seed sales.

motives are likely to be different. Shopkeepers are likely to have little interest in selling new varieties outside of the profit motive and have little technical knowledge about bean production and seed[7]. Based on our observations, some extension agents, on the other hand, may be professionally motivated to promote new varieties, answer technical questions about new cultivars, and encourage farmers to increase seed stocks of the new variety. They are also more likely to provide feedback to researchers on sales and varietal adoption.

One possible drawback to the use of shops and markets for distribution seed of new bean varieties is the bias among farmers in Uganda against store-sold bean seed. Generally, farmers consider the quality of bean seed sold in shops to be inferior compared with their own seed stocks and seed obtained from other farmers (David, 1996c). Packaging and labelling appears to counteract this perception by suggesting the reliability of the product. Moreover, packaging discourages shopkeepers from tampering with the seed (e.g. mixing new varieties with local varieties of the same market class).

Access issues

Two issues are important in considering farmer access to bean seed: how frequently the seed is made available to buyers and whether access is easier or more difficult for certain categories of buyers (e.g. the poor and women). Although the implications of frequency of access for the rate and speed of adoption of a new variety are unclear, it is worthwhile evaluating each distributor on this factor. Shops and farmer distributers (i.e., World Vision's farmer extensionists and members of women's groups) operate on a daily basis and therefore offer the most frequent access to seed, a factor which may be crucial at planting time. Moreover, since both types of outlets are located in villages, transport is unlikely to be a constraint for buyers.

Health care institutions, depending on the type of facility, operate on a fixed weekday schedule during certain hours only, thereby limiting frequency of access. Rural markets are typically periodic (weekly, bi-weekly), operate for a few hours only and therefore also restrict access to seed. Notably, however, in most countries in the East African region, markets and shops are the most important sources for seed of local bean varieties, besides farm-saved seed (David, 1996c; Sperling, 1994). Access to seed of local bean varieties through markets appears to vary by locality in accordance with the number and type of markets, among other factors. Access to new cultivars through markets could be improved by having extension agent distributors visit all markets operating in a given locality at planting time. However, time conflicts between this activity and the other work responsibilities of extension agents, not to mention illness and other reasons for absence, could jeopardize the timely delivery of seed. One way to avoid these problems may be to have extension agents work in teams.

Farmers who bought MCM 5001 seed from shops and a sample of farmers involved in bean

---

[7] The rural stockist program supported by Sasakawa-Global 2000 in Tanzania aims at strengthening the role of shopkeepers as input suppliers by offering them technical training on various aspects of agricultural inputs (e.g. hybrid maize and fertilizer). This program also offer financial guarantees through the Tanzanian Farmers' Association (personal communication: A. Foster).

varietal trials (N=108) (David, et al., 1995) recommended the following channels for diffusing new bean varieties: government agencies (e.g. extension system) (55%), farmers (29%), shops (16%) projects (3%) and other means (5%). In the Ugandan context, where new crop varieties are mainly delivered through the extension system, the preference expressed by over a third of respondents for using market and non-formal delivery channels (i.e., shops and other farmers) probably reflects their dissatisfaction with the present system. Farmers' views also confirm the feasibility of alternative delivery channels.

Contrary to our expectations in view of the types of promotional approaches used, seed sales by World Vision and two of the three women's groups were not significantly associated with farmers' wealth status. This suggests that access by different socio-economic categories of farmers did not vary significantly by distribution channel and that poorer farmers are as motivated as better-off farmers to pay cash for new cultivars and to risk growing them. However, the gender distribution of sales differed by delivery channel, with a higher proportion of women buying seed from World Vision, the health clinic and women's groups (Table 6). Multiple factors may account for this pattern: differences across localities in the extent of male involvement in bean production[8], the greater likelihood that men have cash on hand to use for the unplanned purchase of bean seed from markets/shops, men's greater mobility and involvement in trade in Uganda relative to women and women's more frequent contact with health care institutions and women group members.

Our data suggest that the type and level of operation of farmer groups influences gender distribution in sales. For example, the Bunandasa Cooperative, a group with a mixed membership of about 75, which also operates a shop, recorded a higher proportion of sales to men (60%). In contrast, the other two small (8-10 women members), village-based groups sold between 50-76% of the seed to women. It is important to consider how different seed delivery systems facilitate or hinder women's access to new bean varieties and respond to their specific needs in terms of which and how many new varieties are disseminated and the packed quantities of seed supplied by seed agencies. Such considerations become crucial in situations of growing commercialization of the crop, where increased male involvement in market-oriented production may influence marketing decisions taken by formal seed suppliers, which may not serve the needs of subsistence oriented, mainly women, farmers.

