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REPORT
ON
MINOR CROPS
TAMIL NADU

FASLI 1423
(2013-14)

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

PREFACE

The Minor crops Scheme is implemented in Tamilnadu with a view to capture the key information on certain characteristics viz, yield, types of seeds used, application of fertilizer and pesticides etc., pertaining to the crops like chillies, coriander, ginger, onion, potato, tapioca, turmeric and cashewnut. All these crops, except Cashewnut are used for culinary purposes. As these crops, play significant role in the agricultural economy, it is imperative to conduct Crop Estimation Surveys for these crops in order to get the exact picture of need based parameters to meet the data needs of the Stakeholders.

The Crop Estimation Survey on selected Minor crops like chillies, onion and potato was initiated in Tamil Nadu during 1971-72. Subsequently, the survey was extended to include the crop such as tapioca, turmeric, ginger, coriander and cashewnut. This report on Minor Crops presents the results of Crop Estimation Survey conducted for the above crops for the year 2013-14 together with time series data, which would be of immense use in the context of planning and research.

Chapter I of this report contains a brief Introduction to the Survey, Chapter II deals with the Estimatian procedure, Chapter III highlights the Results of the survey, Chapter IV presents the Time series data for a period of ten-years upto 2013 and Chapter V comprise of diagrammatic representations.

It is hoped that this report will be a useful reference to the Administrators, Planners, Scholars, Statisticians, Economists and all those who are interested in the Socio-Economic planning of TamilNadu.

The Co-operation extended by the Officers and staff of the Department, both at State Head Quarters and Districts in the implementation of the scheme is acknowledged with due appreciation. Constructive feedback for improving the content is solicited.

Sd./- V.Iraianbu,

PRINCIPAL SECRETARY / COMMISSIONER.

Chennai - 6.

Date : 09.12.2015.

CONTENT

EXECUTIVE SUMMARY

Crop Estimation Survey was conducted for the eight minor crops namely chillies, onion, potato, tapioca, turmeric, ginger, coriander and cashewnut. The main objective of this survey is to provide a complete range of information on area covered, average yield per hectare and production of minor crops at district and state level. During 2013-14, a total of 1294 experiments were planned and 1254 experiments were conducted in 29 districts for the above 8 crops. A mixed trend have emerged regarding changes in area, production and yield rate, as indicated below.

Findings of the Survey

Table - 1

CROPWISE AREA, AVERAGE YIELD AND PRODUCTION OF MINOR CROPS

Sl. No.	Crops	Area (ha.)			Average Yield (Kg/Ha.)			Production(Tonnes)		
		2013-14	2012-13	% Variation	2013-14	2012-13	% Variation	2013-14	2012-13	% Variation
1	Chillies	41401	47110	-12.12	272.81	381.02	-28.40	11294	17950	-37.08
2	Onion	24987	24031	3.98	9619.92	8290.69	16.03	240373	199234	20.65
3	Turmeric	31968	46151	-30.73	3672.88	3787.02	-3.01	117415	174775	-32.82
4	Tapioca	83526	81027	3.08	29922.17	34179.61	-12.46	2499279	2769471	-9.76
5	Ginger	304	322	-5.59	6962.44	9605.38	-27.52	2117	3093	-31.56
6	Potato	5919	4268	38.68	20736.19	17848.17	16.18	122738	76176	61.12
7	Coriander	7527	8171	-7.88	347.61	90.43	284.40	2616	739	253.99
8	Cashewnut	92138	93302	-1.25	285.17	211.47	34.85	26274	19730	33.17

A close look at the table above reveals that during 2013-14 the area covered under turmeric has decreased substantially by 30.73 and such decrease in the area may be attributed to late start of cultivation during the sowing period. It may be significant to note that area under potato has increased by 38.68 percent,

the reason being the availability of sufficient rainfall during hot weather seasons that encouraged the farmers to take up potato cultivation. The area in respect of cashewnut has come down by 1.25 percent. On the other hand the area under chillies has shown a decline of 12.12 per cent as compared to that of previous year. This may also be ascribed to late start of cultivation.

The average yield of cashewnut has registered a tremendous increase of 34.85 percent and as a result, the production of cashewnut has also increased by 33.17 percent. This positive situation may be attributed to proper crop management and practice of timely preventive measures.

