RESEARCH-EXTENSION APPROACH TO PROMOTE BULB ONION PRODUCTION IN DRY-LOWLANDS WITH SPECIAL REFERENCE TO CENTRAL PROVINCE IN PAPUA NEW GUINEA

JOHN WA-AI SOWEI, Research Fellow, National Research Institute, P. O. Box 5854, Boroko, Papua New Guinea.

ABSTRACT

Short-day onion varieties were evaluated at Laloki Research Station, Central Province, Papua New Guinea over three years between 1991 to 1993. Potential varieties and planting time have been identified. With an increasing demand for bulb onions in Port Moresby an effective extension approach to promote these varieties and production techniques to the small-scale farmers in Central Province is required.

KEY WORDS: *onion varieties, planting time, effective extension approach, production techniques, farmers*

INTRODUCTION

In Papua New Guinea (PNG) some critics have blamed the Agricultural Research Division of not conducting the right type of research that would be of benefit to the small-scale farming community (Das, 1987). In such a situation the argument is that there are no innovative ideas or techniques to take to the farmers. However, the approach to Agricultural Research has changed over the years. Emphasis has been on the farming systems approach and adaptive on-farm research. Furthe-rmore, station-based research has focused on addressing farmers' production problems, but it seems that the information is not reaching the farmers. This has been attributed to the weak structural linkage between agricultural research and extension (Chamala, 1983; Kesavan, 1983; Chamala, 1987). These are some of the issues that complicate the flow of information from the Researcher to the Extension Agency and the beneficiaries (farmers).

In PNG, Primary Industry Extension Services' decentralization was passed by an Act of Parliament in 1977 with the aim of bringing extension services closer to the rural farming communities. Thus, all provincial Department of Primary Industries (DPI) were responsible for providing extension services. Therefore, research extension programmes of the national Department of Agriculture and Livestock (DAL) may not be fully implemented through the Provincial DPI extension system. The DPI Provincial extension services are based on the farmers' needs and priorities.

Only recently the DAL was directed by the Minister of Agriculture and Livestock to form a working committee to review the current DPI extension system and provide a submission to cabinet to centralize DPI Extension Services. There is a need to re-establish Research-Extension linkage, a problem which probably came about because of the decentralization process.

In this document the various options in designing and disseminating information on bulb onion research results from Laloki Research Station are presented. The approach is designed to stimulate interest within the farming community in the dry-lowlands of the National Capital and Central Provinces to grow bulb onions for the fresh food market in Port Moresby. There is an increasing demand for fresh vegetables to feed the growing population of over 300,000 Port Moresby residents and the surrounding areas.

Overview of the dry-lowlands environment of Central Province

The National Capital and parts of Central Province are classified under the dry-lowlands agroecological environment having a distinct wet and dry season with 92% of the rainfall occurring from December to May and only 8% falling from June to November. Under traditional farming practices crop scheduling is guided by the rainfall pattern and vegetable production is limited in this regard. However, water is in abundant supply from ever-flowing rivers, creeks and underground aquifers. A major constraint is capital and technical know-how in harvesting water for irrigating vegetables during the dry season. Most, if not, all of the farmers would have very little cash to invest in irrigation and basic farm equipment for commercial vegetable production. A high level of

production management would be required to ensure quality and continuity of fresh vegetables.

Farmers who are able to produce vegetables all year round have a market advantage especially the highly priced vegetables (provided that quality is up to standard) which are in short supply during the dry season. The difficulty faced by growers to irrigate during the dry season means that vegetables, which could be produced at this time, have a comparative market advantage. Locally grown vegetables are fresh and could be sold at a competitive price. Most retail outlets in Port Moresby demand quality produce and continuity of supply. The returns for high value crops including bulb onion are good. Figures available from a model farm in the dry-lowlands of the Central Province shows that a net profit of over K6,000 could be generated from a 2 hectare crop of mixed vegetables (Sowei, 1993).

Another constraint is the availability of good agricultural land. The land tenure system in PNG is diverse and complicated. Ownership and availability determines the area, which could be developed for vegetable production or any agricultural enterprise for that matter. On average a small-scale commercial vegetable grower in the Central Province would have 4 hectares of suitable land to grow vegetables.

