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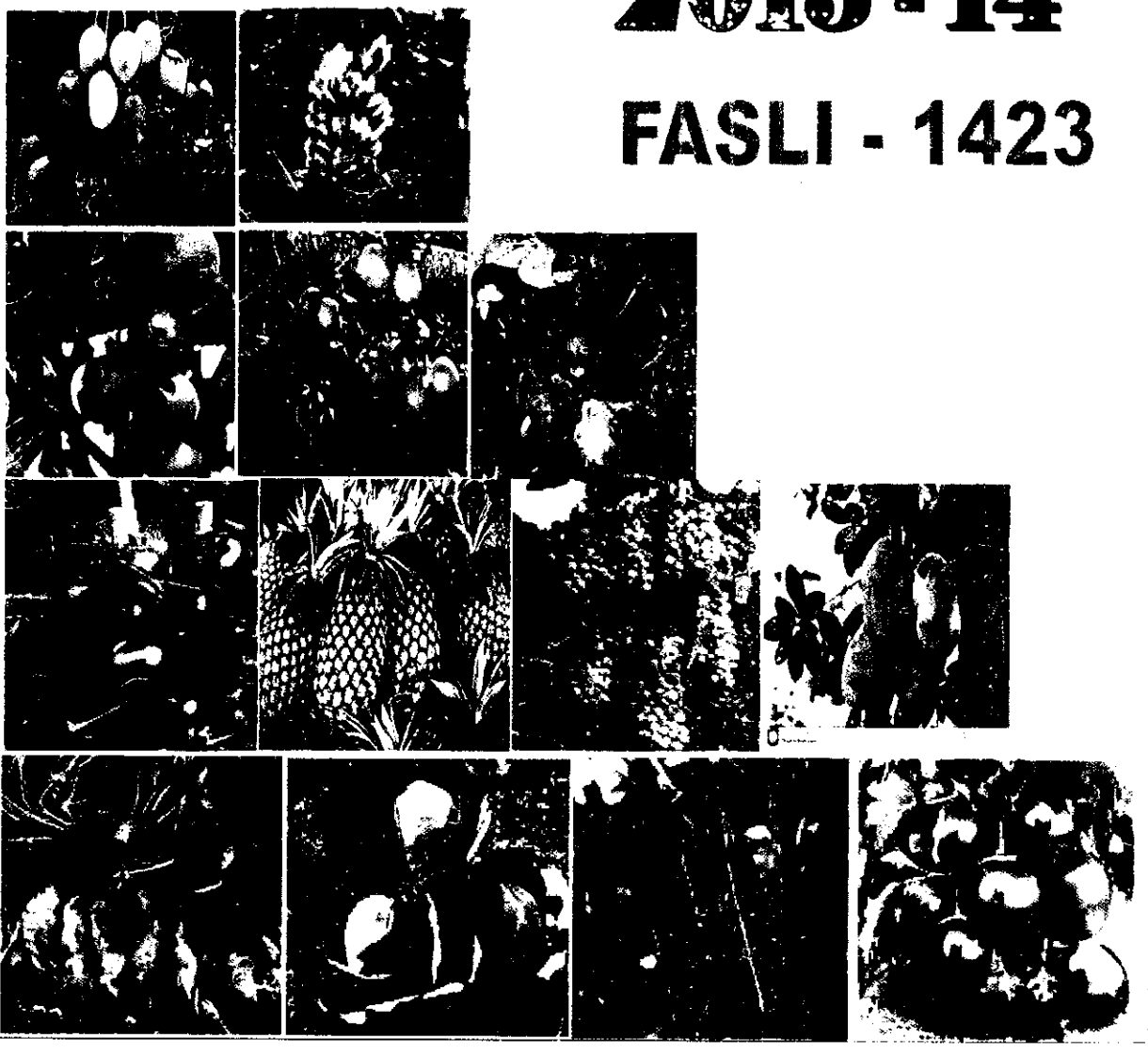
REPORT ON FRUITS AND VEGETABLES

2013 - 14

FASLI - 1423



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

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REPORT

ON

FRUITS AND VEGETABLES

TAMIL NADU

Fasli 1423 (2013-14)

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

PREFACE

Fruits and Vegetables contribute significantly to agricultural economy in terms of its value addition and employment generation. The Crop Estimation Survey on Fruits, Vegetables and other Minor Crops is 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 2013-14 have been presented in this report.

During the year 2013-14, 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.

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/- V.Iraianbu
Principal Secretary / Commissioner

Place: Chennai-6.

Date: 07.04.2015

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 good 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 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 Pot

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 stage 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 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 2013-14, 1232 experiments were planned in 616 villages. The following table shows the details of crop wise experiments planned.

Crop		No. of villages selected
A.	**Fruits**	
	1. Mango	**107**
	2. Banana	100
	3. Guava	47
	4. Lemon	40
	5. Jack	38
	6. Orange	20
	7. Grapes	35
	8. Pineapple	10
	Total	**397**
B.	**Vegetables**	
	1. Tomato	63
	2. Brinjal	71
	3. Lady's Finger	40
	4. Cabbage	25
	5. Sweet Potato	20
	Total	**219**
	Fruits and Vegetables Total	**616**

PLOT SIZE

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

		PLOT SIZE
A.	**FRUITS**	
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 Jun

COLLECTION OF DATA

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

SUPERVISION

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

RESPONSE

Survey was conducted in all the 1232 experiments planned for the y 2013-14.

The following table shows the number of experiments planned & conducted during 2013-14.

NUMBER OF EXPERIMENTS PLANNED AND CONDUCTED

Crop	No. of Experiments	
	Planned	Conducted
A. FRUITS		
1. Mango	**214**	214
2. Banana	200	200
3. Guava	94	94
4. Lemon	80	80
5. Jack	76	76
6. Orange	40	34
7. Grapes	70	70
8. Pineapple	20	20
Sub Total	**794**	**788**
B. VEGETABLES		
1. Tomato	126	126
2. Brinjal	142	142
3. Lady's Finger	80	80
4. Cabbage	50	50
5. Sweet Potato	40	40
Sub Total	**438**	438
GRAND TOTAL (A+B)	**1232**	1226

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 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 'ith' stratum

n_i - No. of villages selected for tree enumeration in the 'ith' stratum

A_i - Total area under the crop in the 'ith' stratum as per "G" Return

a_{ij} - Area under the crop in the 'jth' selected village of "ith" stratum

t_{ij} - No. of trees enumerated in the "jth" selected village of 'ith' stratum

b_{ij} - No. of bearing trees enumerated in the "jth" selected village of 'ith'stratum