Table 6: Proportion of bean seed purchases made by men and women, by seed dissemination channels (percent)

	Sales from shops*	Extension selling in markets	World Vision	Women's groups	Health clinic
Men	86	66	33	47	42
Women	14	34	67	53	58

* Note: Results are from a non-random sample of buyers.

[8] In Central Uganda and parts of the East, where the new varieties were distributed through shops, markets, the clinic and World Vision, beans are a woman's crop grown mainly for subsistence. In Mbale District, they are an important cash crop, increasingly grown by men on personal plots.

Cost and organizational issues

Costs incurred in all seed distribution exercises included: the cost of the seed, labor and materials for packaging, informational leaflets, transport of seed to the sellers and sellers' profit (excluding World Vision on the latter). Additional costs incurred during market sales were: transport of the seed to the market, market tax and lunch allowances for extension agents. The cost of bean seed varies with the production method (e.g. on-station, using outgrowers, seed farm) and the class of seed produced (e.g. certified, commercial, quality declared). The cost of producing 100 kg of certified bean seed at Kawanda Agricultural Research Institute and delivering and selling it through extension agents in Mpigi District was approximately $214 (Table 7)[9]. Considering that the extension agents involved lived within a 100 km radius of Kawanda Research Station, the cost of distribution through the other channels investigated in this study is estimated to be considerably higher. Thus, even where seed is sold at a relatively high price, the endeavor of on-station production remains uneconomic since a considerable subsidy (over half of the delivery cost) is required.

Table 7: Cost of delivering and selling 100 kg of bean seed through rural markets in Mpigi District, Uganda, 1994[a]

Component	Cost (US$)
Seed	100.00
Packaging (labor and materials)	28.00
Leaflets	3.50
Transport of seed from research station to seller	27.00
Transport of seed from seller's house to market[b] and market tax	15.64
Lunch allowance for extension agents (6 days)	20.00
Seller's profit	20.00
Total cost	**214.14**
Sale of seed	87.00
Subsidy	**127.14**

[a] The cost of transport to recover sale proceeds is not included.
[b] Transport was only required by one extension agent who did not own a bicycle.

Follow-up trips to collect sale proceeds constituted a major expense in the distribution approaches employed in our studies but were excluded from our calculated costs. Unless distributors are willing to purchase seed, recovery of sale proceeds by suppliers may prove

[9] Although the costs expended by the Uganda Seed Project in producing and distributing bean seed, using outgrowers and marketing agents, are not available, based on a sale price of US 0.65 per kg, it is estimated to be considerably lower than the costs presented in Table 7.

uneconomical. Although the willingness of shopkeepers and other distributors to buy seed was not investigated, it is unlikely in the Ugandan case where unknown bean varieties and non-commercial distributors (e.g. women's groups, clinics) are involved. Notably, vendors in Rwanda bought seed of new bean varieties from researchers (Sperling et al, 1995).

Before seed suppliers involve non-agricultural agencies in routine bean seed distribution, they should first consider the ease of identifying suitable distributors, whether these agencies are located country-wide and the cost to the supplier of seed delivery (which is determined by, among other factors, the amount of seed each distributor can handle and how sale proceeds will be recovered) and accessibility issues. Table 8 rates the market channels investigated in this paper on these criteria.

Table 8: Evaluation of alternative seed delivery channels in Uganda

	Identification by seed supplier	Country-wide distribution	Cost of delivery to supplier	Access by farmers	Intra-community equity in access
Shops	D	E	H	E	E
Extension agents selling in markets	E	G	H	G/F	F
NGOs	E	F	L	G	G/F
Women's groups	F/D	G	H	E	E
Clinics	E	G	H/M	F	G

Codes for cost of delivery to supplier: H=high; M=moderate; L=low
Other codes: E=excellent; G=good; F=fair; D=difficult

Seed distribution through NGOs is least complicated since these institutions are usually willing to buy seed directly from suppliers, can handle large volumes and may employ or collaborate with extension workers who can mobilize or reach a large number of farmers. However, some drawbacks of relying largely on NGOs as outlets for new bean varieties are the shortage of agriculturally-oriented NGOs in some countries, the absence of NGOs in certain regions of a country (e.g. NGOs working on agriculture mainly operate in the north and southwest of Uganda) and suspicion on the part of some smaller, local NGOs toward new crop varieties. Some NGOs will only participate in seed distribution after involvement in on-farm varietal trials or demonstrations.

