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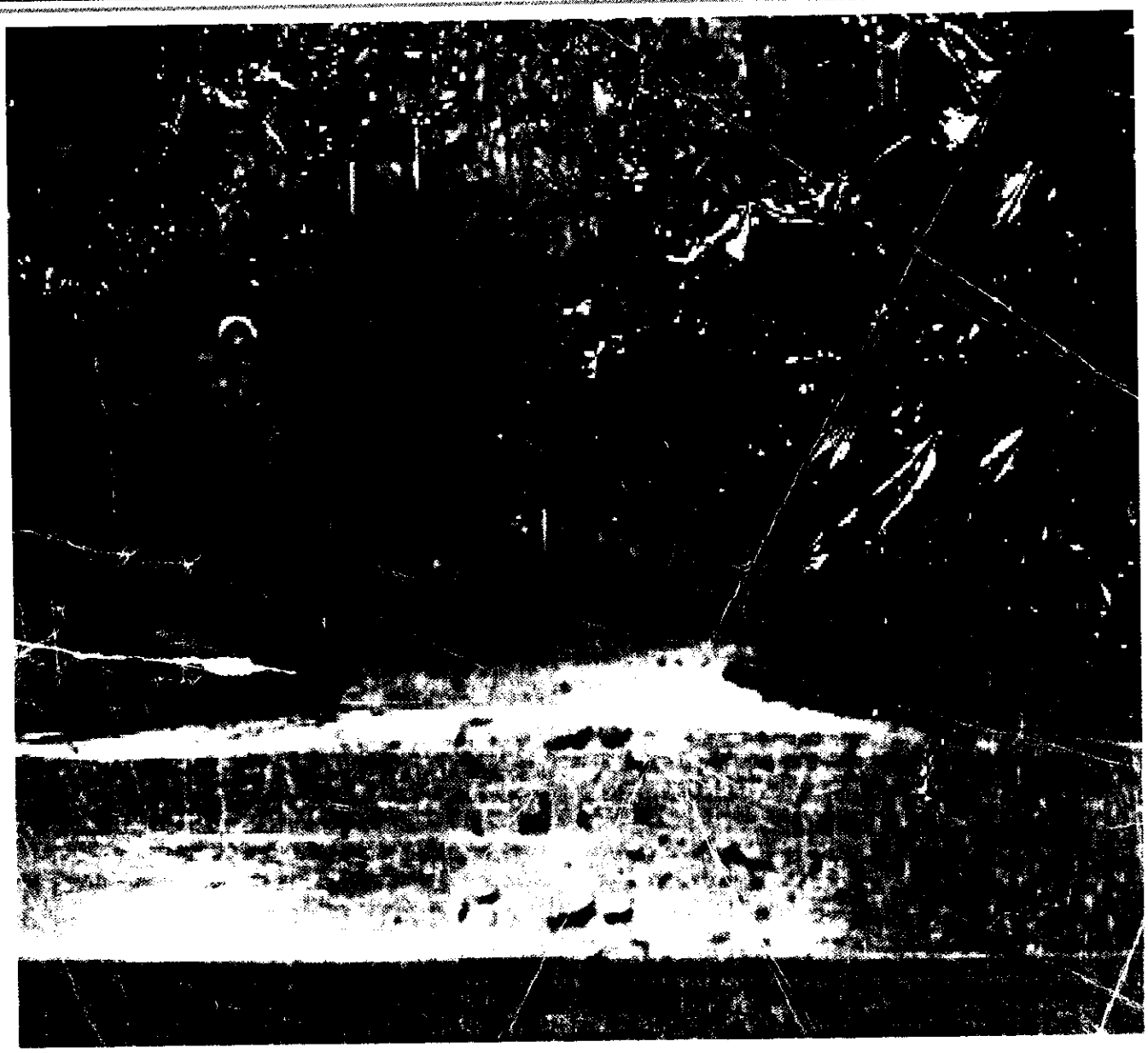
REPORT ON FRUITS AND VEGETABLES

FASLI - 1422

2012 - 13

PRINCIPAL SECRETARY / COMMISSIONER
DEPARTMENT OF ECONOMICS AND STATISTICS
CHENNAI-600 006



பொருள் இயல் மற்றும் புள்ளி இயல் துறை
தமிழ்நாடு அரசு
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REPORT

ON

FRUITS AND VEGETABLES

TAMIL NADU

Fasli 1422 (2012-13)

PRINCIPAL SECRETARY / COMMISSIONER
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CHENNAI - 600 006

PREFACE

Fruits and Vegetables play an important role in the agricultural economy in terms of its value addition and employment generation. The Crop Estimation Survey on Fruits, Vegetables and other Minor Crops is being implemented in Tamilnadu as a Centrally Sponsored Scheme with 100 percent funding by GOI from 1982-83 onwards to estimate the area and yield of selected crops. The results of the survey carried out during 2012-13 have been presented in this report.

During the year 2012-13, the survey covered eight fruit crops viz Mango, Jack, Guava, Lemon, Orange, Banana, Grapes and Pine-apple and five vegetable crops viz Brinjal, Lady's Finger, Tomato, Cabbage and Sweet- Potato.

This report consists of six parts. Part-I highlights the objectives of the Survey, Part-II explains Concept and Definition, Part-III presents the Estimation Procedure, Part-IV reveals the survey results, Part-V presents Findings of the survey and Part-VI contains Comparative Statement for 10 years data on fruits and vegetables crops.

It is earnestly hoped that this report will be useful to administrators, policy-makers in Government, Research scholars, Programme officials of Agriculture and Horticulture Departments and to those interested in the development of horticulture in Tamil Nadu.

Sd/-Dr.Niranjan Mardi,
PRINCIPAL SECRETARY / COMMISSIONER

Place: Chennai-6.

Date: 11.04.2014

CONTENT

PART – I

INTRODUCTION

Fruits and Vegetables are high value addition crops which are labour intensive, generating employment. It is an essential item of human diet and also an important source of nutrition. They are sources of carbohydrates, next only to cereals. These crops are generally commercial in nature fetching lucrative incomes and having large export potential. Despite the fact that crops occupy a pre-eminent position among horticultural crops, reliable data and information of area, production and yield of these crops are found to be inadequate for planning purposes both at micro and macro level. Government of India have extended a scheme for the conduct of Crop Estimation Survey on Fruits and Vegetables to gauge the area and average yield of each crop as in the case of principal crops.

The Crop Estimation Survey on Fruits and Vegetables is being implemented in Tamil Nadu from 1982-83 as a Centrally-Sponsored Scheme with 100 percent financial assistance by the Government of India.

COVERAGE

Currently the following eight fruit and five vegetable crops are covered under this survey.

A. Fruits

1. Mango, 2. Banana, 3. Guava, 4. Lemon, 5. Orange, 6.Jack, 7. Grapes and 8. Pineapple

B. Vegetables

1. Tomato, 2. Brinjal, 3. Lady's Finger, 4. Cabbage and 5. Sweet Potato

OBJECTIVES

The main objectives of the survey are:

1. To arrive at reliable estimates of average yield per hectare and production estimates of each crop both at district and state level and
2. Collection of ancillary information on cultivation practices of selected fruits and vegetables.

In addition, it also covers the following aspects pertaining to tree crops.

i. Estimation of number of bearing and non-bearing trees.

ii. Estimation of average yield per bearing tree.

SAMPLING DESIGN

The sampling technique adopted for the survey is a multistage stratified random sampling. Taluk within a district constitutes the stratum. The three stages of sampling are as follows:

i. The selected village is the first stage sampling unit.
ii. The field / orchard within the selected village is the second stage unit.
iii. The experimental plot within the selected field is the third and ultimate sampling unit.

The villages are selected in proportion to the area under each crop in the taluk covered under the survey. In each selected village, two experimental plots were chosen for the crop.

In case of fruit tree crops viz. mango, guava, jack, lemon and orange, the revenue villages growing the above tree crops constitute the sampling unit. In each of the village selected, two gardens growing the specified tree crop are selected randomly for tree enumeration. From 1998-99 onwards, it has been decided to conduct the survey on garden only. For yield estimation, all the bearing trees in the selected garden are taken in to account.

SAMPLE SIZE

During the year 2012-13, 1200 experiments were planned in 600 villages. The following table shows the details of crop wise experiments planned.