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

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

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

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

Estimated total no. of bearing trees in the 'ith'stratum

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

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}) =

$$\sum_{j=1}^{m_{gi}} Y_{g_{ij}} \Big/ \sum_{j=1}^{m_{gi}} B_{g_{ij}}$$

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 = $\dfrac{\sigma}{R_{m_{gi}}} \times 100$

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

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 $\overline{Y_i} = \sum_{k=1}^{n_{ij}} Y_{ijk} \Big/ \sum_{j=1}^{mj} n_{ij}$

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

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

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

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

E ~ F whichever is greater

PART IV

RESULT 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

2013-2014

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	13956934	885645	14842579	143177	5799	830200
Banana	-	-	-	92463	41534	3840300
Guava	1729384	33814	1763198	7730	4641	358
Lemon	1823293	579274	2402567	8290	2129	170
Jack	315583	101045	416628	2808	15069	423
Orange	293705	62163	355868	1851	2483	45
Grapes	-	-	-	2247	13448	30
Pineapple	-	-	-	578	25290	14

MANGO

Mango is one of the most important fruit crops of the State and is predominantly grown in Krishnagiri, Dharmapuri, Dindigul, Vellore and Tiruvan Districts. During the year 2013-14 under mango, 107 villages were selected for conducting experiments. The district wise number of experiments planned / conducted estimated total number of trees and production estimates for 2013-14 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	590989	36624	627613
2	THIRUVALLUR	22	22	1176511	46071	1222582
3	VELLORE	20	20	1280165	19379	1299544
4	SALEM	10	10	723910	50276	774187
5	DHARMAPURI	20	20	1770698	2499	1773197
6	COIMBATORE	10	10	222683	4630	227312
7	TIRUCHIRAPPALLI	10	10	163875	76836	240711
8	NAGAPATTINAM	10	10	486881	1124	488005
9	MADURAI	10	10	711162	47261	758423
10	THENI	20	20	924825	19796	944621
11	DINDIGUL	20	20	1401199	310223	1711422
12	VIRUDHUNAGAR	12	12	172038	92636	264674
13	TIRUNELVELI	10	10	789588	42157	831745
14	KRISHNAGIRI	30	30	3542410	136133	3678542
	STATE	**214**	**214**	**13956934**	**885645**	14842579

The estimated total number of mango trees for the State during 2013-14 was 148.43 lakhs of which 94.03 percent were bearing trees. Out of 139.57 lakhs bearing trees in the State, Krishnagiri district stood first with 35.42 lakh trees, followed by 17.71 lakh trees in Dharmapuri district, 14.01 lakh trees in Dindigul district and 12.80 lakh trees in Vellore 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)	
		2013-14	2012-13	2013-14	2012-13	2013-14	201
1	KANCHEEPURAM	3473	3254	4988	7413	17324	
2	THIRUVALLUR	10593	10648	7772	11894	82327	126
3	VELLORE	11599	12630	13217	12352	153306	156
4	SALEM	4871	5406	5238	3178	25514	
5	DHARMAPURI	10361	10498	5601	8426	58030	884
6	COIMBATORE	2434	2421	2532	3477	6162	
7	TIRUCHIRAPPALLI	2439	2447	2936	4355	7161	
8	NAGAPATTINAM	2991	2902	5915	4612	17691	
9	MADURAI	6594	6887	2606	1658	17185	
10	THENI	9539	9501	3586	5585	34204	530
11	DINDIGUL	16283	15928	5583	22468	90907	357
12	VIRUDHUNAGAR	3028	2791	2992	3434	9061	
13	TIRUNELVELI	6221	6194	12508	3201	77815	198
14	KRISHNAGIRI	36889	37029	3839	4374	141619	161
	STATE	**143177**	**144509**	**5799**	**8230**	**830289**	1189

The area under mango crop as per Season and Crop Report for the year 2013-14 was at 143177 hectare as against 144509 hectare in 2012-13 with a decrease of 0.92 percent over the year 2012-13.

The estimated average yield per hectare for the State dropped to 5799 kg. during 2013-14 as against 8230 kg. in 2012-13, the decrease in yield rate being 29.54 percent due to lack of proper maintenance and scarcity of water.

The total production of mango during 2013-14 was 830289 tonnes as against 1189270 tonnes in 2012-13, a decrease of 30.18 percent.

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	2013-14	2012-13	2013-14	2012-13	2013-14	
1	Cuddalore	10	10	4251	3982	40400	49752	171740	198
2	Vellore	10	10	4206	5782	30599	20138	128699	1164
3	Tiruvannamalai	10	10	2972	3053	57022	36873	169469	112
4	Namakkal	10	10	1716	-	30444	-	52243	
5	Coimbatore	20	20	7412	8351	43781	34142	324506	285
6	Erode	10	10	10426	12098	30129	36694	314123	4439
7	Thiruchirappalli	20	20	7144	8870	52614	51545	375877	457
8	Karur	10	10	2666	4036	60345	25628	160880	1034
9	Thanjavur	10	10	3176	3087	50902	39883	161663	123
10	Pudukottai	10	10	2303	2505	41118	36495	94696	91
11	Theni	10	10	5996	6010	66453	72453	398454	4354
12	Dindugul	10	10	4037	5439	27512	25853	111066	140
13	Thirunelveli	20	20	7193	8627	29442	22748	211773	196
14	Thoothukudi	20	20	9142	9758	44178	40593	403882	3961
15	Kanyakumari	10	10	6542	6396	30293	22729	198178	145
16	Tiruppur	10	10	1815	-	47876	-	86895	
	STATE	**200**	**200**	**92463**	**106016**	**41534**	**36879**	**3840376**	390973

Thiruchirapalli, Erode, Theni, Thoothukudi, Coimbatore, Cuddalore and Thirunelveli are the main banana producing districts in the State. The area cover

under banana as per Season and Crop Report for the year 2013-14 stood at [illegible] hectare as against 106016 hectare in 2012-13 the decrease being of 12.78 perc[illegible]

The estimated average yield rate per hectare worked out to 41534 kg [illegible] 2013-14 as against 36879 kg. in 2012-13. The increase in the yield rate was [illegible] percent.

The estimated production for the year 2013-14 was 3840376 tonnes against 3909764 tonnes in 2012-13 the decrease being 1.77 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)	
		2013-14	2012-13	2013-14	2012-13	2013-14	2012
1	Cuddalore	571	536	5201	1747	2970	
2	Villupuram	409	399	2042	3572	835	
3	Vellore	636	657	2072	1809	1318	
4	Madurai	1004	924	892	968	895	
5	Dindigul	1324	1769	9554	18988	12649	
6	Virudhunagar	661	673	4622	6561	3055	
7	Tirunelveli	404	379	3767	2936	1522	
	STATE	**7730**	**8114**	**4641**	**8162**	**35872**	662

Guava crop is mainly grown in the districts of Dindigul, Virudhuna[illegible] Villupuram, Vellore, Tirunelveli, Cuddalore and Madurai.