Shops and markets are promising channels for disseminating new bean varieties, particularly if vendors are willing to buy the seed from suppliers. Having extension agents take on a non-traditional role as market vendors appears to improve farmer access, but increases the cost to suppliers in the form of allowances (i.e. for transport, market tax etc) and transport to recover sale proceeds.

A major constraint to involving small farmer groups in bean seed distribution is the difficulty in identifying sufficient numbers of these groups and, if seed is sold, the recovery of sale proceeds without incurring high transportation costs. With the exception of farmer cooperatives, it is doubtful whether farmer groups would be willing to buy the seed

wholesale from seed suppliers, thereby increasing the cost of delivery to the supplier. It is also unlikely that small groups can handle and store large volumes of seed. While clinics can probably handle a larger volume of seed and could be identified nation-wide by district health officials, the problem of recovering sale proceeds remains. One way to reduce transport costs is to have seed suppliers deliver seed to district health offices for distribution to health facilities. The health centers would report the money back to the officer in charge and it would be recovered by the supplier the following season when more seed is delivered.

CONCLUSIONS

While our research confirms the feasibility of distributing bean seed through non-conventional market and non-market channels in Uganda, it shows that each delivery system investigated has advantages and disadvantages which have to be assessed by seed suppliers within a country-specific context. The approaches investigated in Uganda are likely to be relevant to other countries in the region.

Against this background, the following principles and recommendations for the distribution of new bean varieties by formal institutions (the seed sector, NARS and NGOs), derived from years of CIAT's experience and research in this field, are presented.

Guidelines for bean seed dissemination

1. Guidelines for NARS and NGOs

1.1 The free distribution of bean seed should be avoided except in emergency relief situations. Bean farmers in Eastern and Southern Africa are clearly willing to buy bean seed, if certain key principles (outlined below) are observed. When farmers purchase bean seed, they value it more and are therefore more likely to plant and retain it.

1.2 Based on Ugandan and Rwandan experiences, the price of seed of new bean cultivars can be set at twice or more that of local grain (see Appendix 1), although flexibility on this issue is required. The price of familiar seed types can be higher than that of unknown/unappreciated seed types.

1.3 Since small-scale farmers are only willing to pay a small premium for "clean" seed of new bean varieties, seed prices will usually not cover the actual cost of production and delivery under a formal, centralized system.

1.4 Since different distribution channels reach different users, seed of new bean varieties should be distributed through multiple channels in as many localities as possible to maximize the number and types of households that have access to the new varieties.

1.5 Repeated seed distribution over several seasons in several localities may be necessary before a new variety is fully established within local seed networks and markets.

1.6 Package labels in the local language should indicate the name of the variety (use local names where possible), number of days to maturity, resistance to disease, yield, cooking time relative to popular varieties and other important characteristics.

1.7 In situations where seed of a new variety is extremely limited, it might be justified to target distribution to specific geographical areas and categories of farmers who can actively participate in diffusion (cf. Sperling and Loevinsohn, 1993). Relatively large quantities of seed (>5 kg per household) can initially be distributed to a small number of better-off farmers or, if they can be easily identified, to "key distributor" (i.e. farmers who, on their own accord, widely diffuse bean seed).

1.8 Diagnostic studies to document local bean seed systems in major bean producing areas should be considered a research priority by national research programs. This information is crucial for improved seed delivery strategies.

2. Guidelines for the formal seed industry

2.1 The feasibility of distributing bean seed through multiple non-conventional and non-market delivery points, such as farmers' associations, clinics and market vendors, should be explored.

2.2 Based on the premise that different categories of seed suppliers have a comparative advantage in specific markets and for particular bean cultivars, stronger linkages and coordinated efforts need to be developed between the formal seed sector and other suppliers of bean seed (e.g. NGOs, farmers involved in specialized bean seed production).

2.3 A parallel varietal naming system, using an institutional or breeder-derived name and a local name, should be adopted by varietal release committees. Although new varieties will invariably be designated by locality-specific names, a local name is useful for labelling of seed packages and identification by researchers and extension staff monitoring adoption.

3. General principles for seed agencies and supporting institutions

3.1 Bean seed should be packaged in small quantities (50 grams to several kilos). Familiar seed types can be packaged in larger volumes than unknown seed types. Due to their superior yields compared to bush beans, new cultivars of climbing beans can be distributed in very small quantities (e.g 50 grams) in areas where this technology is being introduced.