Crop	No. of villages selected
A. Fruits	
1. Mango	**105**
2. Banana	100
3. Guava	45
4. Lemon	40
5. Jack	35
6. Orange	20
7. Grapes	35
8. Pineapple	10
Total	**390**
B. Vegetables	
1. Tomato	60
2. Brinjal	65
3. Lady's Finger	35
4. Cabbage	25
5. Sweet Potato	25
Total	**210**
Fruits and Vegetables Total	**600**

PLOT SIZE

The experimental plot size for the conduct of crop cutting experiments for each of the fruits and vegetable crops (excluding tree crops) is given below:

A. FRUITS	**PLOT SIZE**
1. Banana	5m X 5m
2. Grapes	5m X 5m
3. Pineapple	5m X 1m
B. VEGETABLES	
1. Brinjal	5m X 5m
2. Lady's Finger	5m X 5m
3. Tomato	5m X 5m
4. Cabbage	10m X 2m
5. Sweet Potato	2m X 2m

PERIODICITY OF THE SURVEY

The period of the Survey is one full Fasli year starting from July to June.

COLLECTION OF DATA

The Statistical Inspectors were entrusted with the task of field work exclusively engaged for this Scheme in 28 districts of the State. The field work such as selection of garden, recording of yield etc., in the case of fruit tree crops and selection of field, plot, recording of yield with regard to other crops are carried out by the Statistical Inspectors appointed exclusively for this scheme. The village Administrative Officers of the selected villages rendered necessary assistance in the selection of field and collection of information from the cultivators.

SUPERVISION

In order to ensure accuracy at every stage, the field work of Statisticall Inspector was supervised by the respective Statistical Officers, Assistant Directors of Statistics, District Deputy Directors and and Regional Joint Directors.

RESPONSE

Survey was conducted in all the 1200 experiments planned for the year 2012-13.

The following table shows the number of experiments planned and conducted during 2012-13.

NUMBER OF EXPERIMENTS PLANNED AND CONDUCTED

Crop	No. of Experiments	
	Planned	**Conducted**
A. FRUITS		
1. Mango	**210**	**210**
2. Banana	200	200
3. Guava	90	90
4. Lemon	80	80
5. Jack	70	70
6. Orange	40	40
7. Grapes	70	70
8. Pineapple	20	20
Sub Total	**780**	**780**
B. VEGETABLES		
1. Tomato	120	120
2. Brinjal	130	130
3. Lady's Finger	70	70
4. Cabbage	50	50
5. Sweet Potato	50	50
Sub Total	**420**	**420**
GRAND TOTAL (A+B)	**1200**	**1200**

PART II

CONCEPT AND DEFINITION

The concept and definition used in this survey are detailed below:

BEARING TREE

Bearing tree is defined as a tree of fruit bearing age, which had either borne fruits any time in the past or during the season.

NON BEARING TREE

Young tree which does not show flower or has not attained bearing age at the time of enumeration (or) tree which has reached the bearing age, but not found bearing fruit during the season, due to disease, old age, etc., are classified as non-bearing tree.

GARDEN

A garden is defined as a piece of land with a minimum number of 9 fruit trees planted in an order.

PURE GARDEN

A pure garden is defined as one which has 100% of the selected fruit crop trees.

MIXED GARDEN

It is the garden where more than 10 percent but less than 90 percent of the selected fruit trees are grown with other crops including perennial crops in the same garden.

REPORTING AND NON–REPORTING VILLAGES

Reporting villages are the villages having recorded area in the Adangal for the crop selected for the Survey. Non reporting villages are those where no area is recorded in the Adangal for the crop selected for the survey.

PART III

ESTIMATION PROCEDURE OF FRUIT TREE CROPS

(Crops: Mango, Jack, Guava and Citrus Fruits)

Estimation of Number of Trees

If N_{ij} - Total No. of villages growing the crop in the 'i^{th}' stratum

n_i - No. of villages selected for tree enumeration in the 'i^{th}' stratum

A_i - Total area under the crop in the 'i^{th}' stratum as per "G" Return

a_{ij} - Area under the crop in the 'j^{th}' selected village of "i^{th}" stratum

t_{ij} - No. of trees enumerated in the "j^{th}" selected village of 'i^{th}' stratum

b_{ij} - No. of bearing trees enumerated in the "j^{th}" selected village of 'i^{th}'stratum

R_{ni} - Average No. of trees per hectare in the 'i^{th}' stratum

$$= \sum_{j=1}^{n_i} t_{ij} \Big/ \sum_{j=1}^{n_i} a_{ij}$$

Estimated Total no of trees for the 'i^{th}' stratum (Tg)= R_{ni}*A_i

Ratio of bearing trees in the 'i^{th}'stratum = $\sum_{J=1}^{m} b_{ij} \Big/ \sum_{J=1}^{n_i} t_{ij}$

Estimated total no. of bearing trees in the 'i^{th}'stratum

$$(Bg)= \left[\sum_{J=1}^{mi} b_{ij} \Big/ \sum_{J=1}^{n_i} t_{ij} \right] \quad X \quad T_g$$

Estimation of Average yield per bearing tree

If m_{gi} = No. of Villages selected for yield estimation

B_{gi} = Total No. of bearing trees in the "j^{th}" selected village of "i^{th}" stratum.

Y_{gij} = Total yield of all the trees in the "j^{th}" selected village of "i^{th}" stratum

Estimated Average yield per bearing tree for the 'i^{th}' stratum (R_{mgi}) =

$$\sum_{J=1}^{mgi} Y_{g_{ij}} \Big/ \sum_{J=1}^{mgi} B_{g_{ij}}$$

Its variance is $V(G_{gi})$ =

$$\left\{ \frac{N_i - m_{g_i}}{(N_i) \times (m_{g_i})} \quad \frac{1}{(B_{g_i})^2} \right\} \times \frac{1}{m_{g_i} - 1} \times \sum_{J=1}^{m_{g_i}} (Y_{g_{ij}} - R_{m_{g_i}} \times B_{g_{ij}})^2$$

Percentage of sampling error = $\frac{\sigma}{R_{m_{gi}}} \times 100$

Where σ = $\frac{\sqrt{V(G_{g_i})}}{m_{g_i}}$

Estimation procedure of average yield of vegetable and other food crops (General Crop Estimation method)

If n_{ij} = No. of plots selected in the "j^{th}" village of "i^{th}" stratum

m_i = No. of villages selected in the "i^{th}" stratum

a_i = Area under the crop as per revenue record in the "ith" stratum

n_i = Total No. of plots selected in the "ith" stratum and considered for analysis

Y_{ijk} = Yield of 'kth' plot of 'jth' village in the 'ith'startum

L = No. of districts selected

Average yield per plot for "ith" stratum is $\overline{Y_i} = \sum_{k=1}^{n_{ij}} Y_{ijk} \Big/ \sum_{j=1}^{m_i} n_{ij}$

Estimation of average yield per plot for all the stratum covered =

$$\overline{Y} = \sum_{i=1}^{L} W_i \times \overline{Y_i} \qquad \text{Where } W_i = \sum_{i=1}^{L} a_i$$

Sampling error of the estimate

E = Mean SSBV / DF

(i.e.) the estimate of the mean square between villages

F = Mean SSWV / DF

(i.e.) the estimate of the mean square within villages9-10

$$V\left[\overline{Y}\right] = \frac{E \sim F \times \sum_{i=1}^{L} ai^2 \Big/ ni}{\sum_{i=1}^{L} ai^2}$$

E ~ F whichever is greater

PART IV

RESULTS OF THE SURVEY

SECTION-A

FRUITS

Estimates of number of Trees, Average Yield, and Production as per the survey are furnished below:

ESTIMATED NUMBER OF TREES, AREA, AVERAGE YIELD AND PRODUCTION

2012-2013

Crop	Estimated no. of trees			Area as per Season and Crop Report (in ha.)	Estimated Average yield (kg./ha.)	Estimated Production (Tones)
	Bearing	Non-Bearing	Total			
Mango	18531061	817678	19348739	144509	8230	1189270
Banana	-	-	-	106016	36879	3909764
Guava	1705878	38877	1744756	8114	8162	66230
Lemon	2172290	216430	2388720	8834	1853	16366
Jack	288289	43173	331463	2936	11852	34797
Orange	483682	88834	572516	1965	3138	6167
Grapes	-	-	-	2356	16270	38331
Pineapple	-	-	-	758	30178	22875

MANGO

Mango is one of the most important fruit crops of the State and it is predominantly grown in Dharmapuri, Dindigul, Vellore and Tiruvallur Districts. During the year 2012-13 under mango, 105 villages were selected for conducting experiments. The district wise number of experiments planned / conducted estimated total number of trees and production estimates for 2012-13 are furnished below.