The area under guava for 2013-14 was at 7730 hectares as against [illegible] hectares in 2012-13 which shows a decrease of 4.73 percent.

The estimated average yield per hectare was put at 4641 kg. in 201[illegible] against 8162 kg in 2012-13, the yield decreased by 43.15 percent due to la[illegible] proper maintenance and scarcity of water.

The estimated production for the year 2013-14 was at 35872 tonnes against 66230 tonnes in 2012-13 recording a decrease of 45.84 percent.

Sl. No.	District	Estimated no. of Trees - Orange		
		Bearing	Non Bearing	Total
1	Cuddalore	427089	0	427089
2	Villupuram	151280	0	151280
3	Vellore	144280	0	144280
4	Madurai	130853	15821	146674
5	Dindigul	660344	6936	667279
6	Virudhunagar	124374	7756	132130
7	Tirunelveli	91164	3301	94465
	STATE	**1729384**	**33814**	**1763197**

The estimated total number of trees for 2013-14 stood at 1763197 out of which 98.08 percent trees are bearing trees.

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)	
		2013-14	2012-13	2013-14	2012-13	2013-14	2012-13
1	Tiruchy	940	899	1705	1139	1603	1024
2	Perambalur	284	293	5031	2643	1429	774
3	Dindigul	2173	3082	1189	2430	2583	7490
4	Virudhunagar	338	298	836	1255	282	374
5	Tirunelveli	2478	2370	3338	1688	8272	3999
6	Theni	530	481	348	190	184	91
	STATE	**8290**	**8834**	**2129**	**1853**	**17647**	**16366**

The main lemon growing districts in the State are Dindugul, Tirunelveli and Thiruchirappalli. The estimated number of trees for 2013-14 was put at 24.03 lakhs out of which 75.89 percent are bearing trees.

Sl. No.	District	Estimated no. of Trees - Lemon		
		Bearing	Non Bearing	Total
1	Thiruchirapalli	184944	11143	196088
2	Perambalur	89191	6868	96059
3	Theni	75915	4609	80524
4	Dindigul	769687	351819	1121506
5	Virudhunagar	37665	21944	59608
6	Tirunelveli	665891	182891	848782
	STATE	**1823293**	**579274**	**2402567**

The area for 2013-14 was at 8290 hectare as against 8834 hectare in 2012-13 which showed a decrease of 6.16 percent.

The estimated yield rate per hectare worked out to 2129 kg. in 2013-14 as against 1853 kg during 2012-13 which showed an increase of 14.90 percent.

The estimated production for the State during the year 2013-14 was at 17644 tonnes as against 16366 tonnes in 2012-13 the increase of 7.83 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)	
		2013-14	2012-13	2013-14	2012-13	2013-14	2012
1	Cuddalore	665	682	13928	10831	9262	73
2	Namakkal	159	254	9689	7069	1541	17
3	Pudukottai	144	144	7767	15515	1118	22
4	Kanyakumari	630	650	23797	17391	14992	11
5	Ariyalur	112	108	3458	1440	387	1
6	Dindigul	322	429	10310	9304	3320	3
	STATE	**2808**	**2936**	**15069**	**11852**	**42313**	**3479**

Kanyakumari, Cuddalore and Dindlgul are the main Jackfruit growing districts in the State.

The area as per the Season and Crop Report was put at 2808 hectares in 2013-14 as against 2936 hectares in 2012-13, showing a decrease of 4.36 percent.

The estimated yield rate per hectare was calculated at 15069 kg. in 2013-14 as against 11852 kg in 2012-13. It showed an increase of 27.15 percent.

The estimated production for 2013-14 stood at 42313 tonnes as against 34797 tonnes in 2012-13, an increase of 21.60 percent.

Sl. No.	District	Estimated no. of Trees- Jackfruit		
		Bearing	Non Bearing	Total
1	Cuddalore	88667	0	88667
2	Namakkal	24506	0	24506
3	Pudukottai	10036	2680	12717
4	Dindigul	34521	1741	36261
5	Kanyakumari	145688	94500	240187
6	Ariyalur	12165	2124	14290
	STATE	**315583**	**101045**	**416628**

The total number of trees estimated for 2013-14 was at 4.166 lakhs and the percentage of bearing trees worked out to 75.75 percent.

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)	
		2013-14	2012-13	2013-14	2012-13	2013-14	2012-13
1	Theni	39	-	11174	-	436	
2	Dindigul	1688	1758	2350	3099	3967	5447
3	The Nilgiris	64	65	677	1488	43	
	STATE	**1851**	**1965**	**2483**	**3138**	**4596**	6167

Dindigul, Theni and The Nilgiris are major Orange growing districts in the State.

The area as per the Season and Crop Report was at 1851 hectares for 2013-14 as against 1965 hectares in 2012-13, which showed a decrease of 5.8 percent.

The estimated yield rate per hectare was 2483 kg. in 2013-14 as against 3138 kg. in 2012-13, which showed a decrease of 20.89 percent in the yield rate. This was due to age old trees and infection due to insects.

The State production for 2013-14 was estimated at 4596 tonnes as against 6167 tonnes in 2012-13. The decrease in the production of orange was 25.47 percent.

Sl. No.	District	Estimated no. of Trees – Orange		
		Bearing	Non Bearing	Total
1	Theni	8681	0	8681
2	Dindigul	268592	54898	323491
3	The Nilgiris	16432	7265	23697
	STATE	**293705**	**62163**	**355869**

The total number of trees was estimated at 3.56 lakhs for 2013-14 and the percentage of bearing trees worked out to 82.53 percent.

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)	
		2013-14	2012-13	2013-14	2012-13	2013-14	2012-13
1	Coimbatore	187	203	21623	17607	4044	3574
2	Theni	1734	1779	12655	16603	21943	29536
3	Dindigul	227	237	12777	12624	2900	2992
	STATE	**2247**	**2356**	**13448**	**16270**	**30218**	**38331**

Grapes are mainly cultivated in Theni, Coimbatore and. Dindigul districts. The area as per Season and Crop Report worked out to 2247 hectares in 2013-14 as against 2356 hectares in 2012-13, the decrease being 4.63 percent.

The estimated yield rate per hectare was put at 13448 kg. in 2013-14 as against 16270 kg in 2012-13, a decrease of 17.34 percent due to the fact that it was raised as a second crop.

