

PW-AAZ-954

POTATOES IN FOOD SYSTEMS  
RESEARCH SERIES  
Report No. 3

# Marketing Thailand's Potatoes : Present patterns and future prospects

Gregory J. Scott



INTERNATIONAL POTATO CENTER (CIP)

1987

#### COVER

The cover is adapted from an intricately carved gourd, or *mate*, obtained in an Andean potato farming community. This work of an anonymous peasant artisan shows Andean people's understanding of the potato's agricultural calendar from the breaking of a field to storage and sale of the harvest.

The purpose of this interdisciplinary research series is to encourage debate and advancement of knowledge about production, distribution, and utilization of potatoes in food systems of developing countries. The views expressed are those of the author(s) and do not necessarily reflect the official position of the International Potato Center.

Comments are invited.

POTATOES IN FOOD SYSTEMS  
RESEARCH SERIES  
Report No. 3

# Marketing Thailand's Potatoes : Present patterns and future prospects

Gregory J. Scott

MARKETING THAILAND'S POTATOES:  
PRESENT PATTERNS AND FUTURE PROSPECTS

Abstract

This study analyzes the marketing patterns for Thailand's potatoes in order to assess future commercial prospects for this crop both at home and abroad. The report utilizes a food systems approach as an analytical framework. Thus, potato marketing activities are scrutinized in the context of potato production and consumption patterns. Informal interviews with growers, traders and consumers carried out in 1984 in Thailand and Singapore served as one source of data for this report. A literature review and official statistics provided further information. Results emphasize the unusual features of potato marketing in Thailand, e.g. the importance of hotels and restaurants in the marketing chain. Additional findings such as high retail marketing margins are likely to be thought provoking for other Southeast Asian countries as well. Recommendations suggest that to address marketing problems efforts to develop production and consumption should be undertaken simultaneously.

Resumen

Este estudio analiza los patrones de comercialización para la papa en Tailandia con el fin de evaluar el potencial comercial de este cultivo en los mercados internos y externos. El documento utiliza el enfoque de sistemas de alimentos como un marco teórico. Entonces, la comercialización de la papa está examinada en el contexto de las actividades de su producción y de su consumo. Entrevistas informales con agricultores, comerciantes y consumidores hechas en 1984 en Tailandia y Singapur sirvieron como una fuente de información para este informe. Una revisión de la literatura y estadísticas oficiales ofrecieron información adicional. Los resultados enfatizan las características particulares del mercadeo de la papa en Tailandia, por ejemplo, la importancia de los hoteles y los restaurantes en los canales de la comercialización. Resultados adicionales, como los altos márgenes de comercialización al por menor, también sean de interés para los otros países del Sudoeste de Asia. Las recomendaciones sugieren que para resolver los problemas de comercialización los esfuerzos para desarrollar la producción y el consumo deben emprenderse simultáneamente.

### Acknowledgements

I would like to take this opportunity to express my appreciation to Dr. Ampol Senanarong, Deputy Director General, Department of Agriculture, for the invitation to visit Thailand in order to conduct this survey and to thank all those who helped make the visit a success. In addition, I would like to acknowledge the special assistance of Manoch Thongjiem of the Horticultural Research Institute, Department of Agriculture both during my stay and in providing essential data for the study. I also am grateful to Prasit Noree of Mae Jo Institute of Agricultural Technology for his consideration and advice while in Chiang Mai. I would like to thank as well Peter Vander Zaag, CIP representative for the Far East, for helping to arrange the survey. In addition, I would like to thank Primo Accatino, Adolfo Achata, Robert Booth, Hugo Fano, Anibal Monares, Robert Rhoades, Manoch Thongjiem and especially Douglas Horton for their constructive comments on earlier drafts of this report. Finally, I owe special thanks to Lilia Salinas and Meche Suito for their patience in typing various versions of this document.

All photos are by the author.

Gregory Scott  
July 1, 1987  
Lima, Peru

## Table of Contents

Acknowledgements .....	3
Contents .....	5
Tables .....	6
Diagrams and map .....	7
I. INTRODUCTION .....	9
II. POTATOES AND ECONOMIC DEVELOPMENT IN THAILAND .....	11
1. Economic development in Thailand: a brief overview .....	11
2. Thai agriculture: principal crops and production trends .....	12
3. Potential for potato production in Thailand .....	12
III. POTATO PRODUCTION .....	17
1. Production, area and yields .....	17
2. Types of producers .....	20
3. Varieties planted .....	23
4. Farm-level production constraints .....	25
IV. POTATO CONSUMPTION .....	27
1. Potatoes in the Thai diet .....	27
2. Potato consumption levels .....	30
3. Types of potato consumers .....	31
4. Constraints to increased potato consumption .....	32
V. POTATO MARKETING .....	33
1. Domestic potato marketing .....	33
a. Principal marketing channels .....	33
b. Types of traders .....	36
c. Prices and margins .....	40
2. Foreign trade .....	47
3. Constraints to improved marketing .....	52
VI. CONCLUSIONS .....	55
APPENDIX 1: Currency equivalents, weights and measures, acronyms/abbreviations .....	57
APPENDIX 2: A note on issues and methods .....	59
REFERENCES .....	63

## Tables

Table 1.	Thailand: Production, area and yield of principal food crops and potatoes, in 1982/84 and changes since 1960 .....	13
Table 2.	Thailand: Potato production, area, and yield according to different sources, 1961/65-84 .....	18
Table 3.	Thailand: Potato production, area, and yield by region, 1972-76 .....	19
Table 4.	Thailand: Principal growing seasons for potatoes by production zone .....	20
Table 5.	Thailand: Daily per capita supply of calories and proteins by major food group, 1979-81 .....	28
Table 6.	Thailand: Average monthly retail price of potatoes in Bangkok, 1978-84 .....	42
Table 7.	Thailand: Average monthly wholesale price of potatoes in Bangkok, 1979-83 .....	42
Table 8.	Thailand: Purchasing price of potato in Chiang Mai market, 1978-82 .....	43
Table 9.	Thailand: Prices and marketing margins for potatoes in selected months, 1978-81 .....	43
Table 10.	Thailand: Estimated revenues and principal costs incurred in potato marketing, 1984 .....	48
Table 11.	Thailand: Volume and value of potato imports and exports, 1974-83 .....	49
Table 12.	Singapore: Imports and exports of potatoes, 1979-83 .....	51

Diagrams and Map

Diagram 1.	Thailand: Agricultural calendar for potatoes .....	21
Diagram 2.	Thailand: Principal marketing channels for potatoes ..	34
Diagram 3.	Thailand: Average monthly potato price received by Bangkok retailers, Bangkok wholesalers, and producers in Chiang Mai, 1978-83 .....	41
Diagram 4.	Thailand: Average annual retail price for potatoes and selected vegetables in Bangkok, 1979-84 .....	45
Map 1.	Thailand: Principal potato growing areas and potato flows .....	14

## I. Introduction

Potatoes are a food crop of considerable potential in many parts of Southeast Asia. According to local and foreign scientists, recent technological advances will not only facilitate yield increases in traditional highland growing areas but also allow the expansion of potato cultivation in mid-elevation and lowland production sites (Kusumo 1983, Batugal 1986). Under such circumstances, the following key question frequently arises: if growers produce more potatoes, where will they be marketed?

The purpose of this study is (1) to provide an answer to this question, in the particular case of Thailand, and (2) to present an example for similar studies in other Southeast Asian countries.

The on-going debate about potatoes in Thailand and elsewhere in Southeast Asia frequently focuses on whether production, consumption, or marketing constitutes the fundamental constraint to increased output and use. In so doing, however, the essential importance of the interrelation between these different activities is often overlooked. Therefore, this study considers potato marketing in the overall food system of this commodity. Potato production and consumption are briefly examined followed by a descriptive analysis of current potato marketing patterns. Finally, an assessment is made of the trading prospects of the crop in both domestic and foreign markets.

While considerable research has been carried out on various aspects related to potato production in Southeast Asia (Page and Horton 1987: 143-146), much less has been written about potato marketing. Thailand is no exception in this regard. Thus, in order to address the key question referred to above, this study is based on fieldwork carried out in Thailand and Singapore in early 1984.<sup>1</sup> Information gathered from a subsequent detailed review of the literature and available secondary data is also included.

This publication forms part of series of studies on potato marketing undertaken since 1981 in collaboration with national potato programs in Bangladesh, Bhutan, Burundi, Madagascar, Peru, Rwanda, and Zaire. While specific issues in each of the countries have often varied, the common goal has been a better understanding of potato marketing in an effort to promote greater production and use of this vegetable.

---

<sup>1</sup> A brief summary of the issues and methods for this study are outlined in Appendix 2.

## II. Potatoes and economic development in Thailand

Development trends in Thailand, as in many other Southeast Asian countries, have been characterized by a high rate of economic expansion, a rapid acceleration in foreign trade and an agricultural sector dominated by rice. As population growth has continued, albeit at a declining rate, recent economic planning has called for new income and employment generating initiatives, including more intensive use of available farmland. Measures to diversify crop production, both to satisfy potential shifts in local eating habits as well to expand foreign exchange earnings, have also received considerable attention. Future potato marketing prospects, and policy decisions influencing these activities, are best considered in this context.

### 1. Economic development in Thailand: A Brief Overview

Thailand is an unusual country in several respects. Thailand was never colonized. Its economy is one of the most dynamic in the developing world. Gross National Product (GNP) per capita grew at an annual average rate of 4.2% between 1965 and 1984 (WB 1986:180). Population presently is roughly 50 million with over 80% residing in rural areas. Still, the average index of food production per capita rose to 138 in 1980/82 vs. 100 in 1969/70, a faster rise than in all but three countries in the world for this period (see WB 1984). Thailand is one of few developing countries with a net surplus in agricultural trade. This surplus reached an estimated US\$3.3 billion in 1983, down from a record US\$3.9 billion in 1982 (Tetro 1984:1).

Despite these impressive achievements, policy makers continue to be concerned about regional disparities in incomes and the untapped potential to increase agricultural production in certain parts of the country. Furthermore, Thailand's economy is highly dependent on foreign trade. Exports represented nearly 25% of Gross Domestic Product (GDP) in 1984. Moreover, although exports (by value) expanded at 10.4% a year from 1973-84, a much faster rate than for imports at 5.9%, the overall deficit in the balance of trade has risen steadily from US\$817 million in 1974-75 to an estimated US\$ 2.3 billion in 1982-83. This negative trade balance has attracted increasing attention on the part of policy makers and planners.

In light of these developments, the recent Fifth Five-Year-Plan (1982-86) included among its major goals:

- Export promotion and improvement in the balance of payments;

<sup>2</sup> Section 1 and 2 draw heavily on data presented in general background documents (see Tetro 1983, 1984 and WB 1984).

<sup>3</sup> Versus 2.8% for low-income economies, 3.1% for middle-income economies, 3.3% for upper-middle-income economies, and 2.4% for industrial market-economies (see WB 1986).

- Reduction of regional, sectorial, and target group income disparities; and,
- Alleviation of poverty in the more backward areas of the country.

In addition to these general goals and the broad policy guidelines intended to help achieve them, the Plan also includes specific reference to the agricultural sector.

## 2. Thai Agriculture: Principal Crops and Production Trends

Agriculture remains the most important sector of the Thai economy. Although agriculture declined from 40 to 20% of Gross Domestic Product (GDP) during 1960-84, it still employs 70% of the labor force (WB 1986:238). Moreover, exports of agricultural products have averaged roughly US\$4.2 billion since 1981 and have represented some 60 to 65% of all foreign exchange earnings from merchandise trade.

While food crops continue to dominate the agricultural sector, a distinct tendency has emerged towards diversification into cash crops for local sale and export; thus, while the rate of growth of agricultural production has steadily declined, this sector-wide trend disguises sharp differences in the evolution of output for particular commodities.

Rice remains the most important food crop in Thailand in terms of area planted (9.1 million hectares), value of exports (20.6 trillion baht 1982), and calories consumed per capita on an average daily basis (1,500). During the last two decades, however, the average rate of increase in production for rice (3.0%) was modest by comparison with sugar cane (24.0%) cassava for livestock feed and starch (49.4%) maize (16.2%) and potatoes (7.5%) (Table 1).

A related development concerns the growth in output for a variety of cash crops, including tobacco, coffee, cashews, and for fruit production, including bananas, pineapples, and coconuts. Crop production in Thailand has become more diversified, more market-oriented, and more attuned to both foreign and domestic trade patterns. The cumulative impression of output patterns is one of a farm economy in transition.