NUMBER OF EXPERIMENTS PLANNED, CONDUCTED, BEARING AND NON- BEARING TREES (MANGO)

Sl. No.	District	No. of Experiments		Estimated no. of Trees		
		Planned	Conducted	Bearing	Non Bearing	Total
1	KANCHEEPURAM	10	10	415315	1732	417046
2	THIRUVALLUR	20	20	2145677	77708	2223385
3	VELLORE	20	20	2842696	55965	2898661
4	SALEM	10	10	710315	53402	763716
5	DHARMAPURI	20	20	1556436	41293	1597729
6	COIMBATORE	10	10	442600	4837	447438
7	TIRUCHIRAPPALLI	10	10	260080	46659	306739
8	NAGAPATTINAM	10	10	431154	13358	444513
9	MADURAI	10	10	634418	98386	732804
10	THENI	20	20	981003	58932	1039935
11	DINDIGUL	20	20	1721789	131888	1853677
12	VIRUDHUNAGAR	10	10	253714	70990	324704
13	TIRUNELVELI	10	10	695703	23938	719641
14	KRISHNAGIRI	30	30	5440160	138590	5578750
	STATE	210	210	18531061	817678	19348739

The estimated total number of mango trees for the State during 2012-13 was 193.49 lakhs of which 95.77 percent were bearing trees. Out of 185.31 lakhs bearing trees in the State Krishnagiri district stood first with 54.40 lakh trees, followed by 28.43 lakh trees in Vellore district, 21.46 lakh trees in Thiruvallur district and 17.22 lakh trees in Dindigul district.

ESTIMATED PRODUCTION AND YIELD OF MANGO CROP

Sl. No.	District	Area as per Season and Crop Report (in ha.)		Estimated Average Yield (kg./ha)		Estimated production (in tonnes)	
		2012-13	2011-12	2012-13	2011-12	2012-13	2011-12
1	Kancheepuram	3254	3428	7413	5607	24122	19221
2	Thiruvallur	10648	10612	11894	3305	126646	35070
3	Vellore	12630	12409	12352	3352	156009	41589
4	Salem	5406	4856	3178	1557	17179	7561
5	Dharmapuri	10498	11332	8426	6949	88460	78746
6	Krishnagiri	37029	34164	4374	3997	161953	136539
7	Coimbatore	2421	2606	3477	5593	8418	14576
8	Thiruchirapalli	2447	2438	4355	8166	10658	19908
9	Nagapattinam	2902	-	4612	-	13384	-
10	Madurai	6887	7067	1658	1383	11419	9772
11	Theni	9501	9405	5585	4872	53059	45823
12	Dindugul	15928	15624	22468	7313	357875	114253
13	Virudhunagar	2953	2791	3434	3139	10142	8762
14	Thirunelveli	6194	6099	3201	2183	19825	13315
	STATE	144509	141140	8230	4438	1189270	626392

The area under mango crop as per Season and Crop Report for the year 2012-13 was at 144509 hectare as against 141140 hectare in 2011-12 with an increase of 2.39 percent over the year 2011-12.

The estimated average yield per hectare for the State came to 8230 kg during 2012-13 as against 4438 kg. in 2011-12, the increase in yield rate being 85.43 percent.

The total production of mango during 2012-13 was 1189270 tonnes as against 626392 tonnes in 2011-12. There was an increase of 89.86 percent due to increase in yield.

BANANA

District wise number of experiments planned, conducted and yield estimates are given in the table below:

NUMBER OF EXPERIMENTS, AND YIELD ESTIMATES

Sl. No.	District	No. of Experiments		Area as per Season and Crop Report (in ha)		Estimation Average Yield (kg./ha)		Estimated production (in tonnes)	
		Planned	Conducted	2012-13	2011-12	2012-13	2011-12	2012-13	2011-12
1	Cuddalore	10	10	3982	4133	49752	23572	198112	97421
2	Vellore	10	10	5782	6179	20138	48156	116438	297556
3	Tiruvannamalai	10	10	3053	-	36873	-	112574	-
4	Coimbatore	20	20	8351	8634	34142	39367	285123	339894
5	Erode	30	30	12098	5246	36694	30377	443923	159356
6	Thiruchirappalli	20	20	8870	8767	51545	55149	457200	483495
7	Karur	10	10	4036	4812	25628	44101	103436	212215
8	Thanjavur	10	10	3087	3212	39883	37758	123118	121277
9	Pudukottai	10	10	2505	3123	36495	66217	91420	206796
10	Theni	10	10	6010	5767	72453	78681	435441	453756
11	Dindugul	10	10	5439	5307	25853	24669	140615	130919
12	Thirunelveli	20	20	8627	8854	22748	23939	196248	211954
13	Thoothukudi	20	20	9758	9586	40593	64852	396107	621672
14	Kanyakumari	10	10	6396	5982	22729	27255	145374	163039
15	Tiruppur	-	-	-	3057	-	36768		112400
	STATE	**200**	**200**	**106016**	**103112**	**36879**	**43695**	**3909764**	**4505435**

Thoothukudi, Theni, Thiruchirapalli, Coimbatore, Erode, Vellore, Kanyakumari and Thirunelveli are the main banana producing districts in the State. The area covered under banana as per Season and Crop Report for the year 2012-13 stood at

106016 hectare as against 103112 hectare in 2011-12 the increase being of 2.82 percent.

The estimated average yield rate per hectare worked out to 36879 kg. in 2012-13 as against 43695 kg. in 2011-12. The decrease in the yield rate was 15.60 percent.

The estimated production for the year 2012-13 was put at 3909764 tonnes as against 4505435 tonnes in 2011-12 the decrease being 13.22 percent.

GUAVA

ESTIMATED PRODUCTION AND YIELD OF GUAVA CROP

Sl. No.	District	Area as per Season and Crop Report (in ha.)		Estimated Average Yield (kg./ha)		Estimated production (in tonnes)	
		2012-13	**2011-12**	**2012-13**	**2011-12**	**2012-13**	**2011-12**
1	Cuddalore	536	611	1747	659	936	403
2	Villupuram	399	451	3572	4059	1425	1830
3	Vellore	657	523	1809	4867	1188	2546
4	Madurai	924	885	968	1895	894	1677
5	Dindigul	1769	1249	18988	9901	33591	12366
6	Virudhunagar	673	694	6561	6374	4415	4424
7	Tirunelveli	379	374	2936	4964	1113	1857
	STATE	**8114**	**7718**	**8162**	**5244**	**66230**	**40471**

Guava crop is mainly grown in the districts of Dindigul, Virudhunagar, Cuddalore, Madurai, Vellore and Tirunelveli and Villupuram. The estimated total number of trees for 2012-13 stood at 1744756 out of which 97.77 percent trees are bearing trees.

The area under guava for 2012-13 was at 8114 hectares as against 7718 hectares in 2011-12 which shows an increase of 5.13 percent.

The estimated average yield per hectare was put at 8162 kg. in 2012-13 as against 5244 kg in 2011-12, the yield increased by 55.64 percent.

The estimated production for the year 2012-13 was at 66230 tonnes as against 40471 tonnes in 2011-12 recording an increase of 63.65 percent.

