
PALAWIJA

NEWS



The CGPRT Centre Newsletter

Volume 7, Number 4

December 1990

Thal, The Home of Chickpea in Pakistan

Habib R. Khan*, M. Riaz Malik*, A.M. Haqqani* and B.A. Malik*

General

Among the grain legumes, chickpea (*Cicer Arietinum*) is the third most important crop, contributing about 14% of total world production of pulses and occupying about 15% of the world area under pulses. Chickpea is mainly produced and consumed in Asia, the Middle East and some Mediterranean countries. It is adapted to cool, dry environments and is basically a temperate or sub-temperate crop grown in the post-rainy seasons with subtropical winters/springs, or temperate springs/summers. There are two main types (*desi* and *kabuli*), distinguished primarily by their seed characteristics.

Pakistan

The major chickpea production area comprises that part of the Punjab known as "Thal", a name derived from the Sanskrit words "Marus Thal" meaning sea of sand. An alternative name is Sind Sagar Doab, freely translated as the land between the Indus and Jhelum rivers. Both names are good descriptions of the area, which occupies 9,000 square miles of the Bhakkar, Khushab, Mianwali, Leiah and Jhang districts in Punjab province.

The area is roughly triangular in shape, with the base to the north and the apex to the south. It is located between latitude 29° 58' and 32° 35'

north and longitudes 70° 43' and 72° 18' east. The area is bounded by the piedmont of the Salt Range in the north, with the Indus River flood-plains to the east, and the 30th parallel to the south.

The climate is hot and windy in summer and mild in winter. Long term rainfall data (more than twenty years) is available from only three stations viz; Khushab, D.I. Khan and Multan, in the immediate vicinity of the Thal area. The average annual rainfall varies between 261 mm to 385 mm in the north-east and 169' mm in the south, following a bimodal pattern with more than 69% falling in summer (June to September).

The soils of the Thal are formed directly or indirectly from mixed calcareous alluvium, deposited either by the Indus river or by the Chenab and Jhelum rivers. The Indus river alluvium is the parent material for the majority of soil in the area. Almost the entire area consists of sand

IN THIS ISSUE

<i>Thal, The Home of Chickpea in Pakistan</i>	1
Habib R. Khan, M. Riaz Malik, A.M. Haqqani and B.A. Malik	
<i>Editorial</i>	3
Seiji Shindo	
<i>A Regional Workshop on CGPRT Crop-Based Small-Scale Processing Industries: Their Effect on Employment and income Generation in Rural Areas</i>	4
C.E. van Santen	
<i>Sweet Potato in Northern Viet Nam: Present Status and Constraints</i>	6
Mai Thach Hoanh, Dao Huy Chien, Trinh Khac Quang, Nguyen Thi Yen, Nguyen Thi Nguyet, Tran Duc Hoang, Nguyen Ba Lieu and Trinh Quoc My	
<i>CGPRT Centre News and Activities</i>	11

* Pulses Programme, National Agricultural Research Centre, Islamabad, Pakistan.

dunes and interdunal valleys. Soils on the dunes are sandy with low water holding capacity. The soils in the valleys are loamy in the north eastern sector and the proportion of fineness decreases towards the south. There are floodplains near the banks of the Jhelum and Indus river (Anonymous, 1968).

Low erratic rainfall makes agriculture precarious. The area sown to various crops fluctuates widely and so does crop production. The tract is partly irrigated by the Thal project canal (Anonymous 1968).

Chickpea Cultivation in Thal Region:

Asia is represented by 13 chickpea producing countries and accounts for the bulk of area (93%) and production (92%) of chickpea in the world. Pakistan is the second most important chickpea producing country in the world, with 9.96% of the area and 7.37% of production (Anonymous 1986).

Chickpea is the major cool season crop of Thal, and has been sown in this region for half a century. The area, production and yield from 1982-1983 to 1988-1989 is presented in tables 1-3. The data in table-1 for 1982-1983, reveal that the area under chickpea in the Thal region was 582 thousand hectares, 86% and 65% of the total acreage of Punjab Province and Pakistan, respectively. From 1983-1984 to 1986-1987, the area under chickpea showed an increasing trend. A decrease of 23% in the area in 1987-1988 (from

764-586 thousand hectare), was due to a prolonged dry spell, particularly at sowing time. In 1988-1989, the area under chickpea (739 thousand ha.) showed an increase of 26.2 percent over the area of 1987-1988. The increase was due to favourable weather conditions at planting time.

Chickpea production and yield is presented in tables 2 and 3. A perusal of the tables reveals that in 1982-1983, the yield and ultimately production were severely affected by blight. The Thal region produced 293.3 thousand tonnes (83% and 60% of Punjab's and Pakistan's production, respectively). There was an increasing trend in production from 1983-1984 to 1986-1987, but in 1987-1988, chickpea production in the Thal region decreased to 218.7 thousand tonnes as against 377.3 thousand tonnes in 1986-1987 (42% decrease). This fall was due to severe drought. Because of the shortfall in production in Thal, the national chickpea production decreased by 36 percent in 1987-1988 compared to the previous year. Grain yield (kg/ha) also showed a similar trend and decreased from 505 kg/ha in 1986-1987 to 382 kg/ha in 1987-1988 due to conditions in the Thal. During 1988-1989, the Thal region accounted for 89% and 57% of production in Punjab Province and Pakistan, respectively. From 1982-1983 to 1988-1989, the Thal region has contributed more than 86% and 61% of the total production of Punjab province and Pakistan, respectively.

Table 1 Chickpea Area In the Thal Region (Area in 000 ha.)

