SMALLHOLDER POTATO PRODUCTION ACTIVITIES IN SOUTH AFRICA: A SOCIO-ECONOMIC AND TECHNICAL ASSESSMENT OF FIVE CASES IN THREE PROVINCES

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By

TGB Hart (HSRC) and HJ Vorster (ARC)

EXECUTIVE SUMMARY

The high protein content and balanced content of minerals and vitamins were some of the factors that led to 35% of the world's potato production taking place in developing countries. The importance of this crop as a staple food in many of these countries makes this an important cash and subsistence crop in many areas. Africa produces 11.5 million tons of potatoes annually, with South Africa produces 15% of this yield on 57 000 ha. The importance of this crop to smallholder farmers is still not completely understood, but an aerial survey of KwaZulu-Natal suggested that the area grown by smallholders is larger than the area grown by commercial potato producers. Of course, their reasons for production may well be different.

Potato is a cool weather crop realising its highest yields and best quality in regions with a temperate climate and long average day length during the growing season. Diseases, pests and water stress are major constraints to potato production. The potato tuber moth (*Phthorimaea operculella* Zeller) is considered a major problem facing potato producers in some parts of South Africa. On the commercial scale insecticides are used to control tuber moth, while smallholders generally tend not to control the pest due to inability to buy insecticides and also possibly due to not recognising the damage of the pest. The larvae of the moth cause tuber losses due to damage caused when they feed, leading in many cases to secondary infections and tuber loss.

The current study focussed on socio-economic conditions and agricultural practices of smallholder potato producers in South Africa. The study attempted to identify smallholder potato farmer constraints and needs. This included the diversity of purposes for production along with practices, pests and disease prevalence. The studies were done in the form of a survey in five villages in three provinces. Mpumalanga and KwaZulu-Natal (resource poor, mainly subsistence farmers) were identified for their high production potential for smallholders due to high rainfall, but the areas differed in climate, seed availability and extension exposure. The southern Cape was identified for farmers with slightly better access to resources (resource medium, smallholder commercial) in this area.

The variability of responses within and between villages highlighted the different types of farmers found in South Africa. This study only gives a snapshot view of what is happening with specifically selected farmers. The results of this study cannot be used to generalise at the village or even broader level, but it does give trends in terms of the constraints and needs of smallholder potato farmers. The report can only comment on what was found in these five villages at the specific time the surveys were done, and the reader must keep this in mind when looking at results. More in-depth studies need to be done at village level to help address area specific farmer needs. Many of these challenges can be related to practises throughout the production cycle and the means to implement these but others depend largely on agro-ecological and socio-economic circumstances and diversity. Focussing on adapted technology development and dissemination would help many of these farmers to achieve a better quality and yield of potatoes.

The number of households engaged in agriculture with full-time farmers varied from a small percentage to about half of the farmers interviewed in the different villages. Half the respondents in village four (KwaZulu-Natal) had large household sizes (8-17 members) with grandparents looking after orphaned children. One-third of respondents in village five in Mpumalanga also had large households (11-14 members) looking after orphaned children. This is a growing trend in many villages that influences farmers' decision-making and should be taken into account when trying to understand motivations for agricultural and other livelihood activities. The employment situation within and between villages varied considerably with agricultural activities performed by full-time farmers, part-time farmers with additional incomes (full-time or part-time) and pensioners. Part-time farmers with additional sources of income often do not spend additional money on inputs, highlighting the complex decision-making processes of smallholder farmers. Pensioners who farmed tended to spend low amounts on inputs and in many cases could only afford minimal inputs. Social support grants, in the form of pensions and child support grants played an important role in all the household incomes of the subsistence farmers. The emerging farmer households received fewer grants.

Some farmers produce potatoes to supplement their household income and consume a smaller portion. However, a number of farmers derive most of the household food supply from agricultural activities, with some attempting to sell a little of the produce where they can. Food security tends to be the main focus of their agricultural activities and they tend to grow a diversity of crops. Marketing of

potatoes is not a priority in these villages, but some households do use sales to supplement income. Only one farmer in village 1 was able to access the formal fresh produce market. Individuals in the various villages might sell to village residents or to hawkers coming from the surrounding towns. Emerging farmers saw an ideal cultivar as one that yielded good-sized marketable potatoes with drought, pest and disease tolerance. Subsistence farmers preferred fast growers with larger tubers that cooked soft and were of good quality and taste.

Access to land within and between villages varies greatly. Beneficiaries of land reform projects seem to have access to more land than non-beneficiaries, but almost all farmers feel they do not have enough land. Land size varies from a backyard garden with access to communal land to a few hectares. Effectiveness of farming the land available was also heavily influenced by access to mechanisation, their age, health status, availability of implements and inputs and the weather. Lack of water seems to be the common denominator in all the villages.

Ownership of tractors was very limited, but many could access a tractor through someone who owns one. Farmers state that this poses problems as they can make use of it when the owner decides it is their turn to be serviced. This causes many delays and the accompanying problems associated with dryland agriculture. KwaZulu-Natal farmers had more problems in accessing tractor services than the other villages. Most of the farmers (except in village 2) had access to basic hand tools (hoe, rake, spade), thus enabling them to do basic soil preparation by hand. At least half the farmers from village three still used animal traction for soil preparation. The land reform beneficiaries in village 1 (smallholder commercial farmers) had access to tractors but this was generally only used when large areas were cultivated, with animal traction used on the smaller plots in an effort to reduce costs. Most of these farmers in this village had access to a motor vehicle.