Sl. No.	District	Estimated no. of Trees - Orange		
		Bearing	Non Bearing	Total
1	Cuddalore	159685	16380	176065
2	Villupuram	105800	1500	107300
3	Vellore	135232	5804	141036
4	Madurai	171253	10768	182021
5	Dindigul	937672	1658	939330
6	Virudhunagar	133126	393	133519
7	Tirunelveli	63110	2374	65484
	STATE	1705878	38877	1744756

LEMON

ESTIMATED PRODUCTION AND YIELD OF LEMON CROP

Sl. No.	District	Area as per Season and Crop Report (in ha.)		Estimated Average Yield (kg./ha)		Estimated production (in tonnes)	
		2012-13	2011-12	2012-13	2011-12	2012-13	2011-12
1	Tiruchy	899	895	1139	4967	1024	4445
2	Perambalur	293	308	2643	1549	774	477
3	Dindigul	3082	2348	2430	2302	7490	5405
4	Virudhunagar	298	296	1255	1338	374	396
5	Tirunelveli	2370	2235	1688	1546	3999	3454
6	Theni	481	336	190	1092	91	367
	STATE	**8834**	**7794**	**1853**	**2266**	**16366**	**17664**

The main lemon growing districts in the State are Dindugul, Thirunelveli and Thiruchirappalli. The estimated number of trees for 2012-13 was put at 23.89 lakhs, out of which 90.94 percent are bearing trees.

Sl. No.	District	Estimated no. of Trees - Lemon		
		Bearing	Non Bearing	Total
1	TIRUCHIRAPPALLI	196191	4663	200854
2	PERAMBALUR	59025	8917	67942
3	THENI	44993	3667	48659
4	DINDIGUL	1163624	82674	1246298
5	VIRUDHUNAGAR	38924	3592	42516
6	TIRUNELVELI	669533	112918	782451
	STATE	2172290	216430	2388720

The area for 2012-13 was at 8834 hectare as against 7794 hectare in 2011-12 which showed an increase of 13.34 percent.

The estimated yield rate per hectare worked out to is 1853 kg. in 2012-13 as against 2266 kg. 2011-12 showing a decrease of 18.23 percent .

The estimated production for the State during the year 2012-13 was at 16366 tonnes as against 17664 tonnes in 2011-12 the decrease being 7.35 percent.

JACK FRUIT

ESTIMATED PRODUCTION AND YIELD OF JACKFRUIT CROP

Sl. No.	District	Area as per Season and Crop Report (in ha.)		Estimated Average Yield (kg./ha)		Estimated production (in tonnes)	
		2012-13	2011-12	2012-13	2011-12	2012-13	2011-12
1	Cuddalore	682	850	10831	0	7387	0
2	Namakkal	254	119	7069	9889	1795	1177
3	Pudukottai	144	144	15515	17718	2234	2551
4	Kanyakumari	650	656	17391	4137	11304	2714
5	Ariyalur	108	104	1440	1586	156	165
6	Dindigul	429	356	9304	12307	3991	4381
	STATE	2936	**2868**	11852	**4930**	34797	**14139**

Districts such as Cuddalore, Dindugul and Kanniyakumari are the main Jackfruit growing districts in the State. The total number of trees estimated for 2012-13 was at 3.31 lakhs and the percentage of bearing trees worked out to 86.97 percent.

The area as per the Season and Crop Report was put at 2936 hectares in 2012-13 as against 2868 hectares in 2011-12, showing an increase of 2.37 percent.

The estimated yield rate per hectare was calculated at 11852 kg. in 2012-13 as against 4930 kg in 2011-12. It showed an increase of 140.41 percent.

The estimated production for 2012-13 stood at 34797 tonnes as against 14139 tonnes in 2011-12. There was an increase of 146.11 percent due to the increase in area and yield rate.

Sl. No.	District	Estimated no. of Trees- Jackfruit		
		Bearing	Non Bearing	Total
1	CUDDALORE	92656	14122	106778
2	NAMAKKAL	40087	864	40951
3	PUDUKOTTAI	20084	14779	34863
4	DINDIGUL	39252	0	39252
5	KANYAKUMARI	87529	12178	99707
6	ARIYALUR	8681	1230	9911
	STATE	288289	43173	331463

ORANGE

ESTIMATED PRODUCTION AND YIELD OF ORANGE CROP

Sl. No.	District	Area as per Season and Crop Report (in ha.)		Estimated Average Yield (kg./ha)		Estimated production (in tonnes)	
		2012-13	2011-12	2012-13	2011-12	2012-13	2011-12
1	Salem	22	24	11154	10878	245	261
2	Dindigul	1758	1652	3099	1653	5448	2731
3.	Nilgiris	65	44	1488	1473	97	65
	STATE	**1965**	**1847**	**3138**	**1777**	**6167**	**3282**

Salem, Dindugul and The Nilgiris are major Orange growing districts in the State.The total number of trees was estimated at 5.73 lakhs for 2012-13 and the percentage of bearing trees worked out to 84.48 percent.

The area as per the Season and Crop Report was at 1965 hectares for 2012-13 as against 1847 hectares in 2011-12, which showed an increase of 6.39 percent.

The estimated yield rate per hectare was put at 3138 kg. in 2012-13 was as against 1777 kg. in 2012-13, which showed an increase of 76.59 percent in the yield rate.

The State production for 2012-13 was estimated at 6167 tonnes as against 3282 tonnes in 2011-12. The increase in the production of orange was 87.90 percent.

Sl. No.	District	Estimated no. of Trees – Orange		
		Bearing	Non Bearing	Total
1	SALEM	4463	361	4824
2	DINDIGUL	448094	67847	515941
3	THE NILGIRIS	31125	20625	51750
	STATE	483682	88834	572516

GRAPES

ESTIMATED PRODUCTION AND YIELD OF GRAPES CROP

Sl. No.	District	Area as per Season and Crop Report (in ha.)		Estimated Average Yield (kg./ha)		Estimated production (in tonnes)	
		2012-13	2011-12	2012-13	2011-12	2012-13	2011-12
1	Coimbatore	203	217	17607	15773	3574	3423
2	Theni	1779	1921	16603	14863	29536	28553
3	Dindigul	237	211	12624	19020	2992	4013
	STATE	**2356**	**2484**	**16270**	**15321**	**38331**	**38057**

Grapes are mainly cultivated in Theni, Coimbatore and. Dindigul districts. The area as per Season and Crop Report worked out to is 2356 hectares in 2012-13 as against 2484 hectares in 2011-12, the decrease being 5.15 percent.

The estimated yield rate per hectare was put at 16270 kg. in 2012-13 as against 15321 kg in 2011-12, an increase of 6.19 percent.

The estimated production was 38331 tonnes in 2012-13 as against 38057 tonnes in 2011-12, the increase being 0.72 percent due to increase in yield rate.

PINEAPPLE

ESTIMATED PRODUCTION AND YIELD OF PINEAPPLE CROP

Sl. No.	District	Area as per Season and Crop Report (in ha.)		Estimated Average Yield (kg./ha)		Estimated production (in tonnes)	
		2012-13	2011-12	2012-13	2011-12	2012-13	2011-12
1.	Namakkal	662	501	30178	30291	19978	15176
	STATE	**758**	**603**	**30178**	**30291**	**22875**	**18265**

Namakkal is the major Pineapple growing district in the State.The area as per the Season and Crop Report was at 758 hectares in 2012-13 as against 603 hectares in 2011-12 showing an increase of 25.70 percent.

The estimated yield rate per hectare stood at 30178 kg. in 2012-13 as against 30291 kg. in 2011-12 the decrease being 0.37 percent.

The estimated production was at 22875 tonnes in 2012-13 as against 18265 tonnes in 2011-12 the increase being 25.24 percent. The increase was due to the increase in area.

SECTION – B

VEGETABLES

Area as per Season and Crop Report, estimated average yield and Production of Vegetables in Tamil Nadu during the year 2011-12 are furnished below :-

AREA, ESTIMATED AVERAGE YIELD AND PRODUCTION

Sl. No.	Crop	Area as per Season and Crop Report (in Ha.)	Estimated Average Yield (Kg./Ha.)	Estimated Production (Tonnes)
1	Cabbage	1547	57784	89393
2	Brinjal	9174	9228	84662
3	Lady's Finger	7434	7962	59191
4	Sweet Potato	304	19928	6058
5	Tomato	21090	14228	300068

CABBAGE

ESTIMATED PRODUCTION AND YIELD OF CABBAGE CROP

Sl. No.	District	Area as per Season and Crop Report (in ha.)		Estimated Average Yield (kg./ha)		Estimated production (in tonnes)	
		2012-13	2011-12	2012-13	2011-12	2012-13	2011-12
1	Theni	181	158	40261	44937	7287	7100
2	Nilgiris	313	640	47753	55202	14947	35329
3	Krishnagiri	827	843	65417	67627	54100	57010
	STATE	**1547**	**1888**	**57784**	**60597**	**89393**	**114406**

Cabbage is mostly being cultivated in The Nilgiris, Krishnagiri and Theni District of Tamil Nadu. The area under this crop as per Season and Crop Report is 1547 hectares in 2012-13 as against 1888 hectares in 2011-12. There was a decrease of 18.06 percent.