The thrust of agricultural policy for the Fifth Plan indicates a concern that past crop production increases have come almost entirely from an expansion in area under cultivation; hence, the guidelines for agriculture emphasize increasing yields through better land utilization, upgraded water and forestry resources, the promotion of more productive cropping patterns, improved high yielding variety seeds, an expansion of credit, and land reform. They also call for improvements in agricultural marketing.

## 3. Potential for Potato Production in Thailand

Biological scientists, both local and foreign, consider potatoes to have considerable production potential for a number of reasons. Potatoes are a short-duration, high yielding crop and, in this sense, they are well

Table 1. Thailand: Production, area and yield of principal food crops and potatoes in 1982/84 and changes since 1960.

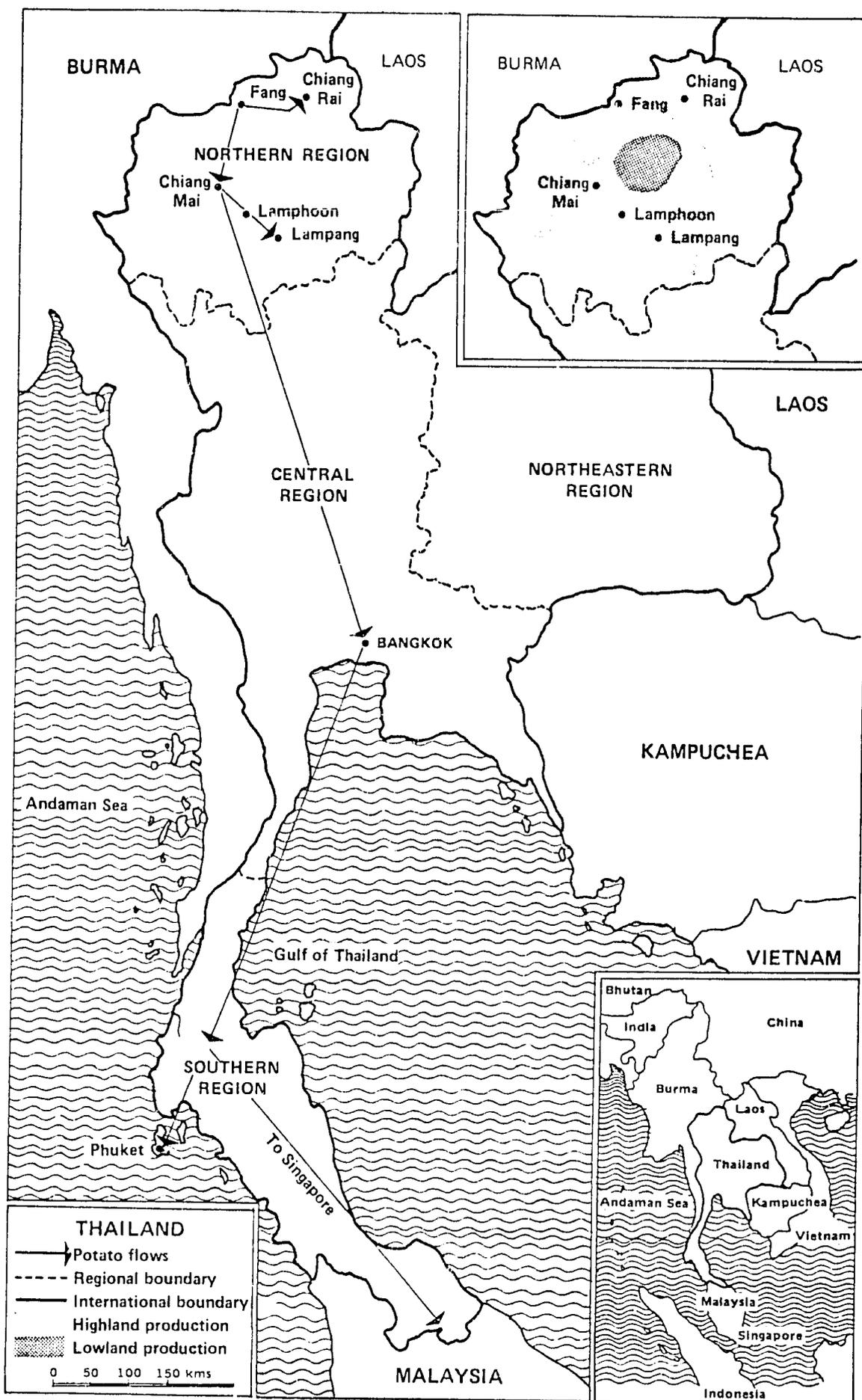
	Production		Area		Yield	
	(000 t)	Annual average rate of increase (%)	(000 ha)	Annual average rate of increase (%)	(t/ha)	Annual average rate of increase (%)
	1982/84	1961/65-1981/83	1982/84	1961/65-1981/83	1982/84	1961/65-1981/83
Rice	18,204.3	3.1	9,338.7	1.7	1.9	0.9
Sugar cane <sup>1</sup>	26,500.3	24.7	589	16.3	44.9	2.1
Cassava	18,920.7	47.9	1,146.7	45.7	16.7	0.3
Maize	3,568.0	16.9	1,511.0	12.9	2.4	1.3
Green beans	40.7	1.4	17.7	0.9	2.3	0.2
Potatoes	7.7	7.8	1.0	n.a.	11.0	4.0

n.a. = not available.

Source: FAO. Production Yearbook. Various years (1976, 1983) Vol. 30, Vol. 37.

1 Principally grown for processing into starch and livestock feed.

Map 1. Thailand: Principal potato growing areas and potato flows.



suited to the overall goal of improving output per unit of land area. Potatoes are perhaps best suited to the highland areas of the Northern Region (Map 1). It is in this area, among others, that the potential for expanding land area under cultivation is greatest. Potatoes, therefore, need not force out other, existing food crops. Potatoes can serve as a supplemental source of food as well as a source of additional cash for low-income farm families in this region. Potatoes are a crop that is imported by neighboring countries such as Malaysia and Singapore; therefore, increased potato exports offer the possibility of contributing to a reduction in the foreign trade deficit. A number of Thai scientists are already carrying out research on various aspects of potato production.

In spite of the potato's recognized potential, production has recently declined to levels 30% below those achieved 10 years previously. There is an on-going debate as to whether this decline in output reflects problems of production, marketing, or limited demand. These three areas are discussed in sections three, four and five.

### III. Potato Production

Information about potato production in Thailand is scarce. According to the oral tradition, the potato probably was brought to Thailand from Burma during the 19th century. Some observers claim, however, that it came from China at around the same time (IPRF: Thailand 1984). Production is small and currently confined to some of the most isolated parts of the country. Recent interest in the potato, both for its commercial potential as an alternative to opium cultivation and as a partial substitute for rice, has led to a series of projects to promote its production by Hilltribe farmers (HAMP 1982, Hoare et al. 1982) and to a modest research program (Tongdee 1978b: 7, Thongjiem and Chouralitwongporn 1985).

#### 1. Production, Area, and Yields

Potato production in Thailand increased from 3,000t to 8,000t between the early 1960s and mid-1970s (Table 2). With the withdrawal of American servicemen in 1975, local demand shrank considerably. Output subsequently decreased to 2,900 t in 1976 (Tongdee 1978b: 3). Production figures for recent years show considerable fluctuation in output: 4,100 t in 1978, to 13,600t in 1981, to 5,600t in 1982. Rural development projects that included potato production helped to induce a steady growth in area harvested from 400 ha to 1400 ha. The jump in output from 1980 to 1981, however, resulted in a 20% slide in retail prices (Table 6). Grower returns probably suffered in the process. Consequently, area harvested fell back to 400 ha in 1982.

Potatoes have remained a minor crop in terms of area harvested, never exceeding 1,400 ha, throughout the period 1961/65 to 1983. Yields apparently improved from 7-8 t/ha in the late 1960s - early 1970s to 10-11 t/ha by the early 1980s, though the data are questionable.

#### Location of Production

Potato production has been traditionally concentrated in the Northern Region (Table 3). Figures for 1972-76 indicate that 75% to 90% of area planted and production has been in this region. By the mid 1970s, the South had replaced the Northeastern and Central Regions as the second most important potato growing area in Thailand.

Within the Northern Region, Chiang Mai and Chiang Rai provinces are noted for potato production. In these areas, potatoes are grown in three different ecological zones. Growers plant potatoes on rain-fed land in

<sup>4</sup> Available data on potato production, area, and yields are inconsistent. FAO data appear most accurate for the period 1961/65 - 1977. Department of Agricultural Extension figures appear most valid for more recent years.

Table 2. Thailand: Potato production, area, and yield according to different sources, 1961/65-84.

Year	Production (000 t)		Area (000 ha)		Yield (t/ha)	
	1	2	1	2	1	2
	1961/65	3.0	n.a.	0.5	n.a.	6.7
1966	7.0	n.a.	1.0	n.a.	7.0	n.a.
1967	8.0	8.1	1.1	1.1	7.1	7.3
1968	8.0	8.6	1.1	0.4	7.3	6.9
1969	8.0	9.0	1.1	1.1	7.3	7.9
1970	8.0	6.5	1.1	0.8	7.3	8.0
1971	8.0	6.7	1.1	0.8	7.3	9.0
1972	8.0	8.7	1.1	1.0	7.3	8.8
1973	7.0	5.4	1.0	0.7	7.1	6.5
1974	6.0	7.2	0.8	1.1	7.2	6.5
1975	5.0	7.9	0.7	0.8	7.2	9.9
1976	2.9	2.9	0.4	0.4	7.2	7.0
1977	5.5	5.5	0.5	0.5	11.1	10.5
1978	6.0	4.1	0.5	0.4	11.1	10.4
1979	6.5	6.3	0.6	0.7	11.0	8.9
1980	6.5	8.9	0.6	1.1	11.0	7.8
1981	7.0	13.6	0.6	1.4	11.1	10.0
1982	7.0	5.1	0.6	0.4	11.1	11.9
1983	7.5	n.a.	0.7	n.a.	11.0	n.a.
1984	8.0	n.a.	0.7	n.a.	11.0	n.a.

n.a. = not available.

Source: (1) FAO, Basic Data Unit; (2) Department of Agricultural Extension, Ministry of Agriculture and Cooperatives.

Table 3. Thailand: Potato production, area, and yield by region, 1972-76.

Year	Region	Production (t)	Area (ha)	Yield (t/ha)
1972	Northern	7,233.5	785.8	9.2
	Northeastern	510.2	75.4	6.8
	Central	905.3	144.8	6.3
	South	1.4	1.3	1.1
1973	Northern	4,131.1	625.9	6.6
	Northeastern	228.0	41.9	5.4
	Central	39.6	3.8	10.4
	South	29.0	7.4	3.9
1974	Northern	6,367.0	859.7	7.4
	Northeastern	225.7	193.1	1.2
	Central	48.0	7.0	6.9
	South	- 552.9	104.6	5.3
1975	Northern	7,336.6	688.5	10.7
	Northeastern	-	-	-
	Central	74.5	10.6	7.0
	South	475.1	94.7	5.0
1976	Northern	2,374.5	316.2	7.5
	Northeastern	12.1	3.8	3.2
	Central	-	-	-
	South	443.7	82.6	5.4

Source: Tongdee (1978b: 2-3).

(1) the foothill areas between 800 and 1000 m and (2) above 1000 m in the highlands. Both these zones are often referred to as simply the "highlands." Some potatoes are also grown with the aid of irrigation in (3) the lowland areas.

### Growing Seasons

There are three, principal growing periods for potatoes. One dry-season crop at the beginning of the calendar year and a rain-fed crop in the middle and end of the year (Table 4). Planting dates for the rainy-season crop vary slightly by ecological zone. Rainy-season crops are planted in April and September in the highland zone vs. April and August for the foothill zone.

Table 4. Thailand: Principal growing seasons for potatoes by production zone.

Production Zone	Elevation	Types	First Crop		Second Crop	
			Plant	Harvest	Plant	Harvest
Highlands	1,000-1,500	Slash and burn/ rain fed	April	July/Aug.	Sep*.	Dec.
Hills	800-1,000	Slash and burn/ rain fed	April	July	Aug.	Nov.
Valley	300-400	Paddy field/ irrigated	Nov/Dec	Feb/March	-	-

Source: Hoare and Tovichakchaikul (1978: 16), Tongdee (1978b:5).