District/Province	1982-1983	1983-1984	1984-198d	1985-1986	1986-1967	1987-1988	1988-1989	Mean
Khushab	189.5	200.8	202.0	209.2	239.0	155.1	246.4	206.0
Mianwali	44.5	51.0	57.0	59.4	56.4	47.9	55.3	53.1
Bhakhar	283.7	327.1	363.9	371.1	393.5	326.3	345.7	345.8
Jhang	20.3	19.5	36.4	25.8	12.8	11.4	30.3	20.9
Leiah	43.9	27.7	47.9	59.8	62.5	44.8	52.1	48.4
Total Thal	581.9	626.5	697.2	725.3	764.2	550.5	738.8	674.2
% age of Punjab	85.6	88.1	87.6	88.3	88.9	91.1	85.4	87.8
% age of Pakistan	65.2	68.1	68.8	70.2	70.6	71.4	70.4	69.3
Punjab	679.8	711.4	795.9	821.1	859.8	642.4	864.9	767.9
Pakistan	892.9	919.6	1013.7	1033.3	1082.1	820.6	1049.9	973.2

Source: Planning unit, Ministry of Food and Agriculture. Government of Pakistan, Islamabad.

Editorial

News Year's Request

Seiji Shindo,
Director
CGPRT Centre

At the start of 1991, I wish to extend a Happy New Year to the readers of the Palawija News.

As our readers may be aware, the CGPRT Centre is a regional institution of ESCAP (Economic and Social Commission for Asia and the Pacific), under the United Nations. Institutionally it is an inter-governmental organ. As such, our daily contacts are made with government agencies, particularly researchers working for national research institutes engaged in CGPRT crop development.

However, or because of this, we strongly feel that the Centre needs a wider audience who are interested in, and directly or indirectly engaged in such activities, to directly communicate with us. The Centre's mandate in fact covers a wide area

relating to CGPRT crops, from production to processing, and utilization. The ultimate audience should include, in addition to research and extension people, administrative officers, university professors and students, processors, traders and even consumers of our mandate crops. Palawija News should also serve as a vehicle and medium for this purpose.

Two years ago, we carried out a readers survey (see Palawija News Vol. 6 No. 3). We were very appreciative of the responses from you and your comments have actually been reflected in the newsletters. For one thing, a large majority of the readership is involved in research outside the social sciences. Many wished to have articles in the newsletter which extend beyond

current projects of the Centre, with a wider geographical coverage.

We need more feed-back from our readers since it not only enriches the content of the Newsletter in responding to your aspirations, but also broadens our own information channels to give a better understanding of the Centre's task. I therefore solicit our readers to write to us about their expectations concerning the Newsletter, regarding content, the areas covered by the articles and so forth.

As we begin the final decade of the 20th century, it is becoming increasingly important that we work collectively to further the well-being of the peoples of the region, to meet their growing expectations and to increase the quality of their daily life.

Table 2 Chickpea Production in the Thal Region (Production in 000 ha.)

District/Province	1982-1983	1983-1984	1984-1985	1985-1986	1986-1987	1987-1988	1988-1989	Mean
Khushab	70.1	77.8	79.6	107.1	121.6	54.0	74.0	83.5
Mianwali	26.5	32.8	28.3	32.9	30.6	18.8	20.1	27.1
Bhakhar	165.2	195.0	172.2	194.5	187.7	123.3	139.0	168.1
Jhang	9.6	9.2	13.0	13.3	6.4	4.4	6.4	8.9
Leiah	21.9	13.9	26.3	33.6	31.0	18.2	21.2	23.7
Total Thal	293.3	328.7	319.4	381.4	377.3	218.7	260.7	311.4
% age of Punjab	83.0	86.4	84.1	86.6	87.6	88.7	88.6	86.3
% age of Pakistan	59.7	63.0	61.0	65.1	64.7	58.9	57.2	61.7
Punjab	353.4	380.6	379.6	440.2	430.5	246.6	294.1	360.7
Pakistan	491.0	521.9	523.7	586.2	583.3	371.5	456.0	504.8

Source: Planning unit, Ministry of Food and Agriculture, Government of Pakistan, Islamabad.

Table 3 Chickpea Yield in the Thal Region (Yield in kg/ha.)

District/Province	1982-1983	1983-1984	1984-1985	1985-1986	1986-1987	1987-1988	1988-1989	Mean
Khushab	370	387	496	512	509	348	339	422
Mianwali	596	638	394	553	543	392	395	502
Bhakhar	582	596	473	524	477	378	396	462
Jhang	473	492	492	518	500	386	370	462
Leiah	499	472	559	562	496	406	423	487
Thal (average)	504	517	481	534	505	382	383	472
Punjab	520	435	477	436	501	384	385	477
Pakistan	550	568	417	567	539	453	466	523

Source: Planning unit, Ministry of Food and Agriculture, Government of Pakistan, Islamabad.

Conclusion

It can be concluded from the data, that the fluctuations in area, production and yield, of chickpea in Pakistan, are mainly dependent on the crop situation in the Thal. The two major factors responsible for low productivity and production of chickpea are drought and ascochyta blight (Malik 1986). Therefore, it is imperative that major research and development efforts should be concentrated on this particular region, to increase production and to achieve yield stability. Simultaneously, production in the conventional areas with better growing conditions needs to be explored.

A Regional Workshop on CGPRT Crop-Based Small-Scale Processing Industries: Their Effect on Employment and Income Generation in Rural Areas

November 19-23, 1990, Los Banos, Laguna, the Philippines

C.E. van Santen
CGPRT Centre Bogor Indonesia

A Summary Report

The above workshop on employment generation through small-scale CGPRT Crop-based Processing Industries from 19 to 23 November, was jointly organized by the CGPRT Centre with:

- (i) The Department of Agriculture of the Philippines (DA); and
- (ii) The Philippines Council for Agriculture, Forestry and Natural Resources Development (PCARRD).

on the premises of PCARRD in Los Banos, Laguna, the Philippines.