The estimated production was 30218 tonnes in 2013-14 as against 38337 tonnes in 2012-13, the decrease being 21.17 percent due to decrease 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)	
		2013-14	2012-13	2013-14	2012-13	2013-14	2012-13
1	Namakkal	468	662	25290	30178	11836	19978
	STATE	**578**	**758**	**25290**	**30178**	**14618**	**22875**

Namakkal is the major Pineapple growing district in the State.The area as per the Season and Crop Report was at 578 hectares in 2013-14 as against 758 hectares in 2012-13 showing a decrease of 23.75 percent.

The estimated yield rate per hectare stood at 25290 kg. in 2013-14 as against 30178 kg. in 2012-13 the decrease being 16.2 percent due to insufficient rain.

The estimated production was at 14618 tonnes in 2013-14 as against 22875 tonnes in 2012-13 the decrease being 36.10 percent due to the decrease 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 2013-14 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	1089	47065	51254
2	Brinjal	10804	8978	96999
3	Lady's Finger	7761	6772	52557
4	Sweet Potato	592	21114	12499
5	Tomato	24633	12338	303917

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)	
		2013-14	2012-13	2013-14	2012-13	2013-14	2012-13
1	Theni	113	181	36248	40261	4096	7287
2	Nilgiris	442	313	41525	47753	18354	14947
3	Krishnagiri	258	827	61295	65417	15814	54103
	STATE	**1089**	**1547**	**47065**	**57784**	**51254**	89393

Cabbage is mostly being cultivated in Krishnagiri, The Nilgiris and Theni District of Tamil Nadu. The area under this crop as per Season and Crop Report is 1089 hectares in 2013-14 as against 1547 hectares in 2012-13. There was a decrease of 29.61 percent.

The estimated average yield per hectare worked out to 47065 kg. in 2013-14 as against 57784 kg. in 2012-13, decrease being 18.55 percent due to scarcity of water.

The estimated production for the year 2013-14 was worked out at 51250 tonnes as against 89393 tonnes in 2012-13, with a decrease being 42.66 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)	
		2013-14	2012-13	2013-14	2012-13	2013-14	2012-13
1	Cuddalore	172	207	6939	16488	1194	3413
2	Vellore	986	1004	8294	6831	8178	6859
3	Salem	1546	1318	5155	4574	7969	6033
4	Coimbatore	395	320	6197	6864	2448	2197
5	Madurai	285	334	7525	9413	2145	3143
6	Dindigul	805	668	2342	3312	1885	2213
7	Krishnagiri	1681	915	14395	11581	24199	10595
8	Dharmapuri	592	536	16890	27013	9999	14477
	STATE	**10804**	**9174**	**8978**	**9228**	**96999**	**84662**

Brinjal is mainly cultivated in Dharmapuri, Krishnapuri, Vellore, Salem, Cuddalore, Madurai, Dindigul and Coimbatore districts.As per the Season and Crop

Report the area under Brinjal worked out to 10804 hectares in 2013-14 as against 9174 hectares in 2012-13, there being an increase of 17.7 percent.

The estimated average yield rate per hectare stood at 8978 kg in 2013-14 as against 9228 kg. in 2012-13 showing an decrease of 2.71 percent.

The estimated production was put at 96999 tonnes in 2013-14 as against 84662 tonnes in 2012-13. Due to increase in area, production had increased by 14.57 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)	
		2013-14	2012-13	2013-14	2012-13	2013-14	2012-13
1	Vellore	1073	885	6890	7991	7393	7072
2	Salem	1835	1767	5450	6735	10001	11900
3	Namakkal	-	171	-	12672	-	2167
4	Coimbatore	273	316	11356	7489	3100	2366
5	Madurai	299	417	10663	9695	3188	4043
6	Dindigul	403	555	4613	9339	1859	5181
7	Dharmapuri	501	-	8276	-	4146	
	STATE	**7761**	**7434**	**6772**	**7962**	**52557**	59191

Lady's finger crop is mainly cultivated in Salem, Vellore, Dindigul, Madurai and Coimbatore districts. The area under this crop as per Season and Crop Report was at 7761 hectares in 2013-14 as against 7434 hectares in 2012-13 exhibiting an increase of 4.40 percent.

The estimated yield per hectare was put at 6772 kg. in 2013-14 as against 7962 kg. in 2012-13 the decrease being 14.95 percent due to scarcity of water and infection from insects.

The estimated production was at 52557 tonnes in 2013-14 as against 5919[illegible] tonnes in 2012-13, the decrease being 11.21 percent. The decrease in 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)	
		2013-14	2012-13	2013-14	2012-13	2013-14	2012-13
1	Villupuram	-	58	-	13526	-	78[illegible]
2	Dharmapuri	-	18	-	29574	-	53[illegible]
3	Karur	33	23	27350	28523	903	[illegible]
4	Madurai	19	-	33550	-	637	
5	Dindigul	32	-	26825	-	858	
6	Tirunelveli	176	-	17564	-	3091	
	STATE	**592**	**304**	**21114**	**19928**	**12499**	**6058**

The Sweet Potato crop is mainly grown in Madurai, Karur, Dindigul and Tirunelveli districts in the State. The area under this crop as per the Season and Crop Report was put at 592 hectares in 2013-14 as against 304 hectares in 2012-13, which displayed an increase of 94.74 percent.

The estimated yield per hectare worked out to 21114 in 2013-14 as against 19928 kg in 2012-13 which depicted an increase of 5.95 percent.

The estimated production for the year 2013-14 stood at 12499 tonnes as against 6058 tonnes in 2012-13. An increase of 106.32 percent was due to increase 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)	
		2013-14	2012-13	2013-14	2012-13	2013-14	2012-13
1	Vellore	1150	1023	7796	7402	8965	7572
2	Salem	2968	2528	6922	7071	20544	17870
3	Dharmapuri	1772	2699	19031	34602	33722	93399
4	Coimbatore	1947	2215	11901	8968	23171	19864
5	Theni	2208	1654	9268	12169	20463	20126
6	Dindigul	1544	1898	9768	9403	15081	17847
7	Krishnagiri	9479	5707	15033	14233	142494	81236
8	Tirupur	1561	1208	9449	9484	14750	11457
	STATE	24633	21090	12338	14228	303917	300068

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 24633 hectares in 2013-14 as against 21090 hectares in 2012-13, exhibiting an increase of 16.80 percent.

The estimated yield per hectare worked out to 12338 kg. in 2013-14 as against 14228 kg. in 2012-13, showing a decline of 13.28 percent due to scarcity of water in Salem and Dharmapuri districts.

The estimated total production was put at 303917 tonnes in 2013-14 as against 300068 tonnes in 2012-13, which showed an increase of 1.28 percent.