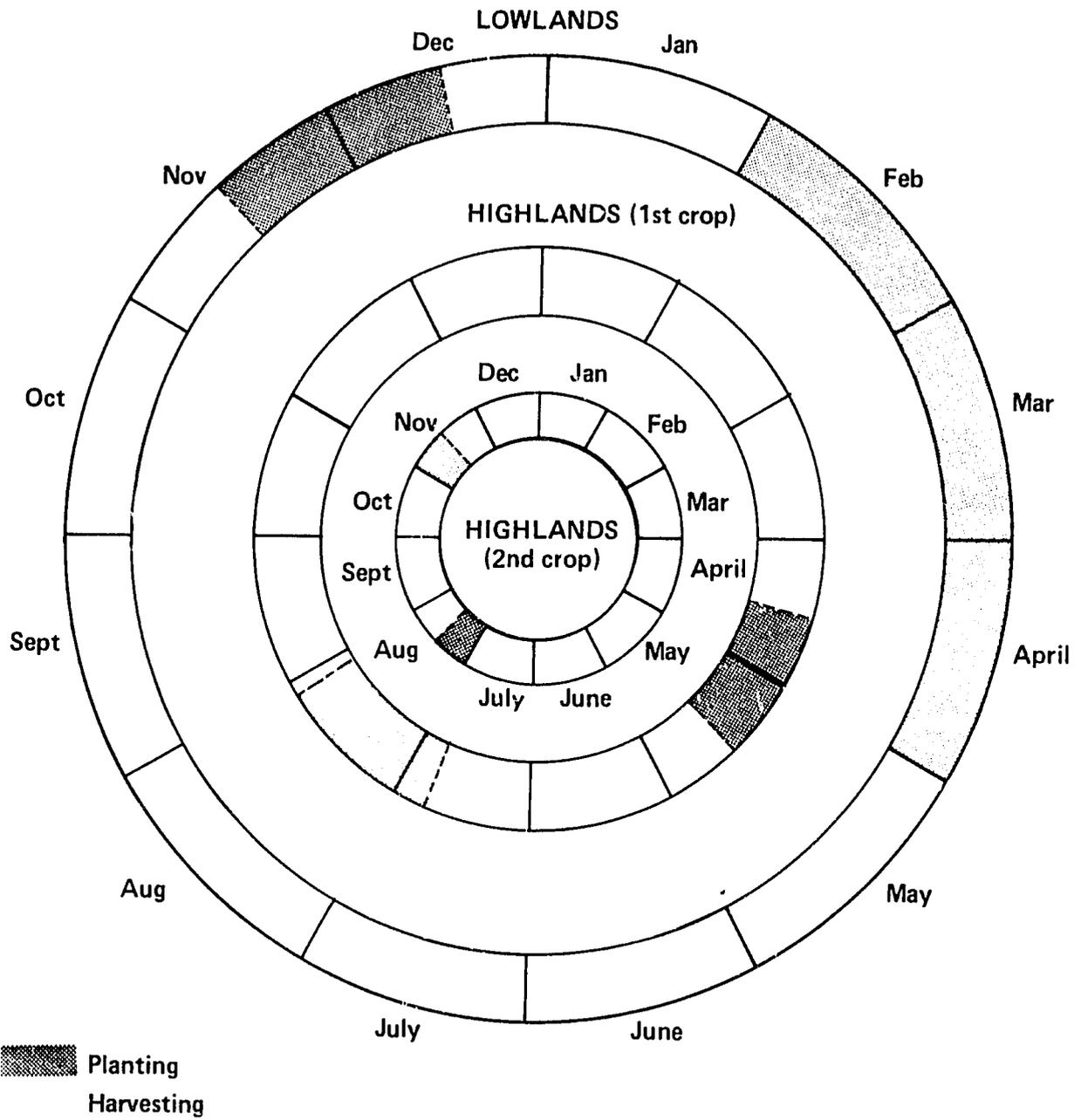
Given the various seasons and zones, potatoes are harvested practically all year round in the Northern Region (Diagram 1). Rainy-season crops are dug in August/September and November/December, though in some highland areas, potatoes are planted and harvested throughout the year (IPRF: Thailand 1984). The dry-season crop is harvested from Jan.-March/April. Observers disagree over the percent of total annual output that is produced in each crop and each zone. However, they concur that the sequence of growing seasons facilitates seed flows between producers in the different ecological zones.

## 2. Types of Producers

Broadly speaking, two types of potato producers can be distinguished on the basis of their location, ethnic origin, seed source, inputs employed as well as access to technical assistance.

Thai farmers grow potatoes using imported seed (see Section V.2), chemical fertilizers and pesticides, on irrigated, flat land in the lowland zone. They often cut up the seed tubers and plant the eyes (IPRF: Thailand

Diagram 1. Thailand: Agricultural calendar for potatoes.



Source: International Potato Reference Files 1984.

1984). They tend to be specialized in crop production. Given the location of their farms, they have ready access to extension and technical assistance. They also are closer to major markets.



Thai potato producer with results of on-farm varietal trial in the lowland zone near Chiang Mai.

Hilltribe (e.g. Meo and Lahu) and Chinese farmers grow potatoes on the rain-fed slopes of the foothill and highland zones (see Hoare and Tovichakchaikul 1978; Hoare and Wiboonjag 1979; HAMP 1982). Little is known about cultural practices of Chinese farmers. Hilltribe growers tend to use fewer purchased inputs. In fact, many buy only locally-procured seed. They tend to plant entire tubers. They undertake a variety of crop and livestock activities throughout the year. They also spend part of

their time working off the farm. The geographic isolation of their farm communities as well as language barriers hamper extension efforts and handicap potato marketing activities.

The vast majority of growers of either type plant no more than 1-2 ha of potatoes per year (Sikkamondhal and Thongjiem 1981). Information presented in Tonguthaisri (1984) indicates farmers planted less than 0.75 ha on average during the period 1983-84. Growers in the highland and foothill zones cultivate potatoes in several seasons and plots; thus the amount of land under potato cultivation at any one time is probably less than 0.25 ha.

### 3. Varieties Planted

Spunta and Bintje are the principal potato varieties grown for the fresh market. Kennebec is grown for processing. Recent experiments in farmers' fields have utilized Russet Burbank (intended for processing into french fries for fast food outlets). Cardinal and a number of new CIP clones are also being tested (Thongjiem and Chouvaltiwongporn 1985).

Hilltribe growers have made more use of Bintje in the past. This variety has a shorter dormancy period. It therefore is more suited to the multiple cropping of potatoes that these farmers during the calendar year are accustomed to practice (Hoare and Tovichakchaikul 1978: 19). The main reason these growers used Bintje, however, was that they could not afford to purchase Spunta seed tubers in March, but could receive Bintje tubers from potato merchants on credit (op. cit.: 19). A recent program of administered credit for highland growers has enabled some highland producers to overcome this constraint and switch varieties.



Simple diffused light store. Many growers in hills and lowlands now utilize this technology.

Lowland farmers are more likely to plant Spunta. This variety is chosen because it produces a large, long tuber that is preferred by suppliers of hotels and restaurants in Bangkok. Traders also like Spunta because it keeps better after harvest and therefore reduces marketing losses due to shrinkage and spoilage. Traders will pay growers 50% more per kg for Spunta than for Bintje.

Since 1979, a local processing firm has purchased potatoes of the Kennebec variety on contract from both highland and lowland growers (Hoare et al. 1982: 311). This variety is ideal for processing into potato chips; however, traders refuse to buy it for fresh market sales.

### Seeding Rates

Estimates of potato seed utilized per hectare vary between 950 and 2,100 kg. These different estimates appear largely attributable to divergent agronomic practices, types of seed employed (imported versus local) and whether the variety planted is destined for the fresh market or processing. They also reflect differences in the estimation procedures themselves. Thus, for example, FAO (1985) makes use of Food Balance Sheet statistics to calculate potato producers apply an average of 1.7 t/ha of seed. Highland Agricultural Marketing Project (HAMP) personnel report that highland growers need about 1,500 kg/ha of seed for table potato production versus roughly 1,250 kg/ha of seed for processing potatoes. Furthermore, Hoare and Tovichakchaikul (1978:21) indicate seeding rates are as low as 950 kg/ha in the lowlands where growers cut seed tubers prior to sowing (see also Tonguthaisri 1984).

### Costs of Production

The few costs of production estimates for potatoes available range between 43,187 Baht/ha (US\$2,100) and 3,500 Baht/ha (US\$160). The former estimate for 1978-79 attributes 90% of total costs to seed (Sikkamondhol and Thongjiem 1981). The latter figure is for growers in one of five highland villages surveyed by HAMP personnel in 1981. These producers utilized neither fertilizer nor pesticide and incurred no transportation costs (HAMP 1982). Tonguthaisri (1984) reports a more recent (1982-83) estimate of 26,218 Baht/ha (US\$1,140). Ministry of Commerce economists based in Chiang Mai interviewed 76 lowland growers as the basis for calculating the costs of potato production per hectare at 26,277 Baht (US\$1,140) for the 1982-83 season.

Most individuals contacted for this study reported potatoes were a more expensive to produce than other substitute crops, thus implying the need for credit to purchase inputs and the willingness of the grower to assume considerable economic risk. Furthermore, seed frequently was identified as the most costly production input. However, hired labor and transportation also accounted for the largest percentage of total costs in certain locations (HAMP 1982). Differences in the estimation procedures employed, the shortage of disaggregate information reported and the varying production technologies studied all preclude a more detailed analysis of production cost data.

#### 4. Farm-Level Production Constraints

Attempts to increase productivity among potato farmers in Thailand suffer from a number of farm-level constraints. Many farmers mention the quality, price, and availability of seed as a major constraint. According to Hoare and Tovichakchaikul (1977, as cited in Sikkamondhal and Thongjiem 1981), seed represents 90% of the costs of production for hilltribe potato growers. Hilltribe farmers are not experienced at selecting seed. They have been discouraged by poor yields from locally-produced, low-quality tubers (Hoare et al. 1982: 309). At the same time, imported seed can be three to four times the price of locally produced tubers. For hilltribe growers accustomed to much higher seeding rates than lowland producers (Hoare and Tovichakchaikul 1978: 21), this can raise production costs considerably.

The Ministry of Commerce controls the importation of seed potatoes. If the price for table potatoes in one year is low, the Ministry then prohibits seed imports so as to reduce production the following year. Growers complain that this limits the availability of seed, increases the price, and complicates their production plans.

Diseases and insects are a related production constraint (Chareonridhi 1978). Potato leaf roll, potato virus Y, late blight (Phytophthora infestans) and early blight (Alternaria solani) are among the diseases most frequently encountered. Damage by tuber moth and mites has also been noteworthy. The remote location of farmers' fields in the highlands and foothill zones hinder identification of these pests by technical personnel. It also complicates the purchase and transport of pesticides.

The financial risks associated with potato production are perhaps the most important farm-level constraint. Producer prices have fluctuated sharply from year to year (Hoare and Wiboonjag 1979:172). Hilltribe growers who took out bank loans to produce potatoes in the past have lost money due to poor yields and low prices. Others have duplicated yields in successive years, but have seen their revenues cut in half by a steep drop in prices.

#### IV. Potato Consumption

Potatoes are eaten by a variety of consumers in Thailand. Tourists and resident expatriates are the most important consumers. Most Thais consider potatoes either a food for foreigners or a minor vegetable. In fact, the Thai phrase "mun farong" means literally "foreign tuber." Existing consumption patterns are influenced by a series of culinary and cultural factors.

##### 1. Potatoes in the Thai Diet

Although diets vary by region, rice is the basic staple and preferred food throughout Thailand. According to FAO statistics, rice constitutes two-thirds of all the calories available for consumption and over half the protein (Table 5). The relative importance of rice has remained virtually unchanged during the last two decades (FAO 1980: 891). Potatoes continue to be perceived and eaten as a complementary vegetable by the average Thai consumer.



Chiang Mai evening market. Note wide selection of fresh vegetables available to consumers.

Table 5. Thailand: Daily per capita supply of calories and proteins by major food group, 1979-81.

Food group	Daily per capita supply of calories	% of total	Daily per capita supply of protein (grams)	% of total
1. Cereals (Rice) <sup>1</sup>	1,540 (1,484)	66.7 (64.3)	27.6 (26.0)	59.1 (55.7)
2. Sugars and honey	288	12.5	0.4	0.9
3. Fruit	96	4.2	1.3	2.8
4. Nuts and oilseeds	65	2.8	1.8	3.9
5. Roots and tubers	63	2.7	0.4	0.9
6. Meat and offals	86	3.7	5.1	10.9
7. Fish and seafood	37	1.6	5.7	12.2
8. Oils and fats	58	2.5	-	-
9. Vegetables	37	1.6	1.9	4.1
10. Eggs	8	0.3	0.6	1.3
11. Milk, pulses, spices	30	1.3	1.9	4.1
Total	<u>2,308</u> <sup>2</sup>	<u>100.0</u>	<u>46.7</u> <sup>2</sup>	<u>100.0</u>

Source: FAO 1984.

1 Husked and milled.

2 Excluding alcohol.





Simple potato processing near Fang.