3.2 Because planting seasons often vary by locality, where possible, bean seed should be multiplied at several sites to supply the major bean producing regions. Otherwise, seed agencies may need to plan one season ahead to ensure timely delivery.

3.3 Support by donor institutions to NARS seed activities which stipulate supplying farmers with free seed should be avoided to prevent undercutting commercial seed production efforts, both by the formal seed industry and non-formal seed suppliers.

This paper calls into question the economic feasibility of centralized, formal bean seed production and distribution. While it may be necessary for the formal seed sector, NARS and NGOs to subsidize the multiplication of large volumes of new cultivars shortly after release, decentralization should rapidly follow in the form of non-formal, community-based systems of production and distribution. Pilot projects to establish farmer-run bean seed enterprises in Uganda and Malawi provide examples of this approach.

APPENDIX

Prices set by different categories of bean seed suppliers in Rwanda and Uganda, 1991-96

Country/Delivery channel	Sale price of new varieties	Sale price of local food grain
RWANDA:		US$ 0.40/kg
NGO (1991)[a]	US$ 0.76/125g[c]	
Shops/ Market vendors (1991)[a]	US$ 0.80-1.00/kg	
UGANDA:		Ush 200-700/kg (US$ 0.23-$0.76)
Shops (1993)[a]	Ush 400/kg (US$ 0.44)	
Markets, NGO, clinic, Women's groups (1994-5)[a]	Ush 800/kg (US$ 0.87)	
Farmer seed enterprises (1994-95)[b]	Ush 600-1200/kg (US$ 0.66-$1.33)	
Uganda Seed Project (1994-1996)[b]	Ush 625/kg (US$ 0.66)	

Sources: Sperling et al. (1995) and authors' own data.

[a] Seed was produced and distributed as part of an experiment.

[b] Four farmer enterprises, established through a CIAT project, sell commercial bean seed. The Uganda Seed Project sells certified bean seed through marketing agents.

[c] Climbing bean varieties; all other new varieties were bush types.

REFERENCES

Cromwell, E. 1990. Seed diffusion mechanisms in small farmer communities: Lessons from Asia, Africa and Latin America. ODI Network Paper no. 21. London: ODI.

Cromwell, E. and S. Wiggins. 1993. Sowing beyond the state: NGOs and seed supply in developing countries. London: ODI.

David, S. ed. 1996a. Alternative approaches to bean seed production and distribution in Eastern and Southern Africa: Proceedings of a working group meeting, Kampala, Uganda, 10-13 October 1994. Network on Bean Research in Africa, Workshops Series no. 32, CIAT, Kampala, Uganda.

David, S. 1996b. Distribution of bean seed through shops and rural markets in Uganda. In: S. David, op cit.

David, S. 1996c. Local seed systems in Uganda: Preliminary results from surveys in two districts. In: S. David, op cit.

David, S., Wortmann, C., Kasozi, S. and Mugisha-Mutetika, M. 1995. Unpublished data from a survey of bean trial farmers and farmers who purchased bean seed from shops. Kawanda Agricultural Research Institute.

Sperling, L., U. Scheidegger, W. Graf, A. Nkundabashaka and B. Ntabomvura. 1992. Mechanismes pour la diffusion des haricot volubiles. In: Actes du sixieme seminaire regionale sur l'amelioration du haricot dans la Region des Grands Lacs, Kigali, 21-25 Janvier 1991. Network on Bean Research in Africa, Workshops Series, no. 17. CIAT, Butare, Rwanda.

Sperling, L. and M. Loevinsohn. 1993. "The dynamics of adoption: Distribution and mortality of bean varieties among small farmers in Rwanda". Agricultural Systems. 41: 441-453.

Sperling, L. 1994. Analysis of bean seed channels in the Great Lakes Region: South Kivu, Zaire, Southern Rwanda, and select bean-growing areas zones of Burundi. Network on Bean Research in Africa, Occasional Publications Series, no. 13, CIAT/ RESAPAC, Butare, Rwanda.

Sperling, L., U. Scheidegger, and R. Buruchara .1995. Enhancing small farm seed systems: Principles derived from bean research in the Great Lakes Region. Network on Bean Research in Africa, Occasional Publications Series, no. 15. CIAT, Butare, Rwanda.

Wiggins, S. and E. Cromwell. 1995. "NGOs and seed provision to smallholders in developing countries". World Development. 23(3):413-422.