The estimated average yield per hectare worked out to 57784 kg. in 2012-13 as against 60597 kg. in 2011-12, decrease being 4.64 percent.

The estimated production for the year 2012-13 was worked out at 89393 tonnes as against 114406 tonnes in 2011-12, with a decrease being 21.86 percent due to decrease in area and yield.

BRINJAL

ESTIMATED PRODUCTION AND YIELD OF BRINJAL CROP

Sl. No.	District	Area as per Season and Crop Report (in ha.)		Estimated Average Yield (kg./ha)		Estimated production (in tones)	
		2012-13	2011-12	2012-13	2011-12	2012-13	2011-12
1.	Cuddalore	207	-	16488	-	3413	-
2	Vellore	1004	965	6831	6369	6859	6146
3	Salem	1318	1599	4574	7263	6030	11614
4	Coimbatore	320	341	6864	10899	2196	3716
5	Madurai	334	412	9413	12427	3144	5120
6	Dindigul	668	-	3312	-	2212	-
7	Tirunelveli	-	389	-	13053	-	5078
8	Krishnagiri	915	469	11581	13347	10596	6260
9	Dharmapuri	536	848	27013	16833	14479	14274
10	Tirupur	-	291	-	14850	-	4321
	STATE	**9174**	**9462**	**9228**	**10638**	**84662**	**100654**

Brinjal is mainly cultivated in Vellore, Salem, Coimbatore, Madurai Tirupur, Tirunelveli, Dharmapuri and Krishnagiri districts.As per the Season and Crop Report the area under Brinjal worked out to 9174 hectares in 2012-13 as against 9462 hectares in 2011-12, there being a decrease of 3.04 percent.

The estimated average yield rate per hectare stood at 9228 kg in 2012-13 as against 10638 kg. in 2011-12 showing an decrease of 13.25 percent.

The estimated production was put at 84662 tonnes in 2012-13 as against 100654 tonnes in 2011-12. Due to decrease in area and yield rate, production had decreased by 15.89 percent.

LADY'S FINGER

ESTIMATED PRODUCTION AND YIELD OF LADY'S FINGER CROP

Sl. No.	District	Area as per Season and Crop Report (in ha.)		Estimated Average Yield (kg./ha)		Estimated production (in tonnes)	
		2012-13	2011-12	2012-13	2011-12	2012-13	2011-12
1	Vellore	885	822	7991	7452	7072	6126
2	Salem	1767	1730	6735	6903	11901	11943
3	Namakkal	171	-	12672	-	2167	-
4	Coimbatore	316	372	7489	11703	2366	4354
5	Madurai	417	-	9695	-	4043	-
6	Dindigul	555	541	9339	7397	5183	4002
7	Tirunelveli	-	286	-	9200	-	2631
8	Dharmapuri	-	719	-	13675	-	9832
	STATE	**7434**	**7662**	**7962**	**8700**	**59191**	**66656**

Lady's finger crop is mainly cultivated in Vellore, Salem, Dharmapuri, Coimbatore and Dindigul districts. The area under this crop as per Season and Crop Report was at 7434 hectares in 2012-13 as against 7662 hectares in 2011-12 exhibiting a decrease of 2.98 percent.

The estimated yield per hectare was put at 7962 kg. in 2012-13 as against 8700 kg. in 2011-12 the decrease being 8.48 percent.

The estimated production was at 59191 tonnes in 2012-13 as against 66656 tonnes in 2011-12, the decrease being 11.20 percent. The decrease in area and yield rate reflects the decrease in production.

SWEET POTATO

ESTIMATED PRODUCTION AND YIELD OF SWEET POTATO CROP

Sl. No.	District	Area as per Season and Crop Report (in ha.)		Estimated Average Yield (kg./ha)		Estimated production (in tonnes)	
		2012-13	2011-12	2012-13	2011-12	2012-13	2011-12
1	Villupuram	58	30	13526	12550	785	377
2	Dharmapuri	18	13	29574	22748	532	296
3	Karur	23	67	28523	20825	656	1395
4	Virudhunagar	-	22	-	28969	-	637
	STATE	**304**	**390**	**19928**	**20491**	**6058**	**7991**

The Sweet Potato crop is mainly grown in Dharmapuri, Villupuram and Karur districts in the State. The area under this crop as per the Season and Crop Report was put at 304 hectares in 2012-13 as against 390 hectares in 2011-12, which displayed a decrease of 22.05 percent.

The estimated yield per hectare worked out to 19928 kg. in 2012-13 as against 20491 kg in 2011-12 which depicted a decrease of 2.75 percent.

The estimated production for the year 2012-13 stood at 6058 tonnes as against 7991 tonnes in 2011-12. A decrease of 24.19 percent was due to decrease in area.

TOMATO

ESTIMATED PRODUCTION AND YIELD OF TOMATO CROP

Sl. No.	District	Area as per Season and Crop Report (in ha.)		Estimated Average Yield (kg./ha)		Estimated production (in tonnes)	
		2012-13	2011-12	2012-13	2011-12	2012-13	2011-12
1	Vellore	1023	1008	7402	6087	7572	6136
2	Salem	2528	3603	7071	9165	17876	33021
3	Dharmapuri	2699	3137	34602	17035	93390	53439
4	Coimbatore	2215	2341	8968	12790	19864	29942
5	Theni	1654	2073	12169	9236	20128	19145
6	Dindigul	1898	1644	9403	8946	17847	14708
7	Krishnagiri	5707	4168	14233	15566	81230	64880
8	Tirupur	1208	1638	9484	9403	11457	15402
	STATE	**21090**	**21972**	**14228**	**12068**	**300068**	**265153**

Tomato crop is mainly cultivated in Krishnagiri, Dharmapuri, Coimbatore, Salem, Dindugul and Theni districts in Tamil Nadu. The area under this crop as per the Season and Crop Report worked out to is 21090 hectares in 2012-13 as against 21972 hectares in 2011-12, with a decrease of 4.01 percent.

The estimated yield per hectare worked out to 14228 kg. in 2012-13 as against 12068 kg. in 2011-12, showing an increase of 17.90 percent.

The estimated total production was put at 300068 tonnes in 2012-13 as against 265153 tonnes in 2011-12, showing an increase of 13.17 percent.

PART - V
5.1 AREA, YIELD AND PRODUCTION – A COMPARISON

CROP	Area (ha.)			Average Yield (tonnes/ha.)			Production (tonnes)		
	2012-13	2011-12	% Vari -tion	2012-13	2011-12	% Vari -tion	2012-13	2011-12	% Vari -tion
Fruits									
Mango	144509	141140	2.39	8.230	4.438	85.44	1189270	626392	89.86
Banana	106016	103112	2.82	36.879	43.695	-15.60	3909764	4505435	-13.22
Guava	8114	7718	5.13	8.162	5.244	55.64	66230	40471	63.65
Lemon	8834	7794	13.34	1.853	2.266	-18.23	16366	17664	-7.35
Jackfruit	2936	2868	2.37	11.852	4.930	140.41	34797	14139	146.11
Orange	1965	1847	6.39	3.138	1.777	76.59	6167	3282	87.90
Grapes	2356	2484	-5.15	16.270	15.321	6.19	38331	38057	0.72
Pineapple	758	603	25.70	30.178	30.291	-0.37	22875	18265	25.24
Vegetables									
Tomato	21090	21972	-4.01	14.228	12.068	17.90	300068	265153	13.17
Brinjal	9174	9462	-3.04	9.228	10.638	-13.25	84662	100654	-15.89
Lady's Finger	7434	7662	-2.98	7.962	8.700	-8.48	59191	66656	-11.20
Cabbage	1547	1888	-18.06	57.784	60.597	-4.64	89393	114406	-21.86
Sweet Potato	304	390	-22.05	19.928	20.491	-2.75	6058	7991	-24.19

The results of the survey reveals that the average yields of banana, lemon and pineapple have shown a negative trend whereas mango, guava, jack, grapes and orange have shown a positive trend during 2012-13. In respect of vegetable crops like brinjal, lady'sfinger, cabbage and sweet potato have shown a decline of average yield whereas tomato only showed an upward trend.