## 2. Potato Consumption Levels

Little is known about per capita consumption levels of potatoes in Thailand. Domestic production and imports together are small and detailed statistics on potato consumption are simply not available. Instead, the literature includes estimates of per capita availability and occasional references to potato consumption by specific groups of consumers.

The Food Balance Sheet prepared by FAO for 1975-77 (see FAO 1980: 893-895) estimates per capita availability of potatoes at 0.2 kg per year. Per capita availability of rice (milled) for the same year was 146.4 kg and for fresh vegetables 29.9 kg. Recent production and import statistics indicate per capita availability fell to less than 0.1 kg per annum in 1982.<sup>5</sup>

Most observers agree that the bulk of Thai potato production is eaten by tourists and resident expatriates (see, e.g., Wantoone n.d.). Some two million tourists visit Thailand annually (Tetro 1983: 43). If, for example, one assumes that 4,000 t are available for tourist consumption, then this represents two kg per person. If the average tourist spends approximately one week in Thailand, then his equivalent annual potato consumption is about 100 kg, or a level similar to those prevailing in many West European countries (Horton and Fano 1985: 161).

---

<sup>5</sup> This estimate assumes domestic production was 5,100t in 1982 (Table 2) and population was 48.5 million (WB 1984).

Based on the very limited evidence available, it is estimated that growers eat less than 5% of the potatoes that they produce (Hoare and Wiboonjag 1979:171). One study did find that when prices for potatoes were unusually low, growers retained more tubers for household consumption; thus, among one group of hilltribe farm households studied, consumption rose from zero in 1977 to 65-135 kg per family in 1978 (op. cit.). This type of consumer behavior suggests that changing economic circumstances could induce changes in even traditional diets of certain households.

### 3. Types of Potato Consumers

Consumers in Thailand can be divided into three groups: (1) potato growers, (2) Thai non-producers, and (3) tourists and resident expatriates.

Growers themselves are relatively small in number, probably less than 2,500 in total. Their consumption is largely restricted to the minor share of the crop that they do not sell. They do not purchase potatoes to eat.

Highland growers contacted by Hoare and Tovichakchaikul (1978: 18) reported that if they substitute potatoes for rice they, "would not have the strength to work in their fields"; thus, although there appears to be some potential for increasing consumption of subsistence potatoes instead of purchased rice at certain times of the year, highland farmers prefer to sell potatoes and buy rice.

Lowland growers contacted for this study certainly gave the impression that they would consume more potatoes, but they did not know how to prepare them. At present, potatoes are cooked in only one or two dishes, neither of which is considered particularly appealing from a gastronomic point of view.

Thai non-producers that eat potatoes are primarily city dwellers in Chiang Mai and Bangkok. Impressions gleaned from informal interviews with both consumers and traders suggest Thai non-producers perceive potatoes as either a snack or an additional, supplementary vegetable. In the first instance, they might be served in the form of potato chips at social gatherings or prepared in an unusual dish for a special occasion. In the latter, potatoes are thought of like cabbage or onions, namely, as a boiled vegetable.

Tourists and resident expatriates in Bangkok eat potatoes in the more expensive hotels and in restaurants that specialize in Western foods. Potatoes are also available in supermarkets in the capital, nevertheless, all these establishments sell potatoes in limited quantities (see Section V.1 below). Interviews with hotel and restaurant personnel in Bangkok and Chiang Mai suggest that foreigners will occasionally consume potatoes but generally eat local foods as part of the experience of being in Thailand. Given the wide variety and modest price of Thai dishes, visitors have several alternatives to choose from.

#### 4. Constraints to Increased Potato Consumption

Among the principal constraints to increased potato consumption are well entrenched culinary habits, the general public's ignorance of the nutritional qualities of the potato and the variety and abundance of alternative foods.

Potatoes are not a regular ingredient in traditional Thai dishes. Partly for that reason, potatoes are a food that Thai are relatively unfamiliar with; hence, boiled potatoes, and perhaps one or two other dishes, are about the only way potatoes are prepared. These recipes are adequate, but not unusually tantalizing. Potato consumption, therefore, is discouraged by the lack of information concerning the imaginative preparation of this particular vegetable.

A related constraint concerns the perception of the potato as a nutritionally inferior food. While local scientists that study the potato may be aware of its nutritional properties, the average consumer appears less well informed. This issue has not been analyzed in depth, but misconceptions about the nutritional value of the potato appear to serve as a deterrent to increased consumption.

Unlike most developing countries, Thailand has consistently produced a surplus of food. This abundance applies to rice as well as to a multitude of fresh vegetables including lettuce, Chinese mustard, coriander, Chinese cabbage, eggplant, cucumber, chili, cabbage, tomatoes, garlic, and shallots. Many of these products are available fresh in local markets and occasionally at lower prices per kg than potatoes. The regular supply of cheap substitutes dampens the demand for potatoes.

Some observers attribute the limited consumption of potatoes to the inadequate workings of the marketing system and consider this an additional, important constraint. The survey now examines this and related marketing issues.

## V. Potato Marketing

Growers in Thailand sell the bulk of the potatoes that they harvest and consider potatoes a cash crop. Most potatoes are shipped to Bangkok for sale to hotels and restaurants. A few tons are marketed each year in neighboring countries. Potato marketing is almost entirely in the hands of private traders. Entry into this line of commerce is unrestricted. Limited government intervention consists primarily in the regulation of seed imports. Planners and policy makers continue to show interest in expanding foreign sales of potatoes. An increase in exports could help offset the downward pressure of producer prices that occurs periodically when local production exceeds domestic demand.

### 1. Domestic Potato Marketing

Food Balance Sheet figures developed by FAO (1980: 893; 1985: 241) and estimates presented in local studies indicate roughly 80% of domestic potato production is sold. The remainder is used as seed or lost to waste. Potatoes move from grower to consumer through a variety of commercial channels.

#### (a) Principal Marketing Channels

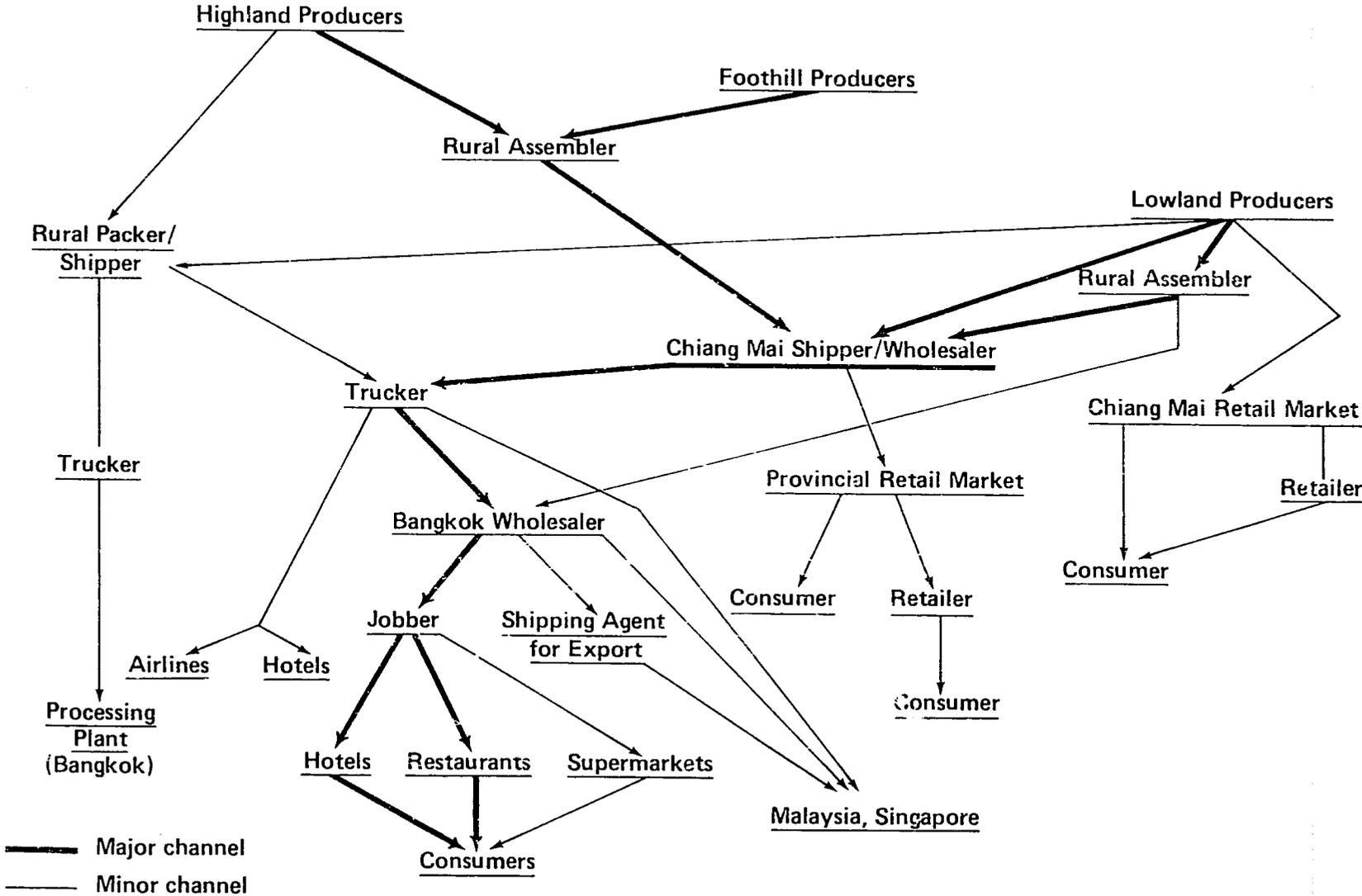
Table potatoes produced in the Northern Region are shipped to Bangkok in several different ways (Diagram 2). Growers in the highlands generally sell their potatoes to local rural assemblers. These traders transport the potatoes to Chiang Mai and sell them to local shipper/wholesalers. From Chiang Mai they are shipped to wholesalers in Bangkok. Some potatoes are sold to local retailers and nearby provincial markets like Lamphoon (Map 1). Growers in the foothills sell their potatoes in similar fashion; however, some potatoes go direct from the foothills to Bangkok.

Lowland growers sell direct to Chiang Mai shipper/wholesalers, to rural assemblers who resell the potatoes in Chiang Mai or Bangkok, or in small lots direct to area retailers and consumers. Most lowland growers prefer to sell to someone at the farmhouse rather than transport the potatoes into the city themselves. According to growers contacted for this study, the latter strategy puts them in a disadvantageous bargaining position vis-à-vis Chiang Mai merchants.

Most potatoes that are sent to Bangkok go either to a wholesaler in one of the major produce markets or to a Chinese potato trader in that neighborhood of the city where such merchants cluster together. These wholesalers sell to jobbers who supply the major hotels and restaurants by regular order. They also may supply shipping agents who export potatoes or send potatoes directly to Malaysia and Singapore. Bangkok wholesalers sell some potatoes in the resort towns of the south as well (Map 1).

Potatoes sold for processing either go to a rural assembler or direct to the packing shed near Fang. After sorting and packing, the tubers are then shipped to the plant in Bangkok.

Diagram 2. Thailand. Principal marketing channels for potatoes



34

Source: Elaborated for this study.



Hilltribe trader in shipper's depot in Chiang Mai.

(b) Types of Traders

Potato marketing in Thailand involves six principal types of traders. They include:

- Highland rural assemblers
- Large-scale, rural assembler/shipping agents
- Chiang Mai shipper/wholesalers
- Bangkok wholesalers
- Bangkok jobbers, and
- Bangkok retailers.