Inputs for smallholder farmers have only been available in the last few years as suppliers have realised the potential market. In spite of this many farmers can still not access these smaller quantities due to their remoteness, lack of capital and lack of knowledge. The average sample household expenditure on inputs with the emerging farmer group was about 9.5% of household income while it varied from 3.4% (village 2) to 12.5% for village 5 where extension support for the communal project is very high. Expenditure within and between villages varied considerably, thus highlighting the importance of developing typologies of farmers. Relatively low income levels and high household sizes seem to seriously curtail expenditure on agricultural inputs. Very little to nothing is generally spent on agro-chemicals for weed, pest and disease control. The inability of most respondents to estimate the value of their produce that they consumed made it difficult to estimate return on expenditure, thus making identification of trends difficult. The relatively high proportion of income that is spent on inputs, despite the very low mean level of household income is a concern.

The general production problems most frequently mentioned by respondent farmers included lack of water (village 1,3,4), nematodes (village 1,3,4,5), blight (village 1,2), moles (village 2,4,5), millipedes (village 2,3,4,5), wilting (village 2,3), cutworm (village 2,3,4,5), rodents (village 2,3,4,5), transport (village 3,4) and only one village mentioning PTM (village 4).

The choice of cultivar to be planted tended to be limited to what was available at the time of planting. This is especially true for farmers who produced mainly for household subsistence. They tend to wait for the rain before buying seed. This is a risk evasion strategy due to the high cost of seed and the variability of the rainfall in the various areas. Village 1 (farmers with better access to resources) preferred BP1 from the four cultivated in the area. In KwaZulu-Natal the most grown cultivars were BP1 and Mnandi. Many farmers stated that Mnandi was difficult to find and then had to buy BP1. Previous work in the province has shown that Mnandi is preferred for its taste and late blight field resistance. BP1 is the variety recommended to extension in Mpumalanga in that specific area, thus the farmers buy this cultivar. It is also freely available at the closest co-operatives.

The various seed sources within and between villages are highly varied and seems to depend on the money available for buying seed, the effectiveness of the storage and the size of the area grown. Many farmers buy certified seed and store seed from their previous season. They also tend to buy the shortfall from any source, even from markets where the health status of the seed is not known. Basic storage facilities are used, with the method of storage once again being variable. The reasons for storage (seed, food, sales) varied considerably. A few farmers reported delayed harvesting as a storage method with one farmer citing a traditional storage method. Storage was done in sheds,

homes, loose, in bags and in crates. Storage problems mentioned included a major problem with rodents eating tubers (village 3,4,5), individuals reporting greening of tubers (village 4,5) and individuals reported PTM damage encountered in storage (village 1,5) and more than half the farmers reporting it as a storage problem in village 4. PTM problems seem to be localised while the rodent problem seems to be universal for the subsistence farmers.

The farmers who had access to irrigation water, did irrigate. However, irrigation was not scheduled. The other farmers did not irrigate as they relied entirely on seasonal rainfall. Individual farmers might infrequently use buckets or watering cans during times of water stress when rainfall was not adequate. In village 4 some flood irrigation and sprinklers attached to a hosepipe were used to irrigate on an ad-hoc basis. Lack of water was a general concern for most farmers.

Crop rotation practices generally tended to be too short. Communal gardens pose special problems as various farmers are farming mixed crops very close together. The lack of land and crops that can be grown in dryland conditions tend to limit rotation possibilities within the specific conditions experienced by these farmers. Field records need to be kept to enable evaluation of crop rotation and pathologists need to assist farmers in identifying possibilities.

Six of the eight farmers in village 1 sprayed for PTM, with farmers feeling that they were controlling the incidence of the pest. The amount of spraying times and chemicals used varied significantly between farmers (1-9 times per season), with them sometimes using sprays not registered for that specific application. Four of the farmers felt that a PTM resistant cultivar might lessen the amount of sprays while the other two felt it would make no difference. Most of the farmers said it would affect labour requirement (their own and seasonal). None of the farmers in the other villages generally sprayed for PTM, with any kind of spraying limited to one or two individuals often using pesticides that were unknown or not registered.

Agricultural training and advice seems to be variable in the various areas. KwaZulu-Natal villages are serviced by an NGO, with some extension support in some areas. A few farmers have mentioned no agricultural support at all. The NGO was advising farmers on the use of low-external-input agricultural practices as a means of reducing inputs while optimising production and local natural resources. This enables households to reduce their expenditure on inputs. Village 5 is heavily supported by an active extension officer who provides agricultural training and advice to farmers involved in communal projects. Besides organising the occasional training course, suggesting and financing the occasional project and providing some advice local agricultural extension does not interfere with farmers' activities in village 1.

Farmers indicated a range of problems, many of which might be simply and cost effectively reduced by means of adopting existing technology to local conditions and practices. Engaging in a process of participatory and adaptive research with farmers will enable them to help optimise their potato production within their specific environment. This can be achieved by encouraging farmers, research institutions and community workers (NGO and PDA) to work together in close collaboration. Adapting current technologies to local conditions tend to be more cost-effective that developing new technologies that, due to their generic nature, are not adapted to local conditions and might not be adopted as a result. Optimising production and storage practices within a low input situation could help to address many pest and disease problems experienced by subsistence farmers, as many of the problems faced are management problems, exacerbated by lack of access to sufficient resources.