
Potato Production in Fiji - Potentials and Constraints

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ABSTRACT

Potato was first introduced into Fiji in the 1860's. Fiji's potato acreage in 1981 was some 9 ha representing a drop since 1960. To meet demand, 9,596 ton worth F\$2.4 million were imported. Potential areas for potato production are Nadala/ Navai/ Nadrau plateaus, Nausori Highlands and Sigatoka Valley where potato was reasonably successfully in the past. Major limiting factor, is widespread bacterial wilt caused by Pseudomonas solanacearum. The Department of Agriculture has unsuccessfully experimented with a number of varieties over the years. Since early 1970, introductions of bacterial wilt resistant varieties from Mauritius and the International Potato Center, Peru, show considerable promise, with resistance to bacterial wilt and which produce reasonably high yields of good quality, medium sized tubers.

Introduction

Even increasing quantities of table potatoes have been imported yearly to Fiji from New Zealand and Australia to satisfy local requirements. Initially, major users were the Europeans with the Fijians and the Indians slowly showing interest. Currently, main outlets for imported potatoes are the Indian community and the hotel trade. During 1980, a total of 9,167 t worth F\$2.63 million was brought into the country while in 1981, this rose to 9,596 t worth \$2.42 million.

There has always been an interest in growing potatoes locally, primarily as a substitute for imports, thereby saving foreign exchange. Several constraints have contributed to the present situation where only a few farmers in Sigatoka Valley and Navai are growing potatoes on a few hectares of land. Variable yields have been obtained under Fiji conditions ranging up to 25 t/ha (Anon, 1949), although in recent years the average has been 5 t/ha.

Historical Background

Potato was introduced into Fiji by European settlers in the 1860's (Seemann, 1873). First grown in Rewa in the wet zone, the tubers were not liked because of a soapy taste. Horne (1881) also mentions a few plants being cultivated by the enterprising settlers and the natives and had felt that it would do better in the dry parts of Fiji. Over the years interest in potatoes was maintained with cultivation spreading, particularly to western Viti Levu. Varieties recommended in the 1940's were Brownell and Bismark (Whitehead, 1948). Since 1960, the two main varieties planted by farmers have been Sequoia and Sebago.

Production over the years has fluctuated in both terms of hectareage planted and yield per unit area. Main reason is presence of bacterial wilt disease Pseudomonas solanacearum, and consequently, production has been confined to a 4- to 5-month period from May-June to September-October. The Land Development authority was instrumental in organizing large scale plantings in the mid-1960's with production centered around Nadala/Navai, Nausori Highlands, and the Sigatoka Valley. The Sigatoka Valley has always been the major center of production with significant quantities being harvested even prior to and during World War II. Potato was popular then as a dry zone winter crop for the local store and bazaar trade (Harvey, 1941). The Nadala/Navai and Nausori Highlands schemes peaked in 1966 when 57 ha was planted. They were moderately successful until their virtual closure in 1969 due mainly to the severe incidence of bacterial wilt. The area in potatoes rose to a high of 134 ha, all in the Sigatoka Valley, in 1972 but declined rapidly and in 1981 only 9 ha were planted.

Production methods remained uniform throughout the country, following fairly substantial land preparation with up to 3 or 4 ploughings and a corresponding number of harrowings. Small, single-eye seed pieces are planted 25 to 30 cm apart in furrows 60 to 90 cm apart. There has been little use of fertilizer or dusting of cut seed. Much of the production has been associated with small holdings: for the 1973 crop, 30% of the growers planted less than 0.2 ha with a further 30% with less than 0.4 ha (Davies and Hampton, 1973).

Until 1968, farmers either marketed their own potatoes or dealt through middlemen or small cooperatives. Since then, in different years the Valley Industrial Cooperative Association (VICA) and the National Marketing Authority (NMA) undertook to market the crop at the grower's request. At times these groups handled 70% of the crop at fixed prices: for example, 8.8c and 11c per kg for medium and table grades, respectively, in 1968. In some years low production resulted from bacterial wilt or severe drought. Most farmers marketed their own crop.

Prior to 1973, the main seed suppliers were retail stores in Sigatoka, Nadi and Ba. Then for a couple of years, NMA was made the sole importer of seed from Australia in a move to stabilize the area planted, following which the retail stores in Sigatoka have been handling seed again. Many farmers in the past obtained seed on credit, the usual method of repayment being a guarantee on the part of the farmer to market his crop through the lending body, be it VICA, NMA or another seed supplier. The crop, however, has been attractive for growers with their own initial capital, providing a reasonable gross margin ranging from \$450 to \$1,000 per ha in 1973 (Davies and Hampton, 1973).

Bacterial wilt has affected production so seriously that few potatoes are now grown. The many varieties imported have all been susceptible except for most recent introductions, providing possibility of re-establishment of the potato industry. The Department of Agriculture has discouraged farmers from large scale potato growing until the selection of a suitable variety. It is expected that 10 ha will be planted to a new variety, CIP 800226 (BR-69.84) in 1984.