Majority of the fruit items of production, viz. mango, guava, jack, orange, grapes and pineapple showed a positive trend whereas the vegetable items like brinjal, lady'finger cabbage and sweet potato have shown a negative trend. Tomato alone showed a positive trend.

PART VI

Time Series data on Area, Estimated Average yield and Production of fruits and vegetables

AREA OF FRUITS AND VEGETABLE CROPS FROM 2003-2004 TO 2012-13

(in ha.)

	CROP	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
A	**FRUITS**										
1	Mango	114926	118444	125104	125856	128221	130012	132697	139496	141140	144509
2	Banana	71088	81498	94648	105206	112793	115804	113681	107394	103112	106016
3	Guava	8274	8066	8453	7792	7141	7050	7017	7498	7718	8114
4	Lemon	7932	8124	8146	7964	7767	7409	7463	7484	7794	8834
5	Jack	2687	2773	2911	2919	2955	2910	2926	3058	2868	2936
6	Orange	2718	2580	2151	2139	2004	2089	2039	2067	1847	1965
7	Grapes	2484	2475	2611	2581	2607	2532	2546	2463	2484	2356
8	Pineapple	735	446	653	634	692	581	500	809	603	758
B	**VEGETABLES**										
1	Tomato	22214	25306	21995	22433	22924	22751	23792	22087	21972	21090
2	Brinjal	9034	7958	7107	6059	6331	7275	6912	7871	9462	9174
3	Lady's Finger	5465	4949	4778	3578	3853	5054	5224	6229	7662	7434
4	Cabbage	1181	1393	1619	2313	2240	1250	2154	2222	1888	1547
5	Sweet Potato	1039	1397	1417	1127	1088	658	778	496	390	304

ESTIMATED AVERAGE YIELD OF FRUITS AND VEGETABLE CROPS FROM 2003-2004 TO 2012-13

(in tonnes/ha.)

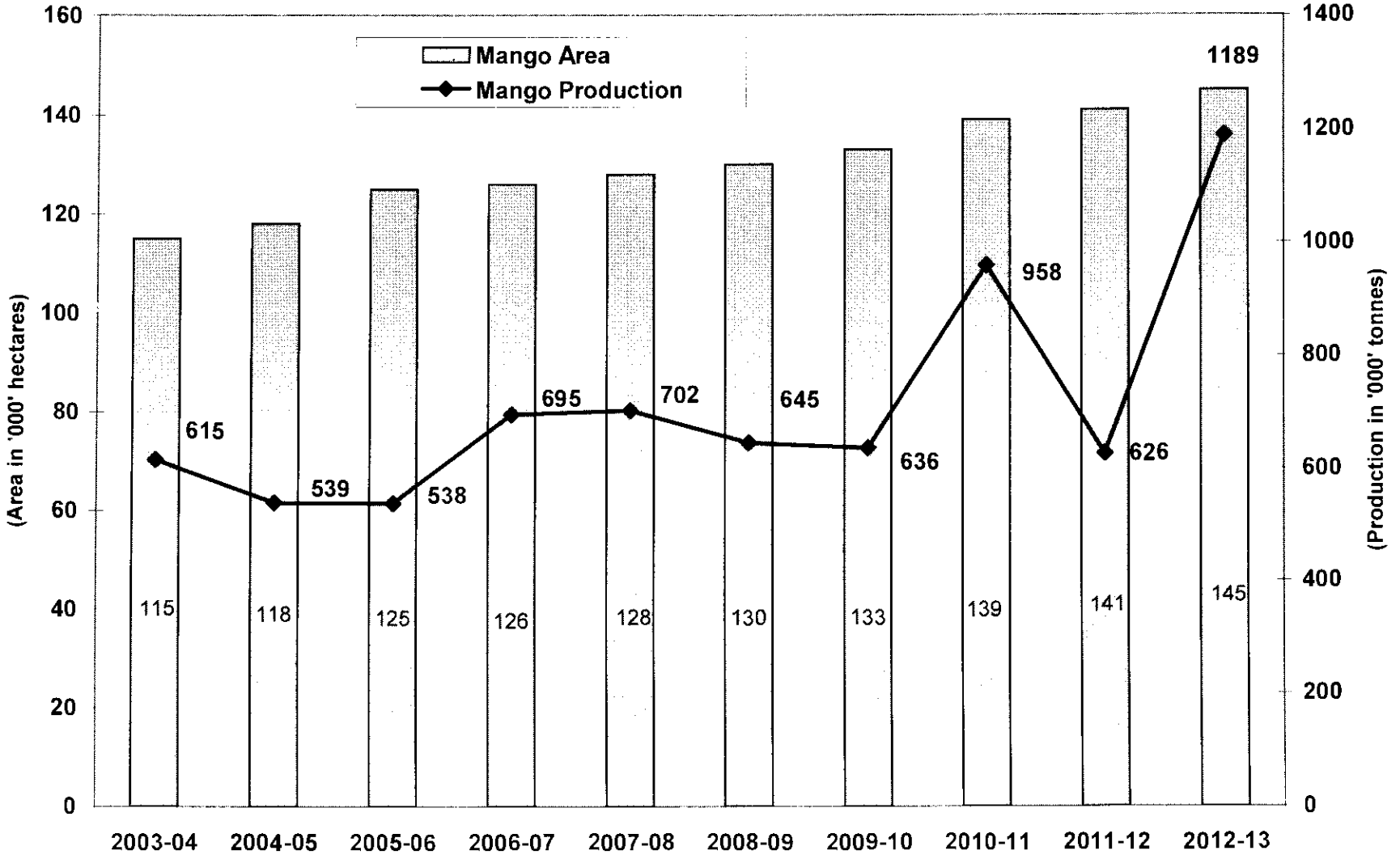
	CROP	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
A	**FRUITS**										
1	Mango	5.354	4.554	4.299	5.519	5.477	4.958	4.795	6.867	4.438	8.230
2	Banana	35.375	42.477	49.104	48.965	47.741	44.453	42.996	44.700	43.695	36.879
3	Guava	7.021	7.995	10.904	11.031	13.603	12.074	13.186	9.109	5.244	8.162
4	Lemon	1.044	1.619	2.523	2.583	2.986	2.788	2.933	4.488	2.266	1.853
5	Jack	9.662	8.943	12.346	13.848	14.749	13.238	13.475	15.117	4.930	11.852
6	Orange	1.962	1.718	1.962	2.021	2.277	1.965	2.057	1.730	1.777	3.138
7	Grapes	24.112	28.176	32.486	29.815	28.921	17.938	17.338	16.333	15.321	16.270
8	Pineapple	31.371	32.922	33.156	33.076	37.866	36.993	36.052	41.965	30.291	30.178
B	**VEGETABLES**										
1	Tomato	10.149	12.705	12.627	12.611	13.047	13.017	13.091	13.506	12.068	14.228
2	Brinjal	11.180	12.650	10.690	11.099	10.011	7.960	9.390	9.997	10.638	9.228
3	Lady's Finger	7.002	8.973	7.525	7.498	6.688	7.608	8.000	8.397	8.700	7.962
4	Cabbage	63.568	66.734	53.426	56.247	50.395	52.978	56.726	51.837	60.597	57.784
5	Sweet Potato	14.484	15.117	20.857	16.799	13.585	13.287	14.629	18.550	20.491	19.928