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

CROP	Area (ha.)			Average Yield (tonnes/ha.)			Production (tonnes)		
	2013-14	2012-13	% Varia-tion	2013-14	2012-13	% Varia-tion	2013-14	2012-13	% Varia-tion
Fruits									
Mango	143177	144509	-0.92	5.799	8.230	-29.54	830289	1189270	-30.18
Banana	92463	106016	-12.78	41.534	36.879	12.62	3840376	3909764	-1.77
Guava	7730	8114	-4.73	4.641	8.162	-43.15	35872	66230	45.84
Lemon	8290	8834	-6.16	2.129	1.853	14.90	17647	16366	7.83
Jackfruit	2808	2936	-4.36	15.069	11.852	27.15	42313	34797	-21.60
Orange	1851	1965	-5.80	2.483	3.138	-20.89	4596	6167	-25.47
Grapes	2247	2356	-4.63	13.448	16.270	-17.34	30218	38331	-21.17
Pineapple	578	758	-23.75	25.290	30.178	-16.20	14618	22875	-36.10
Vegetables									
Tomato	24633	21090	16.80	12.338	14.228	-13.28	303917	300068	1.28
Brinjal	10804	9174	17.77	8.978	9.228	-2.71	96999	84662	14.57
Lady's Finger	7761	7434	4.40	6.772	7.962	-14.95	52557	59191	-11.21
Cabbage	1089	1547	-29.61	47.065	57.784	-18.55	51254	89393	-42.66
Sweet Potato	592	304	94.74	21.114	19.928	5.95	12499	6058	106.32

The results of the survey reveals that the average yields of mango, guava, orange, grapes and pineapple have shown a negative trend whereas banana, jack and lemon have shown a positive trend during 2013-14. In respect of vegetable crops, the average yield of tomato, brinjal, lady'sfinger and cabbage have shown a downward trend whereas sweet potato alone has shown an upward trend.

The production of some fruits, viz. guava and lemon showed a positive trend whereas mango, banana, jackfruit, orange, grapes and pineapple have shown a negative trend. With regard to vegetable items, lady'sfinger and cabbage have shown a negative trend, while tomato, brinjal and sweet potato have shown 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 2004-2005 TO 2013-14

(in ha.)

	CROP	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
A	**FRUITS**										
1	Mango	118444	125104	125856	128221	130012	132697	139496	141140	144509	143177
2	Banana	81498	94648	105206	112793	115804	113681	107394	103112	106016	92463
3	Guava	8066	8453	7792	7141	7050	7017	7498	7718	8114	7730
4	Lemon	8124	8146	7964	7767	7409	7463	7484	7794	8834	8290
5	Jack	2773	2911	2919	2955	2910	2926	3058	2868	2936	2808
6	Orange	2580	2151	2139	2004	2089	2039	2067	1847	1965	1851
7	Grapes	2475	2611	2581	2607	2532	2546	2463	2484	2356	2247
8	Pineapple	446	653	634	692	581	500	809	603	758	578
B	**VEGETABLES**										
1	Tomato	25306	21995	22433	22924	22751	23792	22087	21972	21090	24633
2	Brinjal	7958	7107	6059	6331	7275	6912	7871	9462	9174	10804
3	Lady's Finger	4949	4778	3578	3853	5054	5224	6229	7662	7434	7761
4	Cabbage	1393	1619	2313	2240	1250	2154	2222	1888	1547	1089
5	Sweet Potato	1397	1417	1127	1088	658	778	496	390	304	592

ESTIMATED AVERAGE YIELD OF FRUITS AND VEGETABLE CROPS FROM 2004-2005 TO 2013-14

(in tonnes/ha.)

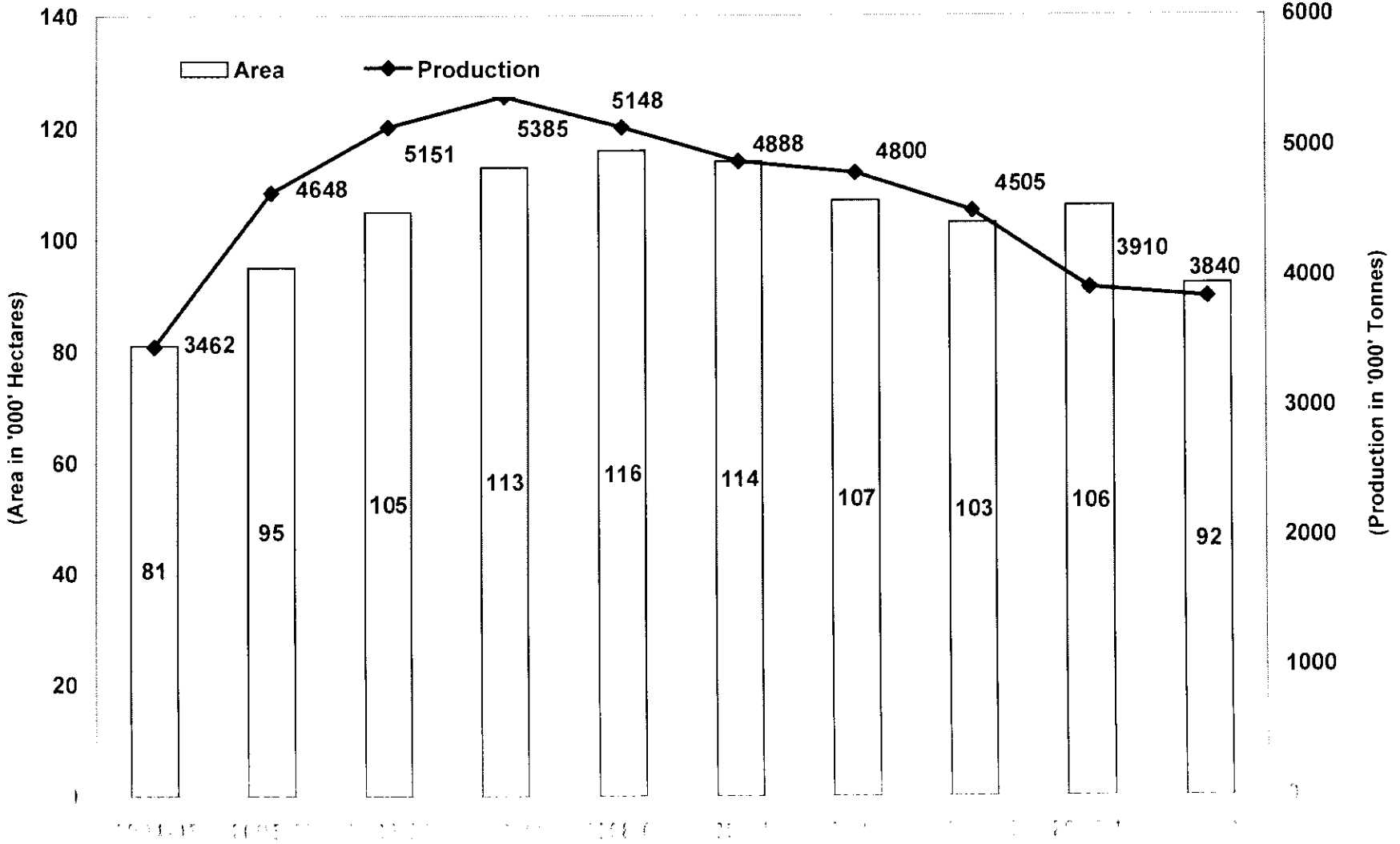
	CROP	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
A	**FRUITS**										
1	Mango	4.554	4.299	5.519	5.477	4.958	4.795	6.867	4.438	8.230	5.799
2	Banana	42.477	49.104	48.965	47.741	44.453	42.996	44.700	43.695	36.879	41.534
3	Guava	7.995	10.904	11.031	13.603	12.074	13.186	9.109	5.244	8.162	4.641
4	Lemon	1.619	2.523	2.583	2.986	2.788	2.933	4.488	2.266	1.853	2.129
5	Jack	8.943	12.346	13.848	14.749	13.238	13.475	15.117	4.930	11.852	15.069
6	Orange	1.718	1.962	2.021	2.277	1.965	2.057	1.730	1.777	3.138	2.483
7	Grapes	28.176	32.486	29.815	28.921	17.938	17.338	16.333	15.321	16.270	13.448
8	Pineapple	32.922	33.156	33.076	37.866	36.993	36.052	41.965	30.291	30.178	25.290
B	**VEGETABLES**										
1	Tomato	12.705	12.627	12.611	13.047	13.017	13.091	13.506	12.068	14.228	12.338
2	Brinjal	12.650	10.690	11.099	10.011	7.960	9.390	9.997	10.638	9.228	8.978
3	Lady's Finger	8.973	7.525	7.498	6.688	7.608	8.000	8.397	8.700	7.962	6.772
4	Cabbage	66.734	53.426	56.247	50.395	52.978	56.726	51.837	60.597	57.784	47.065
5	Sweet Potato	15.117	20.857	16.799	13.585	13.287	14.629	18.550	20.491	19.928	21.114

