

## 17. PRODUCTION OF FOOD LEGUMES IN THE PHILIPPINES WITH SPECIAL REFERENCE TO LECUMINOUS VEGETABLES

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### Introduction

The varied soil types, climate and elevation of the Philippines permit the growing of a wide range of leguminous crops. All of the leguminous vegetables of commerce in the country can be grown during the wet and dry season plantings. Production is governed however, by the tradition in most regions. Cultivation of vegetable crops in the lowlands is generally confined to rainfed areas and seeding or transplanting follow the rice or corn crops planted in May, June, July or August. This is one of the reasons why the supply of even leguminous vegetables is scarce during the wet season and abundant in the dry season.

The importance of leguminous vegetables as the cheapest source of protein is well recognized by Filipinos. According to experts in nutrition, the recommended daily allowance for Filipinos for beans and nuts (dried) as purchased is 16 grams per person or a per capita consumption per year of 5.9 kilos.<sup>1)</sup>

Production of food legumes is a lucrative industry. At times demand arise from foreign markets. This is particularly true in the case of mung bean, bookito bean and red beans, a variety of cowpea.

Records show that in 1970 Philippines exported 756.3 metric tons of red beans valued at \$154,168.92 to Japan.<sup>2)</sup>

### Species and Varieties of Leguminous Vegetables

The principal species of vegetable legumes being raised in commercial scale or giving satisfactory farm income are mung bean (*Phaseolus, aureus* Roxb), yard-long beans (*Vigna sinensis* Stickm.) Saviex Hassk. (Sesquipedales group), snapbean, (*Phaseolus vulgaris* L.), Cowpea (*Vigna sinensis* Stickm.) Saviex Hassk. and garden pea (*Pisum sativum* L.) which is grown specifically in highly elevated or cold areas. The other species being cultivated in semi-commercial scale and serving as a source of additional income is lima bean (*Phaseolus lunatus* L.). Pigeon pea (*Cajanus cajan* Millsp.), hayacinch bean (*Dolichos lablab* L.), yam bean (*Pachyrrhizus erosus* Roxb.) for green pods, winged or asparagus bean (*Psophocarpus tetragonolobus* L.) and (*Moringa olifera* L.), a leguminous tree grown for its young leaves and green seeds are also raised at home garden or backyard scale. Table 1 shows the different species of legume vegetables in the Philippines and their important characteristics.

The varieties of the vegetable legumes grown in the country are shown in table 2. Improved varieties of yard-long beans, mung beans, cowpea and lima bean are evolved through the tedious processes of breeding by scientists of the Bureau of Plant Industry and the University of the Philippines, College of Agriculture.

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<sup>1)</sup> Publication No. 26, Revised, 1970. Food and Nutrition Research Center, National Institute of Science & Technology, National Science Development Board.

<sup>2)</sup> Plant Quarantine Service. Special Report, 1971. Bureau of Plant Industry, Manila.

**Table 1. Maturity, yielding capacity and protein content of different leguminous vegetables grown under Philippine conditions.**

Species	Maturity (days)	Yield (Mt/Ha.)	Protein* (%)
Yardlong ( <i>Vigna sinensis</i> )			
Pole	green-50-65	green 4.0-6.0	green podded 2.8 white podded 2.1 red podded 3.3
Bush	green-40-50		
Mung bean ( <i>Phaseolus aureus</i> )	dried seed-65-85	dried seed-1.2-1.5	green seeded 24.4
Snap bean ( <i>Phaseolus vulgaris</i> )	green-45 dried seed-60-65	green-5.0-7.0 dried-0.8-1.5	green podded 2.0 white podded 1.9 black seeded 21.3
Cowpea ( <i>Vigna sinensis</i> )	green-30-45 dried seed-90-120	green-5.0-6.0 dried seed-1.5-1.8	3.7 20.4
Garden pea ( <i>Pisum sativum</i> )	green-70-80	dried seed-0.6-0.7 green-2.0-2.5	3.3
Lima bean ( <i>Phaseolus lunatus</i> )	green-50-60	No data	24.12
Pigeon pea ( <i>Cajanus cajan</i> )	240 (blooming stage)	No data	green seed 8.2 dried seed 21.8
Hyacinth bean ( <i>Deliches lablab</i> )	No data	No data	green seed 3.0
Yamb bean ( <i>Pachyrrhizus erosus</i> )	green pods-90-100 green-7-10	No data	2.6
Winged or Asparagus bean ( <i>Phosphocorpus tetragonolobus</i> )	after blooming	No data	2.7
Malunggay ( <i>Moringa olifera</i> )	green-89 pods-60-90	No data	2.6