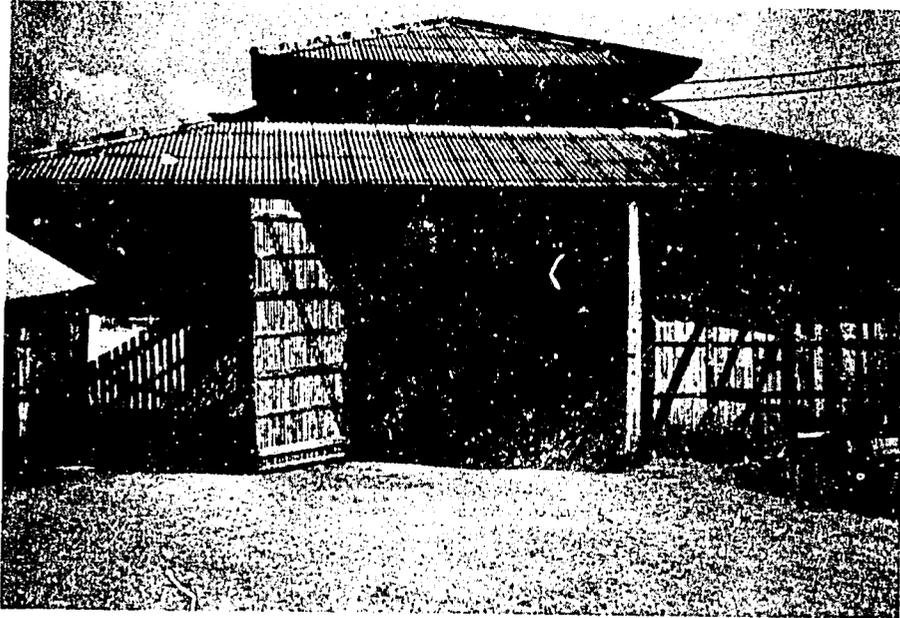
Many potato growing areas in the highlands of the northern region are inaccessible and the growers are all small-scale, peasant producers. Highland, rural assemblers collect potatoes in the local villages and transport them by animal to the nearest road and then by small vehicle to Chiang Mai. Some highland, rural assemblers merely act as commission agents for Chiang Mai merchants who may not speak the local language or are apprehensive about conducting business in such isolated communities. Other highland, rural traders buy and sell potatoes on their own.

Highland, rural assemblers frequently advance growers seed and fertilizer. These seed tubers may be what was graded and stored since the previous harvest or simply the potatoes provided by Chiang Mai merchants.

Two or three large-scale, rural assemblers near Fang not only collect potatoes but also grade, pack, and ship them direct to Bangkok and foreign markets. One Chinese, rural assembler maintains very close contacts with highland and foothill growers of Chinese ancestry. He sells or supplies them seed and fertilizer then buys their potatoes at harvest. In addition to his own pickup trucks, this assembler has two large (approximately 100 t capacity) sheds where he grades, packs, and temporarily stores potatoes, onions, and garlic. He also maintains an office in Chiang Mai. He supplies about 75t per month to the processing company's nearby packing shed and more than that to Bangkok wholesalers. Price movements in Chiang Mai and Bangkok, determine where and when he sells table potatoes.

The processing plant in Bangkok also maintains its own rural assembly center near Fang. The company, through its local representative, provided 280 lowland farmers and 80 highland farmers with highland seed, fertilizers, and pesticides during 1983-84. Lowland, contract farmers bring their potatoes to the packing shed themselves. Highland growers usually work through a rural assembler. Farmers (or rural assemblers) are paid after the potatoes are graded and shipped to the Bangkok facilities, usually a delay of not more than 15 days. In 1982-83, the company received 450t from lowland producers, some 60% to 70% of which was used later as seed for the highland crop, and 600 t from highland growers.

Five or six traders based in Chiang Mai act as shipper/wholesalers. The largest sells about 300 t per month, 30% of which is sold wholesale for cash to local buyers, e.g. retailers in the city's Central Market, hotels, and restaurants. The remainder is sent by truck to Bangkok where traders



Vegetable shipper's storage and packing depot near Fang.



Grading potatoes in packing depot near Fang.

charge him a commission. These shipper/wholesalers also market other vegetables so that most trucks sent to Bangkok carry a mixed load of produce like potatoes, garlic, and hot peppers.

Chiang Mai shipper/wholesalers typically operate out of a converted carport, or shop with a veranda. They receive potatoes there, then sort, grade, and pack them in 40-60 kg baskets for eventual sale. According to these traders, different-sized potatoes have particular markets. Large, elongated potatoes with white flesh are preferred in Bangkok. Medium-sized, oval potatoes with yellow flesh are best for Malaysia and Singapore. Small potatoes are separated out and sold or advanced as seed.



Grading table potatoes at farmhouse near Chiang Mai.

### Bangkok Traders

About 10-12 wholesalers handle potatoes in the Pakamtula (8-10) and Song Wat (2-3) markets in the center of Bangkok. These wholesalers receive potatoes from the Chiang Mai area and resell them locally or abroad. They do no grading, storing, or processing. Furthermore, they act as commission agents, obtaining potatoes from Chiang Mai shippers without making any payment. The selling price, less commission, is returned only after the potatoes have been sold.

Bangkok wholesalers operate out of rented space in the Pakamtula market itself or a small storefront in the Song Wat commercial district. They typically sell 1,500-2,500 kg of potatoes per day, but they also deal in other vegetables. Their principal clients are jobbers who supply hotels and restaurants on the basis of three to four-month contracts. They also

sell some potatoes to retail vegetable vendors, traders in provincial towns in the South, and to shipping agents who export tubers. According to these wholesalers, military personnel occasionally buy damaged potatoes because they are cheap. Government institutions otherwise do not buy potatoes.

The commission of Bangkok wholesalers varies between 5% and 10%. For example, if a jobber buys 15 to 20 baskets, he pays 1.0 baht/kg. The wholesaler then receives .5 baht/kg commission. If a vegetable vendor buys only one or two baskets, he pays 10.5 baht/kg and the wholesaler receives one baht commission. Sales are for cash or credit up to seven days.



Unloading potatoes in Bangkok wholesale market.



Potatoes on display in Bangkok wholesale market.

Most potatoes sold in Bangkok go to hotels and restaurants. These establishments let bids to provide so many kilos of fresh produce per week over a three to four-month period. Jobbers supply these vegetables. They typically buy potatoes from wholesalers two or three times per week. The amount supplied to the hotels varies from 4t to 5t to less than 1t per month. Demand is highest in the peak season months for the tourist trade which is October through February.

A local supermarket chain with four stores also retails potatoes. The four outlets handle about 3t per month. These potatoes are purchased in the Pakamtula market and packaged in small, plastic bags for retail sale. According to the manager of the main store, most potatoes are purchased by foreigners.

### (c) Prices and Margins

The government does not intervene in support of target producer prices for potatoes, although it does so for rice, maize and soybeans. Instead, potato prices and, consequently, marketing margins, are determined by prevailing supply/demand conditions through negotiations between buyers and sellers.

#### Prices

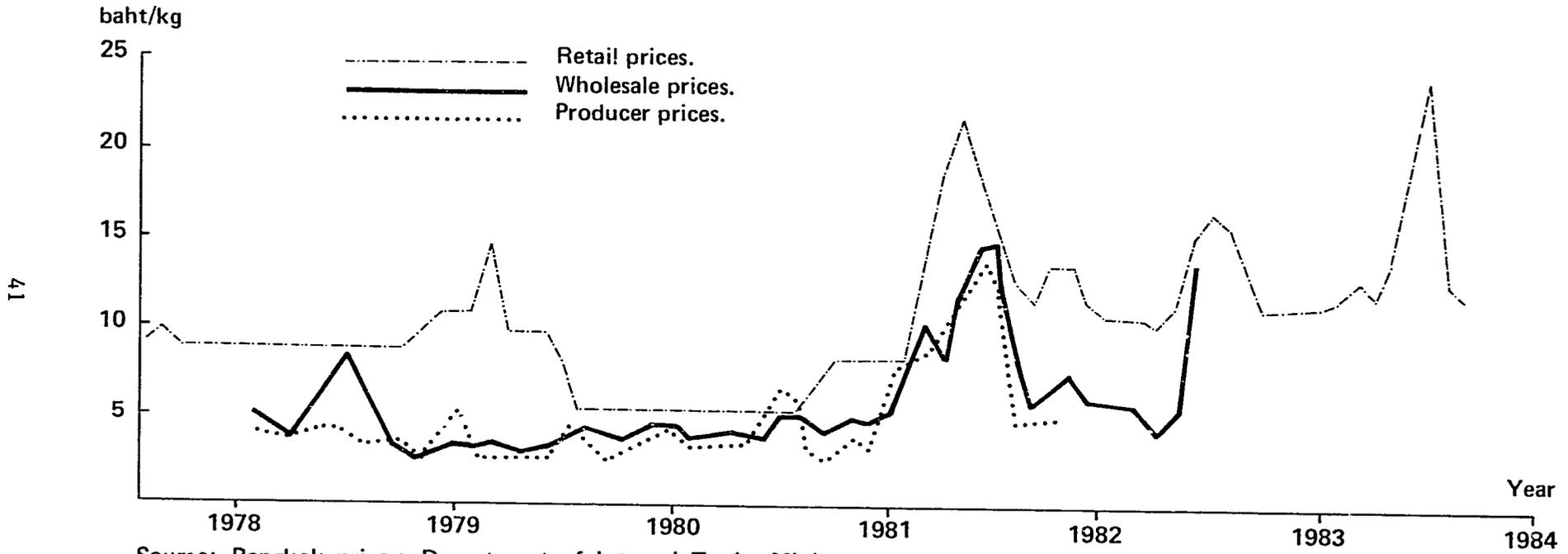
Prices for potatoes in Thailand fluctuate considerably from year to year (Diagram 3). Average annual retail prices were lowest in 1981, 6.6 baht/kg or roughly US\$.30/kg, and highest in 1982, 14.3 baht/kg or US\$.62/kg, for the period 1978-83.<sup>6</sup>

Statistics on potato prices unfortunately are available for only a relatively short period of time (Table 6-8). As a result, the impact of production changes on wholesale or retail prices is hard to interpret. In certain years, like 1980, production increases were accompanied by a decline in average Bangkok retail prices. In others, like 1979, production increases apparently had the opposite effect. A longer series of statistics might clarify this point and help quantify the relation between production and prices.

Potato prices also vary during the calendar year (Table 6 and 8); however, the size and direction of within-year price movements differ from year to year. For instance, there was a 20% difference between the highest and lowest price in 1979 versus a 170% difference in 1980 (Table 6). Retail prices in Bangkok were lowest from August to December in 1980 and highest from August to December in 1981. In more recent years (1982-84), prices have tended to be highest from April to June/July. This conforms to the shortage of potatoes between the end of the lowland harvest and the beginning of potato digging in the highlands (Table 4).

<sup>6</sup> During field work for this survey in April 1984, retail prices in Bangkok were roughly 15-16 baht/kg or US\$65 - US\$70/kg.

Diagram 3. Thailand: Average monthly potato price (current baht/kg) received by Bangkok retailers, Bangkok wholesalers, and producers in Chiang Mai, 1978-83



Source: Bangkok prices: Department of Internal Trade, Ministry of Commerce, Bangkok; Chiang Mai prices; Highland Agricultural Marketing Project, Chiang Mai.

Table 6. Thailand: Average monthly retail price (baht/kg) of potatoes in Bangkok, 1978-84.

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual Average
1978	10.0	9.5	7.5	7.5	7.0	6.5	9.0	10.0	9.0	9.0	9.0	9.0	8.6
1979	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	10.0	11.0	11.0	9.4
1980	11.0	15.0	10.0	10.0	10.0	8.5	5.5	5.5	5.5	5.5	5.5	5.5	8.1
1981	5.5	5.5	5.5	5.5	5.5	5.5	5.5	7.0	8.5	8.5	8.5	8.5	6.6
1982	8.5	8.5	14.0	19.0	22.0	18.5	15.5	13.0	12.0	14.0	14.0	12.0	14.3
1983	11.0	11.0	10.5	12.0	15.5	17.0	16.0	13.0	11.5	11.5	11.5	11.5	12.7
1984	12.0	13.0	12.0	15.0	20.5	24.5	13.5	12.0	13.5	n.a.	n.a.	n.a.	n.a.

n.a. = not available.

Source: Department of Internal Trade. Ministry of Commerce.

Table 7. Thailand: Average monthly wholesale price (baht/kg) of potatoes in Bangkok, 1979-83.

Year	Jan.		Feb.		Mar.		Apr.		May		Jun.		Jul.		Aug.		Sept.		Oct.		Nov.		Dec.		Annual Average	
	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
1979	5.3	n.a.	4.5	n.a.	4.0	n.a.	5.3	n.a.	6.8	n.a.	8.5	n.a.	6.8	n.a.	4.3	n.a.	2.8	n.a.	2.8	n.a.	3.0	n.a.	3.5	n.a.	4.8	n.a.
1980	3.3	6.5	3.5	6.3	3.3	5.4	3.3	5.0	3.5	4.8	3.8	4.8	4.5	5.5	4.3	5.5	3.8	5.5	4.0	5.5	4.5	5.5	4.5	6.3	3.9	5.5
1981	4.0	5.1	4.0	5.4	4.3	5.7	4.3	6.0	4.0	6.7	5.5	6.3	5.5	8.9	4.5	7.2	4.5	6.0	5.3	6.1	4.8	6.9	5.3	6.6	4.6	6.4
1982	7.5	10.0	10.5	13.8	8.5	10.2	13.0	13.3	15.0	16.8	15.0	15.9	9.0	11.0	6.0	7.4	6.8	7.3	7.5	8.4	6.5	7.2	6.3	6.6	9.3	10.7
1983	6.0	6.7	3.5	6.3	4.5	5.5	5.5	4.8	14.0	6.8	n.a.	12.3	n.a.	12.8	n.a.	5.9	n.a.	6.0	n.a.	7.0	n.a.	6.5	n.a.	7.8	n.a.	7.3

n.a. = not available.