The objectives of the workshop were:

- (i) to assess the situation regarding rural employment and the income generation effects of small-scale processing industries, specifically those based on CGPRT crops (coarse grains, pulses, roots and tuber crops) in Asia; and
- (ii) to draw-up activities which enhance their effect within rural populations, particularly the small farmers and landless.

The workshop was composed of planners and researchers involved in employment and income generating activities in rural areas. The participants exchanged views and identified issues requiring follow-up studies and formulation of policies. Emphasis was placed on small-scale or cottage type industries located in villages or small rural towns and covered processing, marketing and utilization of CGPRT crops. Implications on the role of women were a subject in this connection.

The workshop was attended by twenty nine persons from the following countries: the People's Republic of China, Indonesia, the Republic of Korea, Malaysia, Nepal, the Philippines, Sri Lanka, Thailand and Viet Nam. Furthermore, three resource persons and five observers including representatives from IRRI and the ESCAP Secretariat, also attended. The Director and the Programme Leader for Human Resources Development represented the Centre.

After the opening ceremony, which included a keynote speech from the Undersecretary of the Department of Agriculture, nine country papers and three resource papers were presented. This was followed by one and a half days of group discussions. The participants were divided into three groups which all discussed the same issues, but from the respective viewpoints of coarse grains, pulses, and root and tuber crops. On the fourth day, a field trip was organized with excursions to three small-scale CGPRT crop processing industries, following a visit to the laboratoria for post-harvest processing at the University of the Philippines. On the last day of the workshop, each of the three groups presented their findings, after which the following conclusions and recommendations were discussed and approved.

Conclusions

1. It was agreed that there is widespread unemployment and underemployment in rural areas of most of the developing countries of Asia, which needs to be addressed.
2. It was recognized that the development of small-scale processing industries of CGPRT crops could alleviate this situation by absorbing the unemployed and underemployed rural labour force in many developing countries of the region.
3. It was also recognized that the impact of those small-scale industries processing CGPRT crops would have varying degrees of effect, depending on the importance of the crops and the stage of development of each country. At present, these industries contribute a relatively small proportion to labour force absorption.
4. Small-scale processing industries of CGPRT crops, however, contain a large potential for absorbing unemployed and underemployed labour in many countries. Thus these industries should be promoted.
5. It was recognized, that in spite of the potential of CGPRT crops' small-scale processing industries, their development is at present constrained by the following difficulties:
 - a. Inadequate supply of raw materials and intermediate inputs.
 - b. Lack of appropriate technology and skilled manpower.

- c. Underdeveloped markets and marketing channels.
- d. Lack of support services and infrastructure.
- e. Inadequate government policies, or insufficient implementation if such policies exist.
- f. Lack of capital.
- g. Lack of co-ordination of production-processing and marketing activities.

Recommendations

1. General
 1. It is recommended that a database on production, processing and marketing of CGPRT crops should be initiated and, where applicable, strengthened.
 2. It is recommended that market information, which links producers with processing industries, be strengthened.
 3. It is recommended that more research be undertaken to identify, develop, and generate appropriate technologies relevant to small-scale processing industries.
 4. It is recommended that the role of government be more specifically defined in the promotion of small-scale processing industries of CGPRT crops.
 5. It is recommended that the ESCAP member countries promote exchanges of research results on CGPRT crops, together with their experience and expertise on CGPRT crop processing.
 6. It is recommended that appropriate training activities be undertaken for the human resources development of people involved in CGPRT crops' processing industries and marketing.
 7. It is recommended that the CGPRT Centre, in formulating its future programme, considers research and development issues identified by the present workshop and mobilizes funds to address these issues.

Along with the above general recommendations, the workshop indicated specific activities for research and development, following a cropwise and countrywise agenda for future research and development.

The arrangements made for the workshop by the host organization, PCARRD, were excellent. All participants were grateful for the great efforts made by Dr. A.R. Librero, Director, Socio-economic Division of PCARRD and her staff.

Sweet Potato in Northern Viet Nam: Present Status and Constraints

Mai Thach Hoanh¹, Dao Huy Chien², Trinh Khac Quang¹, Nguyen Thi Yen¹, Nguyen Thi Nguyet¹, Tran Duc Hoang², Nguyen Ba Lieu² and Trinh Quoc My²

Introduction

This paper is a continuation of our series on aspects of sweet potato production, processing and marketing in Viet Nam. The map in our previous publication: *Palawija News* Vol. 7, No. 3, should be referred to for identification of regions.

Viet Nam is a tropical country with eight major agro-ecological regions. In the northern four regions there are four seasons, while for the four regions in the south there are two seasons per year. The central coast (Regions V and VI) is the principal area for sweet potato production with over 50% of the total production area.

A survey on sweet potato production in the four northern regions was conducted with the following objectives:

- 1) To clarify the present situation of sweet potato production, processing and utilization;
- 2) To understand the socio-economic merits of sweet potato production;
- 3) To determine the factors limiting sweet potato production; and
- 4) To identify potential areas for improvement of sweet potato production, processing and utilization.

Methodology

The survey was conducted using a survey form prepared by the International Potato Center (CIP) Region VII, in Los Banos, the Philippines, and the Coarse Grains, Pulses, Root and Tuber Crop Centre (CGPRT) of Bogor, Indonesia. Some modifications were made.

One hundred and thirty seven households (HH) growing sweet potatoes, from 36 co-operatives in 26 districts and 15 provinces, were

selected for the survey. During the survey, scientists and extensionists interviewed sweet potato farmers with a series of open ended questions.