\* SOURCE: Food and Nutrition Research Center of the Philippines, National Institute of Science and Technology.

**Table 2. The varieties of different leguminous vegetables grown under Philippine conditions.**

Species	Varieties
Yardlong bean	Los Banos Sitao No. 1, E. G. Bush Sitao Nos. 1 & 2, E. G. Pole Sitao No. 1, DES Pole Sitao No. 2*
Mungbean	M. G. 50-10A, MD 15-2, BPI Glabrous No. 3, Gloosy Green S <sub>1</sub> , CES 14, CES 55*
Snapbean	Contender, Law's Champion, Tender Pod, Tender Green 406-B and 106A, Bush Type**
Cowpea	E. G. Darkgreen Podded Nos. 1 & 2*
Garden pea	Sugar Mammoth, Mira green, Manda-laska Wilt resistant*
Lima bean	Habas*
Pigeon pea	Purple podded and Green (traditional varieties)
Hyacinth bean	Purple and white seeded (Traditional variety)
Yam bean	Traditional variety
Winged or Asparagus bean	Green Podded (Traditional Variety)
Malunggay	Tree type (Traditional), Japanese type**

\* Recommended varieties of the Philippine Seed Board

\*\* Found adapted under Philippine conditions

(Improved varieties are recommended for commercial planting by the Philippine Speed Board after their agronomic characters and performance at various locations are evaluated).

The varieties of the species under propagation in backyard scale are still the old or so-called traditional varieties.

### Situation

Statistics of 1969 indicated that the area devoted to beans and peas (includes dry beans, mung bean and peas only) is 44,850 hectares with an aggregate production of 20,336 metric tons.<sup>3)</sup> In 1970 the area for beans and peas went up to 49,980 the aggregate production being 23,001 metric tons.<sup>4)</sup> Preliminary estimates in 1971 have shown that the area grown for beans and peas is 49,220 hectares and the aggregate production is 23,635 metric tons.<sup>5)</sup> based on the population of 1971 and the recommended per capita consumption per for beans the national requirement should be somewhere around 219,472 metric tons to have 100% self sufficiency. On this score the sufficiency ratio of the country for beans and peas in 1971 was around 10.7% only.

### The Program

The production of vetable legumes is an integral part of the National Vegetable Program. Perhaps it will be a good idea to have an overview of the entire program.

The Bureau of Plant Industry of the Department of Agriculture and Natural Resources leads in implementing the Vegetable and Beans Production and Distribution Program. The program has been conceived as early as 1969. The government agencies cooperating with the implementation are the University of the Philippines, College of Agriculture and Agricultural Productivity Commission. The National Food and Agriculture Council oversee the total coordination. The program is receiving assistance from the U.S. Agency for International Development. Another foreign agency likely to come in to the picture is the U.S. Peace Corp.

The general objective of the program is to improve the situation of the vegetable industry in general, through research, production of quality seeds to meet part of the requirements of the farmers and massive campaign for the utilization of new technology. During the period July, 1971 to June, 1972 the program aimed at achieving a sufficiency ratio of 30% in commercial vegetables in 21 selected first priority provinces and then increasing the sufficiency level at the rate of 10% annually.

#### 1. Status

The cumulative area planted to legume vegetables for the period beginning July, 1971 and ending May, 1972, as reported by the Provincial Personnel involved in the program is shown in Table 3. It will be noted that mung bean is the most common in many provinces and it ranked as number one in terms of hectarage. Yard-long beans is common as well in many provinces followed by snap bean and cowpea. It appeared, however, that in terms of total area planted, snap bean ranked next to mung bean followed in descending order by yard-long beans and cowpea. The least common in the provinces are lima bean and garden pea. The case of garden pea is not surprising because of its limited adaptation.