Source: (1) Department of Internal Trade. Ministry of Commerce.  
(2) Department of Business Economics. Ministry of Commerce.

Table 8. Thailand: Purchasing price of potato (baht/kg) in Chiang Mai market, 1978-82.

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
1978	4.5	4.5	4.5	4.5	4.5	4.5	5.0	5.0	5.0	3.5	3.6	5.0
1979	4.0	4.0	4.0	4.0	4.0	4.0	3.8	3.8	3.8	2.8	3.6	5.0
1980	3.3	2.3	2.3	2.3	3.0	4.0	4.5	2.5	2.8	3.5	4.0	4.3
1981	3.5	3.7	3.5	3.5	4.3	6.4	6.0	3.0	2.8	3.8	3.4	5.2
1982	8.0	9.0	9.0	12.0	14.0	13.5	4.9	5.2	n.a.	n.a.	n.a.	n.a.

n.a. = not available.

Source: Highland Agricultural Marketing Project, Chiang Mai.

Table 9. Thailand: Prices and marketing margins for potatoes in selected months, 1978-81.

	1978		1979						1980						1981					
	Feb.	Mar.	Jan.	Feb.	Mar.	Apr.	Aug.	Sept.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Mar.	Apr.	May	Jul.	Aug.	Sept.
<u>Price</u> (baht/kg)																				
4	9.5	7.5	9.0	9.0	9.0	9.0	9.0	9.0	11.0	15.0	10.0	10.0	10.0	8.5	5.5	5.5	5.5	5.5	7.0	8.5
3	-	-	5.3	4.5	4.0	5.3	4.3	2.8	3.5	3.5	3.3	3.3	3.5	3.8	4.3	4.3	4.0	5.5	4.5	4.5
2	2.1	1.6	3.3	3.0	3.5	4.3	2.0	2.1	2.5	2.2	2.6	2.3	2.4	2.5	2.8	2.7	3.0	3.8	3.5	3.3
1	2.5	1.3	2.2	2.4	3.0	3.7	2.0	1.8	2.8	2.1	2.5	2.0	2.1	4.0	2.5	2.4	2.8	3.5	3.0	3.0
<u>Margin</u> (% of retail price)																				
3/4	-	-	58.9	50.0	44.4	58.9	47.8	31.1	31.8	23.3	33.0	33.0	35.0	44.7	78.2	78.2	72.7	100.0	64.3	52.9
2/4	25.8	21.1	36.1	33.3	38.7	47.2	22.2	23.6	22.7	14.8	26.1	23.0	23.6	29.4	51.1	49.8	53.6	68.2	50.0	38.2
1/4	22.4	18.0	25.0	26.3	33.0	40.9	21.8	20.2	25.0	13.9	24.7	20.0	21.0	47.1	45.4	44.2	50.9	63.6	42.9	35.3

Note: 1 = Chiang Mai producer price; 2 = Chiang Mai wholesale price; 3 = Bangkok wholesale price; 4 = Bangkok retail price.

Source: Bangkok wholesale and retail prices, Dept. of Internal Trade; Chiang Mai wholesale and producer price, Northern Agricultural Development Project.

Although potatoes would appear to be a relatively expensive vegetable, US\$.65/kg vs. US\$.15/kg in Lima, Peru, they actually sell retail in Bangkok at a lower price per kilo than many other vegetables (Diagram 4). According to Dept. of Internal Trade statistics for the period 1979-83, potatoes ranged between 0.4-.6 the average annual price of fresh chilies, 0.3-0.9 the price of shallots, 0.5-1.1 the price of sweet peppers, 0.5-1.1, 0.5-1.0 the price of sweet potatoes, and 0.5-0.8 the price of tomatoes.<sup>7</sup>

### Marketing Margins

Estimates of marketing margins for potatoes are few and far between (see e.g. Hoare and Tovichakchaikul 1978:22). Based on the meager information available, growers have generally received between 15% and 35% of the retail price (Table 9). Grower prices, however, were as high as 64% of the retail price in 1981, a year when production was unusually high and retail prices unusually low (Table 2 and 6). It is interesting to note that grower prices tend to vary much less than prices at the retail level.

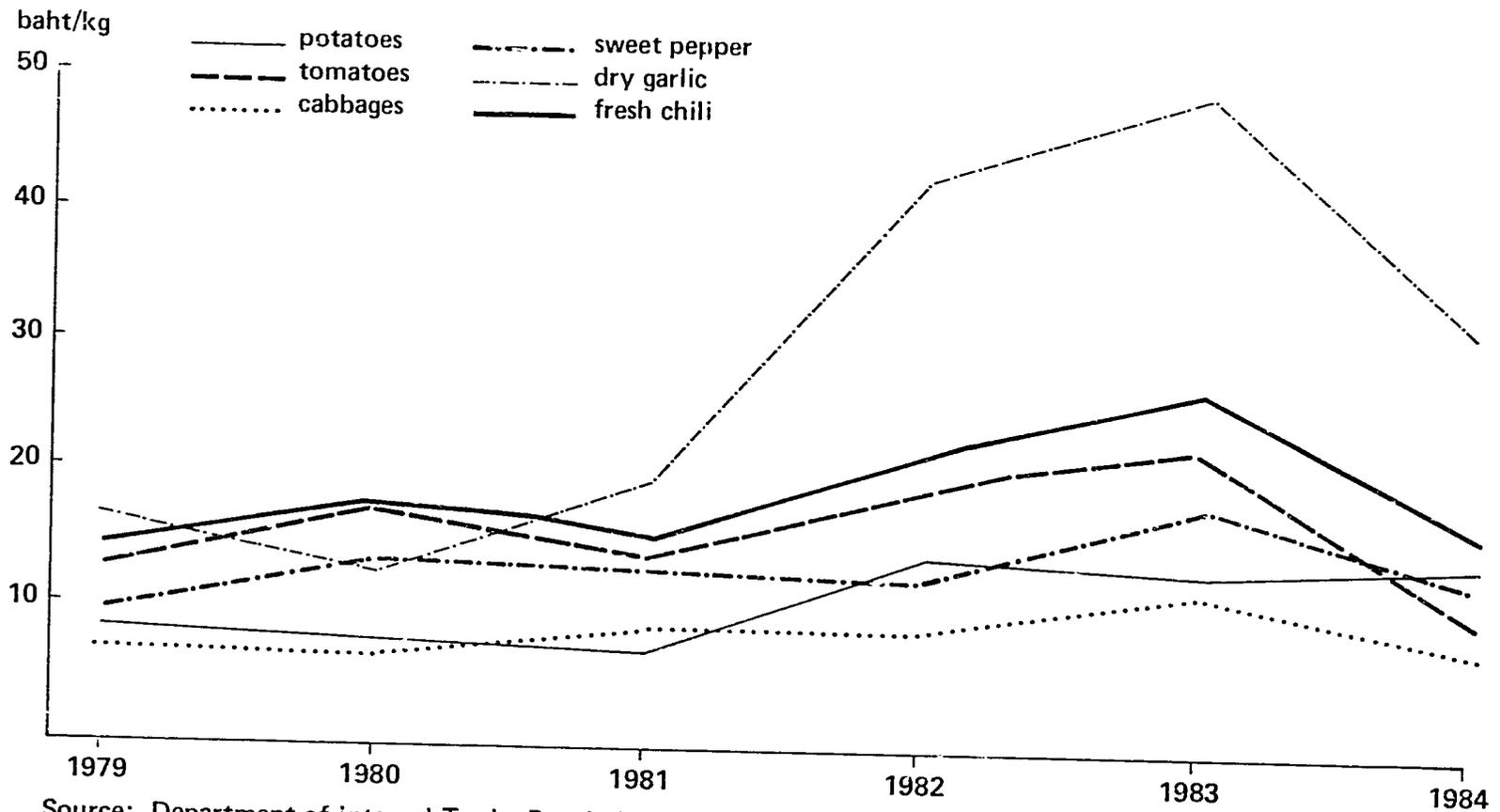
Retailers receive the highest share of the price paid by the consumer, though 1981 was again an exception. There are several reasons for this. On the one hand, retailers in Bangkok and Chiang Mai typically handle a much smaller volume than wholesalers; thus, their margin per kilo is higher because they need to recover costs and earn profits over a much smaller quantity of potatoes. Alternatively, retailers are perhaps in a much better position to know what the market will bear i.e. the highest price they can ask for without affecting consumer purchases. Hotels and restaurants will probably purchase a certain amount of potatoes each month regardless of the price provided the quality is good (see 1978-79 and 1979-80, Diagram 3). There appears to be at least one, important exception to this general rule. If potatoes are in abundant supply, it is much more difficult for retailers to maintain high prices without inviting competition from traders who would not normally sell them because of the limited quantities involved. This appears to have been the case during 1981.

There appears to be little difference between the price paid to growers and the wholesale price in Chiang Mai for potatoes sold in bulk. This suggests that there may be considerably more competition between Chiang Mai shipper/wholesalers, independent rural assemblers, and rural packer/shippers than between Bangkok jobbers and retailers. Still, this interpretation must be considered as tentative for the following reason. Given the difficulties in transporting potatoes down from the highlands in the rainy season, high transportation costs should result in larger differences between the price paid growers and the Chiang Mai wholesale price. This means that the available price data may not be very accurate.

---

<sup>7</sup> Price comparisons for potatoes and shallots involved Dept. of Internal Trade data for the former and Dept. of Business Economics statistics for the latter.

Diagram 4 Thailand: Average annual retail price for potatoes and selected vegetables in Bangkok, 1979-84



Source: Department of internal Trade, Bangkok.

## Marketing Costs and Revenues

Estimated revenues and principal marketing costs for potatoes produced in Chiang Mai province and sold in Bangkok are listed in Table 10. Based on this information, it seems apparent most marketing costs are absorbed by provincial traders.

If shrinkage costs are assumed to be 1% of gross revenues, freight to Bangkok 0.4 baht/kg, and the cost of the bamboo basket 12 baht/each, Chiang Mai shipper/wholesalers earn less than 1 baht net revenue for each kilo of potatoes sold. Much more detailed information is required in order to determine the rate of return on capital and to assess profits in potato shipping and wholesaling versus earnings in some other line of commerce. Such calculations are complicated by the variety of products sold by such traders (what percentage of telephone costs or returns to management should be assigned to potato marketing) and the revenues earned from complementary activities such as the "lending" of seed. Similar observations apply in the case of rural assemblers and Bangkok wholesalers.

The exceptionally-high, gross revenues of potato sales per kilo in Bangkok supermarkets are harder to explain. Shrinkage costs due to losses in packaging as well as in handling by customers could be high. Operating expenses to support building and equipment maintenance as well as a staff of regular employees may be considerable. The nature of this commodity, however, and the supermarket's highly segmented group of customers, upper income Thai and resident expatriates, suggest returns on this low-volume item are substantial.

## Prospects for the Domestic Market

Future potato sales in the domestic market will largely on two factors: (1) the number of tourists that visit Thailand and (2) changing eating habits of Thai consumers. These phenomena may well be related.

Existing distribution pattern for potatoes indicate that as the volume of tourists entering Thailand varies during the year, the quantity of potatoes sold tends to fluctuate in parallel fashion. Thus, more tourists on a year-to-year basis is likely to increase domestic demand for potatoes accordingly.

Some observers visualize that the growth in tourism will result in a growing demand for potatoes among the local population as well. According to this view, young, urban Thai consumers may well be influenced by the "demonstration effect" of foreigners eating snack foods. Consequently, there will be a rising demand for processed potato products as has taken place in other Southeast Asian countries, e.g. Singapore.<sup>8</sup> It is further

---

<sup>8</sup> McDonald's operates 19 outlets in Singapore (see "New Post at McDonald's for Cantalupo Signals Big Push in International Arena", Wall Street Journal, April 28, 1987); McDonald's has 24 outlets in Hong Kong (The Economist, November 29, 1986). There are two McDonald's stores currently in operation in Bangkok.

envisioned that rising incomes and continued rural-to-rurban migration will greatly facilitate this shift in the way potatoes are thought of and consumed. Unfortunately, detailed information on the potato consumption patterns of Thai consumers by age, place of residence and income group is not available. Hence, the magnitude of this potential increase in the demand for potatoes is impossible to quantify.