Results and Discussion

Sweet potato production. The planting area for sweet potato in Viet Nam from 1980 to 1989, decreased from 450,000 ha to 320,000 ha (Tables 1,2). The sweet potato area in the northern part is twice that of the southern part. In northern Viet Nam, 50% of the sweet potato area is concentrated in the region from Thanhhoa to Thuathien in the north central coast area (region IV).

According to national statistics, yields of sweet potato have fluctuated from 5.5 to 6.6 t/ha. The yield of sweet potato in the north is almost identical to that in the south. Yields are highest in the Red River Delta, in comparison with those of the highlands-midlands region and the north central region.

The north central zone (region IV) is the biggest sweet potato production area in the north of Viet Nam (Table 2).

Sock-economical situation and soil types.

In the north, 137 households were surveyed. The average number of persons per household was 6.4. Men accounted for 48% and women comprised 52% of the population (Table 3). In the highland and midland region, with 44 households surveyed, persons per household averaged 6.9 with 48% being men. The total labour force made up 38%.

In the Red River Delta (34 households surveyed), persons per household averaged 5.8 with 50% being men. 45% of inhabitants were engaged in the labour force. In the north central zone (59 households surveyed), there were 6.4 persons per household, with 49% being men. 50% of the inhabitants were engaged in the labour force (Table 3).

Soil types utilized for sweet potato production in northern Viet Nam are presented in Table 4. In the highlands and midlands region, sandy loam is popular for planting sweet potato with 48% of all households using this type of soil. In this region, light loam soil and sandy loam soil with small stones were also used for sweet potato production. In the Red River Delta, sandy loam and light loam soil were widely used for planting sweet potato, with 67 to 70% of households using these kinds of soil. In the north central zone, sandy and sandy loam soils are the principal soil types for sweet potato production, with 57-66% of households using these soil types.

¹ Food Crop Research Institute, Haihung, Viet Nam.

² Potato and Vegetable Research Centre, National Institute of Agricultural Science, Vandien, Hanoi, Viet Nam.

Table 1 Area, yield and total production of sweet potato, maize and other root crops.*

	Total	Crop					Canna**
		Maize	Sweet Potato	Cassava	Potato	Taro**	
Area (1000 ha)							
1980	1449	389	450	442	93	15	19
1985	1129	397	320	335	23	10	23
1986	1123	400	329	314	33		
1987	1121	405	332	298	39		
1988	1241	510	336	317	38		
1989	1079	504	326	217	33		
Yield (t/ha)							
1980		1.1	5.4	7.5	9.2	11.4	12.4
1985		1.5	5.5	8.8	8.0	13.5	11.4
1986		0.4	5.9	1.1	9.2		
1987		1.4	6.6	9.1	12.5		
1988		1.6	5.6	8.9	9.1		
1989		1.6	5.6	9.9	10.2		
Total Production (1000 t)							
1980	2759	428	2417	3323	872	167	236
1985	2325	587	1777	2939	188	135	265
1986	2376	569	1958	2882	305		
1987	2460	561	2203	2839	346		
1988	2583	814	1901	2839	346		
1989	4955	806	1852	1959	337		

* Data from National Statistical Board.

** No data available for 1986-1989.

Table 2 Area (1000 ha), yield (t/ha) and total production (1000 t) of sweet potato.*

Location	1985	1986	1987	1988	1989
Area					
Southern 4 regions	111	102	100	94	
Northern 4 regions	208	227	231	242	117
Highlands and midlands (Region II, III)	45	51	53	53	22
Red River Delta (Region I)	47	58	60	64	34
North central (Region IV)	115	117	117	124	60
Total	320	329	332	336	
Yield					
Southern 4 regions	6.1	5.8	6.1	6.1	
Northern 4 regions	5.2	6.0	6.8	5.5	
Highlands and midlands	4.0	5.8	6.7	5.1	
Red River Delta	6.1	6.7	8.5	6.3	
North central	4.9	5.6	6.0	5.2	
Total	5.5	5.9	6.6	5.6	
Production					
Southern regions	688	597	617	574	
Northern regions	1089	1360	1585	1327	689
Highlands and midlands	286	297	359	276	187
Red River Delta	295	396	518	402	238
			706	648	274
Total	1777	1958	2202	1901	

* Data from National Statistical Board.

Table 3 Population distribution as households (hh), person/ hh (Per/hh) and labour force of hh growing sweet potato in northern Viet Nam

	hh		per/hh	Men	Women	Labour
	No.	% of total				
Highlands/Midlands						
Caobang						
Hetuyen	2	14	7	58	42	35
Ouanghoa	3	15	5	54	46	46
Tralinh	4	24	6	50	50	29
Langson						
Trangdinh	4		328	44	56	25
Caoloc	3	23	7.6	40	60	39
Vinhphu						
Vinhluc	3	23	7.6	44	56	21
Baibien	6	50	8.3	48	52	46
Vanhoi	4	35	8.7	43	57	31
Habac						
Bienson	3	17	5.6	36	64	35
Mairung	5	28	5.6	50	50	57
Trungthanh	2	10	5	60	40	70
Langgiang	5	31	6.2	59	41	38
Total	44	302	6.9	48	52	

Table 3 Population distribution as households (hh), persons/hh (per/hh) and labour force of hh growing sweet potato in northern Viet Nam (Continued).