ESTIMATED PRODUCTION OF FRUITS AND VEGETABLE CROPS FROM 2004-2005 TO 2013-14

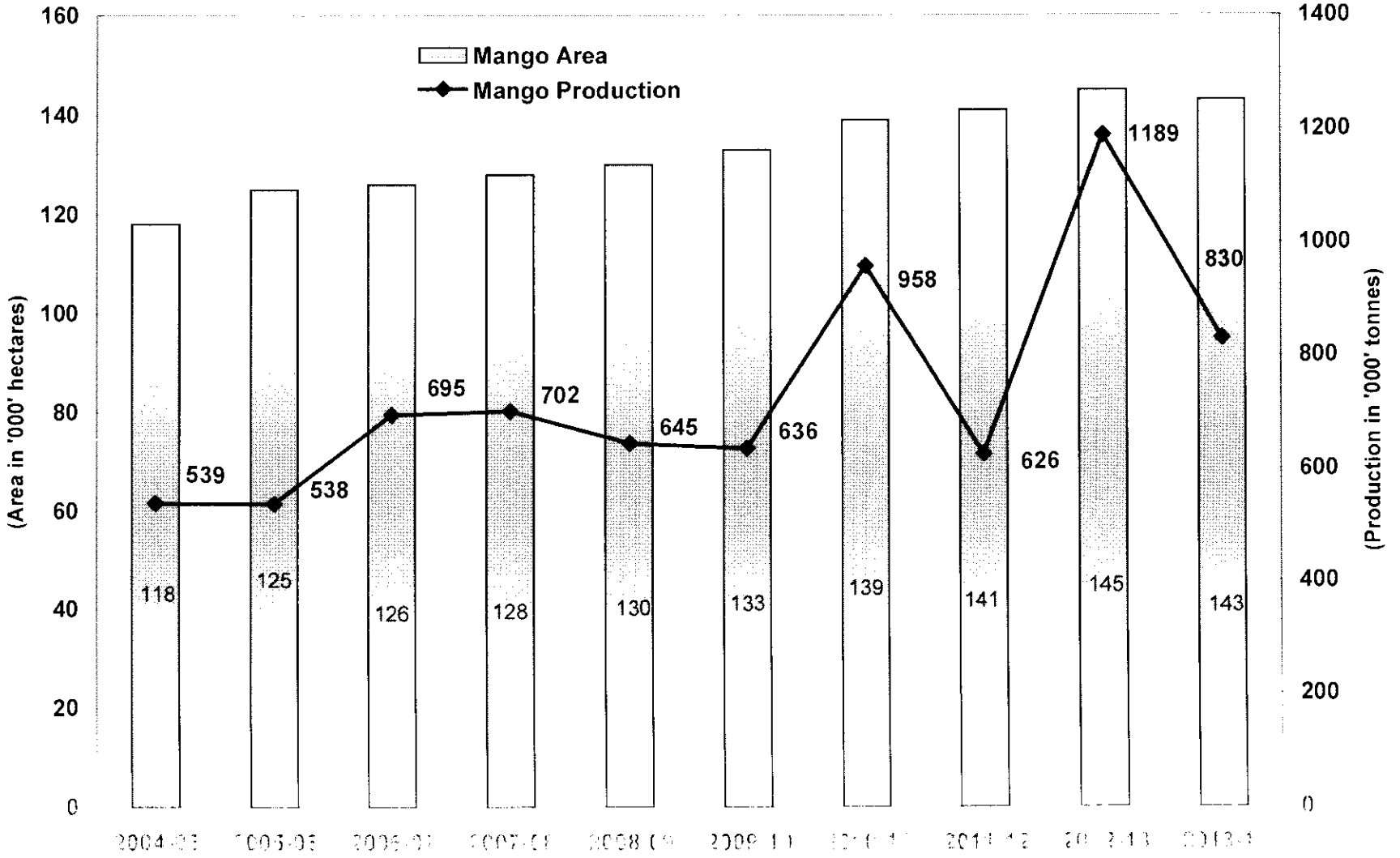
(in tonnes)