The volume or quantity of the legume vegetables produced in 20 out of the

<sup>3)</sup> Bureau of Agricultural Economics, DANR, Philippines, 1969.

<sup>4)</sup> Bureau of Agricultural Economics, DANR, Philippines, 1970.

<sup>5)</sup> Preliminary estimates. Bureau of Agricultural Economics, DANR, Philippines, 1971.

**Table 3. Cumulative area (hectares) planted, for the period July, 1971 to May, 1972, to various legume vegetables in 20 out of 21 first priority provinces of the Vegetable and Bean Production and Distribution Program.**

Provinces	Yard-leng Beans		Mung Beans	Snap Beans	Cowpea	Garden Pea	Lima Bean	Total
	Bush	Pole						
Albay	—	55.75	—	4.50	—	—	—	60.25
Batangas	—	1.30	25.00	—	—	—	1.70	28.00
Benguet	—	—	—	460.25	—	155.33	—	615.58
Bukidnon	—	60.00	42.00	45.00	89.00	23.00	—	259.00
Bulacan	—	1,094.00	15.00	—	—	—	—	1,109.00
Cavite	—	—	134.20	169.25	—	—	—	303.45
Cebu	1.33	14.91	11.00	—	—	—	—	27.24
Davao del Sur	—	23.25	49.50	58.18	4.00	—	—	134.93
Ilocos Sur	—	—	77.55	267.65	—	—	—	345.20
Iloilo	—	—	344.00	—	17.50	—	—	361.50
Isabela	73.26	25.16	354.31	—	161.65	19.58	20.38	654.34
Laguna	1.00	19.50	39.50	—	4.70	—	—	64.70
Misamis Oriental	—	42.53	—	—	—	—	—	42.53
Negros Oriental	44	—	59.73	44.75	—	—	—	104.92
Nueva Ecija	—	—	31.00	801.00	—	—	—	832.00
Pampanga	—	334.00	361.50	—	218.00	—	—	913.50
Pangasinan	—	93.80	6,512.00	1,205.53	20.35	—	151.38	7,983.06
Rizal	—	75.85	.80	—	—	—	—	76.65
South Cotabato	—	—	238.99	131.10	—	—	—	370.09
Tarlac	—	—	2,390.00	723.00	479.00	—	—	3,592.00
Total	76.03	1,840.05	10,686.08	3,910.21	994.20	197.01	173.46	17,877.94

**Table 4. Cumulative production (metric tons) for the period July, 1971 to May, 1972 of various legume vegetables in 20 out of 21 first priority provinces of the Vegetable and Bean Production and Distribution Program.**

Provinces	Yard-leng Beans		Mung Beans	Snap Beans	Cewpea	Carden Pea	Lima Bean	Total
	Bush	Pole						
Albay	—	274.62	—	27.22	—	—	—	301.84
Batangas	—	1.33	20.00	—	—	—	1.33	22.66
Benguet	—	—	—	2,164.16	—	641.20	—	2,805.36
Bukidnon	—	46.00	138.00	35.00	94.00	21.00	—	334.00
Bulacan	—	2,240.00	4.50	—	—	—	—	2,244.50
Cavite	—	—	35.41	278.80	—	—	—	314.21
Cebu	4.60	32.13	1.10	—	—	—	—	37.83
Davao del Sur	—	138.31	37.00	65.05	20.00	—	—	260.36
Ilocos Sur	—	—	286.40	1,221.50	—	—	—	1,507.90
Iloilo	—	—	371.60	—	20.37	—	—	391.97
Isabela	252.44	147.49	262.91	—	401.54	97.32	25.74	1,187.49
Laguna	1.00	19.50	26.76	—	16.40	—	—	63.66
Misamis Oriental	—	12.00	—	—	—	—	—	12.00
Negros Oriental	.45	—	34.41	101.58	—	—	—	136.44
Nueva Ecija	—	—	31.00	6,424.00	—	—	—	6,455.00
Pampanga	—	1,201.00	521.00	—	327.00	—	—	2,049.00
Pangasinan	—	187.50	3,355.55	602.50	85.25	—	187.50	4,918.28
Rizal	—	902.69	.20	—	—	—	—	902.89
South Cotabato	—	—	336.25	188.37	—	—	—	524.62
Tarlac	—	—	6,519.00	6,691.00	11.00	—	—	13,221.00
Total	258.49	5,202.57	12,481.09	17,799.18	975.56	759.52	214.57	37,690.96