	hh	per	per/hh	Men	Women	Labour
	No.			% of total		
Red River Delta						
Hasonbinh						
Saison	5	30	6	47	53	53
Trunghoa	5	32	6.4	47	53	3
Haihung						
Phutien	2	10	5	50	50	50
Gialoc	2	11	5.5	46	54	45
Kimmon	4	18	4.5	50	50	61
Thaibinh						
Vuthu	4	19	4.7	53	47	46
Thaithuy						
- Thaihung	2	84	4	63	37	37
- Thaison	3	20	6.6	50	50	35
Hanaminh						
Y yen	5	27	5.4	49	51	40
Namnin	4	21	5.2	58	42	42
Total	34	196	5.8	50	50	44
North Central						
Thanhhoa						
Hauloc						
- Hoaloc	4	23	5.8	44	56	26
- Phuloc	6	31	5.1	46	54	48
Tinhgia						
- HaiAn	3	19	6.3	53	47	57
- Binhminh	4	25	6.3	44	56	32
Trieuson						
- Tienhong	4	25	6.3	52	48	72
Ngean	3	20	6.6	30	70	30
	3	26	8.6	39	61	13
Hatinh						
Nghiloc						
- Nghitruong	4	19	4.7	47	53	36
- Nghikim	5	33	6.6	46	54	57
Quangbinh						
Thachha						
- ThachHa	4	19	4.7	47	53	36
- Bacthuong	5	33	6.6	46	54	57
Quangtri						
Botrach						
- Mytrach	4	25	6.2	76	24	56
- Dong trach	3	22	7.3	55	45	45
Thuathien Hue	5	22	7.3	55	45	45
Total	59	379	6.4	49	51	50

Production Practices

In north Viet Nam, sweet potato is considered easy to grow, as it can be planted all year round in diversified cropping systems (Table 5). Sweet potato is also a crop with low production costs. A most important function of this crop is that it serves to protect farmers from famine.

Sweet potato varieties are abundant in north Viet Nam. In the highlands and midlands region, there were 11 local cultivars. The released cultivars Hoanglong and clone 59 are for the winter crop season, while Batluanxuan,

Red Skin and No. 8 are for the spring crop season. In the north central zone, clones were identified including Chiemdau which is the most popular because of its wide adaptation. In the Red River Delta, Hoanglong, Chiemdau, clone 59 and No. 8 are popular.

There are many kinds of pests and diseases which damage sweet potato. Leaf moth, loaf roll moth and grey moth are the most common. Weevil seriously damaged sweet potato in the north central region but was not so serious in the Red River Delta nor in the highlands and midlands region. Diseases are not a serious problem for sweet potato production in northern Viet Nam.

Economic comparison between sweet potato and rice. Production costs for sweet potato are lower than those for rice (Table 6). The product value of sweet potato is only about one third that of rice. The product value of sweet potato compared to rice is 28% for the north central region and 24% for the Red River Delta and the highlands-midlands region.

Sweet potato is more important in the north central region, especially in Nghetinh province. The district of Thachha has obtained 25-30 t of fresh root yield per ha. In this district, 3 households were surveyed. Sweet potato production was slightly higher per man-day for 2 farmers, in comparison to rice and groundnut (Table 7). The third farmer had a relatively high factor of labour, fertilizer and other inputs. The effectiveness of sweet potato production is high in the north central zone (Region 4).

Evaluation of sweet potato in the total food system. In northern Viet Nam, root crops include sweet potato; potato, cassava, taro, canna, yam and yam bean. Survey data showed that rice makes up 34% of the total food production in Region IV, and makes up 47% of the total in the Red River Delta and highland-midland region (Table 8). Sweet potato comprised 13 to 19% of the total food production. It is the most important root crop in food production, in comparison to the other root crops. For the highland-midlands region, sweet potato comprised 17% and taro 15%, of total food production. For the Red River Delta, sweet potato comprised 19%, canna 12% and cassava 10%, of total food production (Table 8). In the north central zone (Region IV), there were 4 important root crops: cassava (22% of total food production), sweet potato (13% of total food production), yam (9% of total food production) and taro (7% of total food production).

Table 4 Soil types utilized for sweet potato production by village and household in northern Viet Nam

Soil type	Highlands and Midlands				Red River Delta				North Central			
	Village		Households		Village		Households		Village		Household	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Villages	12				10				14			
Households			44				34				59	
Red loam									2	14	7	11
Heavy loam	1	8	2	4	2	20	6	17				
Light loam	3	25	9	20	7	70	23	67	6	42	15	25
Sandy loam	7	58	21	47	10	100	24	70	12	83	39	66
Sandy	3	25	8	18	1	10	1	2	11	78	34	57
Loam w/small stones	3	25	9	20								

Table 5 Crop rotation and intercropping patterns in northern Viet Nam

Highlands and Midlands			Red River Delta			North Central		
1. Crop rotations								
Summer	Winter	Spring	Summer	Winter	Spring	Summer	Winter	Spring
rice	S.P.	groundnut	rice	S.P.	groundnut	rice	S.P.	groundnut
rice seed beds	vegetables	S.P.	rice	S.P.-soybean	groundnut	rice	S.P.	groundnut
rice	S.P.	maize		S.P.	groundnut			
					-soybean	rice	corn	S.P.
S.P.		maize	rice	potato	S.P.	rice seedling	S.P.	S.P.
			maize	potato	S.P.	S.P.	-	S.P.
			rice	S.P.	groundnut			groundnut
			rice-vegetable		S.P.			
2. Intercropping								
Sweet potato + soybean + soybean Sweet potato + cassava Soybean + cassava			Sweet potato + soybean			Sweet potato + soybean or taro Canna + cassava Groundnut + cassava Soybean + cassava Taro + Black pepper Winter/spring sweet potato + hot pepper + cassava		

Table 6 Economic aspects: comparison of sweet potato (SP) with rice in northern Viet Nam