Shifts in how fresh potatoes are perceived, especially by low-income consumers, might also result in a noteworthy increase in the demand for potatoes. For example, potato consumption in Bangladesh -- another Asian country where rice dominates the diet -- more than doubled between 1975-76 and 1981-82 (Scott 1987). Changes in eating habits there were brought about by among other things a 50% decline in the real price of potatoes between 1972 and 1984 (op.cit.: 103) and by an enthusiastic campaign to promote the nutritional attributes of the potato. Available information in Thailand provides a partial explanation why low-income households in Thailand do not eat potatoes even when they are cheap and in seasonably abundant supply. Substitutes are available and, perhaps, are considered a more palatable part of the daily diet. Nevertheless, more precise characterization of consumers' perceptions of fresh potatoes would greatly facilitate evaluating this vegetable's future marketing prospects.

## 2. Foreign Trade

Thailand's volume of foreign trade in potatoes has been only a fraction of the commerce in other farm commodities. Nevertheless, imports of potato seed have been a critical component in domestic production. Conversely, there is considerable interest in expanding potato exports to absorb the additional surpluses that could develop from increases in productivity and area planted.

### Imports

Thailand has imported several hundred tons of potatoes each year during the last two decades (Table 11). Most were Dutch seed. Some fresh potatoes came from Hong Kong and the United States in the 1970s.

Potato imports declined from over 800t per year 1967 to 150t in 1982. Several factors explain this trend. The price per ton of imported potatoes rose from US\$167/t to US\$740/t over this period (op. cit.), spurring greater use of local seed (see Hoare et al. 1982). Reduction in domestic demand for potatoes has also led to a decrease in area planted and the demand for seed. Furthermore, the Ministry of Commerce has restricted seed imports in recent years.

### Exports

Thailand normally exports less than 200t of fresh table potatoes (Table 11). In 1978 and 1979, potato exports were unusually high, reaching 1,550t and 650t respectively. Most of these tubers have been sold in Hong Kong and Laos, with a few also going to Brunei, Malaysia, and Singapore.

Table 10. Thailand: Estimated revenues and principal costs incurred in potato marketing, 1984.

Type of Marketing Participant	Principal Costs Incurred	Price Received baht/kg 1	Price Received as % of Retail Price 2	Gross Revenue Less Purchase Price baht/kg 3
1. <u>Grower</u>		5.5-7.0	29-37	5.5-7.0
2. <u>Local Rural Assembler</u>		8.0	42	2.5-1.0
	a. Collection			
	b. Temporary storage			
	c. Shrinkage			
	d. Loading			
	e. Transfer to Chiang Mai			
	f. Unloading			
3. <u>Chiang Mai Shipper/Wholesaler</u>		9.5-10.0	50-53	1.5-2.0
	a. Selecting, Grading			
	b. Shrinkage			
	c. Packing			
	d. Basket			
	e. Loading			
	f. Transport to Bangkok			
4. <u>Bangkok Wholesaler</u>		10.5-11.0	55-60	0.5-1.5
	a. Unloading, transfer to market stall			
	b. Stall rental			
	c. Shrinkage			
	d. Loading for shipment			
5. <u>Bangkok Supermarket</u>		18.9	100	7.9-8.4
	a. Transport			
	b. Selecting			
	c. Plastic Bag			
	d. Shrinkage			

Source: Field work for this study.

Table 11. Thailand: Volume and value of potato imports and exports, 1974-83.

Year	Country of origin	Imports		Country of destination	Exports <sup>1</sup>	
		Volume (t)	Value (000 baht)		Volume (t)	Value (000 baht)
1974	Hong Kong	169	1252	Hong Kong	7	30
	USA	18	82			
	Netherlands (seed)	241	1850			
	Total	429	3184			
1975	Hong Kong	21	209	Malaysia	46	155
	USA	18	162			
	Netherlands (seed)	81	703			
	Total	120	1074			
1976	Netherlands	241	2181	Laos	33	141
	USA	36	123			
	Netherlands (seed)	33	337			
	Total	310	2641			
1977	Netherlands	33	110	Laos	11	83
	Netherlands (seed)	183	2406			
	Total	216	2516			
	Total					
1978	Netherlands	26	536	Hong Kong	1553	5405
	Netherlands (seed)	192	2332			
	Total	218	2868			
	Total					
1979	Japan	13	109	Hong Kong	656	2460
	Total	13	109			
	Total					
1980	Netherlands (seed)	110	1748	Laos	11	83
	Total	110	1748			
	Total					
1981	Hong Kong	1	13	Brunei	190	1055
	Netherlands (seed)	149	2430			
	Total	150	2443			
1982	Netherlands (seed)	132	2268	Hong Kong	3	31
	Total	132	2268			
	Total					
1983	Netherlands (seed)	71	1060	Japan	5081	17642
	Total	71	1060			
				Total	5081	17642

Source: National Potato Program, Thailand, Ewald and Jones (1980).

<sup>1</sup> In addition to the volumes indicated, small quantities of potatoes have been exported annually to Malaysia, Laos, Singapore, and Vietnam since 1975.

Figures for 1983 indicate that Thailand exported 5,000t of fresh potatoes to Japan as well as some to Brunei, Hong Kong, Laos, Korea, Malaysia, Singapore, and Vietnam.<sup>9</sup> Although production figures for 1983 are not available, the sharp drop in Bangkok prices suggests these exports resulted from a saturated domestic market.

#### Prospects for Export to Singapore

Thai officials frequently mention Singapore as a potentially important export market for potatoes. Singapore imports 40-50,000t of potatoes annually, mostly from the People's Republic of China, the Netherlands, Taiwan, and Australia (Table 12). About half are exported again to Brunei and various states in Malaysia. Produce traders in Singapore contacted for this study offered several reasons for the existing import patterns.

Most importantly, Singapore traders reported paying Singapore \$18 per 30 kg basket of potatoes. This is equivalent to 6.5 baht/kg, or about the price paid growers in Chiang Mai.<sup>10</sup> At prevailing prices, Thai potatoes appear too expensive to compete with those sold by rival exporters in Singapore.

Thai potatoes tend to be large, long tubers with white flesh. Consumers in Singapore prefer a medium to small (10 cm x 5 cm), round potato with yellow flesh. These smaller tubers are ideal for including in curries, the most popular local recipe that calls for potatoes. Traders generally buy Cardinal or Bintje varieties.

Most potatoes sold wholesale in Singapore are in 25-30 kg boxes or bags. Local retailers and consumers in Singapore prefer smaller-sized packages because they are easier to handle and to transport; yet, these preferred-size packages are roughly twice the size of the average Thai bamboo basket of potatoes.

Potatoes from China and Taiwan have a cleaner appearance than Thai potatoes which also tend to have a shorter shelf life (one week) than, for example, Taiwan potatoes (up to three weeks).

In addition to these considerations, Dutch shippers are represented in Singapore by a local commission agent who is fluent in Chinese. As many traders in Singapore only speak Chinese, language can be a problem for foreign businessmen.

<sup>9</sup> The usually high figure for Japan suggests this statistic may be revised downward in the future. However, Thai potato program personnel contend poor harvests in several Asian countries that traditionally export potatoes enabled Thailand to sell this quantity to Japan.

<sup>10</sup> This assumes an exchange rate of Singapore \$1 = 10.97 baht. These prices are for April 1984.

Table 12. Singapore: Imports and Exports of Potatoes, 1979-83.

Year	Country	Imports		Country	Exports	
		1	2		1	3
		Volume	Value		Volume	Value
1979	China, People's Rep.	27.3	10.9	Malaysia	19.9	5.5
	Taiwan	6.2	2.4	Sabah	1.2	.7
	Netherlands	6.0	4.1	Brunei	1.2	.6
	Hong Kong	.4	.2	Sarawak	1.0	.6
	Other	.1	.6	Other	.1	.1
	Total	43.7	19.3	Total	23.4	7.5
1980	China, People's Rep.	28.4	13.0	Malaysia	21.3	6.1
	Taiwan	7.3	2.9	Sabah	1.4	.9
	Netherlands	6.7	4.3	Sarawak	1.1	.7
	Australia	3.2	1.6	Brunei	1.1	.7
	Other	.9		Other	.1	.1
	Total	46.7	22.6	Total	25.0	8.5
1981	China, People's Rep.	31.9	13.9	Malaysia	25.4	11.5
	Netherlands	10.2	6.7	Sabah	2.1	1.0
	Taiwan	6.8	2.0	Brunei	1.5	.8
	Australia	2.1	1.3	Sarawak	1.2	.9
	Other	.6	.5	Other	.1	.1
	Total	51.6	25.1	Total	30.1	14.2
1982	China, People's Rep.	27.7	12.7	Malaysia	25.1	11.7
	Netherlands	10.0	7.7	Brunei	1.5	.9
	Australia	5.3	3.3	Sabah	1.5	1.0
	Taiwan	3.6	2.1	Sarawak	1.3	.9
	Other	1.1	.7	Other	.1	.1
	Total	47.7	26.5	Total	29.5	14.5
1983	China, People's Rep.	24.3	10.1	Malaysia	20.0	10.1
	Netherlands	14.4	8.6	Sabah	1.5	1.1
	Taiwan	3.0	1.7	Sarawak	1.2	.9
	Australia	2.3	1.2	Brunei	1.1	.8
	Other	1.5	1.0	Other	.1	.1
	Total	45.6	22.6	Total	23.8	12.8

Source: Singapore Trade Statistics. Dept. of Statistics, Singapore.

1. 000 t.
2. Millions of Singapore \$ dollars, CIF.
3. Millions of Singapore \$ dollars, FOB.



Potatoes on display in wholesaler's shop in Singapore. Note Bintje variety and 25 kg sack.

Singapore traders also indicated that Thai growers and shippers do have certain marketing advantages. In times of acute scarcity, produce merchants in Singapore say they can telephone shippers in Thailand and potatoes will be delivered in 24-30 hours. Such shipments are overland by truck. Potatoes take about a week to arrive by boat from Taiwan or the People's Republic of China. Furthermore, growers in Thailand harvest potatoes in September and early October. Singapore traders point out that other suppliers have exhausted their stocks and are awaiting the new crop at this time of year. Finally, as one Singapore produce wholesaler observed, consumers in Singapore do not care where the potatoes are from provided they are good quality and sold at reasonable prices. By exploiting their own marketing strengths and correcting their weaknesses, Thai growers and shippers might well put this observation to the test in Singapore.

### 3. Constraints to Improved Marketing

The fundamental constraint to potato marketing in Thailand is the limited demand for this commodity. This phenomenon is partly a function of tastes and preferences, culinary practices as well as the availability of substitutes (see Section IV.4). It also reflects the inability of the existing potato production and marketing system to offer abundant supplies of this vegetable on a year-round basis at a low price.

Efforts to improve potato marketing at the farm-level are handicapped primarily by the geographic isolation of growing areas, the vulnerable bargaining position of producers and the limited as well as variable

government marketing policies that affect this crop. Highland farmers have considerable difficulty in hauling their potatoes to main highways, especially in the rainy season, on account of the poor rural road network (HAMP 1982). The secluded location of highland communities preempts more intense competition between prospective outside buyers as well. Highland potato producers are also adversely affected by the shortage of reliable information on prices paid and volumes sold in major markets and by their need for cash at harvest time. Furthermore, aside from the periodic buying programs under the auspices of HAMP project, there is a no government support price or purchase program for potatoes as is the case for other agricultural commodities. Rather, year-to-year changes in government policy on seed imports generates considerable uncertainty about total seed availability, hence area planted, production and the expected price for table potatoes at harvest time.

Constraints to improved wholesaling and retailing concern primarily the condition and appearance of the potatoes. As producers often have difficulty in gaining access to good quality seed, their harvested tubers are more likely to carry soil-borne diseases that induce high shrinkage and spoilage losses after harvest. Furthermore, as potato production zones are currently a considerable distance from major markets, poorly graded and packaged potatoes are susceptible to rapid deterioration in quality during shipping and handling. These losses raise marketing costs and consumer prices. Moreover, potatoes that have not been properly cleaned for market are hard to sell or require an additional expense to bring up to acceptable consumer standards.

Export prospects for Thai potatoes are also restricted by several considerations. In the case of Singapore, the price per kg of Thai potatoes, their skin color and tuber size, the weight of the standard package as well as the quality specifications have all been limiting factors.

## VI. Conclusions

Potatoes have long been grown in Thailand as a minor food crop. Commodity specialists nevertheless agree that the potential to increase production is great, but opinions differ as to how this potential can best be realized. Some observers have pointed to farm-level production constraints and suggested that if Thai farmers improved their cultivation techniques and produced more potatoes, these could be easily marketed. Others have expressed concern about periodic declines in producer prices and argued that marketing problems limit potato production. This study throws new light on these issues. Although more detailed socioeconomic research on potatoes in Thailand would be useful, the following general conclusions may be of relevance not only in Thailand but also in other parts of Southeast Asia where potatoes are currently grown on a limited scale.