	CROP	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
A	**FRUITS**										
1	Mango	539404	537780	694554	702260	644626	636330	957982	626392	1189270	830289
2	Banana	3461788	4647637	5151394	5384825	5148134	4887841	4800473	4505435	3909764	3840376
3	Guava	64489	92168	85952	97137	85124	92523	68299	40471	66230	35872
4	Lemon	13155	20551	20569	23190	20658	21886	33592	17663	16366	17647
5	Jack	24798	35939	40424	43585	38522	39427	46229	14139	34797	42313
6	Orange	4432	4215	4323	4562	4105	4194	3577	3282	6167	4596
7	Grapes	69736	84820	76953	75398	45418	44144	40230	38057	38331	30218
8	Pineapple	14683	21652	20970	26203	21493	18026	33949	18265	22875	14618
B	**VEGETABLES**										
1	Tomato	321519	277728	282912	299095	296142	311450	298315	265153	300068	303917
2	Brinjal	100673	75971	67247	63380	57917	64902	78685	100654	84662	96999
3	Lady's Finger	44410	35951	26829	25768	38449	41794	52302	66656	59191	52557
4	Cabbage	92961	86497	130099	112883	66223	122187	115181	114406	89393	51254
5	Sweet Potato	21118	29555	18933	14780	8743	11381	9201	7991	6058	12499

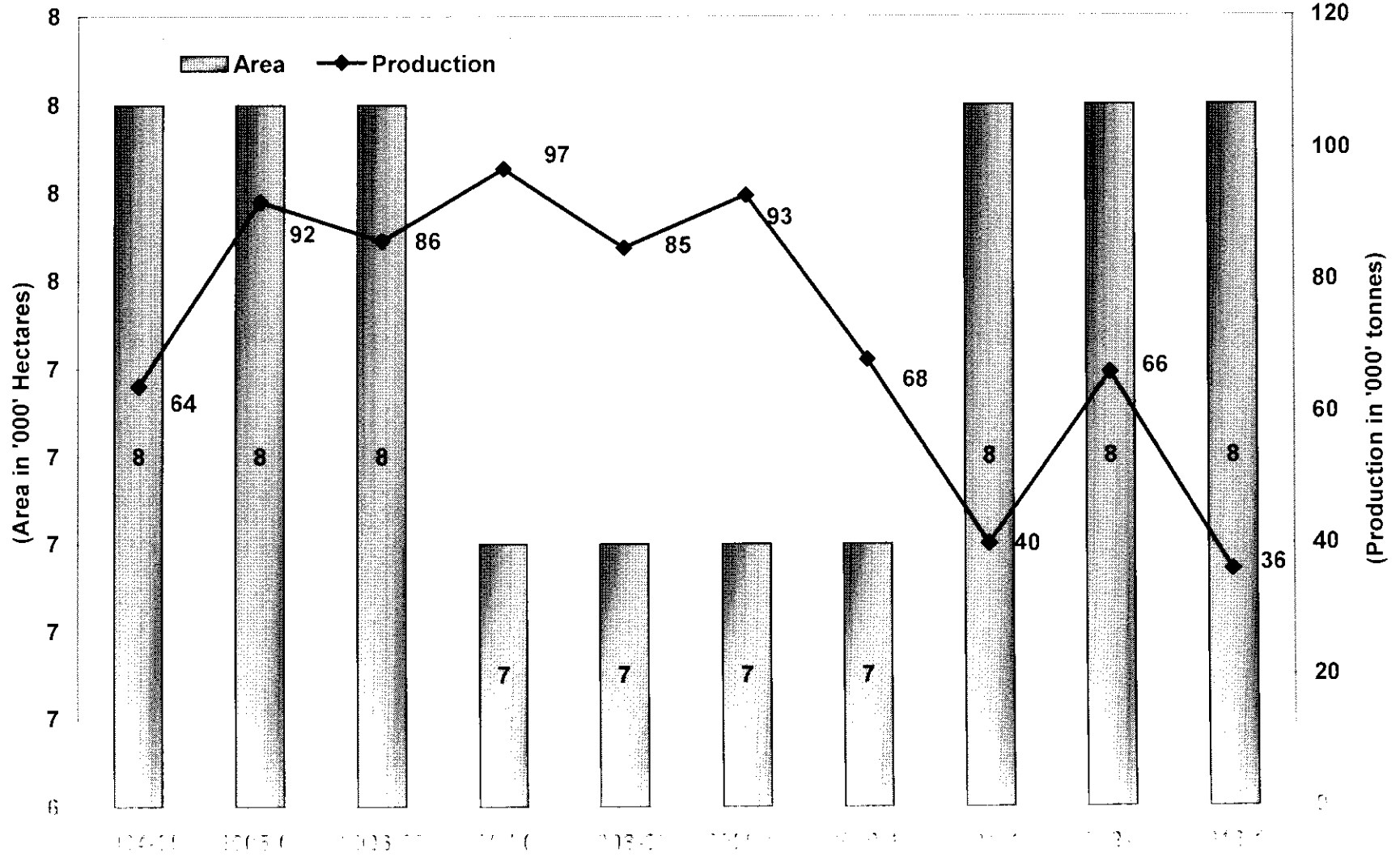
AREA AND PRODUCTION OF BANANA (2004-05 TO 2013-14)