Items	Highlands/Midlands (44 hh)					Red River Delta (34 hh)					North Central (59 hh)				
	hh %	Fertili- zer use %	Cost (d/kg)	Income (d/ha)	Income (1000d/ hh)	hh %	Fertili- zer use %	Cost (d/kg)	Income (d/ha)	Income (1000d/ hh)	hh %	Fertili- zer use %	Cost (d/kg)	Income (d/ha)	Income (1000d/ hh)
A. Rice			390	1564	610			380	1600	551			350	1018	468
Manure	100	10				100	12				94	9			
N (kg/ha)	95	64				100	77				84	58			
P ₂ O ₅ (kg/ha)	64	51				94	57				57	35			
K ₂ O (kg/ha)	50	46				52	44				8	183			
Man-days/ha			312					215					334		
B. Sweet Potato			110	1163	193			100	1450	175			120	1448	184
Manure (t/ha)	90	8				100	8				93	11			
N (kg/ha)	81	48				88	64				86	40			
P ₂ O ₅ (kg/ha)	31	37				61	48				30	28			
K ₂ O (kg/ha)	52	50				58	52				60	53			
CaO (kg/ha)											3	100			
Man-days/ha			167					209					293		
Total					804					727					652
% Income from S.P					24					24			28		

Table 7 Economic comparison between sweet potato, rice and groundnut in the districts of Thachha and Nghetinh, North Central Region.*

	Rice	Sweet Potato	Groundnut
Input			
- Material, fertilizer, irrigation and chemical (1000 d/ha)			
Mr. Mau	240	103	244
Mr. Mui	192	130	290
Mr. At	238	251	189
- Man-days/ha			
Mr. Mau	360	220	460
Mr. Mui	380	200	460
Mr. At	360	260	440
- Output (100 d/ha)			
Mr. Mau	700	490	850
Mr. Mui	700	420	860
Mr. At	490	560	1000
- Profit (output-input, 100 d/ha)			
Mr. Mau	460	387	606
Mr. Mui	508	290	570
Mr. At	242	309	811
- Value of one man-day (d/day)			
Mr. Mau	1277	1760	1317
Mr. Mui	1336	1450	1239
Mr. At	672	1181	1842

*Survey data from June 10 to June 30, 1990.

Production constraints. Based on the survey results, the limitations were the lack of high yielding varieties, inadequate irrigation, lack of fertilizers, pests, and the lack of processing technology (Table 9). Low economic returns are also a limiting factor. In the highlands and midlands region, 68% of the households did not process their sweet potato. 64% of the households did not have irrigation while 57% of the households lack fertilizer.

In the Red River Delta, 88% of the households did not process their sweet potato and 65% of the households lacked short duration cultivars for the cropping pattern: spring-rice, summer/autumn rice, winter-sweet potato, per yearly cycle. In Region 4 (north central), 68% of the households have no irrigation, 66% of the households lack fertilizers and 59% do not process their sweet potato.

In general, survey results show that there are 3 major constraints in sweet potato production for northern Viet Nam:

- 1) lack of suitable processing technology;
- 2) lack of irrigation; and
- 3) lack of fertilizer.

It is necessary of solve these 3 major constraints to develop sweet potato production in North Viet Nam.

Table 8 Food production per household from sweet potato and other crops in northern part of Viet

	Highlands/Midlands (44 hh)						Red River Delta (34 hh)						North Central (59 hh)						
	hh	Area	Yield	Produc-	Food	%	hh	Area	Yield	Produc-	Food	%	hh	Area	Yield	Produc-	Food	%	
	%	(ha)	(t/ha)	tion (t)	(kg/ha)	%	%	(ha)	(t/ha)	tion (t)	(kg/ha)	%	%	(ha)	(t/ha)	tion (t)	(kg/ha)	%	
Food/hh/yr					3332						3074	100						3915	100
Food (kg/per)					278						256							326	
Rice	100	0.390	4.0	1.564	1564	47	100	0.345	4.2	1.452	1564	47	98	0.46	2.9	1.339	1339	34	
Other food					1768	53					1622	52						2576	65
Sweet potato	100	0.166	10.6	1.763	587	17	100	0.121	14.5	1.755	585	19	100	0.127	12.0	1.533	511	13	
Potato	36	0.038	15.6	0.594	198	6	88	0.061	12.5	0.763	254	8	10	0.017	16	0.272			
Maize	82	0.135	2.2	0.301			29	0.067	2.3	0.159			30	0.152	2.0	0.307			
Cassava	4	0.063	14.5	0.564	304	9	29	0.063	15.1	0.953	317	10	18	0.163	15.9	2.595	865	22	
Taro	25	0.067	23.4	1.573	524	16							6	0.092	9.5	0.874	291	7	
Soybean	45	0.062	1.1	0.069			6	0.030	1.7	0.053			3	0.15	0.23	0.035			
Groundnut	52	0.056	1.6	0.091			67	0.033	1.6	0.053			69	0.123	1.33	0.164			
Canna							14	0.082	13.8	1.131	377	12	5	0.016	36	0.576	192	5	
Yam													8	0.059	18.5	1.091	363	9	
Yam bean													6	0.014	20	0.280			

*Survey data from 137 households of sweet potato farmers, June 10 to June 30, 1990.

Table 9 Constraints for sweet potato production in northern Viet Nam.

Region	Highlands/ Midlands		Red River Delta		North Central	
	No.	%	No.	%	No.	%
Household						
households	44	100	34	100	59	100
lack of good varieties	18	41	22	65	27	46
poor soil	7	16	8	24	9	15
lack of irrigation	28	64	2	6	40	68
chemicals for diseases/pests	23	52	0	0	18	31
lack of fertilizer	25	57	12	35	39	66
labour	3	7	0	0	0	0
policy problems	23	52	13	38	19	32
processing limitations	30	68	30	88	35	59
low economic benefits	13	30	8	24	21	26

Conclusions and Recommendations

Sweet potato in Viet Nam ranks third after rice and maize in terms of land area for production. Sweet potato production in North Viet Nam is two thirds of the total for all of Viet Nam. The central coast, from Thanhhoa to Thuanhai, is the most important area for sweet potato production in Viet Nam.