1. Potato production in Thailand is limited by a combination of farm-level, consumption, and marketing constraints. Solutions to any one set of constraints are not likely to result in substantially higher levels of output. Rather, an integrated potato improvement program with research and extension activities in all three areas is required. In the past, potato research and extension have focused primarily on technological constraints to production such as seed, agronomy, and pest problems. But consumption and marketing problems also exist and they have received little attention to date. Future potato program activities might well devote more time to promoting consumption and improving marketing.

2. Results of this study strongly suggest that in certain Southeast Asia countries, lower prices for potatoes may be a necessary, but not sufficient, condition for increased potato consumption.<sup>11</sup> In the case of Thailand, growers in the highlands strongly prefer rice even at times when potatoes are abundant and rice is scarce (Hoare and Tovichakchaikul 1978: 19). As a result, efforts to gain a better understanding of local eating habits should be combined with initiatives to lower the retail price for potatoes through improved marketing procedures. Two specific research topics that merit closer examination are: (1) consumer preferences, and (2) retail trade. The former study might help determine, for example, whether potatoes are perceived as a less preferred food or merely those varieties that traditionally are grown and marketed. Furthermore, consumer research should aim to identify not only the preferred type of fresh potatoes, including tuber size, flesh color, and cooking quality, but also the most desired form in which potatoes are eaten, i.e., fresh vs. processed. The results of this research could assist in expanding the market for potato varieties that are already available locally as well as aiding production specialists in evaluating new germplasm. The latter topic should attempt to identify the reasons for the large retail marketing

---

<sup>11</sup> Poats (1982) reports similar findings for the case of Indonesia.

margin.<sup>12</sup> A better idea of how costs might be reduced (e.g.), by improving management practices and simple marketing technology) or profits curtailed (e.g., by promoting greater competition through additional credit to encourage entry into the business) could help to make potatoes cheaper and to expand consumer demand for them.

3. The prospect of increased foreign exchange earnings through expanded potato exports has long been a topic of considerable interest in Thailand. Research carried out for this report found, however, that retail prices in the Singapore market were roughly equivalent to the prices paid to producers in northern Thailand. Moreover, product specifications and quality requirements in Singapore were quite different from those found commercially acceptable by traders who buy and sell potatoes in Thailand. Thus, although growth in potato exports may be possible, results of this study suggest that the difficulties of increasing potato sales abroad may, in fact, be more formidable than those associated with expanding potato trade in the domestic market.

4. Research in Thailand on the socio-economic aspects of potato marketing has been limited in the past by the shortage of trained personnel assigned to this crop. Potato production is so limited that it is hard to justify the additional use of scarce, well-trained manpower in the potato program. Yet, without additional research the program might well find it difficult to expand beyond existing output levels. Ways to increase the social science input within the potato program need to be explored. One alternative would be to encourage university professors and their students to conduct research in this area.<sup>13</sup> Another would be to seek more active collaboration with other government agencies that have expertise in this area, e.g., the Ministry of Commerce. Finally, regional collaboration between national potato programs in this line of research might also prove useful.

---

<sup>12</sup> Research on food marketing generally (see Riley and Weber 1983: 328) and potato marketing specifically (Scott 1983: 51-53; Scott 1985: 104-105; Scott 1987: 29) have found high retail marketing margins to be a key problem in various developing countries.

<sup>13</sup> This strategy is currently being pursued by Thai potato program personnel.

## APPENDIX 1

### Currency Equivalentents

Currency Unit =	Thai Baht	Time - Period
20.48 baht =	US\$1.00	1978-80
21.87 baht =	US\$1.00	1981
23.05 baht =	US\$1.00	1982-84

Source: Ministry of Finance, as cited in Tetro (1983).

### Weights and Measures

One hectare =	2.471 acres
One hectare =	6.25 rai
One metric ton =	2,204.622 pounds
One metric ton =	1,000 kilograms

### Acronyms/Abbreviations

CIP	=	International Potato Center (Centro Internacional de la Papa)
HAMP	=	Highland Agricultural Marketing Project
HRI	=	Horticultural Research Institute, Dept. of Agriculture
MIAT	=	Mae Jo Institute of Agricultural Technology
TISTR	=	Thailand Institute of Scientific and Technological Research
UNDP	=	United Nations Development Program
kg	=	kilogram
km	=	kilometer
ha	=	hectare
t	=	metric ton

## APPENDIX 2

### A Note on Issues and Methods

The purpose of this brief note is to outline the issues examined and methods employed in carrying out this study.<sup>1</sup> The procedures described here could be utilized to conduct similar studies for other food crops.

#### (i) Issues

The two principal issues examined in this study are:

- The precise nature of current potato marketing activities in relation to prevailing production and consumption patterns in Thailand; and,
- Ways to improve marketing procedures so as to promote increased potato production and consumption.

In order to address these issues, this study focused on the following questions:

1. What are the recent levels and planned increases of potato production envisioned by the current National (Regional) Plan? How will marketing patterns, programs, policies affect the realization of these production targets?
2. Has potato production increased faster than population? Does this trend suggest a change in the orientation of potato production?
3. Where are potatoes produced and at what times of the year? Are established, regional, growing seasons, complementary or competitive?
4. What type of producer plants potatoes?
5. What is the role of potatoes in the local diet? Does this vary by region?
6. What size, shape and skin color of potatoes are preferred? By which consumers?
7. What are current levels of annual per capita potato consumption nationally? regionally? In urban vs. rural areas? Has this level changed significantly over time?
8. How do income levels effect potato consumption?

---

<sup>1</sup> Interested researchers may also wish to consult William O. Jones (1974), "Regional Analysis and Agricultural Marketing Research in Tropical Africa: Concepts and Experience, Food Research Institute Studies, Vol. XIII, No.1, pp. 3-28.

9. What share of total potato production is sold? Consumed on the farm for food? For seed? Lost in post-harvest storage and handling?
10. What volume of potatoes are exported? Imported? Sold in urban areas? Traded in rural markets located in growing areas? Shipped to rural markets in non-growing areas?
11. Which type of producer grows the majority of marketable surpluses?
12. Do potato producers plant certain varieties for market and other for their own consumption?
13. Who are the participants in the principal potato marketing channels? What are their functions?
14. What is the nature of current buying and selling practices? Do traders finance production? Are growers paid in cash at the time of sale?
15. How much do potato prices rise and fall in periods of abundance vs. in those of shortage?
16. How much do potato prices vary between principal markets? What are the reasons for these variations?
17. Have retail prices for potatoes in the capital risen faster in the last 10 years than prices in general? Than the prices of substitutes? of compliments?
18. What share of the retail price is received by producers? By rural assemblers? Truckers? Wholesalers? Retailers? What are the reasons for the distribution of these shares? Have the shares of producers, rural assemblers, etc. changed over time?
19. What is the role of government in marketing of table potatoes? Do government agencies provide information? Build roads? Markets? Supply credit? Purchase and/or store potatoes? Regulate potato prices? Impose taxes?
20. Which government institutions assume marketing responsibilities?

(ii) Methods

Given the shortage of available information on agriculture in general and potato marketing in specific, the author used a variety of different procedures to examine the questions outlined above. They include (a) an analysis of international documentation including World Bank reports, FAO studies and statistics, and United Nations Development Program background documents, (b) a local literature review, in particular Ministry of Agriculture reports and student theses, (c) collection of official statistics from various government agencies, (d) participant observation through visits to growing areas, provincial and capital markets,

transportation depots, storage facilities, wholesale and retail outlets and (e) informal interviews with growers, traders, consumers, and Ministry personnel.

In light of the limited resources available for fieldwork and the scarcity of reasonably reliable secondary data, this study did not test any formal quantitative models. Instead it provides a descriptive analysis of prevailing potato marketing patterns in Thailand and Singapore. While the author acknowledges the uneven coverage of the study, this limitation reflects the availability relevant information in the countries being considered.

This report relies largely on a discussion of broad trends and a qualitative assessment of many specific problems though statistics are referred to substantiate certain observations. It is envisioned that subsequent, more detailed research could build on the findings contained in this study.

## References

- Batugal, P.A.  
1986 Lowland white potato production in the Philippines. Paper presented during the AGRITECH '86 Seminar, Third Agricultural Technology Exhibition, May 27, 1986, PHILCITE, Manila, Philippines.
- Chareonridhi, S.  
1978 Virus diseases of potatoes and possibilities to produce seed potatoes in Thailand. Paper presented at the Second Regional Symposium on Pathogens and Pests of the Potato in the Tropics, February 9-16. Baguio City, Philippines.
- Ewald, M. and J. Jones  
1980 U.S. Potato Marketing. The origins and destination of potato products. Progress Report No.209. Department of Agricultural Economics and Applied Statistics. University of Idaho. Moscow, Idaho.
- FAO  
1980 Food Balance Sheets, 1975-77. Rome.  
1983 Production Yearbook. Vol. 37. Rome.  
1985 Food Balance Sheets, 1979-81. Rome.
- Highland Agricultural Marketing Project (HAMP)  
1982 Potato Production and Marketing. Chiang Mai, Thailand.
- Hoare, P. and S. Tovichakchaikul  
1977 Report on traditional highland potato cultivation and prospects for increased production in Nihom Chiang Dao. Highland Agricultural Project. Chiang Mai University. Chiang Mai.  
1978 Traditional highland potato cultivation and prospects for increased production in Nihom Chiang Dao. Thai-Australian Highland Agricultural Project. Canberra City.
- Hoare, P. and S. Wibbonjag  
1979 Experimental use of commercial bank short-term production credit in hilltribe villages in Nihom Chiang Dao. Thai-Australian Highland Agricultural Project Fourth Report. Australian Development Assistance Bureau. Canberra City.
- Hoare, P., S. Wiboonjag and Y. Comadom  
1982 Use of institution agricultural credit by hilltribe farmers in Northern Thailand. Thailand Journal Agricultural Science, (15):301-317.

- Horton, D. and H. Fano  
1985 Potato Atlas. International Potato Center. Lima, Peru.
- International Potato Reference Files (IPRF): Thailand  
1984 International Potato Center. Lima, Peru.
- Kasumo, S.  
1983 Medium elevation potato growing. Warta Lembang 7 (2):1-7.
- Page, O. and D. Horton  
1987 SAPPRAD. Southeast Asian Program for Potato Research and Development 5-Year Review 1982-86. International Potato Center. Lima, Peru.
- Poats, S.  
1983 "Beyond the Farmer: Potato Consumption in the Tropics." In: W.J. Hooker (ed.) Research for the Potato in the Year 2000. International Potato Center (CIP). Lima, Peru.
- Scott, G.  
1985 Markets, Myths and Middlemen: A Study of Potato Marketing in Central Peru. International Potato Center. Lima, Peru.  
1986 Potatoes in Central Africa: A Study of Burundi, Rwanda and Zaire. International Potato Center. Lima, Peru.  
1987 Marketing Bangladesh's Potatoes: Present Patterns and Future Prospects. International Potato Center. Lima, Peru.
- Sikkamondhol, B. and M. Thongjiem  
1981 Potato production in Thailand (mimeo). Department of Agriculture. Bangkok.
- Tetro, C.  
1983 Thailand: Annual agricultural situation and policy report. Foreign Agricultural Service. USDA. Bangkok.  
1984 Thailand: Annual agricultural situation and policy report. Foreign Agricultural Service. USDA. Bangkok.
- Thongjiem, M. and P. Chouvalitwongporn  
1985 The Quest for Improved Potato Varieties in Thailand. CIP Circular, Vol 13(3):1-3.
- Tongdee, S.  
1978a Crop storage structures in potato growing regions in Thailand. Applied Scientific Research Corporation of Thailand. Bangkok.  
1978b Post-harvest operations and marketing channels of potatoes in Thailand. Applied Scientific Research Corporation of Thailand. Bangkok.

- 1979 Post-harvest operation and marketing channels in Thailand. Paper presented at 5th International Symposium on Tropical Root and Tuber Crops. Sept. 17-21. Philippines.
- Tonguthaisri, T.  
1984 Potatoes. Paper presented in the training course on "General Agriculture." Chiang Mai, Thailand.
- Warrit, B.  
n.d. Potato production and research in Thailand. Department of Horticulture. Chiang Mai University. Chiang Mai, Thailand.
- World Bank.  
1979 Thailand: Northern Agricultural Development Project (NADP). East Asia and Pacific Regional Office.
- 1984 World Development Report 1984. Oxford University Press. New York.
- 1986 World Development Report 1986. Oxford University Press. New York.