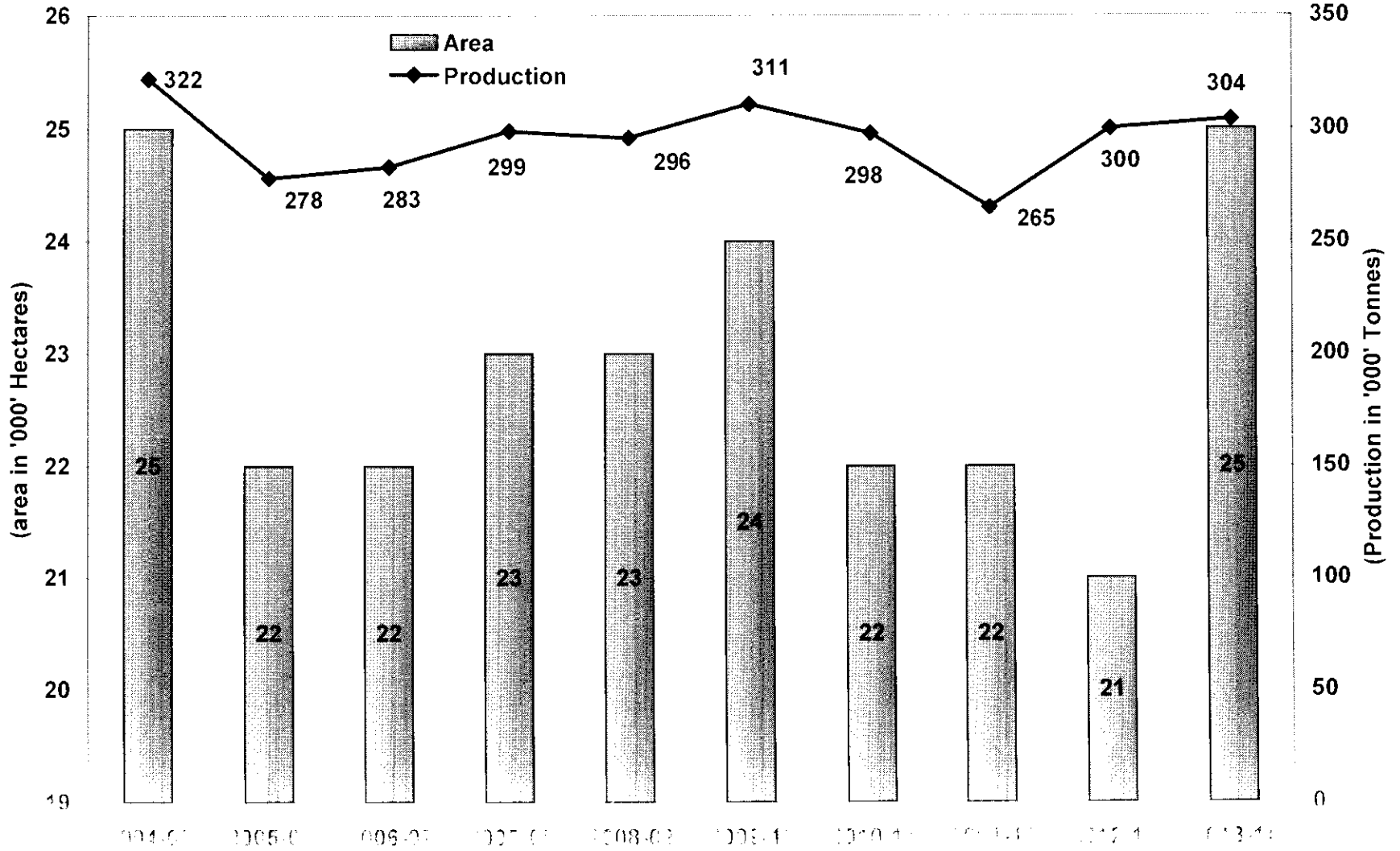
AREA AND PRODUCTION OF MANGO (2004-05 TO 2013-14)



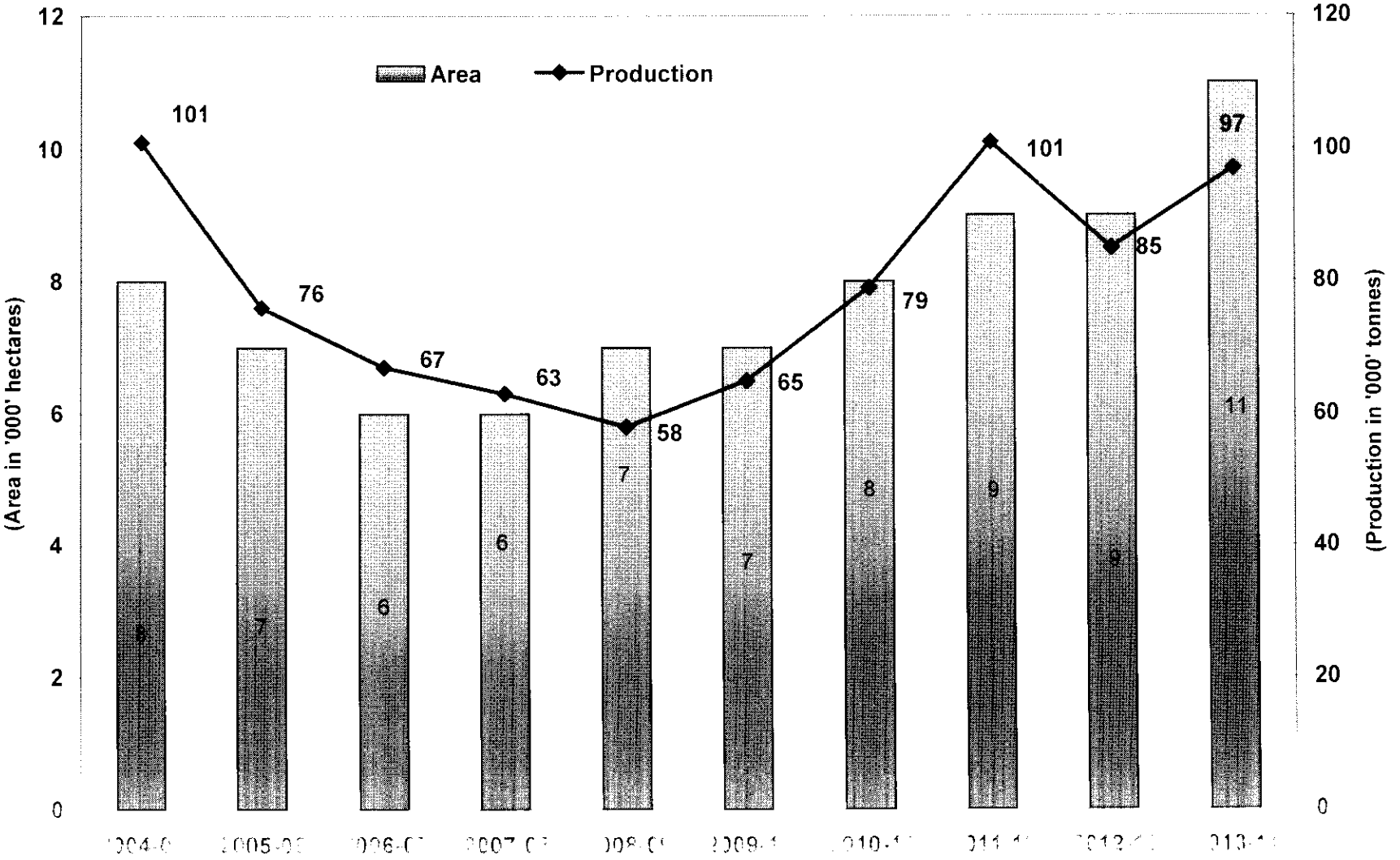
AREA AND PRODUCTION OF GUAVA (2004-05 TO 2013-14)



AREA AND PRODUCTION OF TOMATO (2004-05 TO 2013-14)



AREA AND PRODUCTION OF BRINJAL (2004-05 TO 2013-14)



AREA AND PRODUCTION OF LADY'SFINGER (2004-05 TO 2013-14)