Onion variety selections for the dry-lowlands

Bulb onion varieties selected for production in the dry-lowlands of Central Province produced optimum marketable yields during the dry season, provided that the crop is irrigated. During the wet season, the onion crop can be severely affected by purple blotch (*Peronospora destructor*) a widespread fungal disease in onion.

Having identified the varieties, time of planting and management practices, a pilot programme will be conducted by DAL Food Management Division to extrapolate research results from Laloki Research Station to the farmers' field. A proposed strategy of bringing research results to the farmers is discussed in this report.

Strategies to promote onion production in the dry-lowlands

Target audience

To introduce new onion varieties and promote production methods, the target groups will be the innovative small-scale vegetable growers in the National Capital and Central Provinces.

Extension approach

The extension approach will be conducted using the five-step adoption model proposed by Mortiss (1988). The program will be designed so that the farmers are involved in the decision making process. The approach will be based on group discussions, active participation and practical field demonstrations. This method has been reported to have the most impact in Papua New Guinea (Das, 1987).

1. **Awareness** - The awareness phase has been done through the mass media: PNG Post Courier Daily Newspaper, The National Broadcasting Commission's (NBC) "Tropical Gardener Program", The Independent and through the DAL Newsletter, Didimag and Harvest.

2. **Interest** - During the variety evaluation in 1993, a field day was organized at Laloki Agricultural Research Station for farmers in the area. Interest has been established, as many of the innovative vegetable farmers were quite willing to participate in establishing demonstration plots on their farm.

3. **Evaluation** - The evaluation phase will involve organizing group discussions with farmers to encourage their participation so that they will weigh out the benefits and other problems they might have in adopting the production methods and onion varieties.

4. **Trial** - Selected innovative farmers wanting to test the varieties and production techniques will be provided with free seeds and consultation. These farmers will establish demonstration plots to gain hands-on eperience on how to manage the onion crop.

5. **Adoption** - After establishing farm demonstration plots, farmers will then decide whether to adopt or reject the technology of onion production (production methods and varieties).

Other promotional activities

A number of methods could be used to disseminate research results to farmers to promote onion production. The Research Staff would undertake the following:

(1) Organize onion field days - for farmers and Extension Officers in DAL Food Management Division and the Fresh Produce Development Company (FPDC). The FPDC is a New Zealand Aid funded vegetable development project, providing extension advisory services to the vegetable growers in PNG.

Field plots should be established early April so that the crop will be in at least three different stages - seedling, bulb initiation, full bulb development and maturity for the planned field day.

During the field-day the Researchers and Extension Officers could explain techniques in nursery establishment, production practices, harvesting and curing, handling, storing, grading and marketing of bulb onions. Farmers' participation should be encouraged in discussing the production techniques. The farmers will have to be guided by the Researchers and Extension Officers through different onion production stages.

Demonstrations on farmers' field would be a starting point where the farmers could practice what they have learned during the field day. The Researchers and Extension Officers would monitor their progress and advise them if they have to. The idea is to use the adult learning approach to help the farmers teach themselves. At the end of the day the farmers should then decide whether to adopt or reject the new onion varieties and production methods. The good prices offered for bulb onion in Port Moresby may be an incentive for the farmers to reaffirm their adoption process.

In the initial planning phase notices and posters would be sent out to the mass media. To help promote the onion field-day representatives from the mass media would be invited to cover the event. Also in the planning phase the Researchers and Extension Officers would invite individual farmers. Transport should be arranged to pick-up farmers at a central location. Leaflets and posters should be circulated well in advance. The DAL Publications Section could promote the event through its monthly Didimag Newsletter.

(2) On-farm demonstration plots - during the field day at Laloki Research Station interested farmers would be identified to establish on-farm demonstration plots. This process gives farmers the opportunity in trying out new production techniques and varieties so that they can then decide to adopt or reject the technology.

Extending research results to the farming communities in PNG is very complex. Farmers', limited educational background, socio-economic condition, infrastructure, land tenure and general farmer attitude towards accepting new ideas and technology are some of the barriers facing agricultural development in PNG. However there are indications that farmers are willing to change and improve on their traditional farming practices. Figures available in 1980 show that of the total rural population 8.5% were classified as pure subsistence farmers, 87% semi-subsistence/ semi-commercial and 4.5% were engaged in commercial plantation crops (White Paper on Agriculture, 1989).