ESTIMATED PRODUCTION OF FRUITS AND VEGETABLE CROPS FROM 2003-2004 TO 2012-13

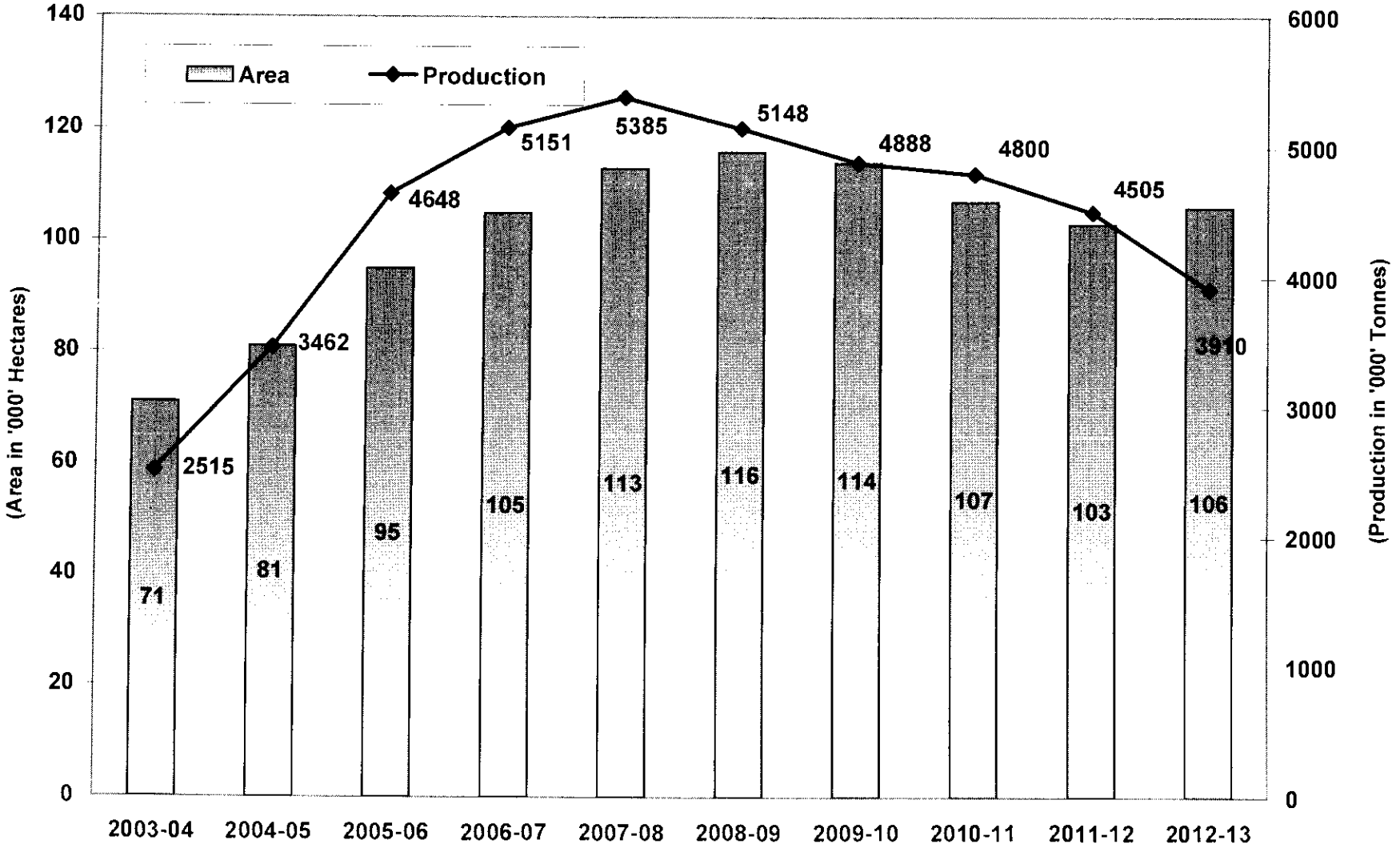
(in tonnes)

	CROP	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
A	**FRUITS**										
1	Mango	615370	539404	537780	694554	702260	644626	636330	957982	626392	1189270
2	Banana	2514729	3461788	4647637	5151394	5384825	5148134	4887841	4800473	4505435	3909764
3	Guava	58093	64489	92168	85952	97137	85124	92523	68299	40471	66230
4	Lemon	8282	13155	20551	20569	23190	20658	21886	33592	17663	16366
5	Jack	25962	24798	35939	40424	43585	38522	39427	46229	14139	34797
6	Orange	5334	4432	4215	4323	4562	4105	4194	3577	3282	6167
7	Grapes	59893	69736	84820	76953	75398	45418	44144	40230	38057	38331
8	Pineapple	23057	14683	21652	20970	26203	21493	18026	33949	18265	22875
B	**VEGETABLES**										
1	Tomato	225440	321519	277728	282912	299095	296142	311450	298315	265153	300068
2	Brinjal	100996	100673	75971	67247	63380	57917	64902	78685	100654	84662
3	Lady's Finger	38269	44410	35951	26829	25768	38449	41794	52302	66656	59191
4	Cabbage	75074	92961	86497	130099	112883	66223	122187	115181	114406	89393
5	Sweet Potato	15049	21118	29555	18933	14780	8743	11381	9201	7991	6058

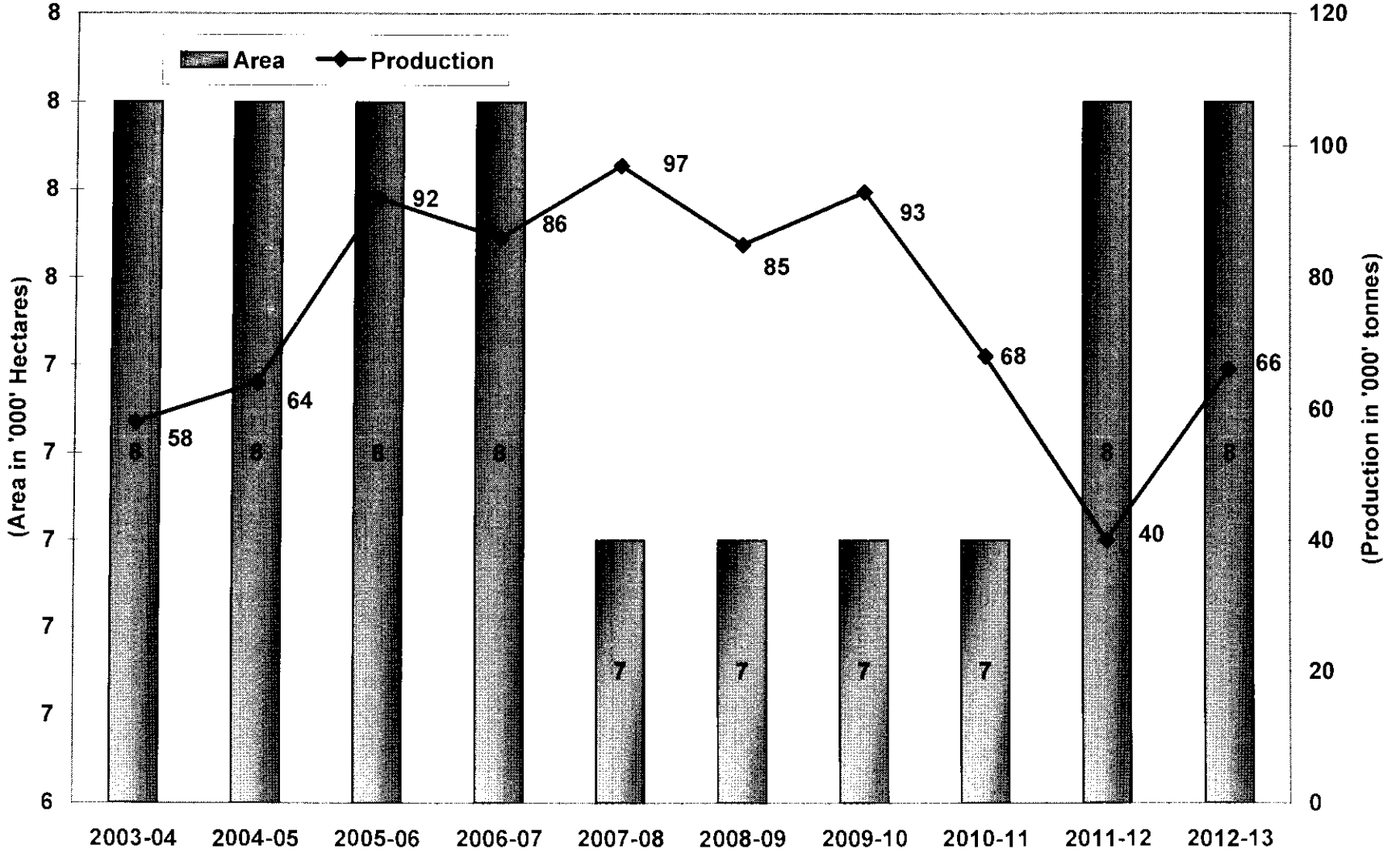
AREA AND PRODUCTION OF MANGO (2003-04 TO 2012-13)