The Potential

Evaluation indicates Fiji has an excellent potential for potato production. A large market exists to which the initial production could be geared. The demand for potatoes currently is approximately 800 tons per month of which a negligible amount is supplied by local production. It is envisaged that the demand would

increase in the future due to the expansion in the tourist industry and to a lesser extent to natural population growth. Earlier attempts at organized planting and marketing have shown that this crop can be successfully grown under Fiji conditions. Prospects appear good for partial if not full import substitution, with possible exports to neighboring South Pacific countries.

It may also be feasible to establish a small processing unit to remove small-sized potatoes from the market as canned whole potatoes for the hotel trade. Sufficient land in suitable areas (Nadala/Navai/Nadrau, Nausori Highlands and Sigatoka Valley) and manpower, are available. The bacterial-wilt resistant variety now recommended has performed well in trials yielding more than 17 t marketable tubers per ha, while Sequoia and Sebago, though susceptible to bacterial wilt, could also be grown with some success.

Extension of the growing season, particularly in the highlands, appears possible. Plantings in April and August would enable locally grown potatoes to be available for 6 months of the year, from July to January. The supply situation could be further improved with a heavily mulched planting in November to mature in February. These considerations coupled with capital inputs, improvements in husbandry, pest and disease control and market protection should enable a thriving industry to be established.

The Constraints

Major constraints limiting Fijian potato production can be classified into two categories: biological or environmental, and socioeconomic.

Biological or Environmental Constraints

Major diseases and pests

Bacterial wilt has been the most serious disease, limiting potato production in Fiji. Because of difficulty in control, efforts have been directed toward finding a resistant variety possessing other favorable characteristics. Other diseases, important at times, are early and late blights, blackleg, and Fusarium sp., and Phythium sp. root rot. Serious pests on occasions are greasy cutworm, aphids and thrips.

Climate

Potatoes have been grown almost at sea level at Sigatoka and up to 1,000 m at Nadala/Navai on sandy loam and humic latosols. The mean annual temperatures range from 18°C to 20°C in these areas which all experience a dry period of 4 months per year of which 1 month is very dry. These conditions are not ideal for potato production and the situation has been aggravated by all the past production being rain-fed with no provision for irrigation during the dry periods.

Socioeconomic Constraints

Attitude of the farmers

One problem has been that farmers do not regard potato production as a business. Some tend to carry on as an extension of their normal subsistence cropping. Despite recommendations from the Department of Agriculture, farmers have resisted using fertilizers or dusting of cut seed with fungicides, the result being lower

yields. Similarly, little use has been made of chemical sprays to control leaf diseases and insect pests.

Seed potatoes

Fresh seed has been imported each season from Australia as seed potatoes could not be stored from one season to the next. High ambient temperatures and the long storage period from September/October until April/May resulted in large in-store losses. Shriveled seed tubers with long sprouts resulted in poor growth in the field. Imported seed often arrived late, disrupting the programmed early plantings and was expensive to purchase. Trials had shown that cool storage at 4.4° to 7.2°C was essential if a local seed potato industry was to be developed (Thompson, 1969). However, this would make the seed prohibitively expensive for the farmer.

Marketing

Organized marketing would be essential if potatoes were to be grown on a large scale. In some years difficulties were experienced in marketing due to damage from hurricanes, growers not holding potatoes for a fortnight after digging to remove those rotting as a result of bacterial wilt and to allow skins to harden, growers selling direct to middlemen at lower prices, lack of proper storage facilities, and the presence of substantial quantities of better quality imported potatoes. Since no cool storage facilities were available, local produce has had to be marketed quickly and efficiently particularly under unfavorable harvesting conditions, such as wet weather.

At times, there was considerable consumer resistance with regard to quality and price of Fiji-produce compared with the imported potatoes.

Credit

High input costs, especially seed, cause problems mainly for the small farmers necessitating the concentration on growers with their own initial capital and the provision of credit through lending agencies.

Conclusions

The future for potato production in Fiji appears bright especially with the prospect of a bacterial wilt resistant variety. Other constraints could be overcome or at least minimized through proper planning and an extensive education program involving extension agents, farmers, retail stores handling seed and the marketing organizations.

Due to a readily available secure market, reasonable gross margins, and farmers being interested in growing the crop, it would be easier to implement a new planting program and at the same time bring about changes in farmer attitude and behavior. Until the new variety becomes available in sufficient quantities, there will be a need to improve crop rotation, thus enabling the growing of Sequoia and Sebago. Mulching with sugarcane bagasse, rice straw, grass or reeds to lower soil temperatures and irrigation during the dry periods could improve yields.

Credit could be handled on similar lines as in the past while organized marketing with legislation restricting imports at the time of harvest of local

potatoes and farmers cooperating with the marketing organizations would ensure efficient disposal.

The total seed requirement for the country could be fully imported. However, the recent promising results with low-cost potato stores at ambient temperatures at locations in both the lowlands and the highlands indicate a possibility of local seed potato production especially in the highlands. This coupled with the prospect of more than one planting would mean shorter storage periods and, hence, lower storage losses, enabling good quality seed potato being available whenever needed for planting. The prospect of true potato seed being readily available in the future would provide great impetus to the potato production program and opportunities for unlimited expansion.

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