Lack of processing technology, limited irrigation and lack of fertilizers are major constraints.

Increased purchasing power for sweet potato is needed in North Viet Nam. There is also a need to introduce suitable processing technology for sweet potato farmers.

CGPRT Centre News and Activities

The Centre's Human Resources Development Programme

Activities Planned For 1991

The Centre's Human Resources Development Programme (HRDP) will engage in the following activities for 1991:

1. SECOND MEETING ON: REGIONAL STATISTICAL DATABASE SYSTEMS FOR CGPRT CROPS

- **Location:** CGPRT Centre, Bogor, Indonesia -

- **Period:** February 19-21, 1991

- **Organized:** On request and in co-operation with the Centre's Information Documentation Services Programme

- **Objectives:** A meeting of the eight Country Correspondents and related staff involved in the Centre's RSDS for CGPRT crops, to discuss the progress to date, and to identify ways and means to improve RSDS.

2. REGIONAL TRAINING COURSE ON: ON-FARM RESEARCH FOR FOOD LEGUMES AND COARSE GRAINS IN ASIA

- **Location:** Malang Research Institute for Food Crops, Malang, Indonesia

- **Period:** April 22 - May 3, 1991

- **Organized:** On request of the UN/FAO/RAS/89/040 Project: Regional Co-operative Programme for the Improvement of Food Legumes and Coarse Grains in Asia. Implementation by the Centre in cooperation with the Central Research Institute for Food Crops (CRIFC), Bogor, Indonesia; the Malang Research Institute for Food Crops (MARIF), Malang, Indonesia and the International Wheat and Maize Improvement Centre (CIMMYT), Mexico (requested).

- **Objectives:** To increase the capabilities and understanding of selected research and extension staff members, involved in conducting on-farm research. Particular emphasis will be given to conducting on-farm experimentation, including design, field observations and analysis of on-farm trials.

3. WORKSHOP ON: METHODS AND PROCEDURES FOR COMPARATIVE ADVANTAGE ANALYSIS OF CGPRT CROPS

- **Location:** CGPRT Centre, Bogor, Indonesia

- **Period:** August 19-24, 1991

- **Organized:** On request of the European Development Fund and the UN/FAO/RAS/89/040 Project: Regional Co-operative Programme for the Improvement of Food Legumes and Coarse Grains' in Asia. Implementation by the Centre in co-operation with the Centre for Agro-socio Economic Research (CASER), Bogor, Indonesia; the Food

Research Institute, Stanford University, USA (requested), and the International Wheat and Maize Improvement Centre (CIMMYT), Mexico (requested).

- **Objectives:** To discuss the experiences gained from the first workshop on CAA conducted in 1987. In particular, to discuss case studies prepared by selected participants of the first workshop and two case studies conducted by the Centre in co-operation with Indonesian and Thai Research Institutes. Emphasis will be placed on the use of the Domestic Resources Allocation Method.

4. SEMINAR ON: CHANGING DIETARY INTAKE AND DEVELOPMENT OF SECONDARY CROPS IN ASIA

- **Location:** Rural Development Administration, Suweon, Republic of Korea

- **Period:** September 24-28, 1991

- **Organized:** By the CGPRT Centre in co-operation with The Asian Productivity Organization (APO), Tokyo, Japan, and The International Technical Co-operation Centre of the Rural Development Administration, Korea.

- **Objectives:** To discuss an overview of the changes in dietary intake over the last twenty years and their implications for CGPRT crop development in Asia, including identification of research and development issues.

5. SECOND WORKSHOP ON: INCREASING SOYBEAN PRODUCTION IN ASIA - THREE YEARS EXPERIENCE OF THE SOYBEAN YIELD GAP ANALYSIS PROJECT (SYGAP) IN INDONESIA AND THAILAND

- **Location:** CGPRT Centre, Bogor, Indonesia -
Period: November 18-23, 1991

- **Organized:** On the request of the SYGAP II Project. Implementation by the CGPRT Centre in co-operation with the Central Research Institute for Food Crops (CRIFC), Bogor, Indonesia; Bogor Research Institute for Food Crops (BORIF), Bogor, Indonesia; Centre for Agro-socio Economic Research (CASER), Bogor, Indonesia, and the Field Crops Research Institute, the Office for Agricultural Economics and the Department of Agricultural Extension of the Ministry of Agriculture and Co-operatives of Thailand.

- **Objectives:** To evaluate the SYGAP II Project operations in Indonesia and Thailand and to discuss and identify further research and development activities required for increasing soybean production in Asia, particularly in Indonesia, Thailand, Viet Nam and the Philippines.

Participation

The participation in the above Human Resources Development Programme (HRDP) activities is by invitation. However, the Centre always keeps a few positions open at each meeting for other interested persons who may join as observers. In case you are interested in joining one of the above activities, you are advised to send your request to the Director of the CGPRT Centre, Jalan Merdeka 145, Bogor 16111, Indonesia.

International Course on Food Processing, Quality Assurance and Marketing in Food Processing Enterprises.

August 4 - November 2, 1991
Wageningen, The Netherlands.

The course **aims** :

1. to broaden participants' views on problems of small and medium scale food processing;
2. to upgrade participants' knowledge concerning the analysis of these problems and the selection of appropriate technology; and
3. to impart techniques for implementation, focusing on quality assurance and marketing.

The **programme** comprises the following modules:

1. Problem setting.
2. How and where to get information on technology?
3. How to assure appropriate product quality?
4. How to reach the market?
5. How to organize training courses and consultancy work?
6. Product specific assignment.

The course is **intended for** professionals from:

1. business advisory, training and support institutions; and
2. technological services for formal small-and medium-scale food processing enterprises.