(3) Onion information bulletin - to aid in technology transfer or adoption, a simple step-by-step procedure on planning, nursery techniques, field management, postharvest handling and marketing of onion in the form of an information bulletin which could be produced. The information bulletin is written in English but could be translated into the regional dialect, Motu. This bulletin is to be made available to both the vegetable Extension Officers and the growers in the dry-lowlands of the National Capital and Central Provinces. To aid farmers with limited educational background an onion production poster (pictorial form) shoulod be produced with the assistance of the DAL Publications Section.

(4) Audio visual aids - the DAL Publications Section's Video Production Unit have access to equipment and facilities for filming different stages of onion production. Once completed the videotape could be used as a teaching tool in Agricultural Colleges and for farmer training. Copies of the video should also be available at a minimal cost to Extension Officers, farmers, teachers and the general public.

(5) Television and radio broadcasts - almost all the villages situated along potential vegetable growing areas in the dry-lowlands of the National Capital and Central Provinces have rural electricity. The only television station, EM-TV offers some scope for broadcast and would help in developing an awareness or interest for other farmers to attend meetings, field days and visits to demonstration plots and let the innovative farmer explain what he has learned to other farmers.

Another means of communicating information from the Researcher to the Extension Officer and the Farmer is through the Provincial Radio Station. Information on onion production could be broadcast using the regional dialect so those farmers could grasp the message easily.

(6) Publications - *Didimag Newsletter* and *Harvest* are bi-monthly and bi-annual publications respectively. These publications should be used to publish a simplified and translated version of the information bulletin on onion production in the dry-lowlands of the National Capital and Central Provinces. A simplified pictorial poster on various aspects of onion production should be produced with the assistance from the DAL Publications Section and made available to less educated farmers.

CONCLUSION

The success of the approaches outlined to provide information generated from trials conducted at Laloki Research Station would very much depend on how well the message is communicated through to the farmers. It is my belief that approaches such as the field day and the do-it-yourself field demonstration plots should have the most impact because "seeing is believing". The final decision of whether farmers will accept and take-up growing bulb onion depends on the farmers' resources (land, labour and capital); the Researcher and Extension Agents only help the farmers to reach that decision. Another challenge for extension agents is to facilitate the transition of the traditional subsistence farmer taking up commercial or semi-commercial farming practices.

Insufficient funds provided for extension work may also hinder the use of effective approaches such as organizing field-days and on-farm demonstration plots to promote onion production in the area. This is an ongoing problem, which has also contributed to an ineffective Research-Extension-Farmer linkage. The DAL has been mandated to re-establish that vital link so that information gnerated from Research Stations can reach the target aaudience - the farmers.

REFERENCES

CHAMALA, S. (1983). Extension Approach for Integrated Rural Development in the Pacific. Paper presented at XV Pacific Science Congress, Otago University, N.Z. (Feb. 2-9).

CHAMALA, S. (1987). Extension Approaches for Integrated Rural Development in Papua New Guinea. pp1-16. *In Proc. of the First Papua New Guinea Agriculture Extension Seminar*. Ed. Silovo and Jikan. Department of Agriculture and Livestock, Port Moresby.

DAS, D.K. (1987). Technology, Policy and Extension Starategy in Agricultural Development. pp 18-30. *In Proc. of the First Papua New Guinea Agriculture Extension Seminar*. Ed. Silovo and Jikan. Department of Agriculture and Livestock, Port Moresby.

KESAVAN, V. (1983). Agronomy: Research Extension, Training. pp275-346. *In Profile and Planning Study for Subsistence Food Production*. Vol. 2. Department of Primary Industries, Government of PNG, UNDP and FAO.

SOWEI, J.W. (1993). How successful is vegetable farming in Central Province? *Didimag Newsletter*. 25 (10): 6-7.

White Paper on Agriculture (1989). National policies for the development of Agricultural Sub-Sector. Department of Agriculture and Livestock. Hohola Printers and Designers, pp. 39.