Expl Agric. (2008), volume 44, pp. 1–13 © *2008 Cambridge University Press*
doi:10.1017/S0014479708006170 *Printed in the United Kingdom*

IDENTIFYING SEED UPTAKE PATHWAYS: THE SPREAD OF *AGYA AMOAH* RICE CULTIVAR IN SOUTH WESTERN GHANA

By K. A. MARFO†, P. T. DORWARD‡, P. Q. CRAUFURD‡, F. ANSERE-BIOH, J. HALEEGOAH *and* R. BAM

CSIR-Crops Research Institute, P.O. Box 3785, Kumasi, Ghana and ‡School of Agriculture Policy and Development, University of Reading, Reading RG6 6AR, UK

(*Accepted 14 August 2007*)

SUMMARY

A study was carried out to identify the factors that contributed to the natural spread and uptake of a rainfed rice variety named *Agya Amoah* in the Western Region of Ghana after introduction of a small amount (0.5 kg) of seed in 1987 by a small-scale farmer. Fifteen years after its introduction over 73% of rice farmers had grown the variety in the Western Region. Initial awareness of the variety was created by information provided mainly by friends, seeing the variety grown in fields and from relatives. Seed for initial planting of the variety was purchased from other farmers by 67% of farmers, but in the most recent season 77% of farmers used their own saved seed. Annual incremental income per household from the replacement of the previously most widely grown variety with *Agya Amoah* was estimated to be US $282. The results show that informal systems can result in relatively fast spread and extensive uptake. Local seed systems need to be understood to design appropriate activities that are likely to lead to rapid spread and equitable distribution of introduced varieties, irrespective of characteristics such as wealth and kin.

INTRODUCTION

The importance of informal seed systems in smallholder farming systems in developing countries has attracted much interest. The discussions have largely centred on how the role of the informal system complements that of the formal system (Jones *et al.*, 2001; Witcombe, 2002). For example, in a review of seed systems in three Central American countries, Almekinders *et al.* (1994) identified (i) varietal use and development; (ii) seed production and storage by farmers under local conditions, and (iii) seed exchange mechanisms as the three principal components. They observed that while formal breeding programmes best address varietal development, informal (local) mechanisms are important in production, storage and exchange. Nonetheless, it is recognized that in many countries formal seed systems work poorly at best, and farmers are often not benefiting from the outputs of modern plant breeding (Tripp *et al.*, 1998). Participatory varietal selection (PVS, Witcombe *et al.*, 1996) has been successfully used to identify, introduce and then disseminate varieties of numerous crops using informal seed systems (Almekinders and Elings, 2001). Sperling and Cooper (2004), in their

†Corresponding author. E-mail: k.marfo@cropsresearch.org

review of how seed systems can strengthen seed security, concluded that problems of

The main survey, which involved collection of mainly quantitative data, was carried out in the field during the period November 2002–January 2003. A four-page questionnaire was designed, pre-tested and administered through personal interviews, to elicit information on the socio-economic background of the farmers, farm information, knowledge and cultivation of various varieties and seed management.

Figure 1. The spread of *Agya Amoah* in Western Region, Ghana. Maps show: (i) the location of the Districts in Ghana where *Agya Amoah* was grown; and (ii) the location *Agya Amoah* was first grown at in 1987, survey locations and locations where *Agya Amoah* was reported to have been grown by 1990. District boundaries are shown by thick lines and major roads (mostly dirt) by thin lines.

Rice varieties

Farmers, both upland and lowland, were growing a range of rice varieties, the most important of which are given in Table 1. However, 61% of the total rice area was planted to a single variety, *Agya Amoah*, which had largely replaced *Bosome mmiensa*. Other local varieties (defined as varieties named by farmers but not introduced by extension or research), *Bosome Nnan* ('four-month') and *Kotoko* (red-seeded *O. glaberrima*),

Table 1. Importance of rice varieties grown in Western Region of Ghana, percentage of farmers ($n = 180$).

	Order of importance					
Varieties	1st	2nd	3rd	4th	5th	Not grown
Agya Amoah	64.4	12.2	1.1	0.6	0.0	21.7
Mercy	1.1	5.0	0.0	0.6	0.6	92.8
Bosome Mmiensa	3.9	9.4	1.7	0.6	0.0	84.4
Bosome Nnan	0.0	2.8	1.1	0.0	0.0	96.1
Abankora	5.0	1.7	1.7	1.7	0.0	90.0
Kotoko	0.0	2.8	1.1	2.2	0.6	93.3
Sikamo	3.3	1.1	0.6	0.0	0.0	95.0
Other local	12.8	9.4	2.8	0.6	0.0	74.4
Other improved	5.6	3.9	1.7	0.0	0.0	88.9

Sperling, L. and Cooper, H. D. (2004). Understanding seed systems and strengthening seed security: A background paper. In *Towards Effective and Sustainable Seed Relief Activities. Report of the Workshop on Effective and Sustainable Seed Relief Activities*, (Eds L. Sperling, T. Osborn and D. Cooper). Rome: Food and Agriculture Organization of The United Nations.

Tripp, R., Walker, D. J., Opoku-Apau, A, Dankyi, A. A. and Delmini, L. L. (1998). Seed management by small-scale farmers in Ghana: A study of maize and cowpea seed in the Brong-Ahafo and Volta Regions. *Natural Resources Institute Bulletin* 68.

Witcombe, J. (2002). Participatory crop improvement in rice in the DFID Plant Sciences Research Programme. In Breeding Rainfed Rice for Drought-Prone Environments: Integrating Conventional and Participatory Plant Breeding in South and Southeast Asia. *Proceedings of a DFID Plant Sciences Research Programme/IRRI Conference 12–15 March 2002 IRRI, Los Banos, Laguna, Phillipines.*

Witcombe, J., Joshi, R., Joshi, K. and Sthapit, B. (1996). Farmer participatory crop improvement. I: Varietal selection and breeding methods and their impact on biodiversity. *Experimental Agriculture* 32:445–460.

Witcombe, J. R., Petre, R., Jones, S. and Joshi, A. (1999). Farmer participatory crop improvement. IV. The spread and impact of a rice variety identified by participatory varietal selection. *Experimental Agriculture* 35:471–487.