The course is at post-graduate level, given in the English language and leads to a Certificate. Applicants should have BSc or BA level and at least three years of working experience.

Course Brochures and application forms are available on request from: The International Agricultural Centre P.O. Box 88, 6700 AB Wageningen, The Netherlands. The closing date for application is May 15th, 1991.

New Publications

Fertile Soil.

by Robert Parnes

This practical guide contains much useful information for field practitioners interested in sustainable agriculture. The use of organic residues and reduction of chemical inputs is especially well covered. There are twenty six charts detailing the nutrient potential of various fertilizers and their effects on a range of crops. The buffering capacity, the ability of highly fertile soils to absorb climatic shocks is highlighted. This enables crops to better withstand pests, disease and drought.

It is felt that the book contributes to a growing body of practical literature on agriculture, which perhaps merits the attention of researchers as well. For information on this publication contact:

agAccess, 603 Fourth Street
Davis, CA 95616 (916) 756-7177
Fax. (916) 756-7188
U.S.A.

Plant Resources of South-East Asia

Bibliography 1: Pulses

This new publication by PROSEA is intended to supplement their previous work (PROSEA Handbook Volume I: Pulses). It is a survey of less accessible literature, mainly from S.E. Asia, to guide users of their first handbook to more localized information in the region. It is available from the PROSEA, P.O. Box 234, Bogor 16122, Indonesia. Tel: (0251) 22859, Fax: c/o (62) (251) 326425.

Variability in Grain Yields

Edited by Jock R. Anderson and Peter B.R. Hazell
The Johns Hopkins University
Press 1989 by Taco Bottema, CGPRT Centre

In 1989 the book: "Variability in Grain Yields" came out, summarizing a wide discussion focusing on yield variability and its causes. The main line of reasoning is that with the introduction of nitrogen responsive varieties and expanded availability of inputs and technology, the major determinant of the food security situation is the variation in yield. It was found that national yields of various countries increasingly correlated. A wealth of approaches are presented, in a solid and thorough

manner, ranging from national aggregate yield to analysis of farm yield through time

Yet significantly, no firm evidence is submitted to support the leading notion of expanded yield variability influencing the food security situation. This may be attributed to technical difficulties intrinsic to aggregate data sets, but it raises the question, as indicated by contributors, whether simple trade and stock's policy would be sufficient in dealing with fluctuations in yearly food availability. In the synthesis, it is correctly pointed out that in agricultural policy, effective marketing systems, buffer stocks and price stabilization, agricultural diversification and finally, public provision of information, are important. Not surprisingly, climatic factors were found to be the major source of yield variance. Agronomic inputs (fertilizers) tend to increase yield variability because of the intensity of pest problems. The book is likely to remain a landmark for years to come for those who cope with yield variance.

It would be of added interest in future work on this issue, to pay specific attention to cereal yield under tropical conditions with a more regular and higher level of rainfall. It is a well known fact that in Indonesia, national yield of rice was severely affected by attacks of the brown plant hopper in the years 1976-1978, with recurring attacks in 1983. It should also be of considerable interest to study area fluctuation which can be hypothesized to increase with the expanded cropping intensity, affecting in a wider sense, production levels.

New Distributor and Agents

CGPRT Centre publications are now also available at:

Europe

Natural History Book Service Ltd.
2 Will Road, Totnes,
Devon TQ9 5XN
United Kingdom

Indonesia

Toko Buku Alumni	Pancaran Ilmu
Jl. Jend. Achmad Yani 206-E	Jl. Veteran No. 91
Banjarmasin	Padang
	Telp. (0751) 23791
Sendok Ilmu	
Jl. Jend. Sudirman 102	
Palembang 30126	
Telp. (0711) 20166	

CGPRT Centre

The Regional Co-ordination Centre for Research and Development of Coarse Grains, Pulses, Roots and Tuber Crops in the Humid Tropics of Asia and the Pacific (CGPRT Centre) was established in 1981 as a subsidiary body of UN/ESCAP.

Objectives

In co-operation with ESCAP member countries, the Centre will initiate and promote research, training and dissemination of information on socio-economic and related aspects of CGPRT crops in Asia and the Pacific. In its activities, the Centre aims to serve the needs of institutions concerned with planning, research, extension and development in relation to CGPRT crop production, marketing and use.

Programmes

In pursuit of its objectives, the Centre has three programmes which are mutually supportive:

1. Research, which entails the preparation and implementation of studies covering production, utilization and trade of CGPRT crops in the countries of Asia and the South Pacific;
2. Training of national research and extension workers;
3. Information and documentation which encompasses the collection, processing and dissemination of relevant information for use by researchers, policy makers, and extension workers.

Palawija News

Contributors are invited to submit concise summaries of significant social research related to CGPRT crops for publication. Submissions should be limited to two to four double-spaced typewritten text. Two figures (graphs or tables) may accompany the article. Include only references cited. All articles are subject to editing to meet space limitations.

Please send all queries relating to articles in *Palawija News* to Head Publications Section, CGPRT Centre, Jalan Merdeka 145, Bogor 16111, Indonesia.

Palawija News is distributed free of charge to interested individuals and institutions. Please send address corrections and additions to the Distribution Officer, Publications Section.

<p>CGPRT CENTRE Publications Section</p>
--

Editor:	John H. Owens
Production:	Deddy Subandi M. S. Tayanah (Yayan)
Distribution:	Taufik Angasali
Printer:	SMT Grafika Desa Putera



CGPRT Centre

Jalan Merdeka 145,
Bogor 16111, Indonesia
Telephone: (0251) 336290, 329399
Fax: 62-251- 336290
Telex : 48369 AARDMA IA
Cable : ESCAP CGPRT Bogor

Palawija News
Volume 7, Number 4