21 first priority provinces is shown in table 4. It is apparent that among the legume vegetables, snap bean had the largest volume followed in descending order by mung bean, yard-long bean and cowpea. It should be noted, however, that the bulk of snap bean harvested is in green form, hence, the possibility of obtaining a larger volume than mungbean. Based on the report a total of about 37,691 metric tons of various leguminous vegetables has been produced in 20 first priority provinces. This indicated that a sufficiency ratio of about 17% has been contributed by the 20 priority provinces.

## 2. Problems

### 1) Availability of quality seeds.

Availability of quality seeds is not much of a problem except when there are natural calamities like typhoons and drought. This is due to (1) the ability of the Bureau of Plant Industry to produce the bulk of seed requirements, and (2) farmers are saving part of their crops for seed purposes.

### 2) Lack of far better varieties.

Although new varieties have been developed in some of the major vegetable legumes, there is still a need for varieties possessing combined desirable characters such as excellent yielding ability, good eating quality and resistance to pests and diseases.

### 3) Limited financial assistance.

Vegetable legume producers are operating in small areas. In general, they could not afford to provide the necessary farm improvement. Credit facilities have been limited in the past years.

### 4) Marketing.

The problems in marketing are considered very vital to the fruit and vegetable industry as a whole. Following are the principal factors affecting marketing.<sup>6)</sup>

- (1) Limited transportation facilities and the lack of provisions for preserving freshness of green vegetables.
- (2) Lack of marketing intelligence.
- (3) Lack of knowledge in grading by producers despite the availability of standards.
- (4) Lack of marketing cooperatives.
- (5) Lack of storage facilities.
- (6) Inadequate credit facilities.

## Prospects of Producing Normally Imported Dried Beans and Peas

The bulk of beans and garden peas (dried beans) needed by processors is imported. All chick peas needed by the canning industry are likewise imported. According to the records of the Plant Quarantine Service, Bureau of Plant Industry, the aggregate quantity of mung bean, garden pea and chick pea imported into the country in Fiscal Year 1971-1972 is 2283.3 metric tons.<sup>7)</sup> Based on experimental data and experiences beans, mung bean and peas can be raised profitably. It is highly probable for the producers to supply the requirement for these two items. Perhaps what is needed is a strong tie-up and this is for the industrialists to assist producers by way of extending financial assistance and then absorbing the produce at the highly favorable price. Quite recently, introduced varieties of chick pea or Bengal Gram (*Cicer arietinum*) were tested at the Baguio Experiment Station (high

<sup>6)</sup> Fruit and Vegetable Marketing Program developed in early 1972 by a committee created by the Secretary of Agriculture and Natural Resources, Philippines.

<sup>7)</sup> Plant Quarantine Service: Record of Fiscal Year 1971-1972. Bureau of Plant Industry, Manila.

elevation) of the Bureau of Plant Industry. According to Mr. Valentino Balaoing, Project Leader of the trials on introduced varieties of vegetable crops at the Baguio Experiment Station, at least one entry gave promising results (private communication).

### Concluding Remarks

The chance of improving the situation of the vegetable industry in general is very bright. The President of the Republic laid out lately a sound budget to support a nation-wide drive on the establishment of cooperatives, including fruit and vegetable cooperatives. A Fruit and Vegetable Industry Development Bill has been initiated by the Congressional Economic Planning Office, House of Representatives, Office of the Speaker. The main objective of the bill is to accelerate the development of these two food items. Officials are very much concerned about the diet of the people so that strong emphasis has been laid to produce them in sufficient quantity.

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