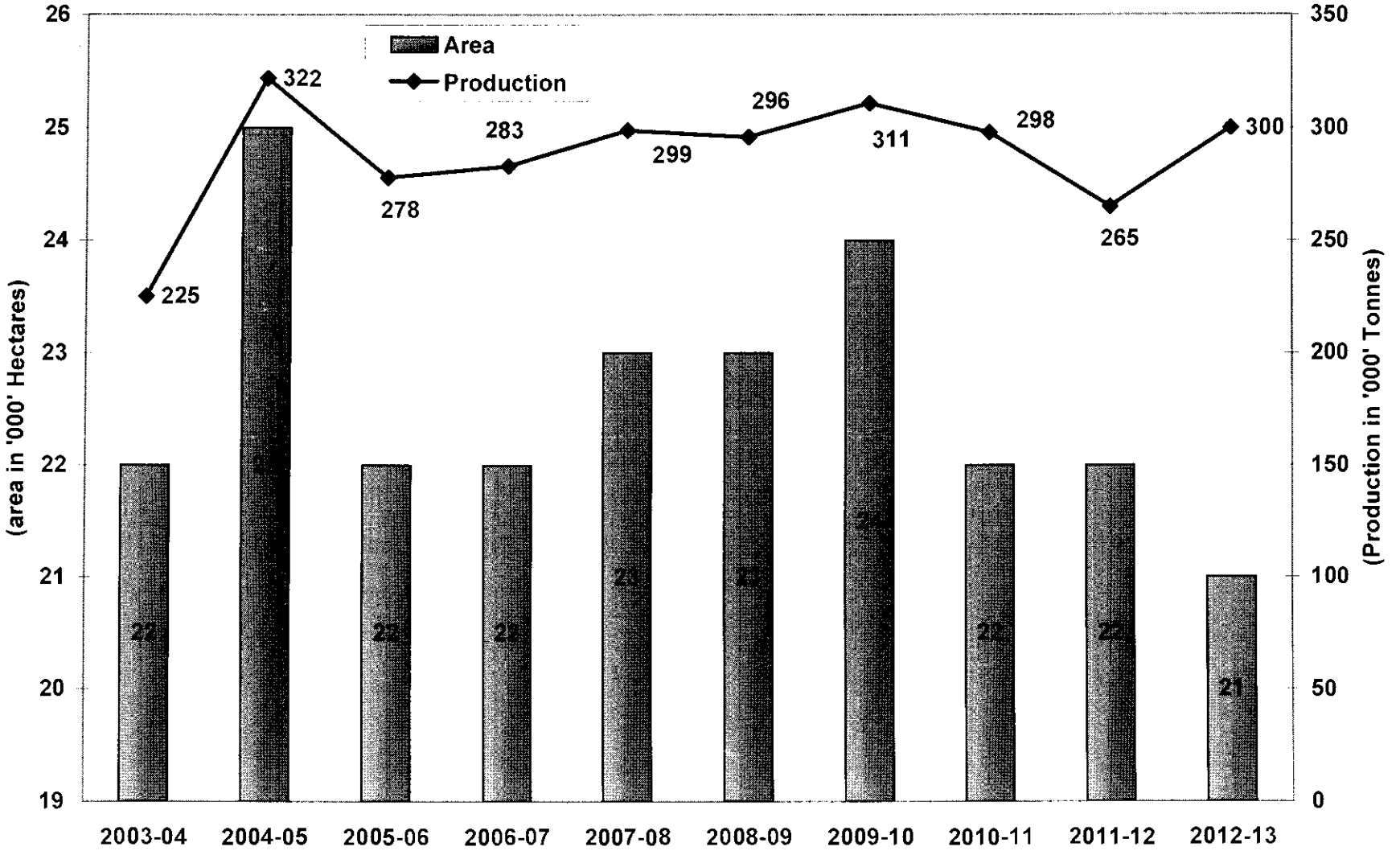
AREA AND PRODUCTION OF BANANA (2003-04 TO 2012-13)



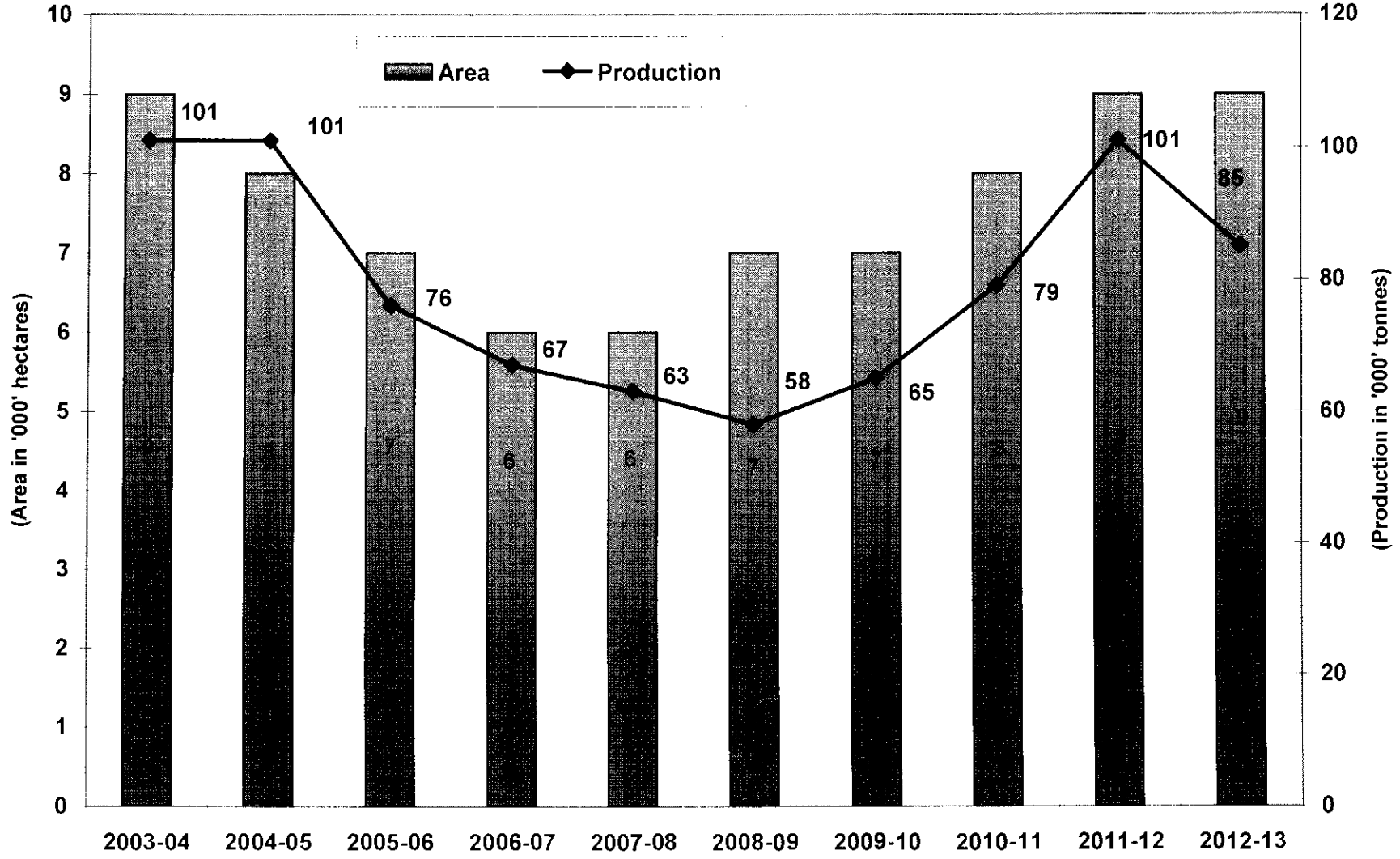
AREA AND PRODUCTION OF GUAVA (2003-04 TO 2012-13)



AREA AND PRODUCTION OF TOMATO (2003-04 TO 2012-13)



AREA AND PRODUCTION OF BRINJAL (2003-04 TO 2012-13)



AREA AND PRODUCTION OF LADY'SFINGER (2003-04 TO 2012-13)