The area covered under turmeric has shown a drastic decline of 30.73 percent as compared to previous year, and there is a decrease of average yield per hectare by 3.01 percent which eventually shown a decrease in the production of turmeric by 32.82 percent. During the course of harvest season, flowerings could be seen in chillies crop, which would ensure better harvest. Disproportionate application of pesticides and manures hampers the flowerings in the plants at the maturing point of time, resulting in low production ultimately. The low production eventually led to the prevalence of increase in turmeric prices during 2013-14.

A Negative situation is noticed in the case of production of chillies, turmeric, tapioca and ginger crops during 2013-14 over that of the previous year whereas the production of onion, potato, coriander and cashewnut have shown a positive trend during 2013-14 as compared to previous year.

1CHAPTER - I

THE SURVEY ON MINOR CROPS

INTRODUCTION

The Scheme for the conduct of Crop Estimation Survey on selected minor crops like Chillies, Onion and Potato was initiated in Tamil Nadu during 1971-72 (Fasli 1381) in order to estimate the yield rate and production in a scientific manner by conducting crop cutting experiments. Subsequently, the survey was extended to cover the following crops in a phased manner, as detailed below.

Tapioca	from 1975-76
Turmeric, Ginger	from 1980-81
Coriander	from 1990-91
Cashewnut	from 1993-94

OBJECTIVE OF THE SURVEY

The main objective of this survey is to obtain reliable estimates of average yield per hectare and production of certain minor crops at the district and State level with a reasonable degree of precision. In addition to this, certain additional information on manuring, high yielding varieties and other agricultural practices adopted in respect of these crops were also collected and analysed in the tables annexed.

COVERAGE

The survey was conducted in the districts, where these crops are grown more predominantly. During 2013-14, 29 districts were covered under this survey.

SAMPLING DESIGN OF THE SURVEY

The sampling design adopted for this survey is a stratified multi-stage random sampling technique. The taluk is taken as stratum and villages within the taluk form the primary sampling units. Selection of fields and selection of experimental plots on specified size in each selected field form the second and third stages of sampling units.

SAMPLE SIZE

The following Table shows the number of experiments planned and conducted during the year 2013-14.

Number of Experiments Planned and Conducted

Crop	No. of Experiments	
	Planned	Conducted
1. Chillies	200	184
2. Onion	218	218
3. Turmeric	220	220
4. Tapioca	224	218
5. Potato		
Summer	66	66
Winter	56	48
6. Ginger	30	20
7. Coriander	82	82
8. Cashewnut	198	198
Total	1294	1254

1294 experiments were planned and 1254 were conducted. 40 experiments were not conducted due to non availabilitly of crop.

PLOT SIZE

The size of the experimental plot is given below:

Chillies, Onion and Turmeric	:	5M X 5M
Potato	:	10M X 2M
Tapioca and coriander	:	2M X 2M
Ginger	:	2M X 1M
Cashewnut	:	Entire selected garden.

PERIOD OF THE SURVEY

The periodicity of the Survey extended over a full Fasli year starting from July 2013 to June 2014.

COLLECTION AND SUPERVISION

At the district level, Block Statistical Inspectors are the primary workers of the survey for all crops except cashewnut and coriander for which the fieldwork is entrusted with the Assistant Horticulture Officers of the Department of Horticulture and Plantation Crops. In order to ensure maximum accuracy in yield estimation, the fieldwork is supervised by the respective Divisional Assistant Director of Statistics, District Deputy Director of Statistics and Regional Joint Director of Statistics at various stages.

CHAPTER II

ESTIMATION PROCEDURE

The following estimation procedure is adopted for finalising the estimates of average yield. The average yield of crops at Taluk level is calculated as a simple mean of individual plot yields. It can be denoted mathematically as follows:

$$\overline{Y_i} = \left\{ \sum_{j=1}^{m_i} \sum_{k=1}^{2} Y_{jk} \right\} \Big/ n_i$$

Where $\overline{Y_i}$ = average yield for 'i'th taluk.

Y_{jk} = yield of 'k'th experiment in 'j'th village.

n_i = number of experiments in 'i'th taluk.

m_i = number of villages in 'i'th taluk.

The average yield for the district is calculated by combining the stratum means using the area under the respective crop in the stratum as weight.
Mathematically,

$$\overline{Y}(d) = \left\{ \sum_{i=1}^{te} \overline{Y_i} \times a_i \right\} \Big/ \sum_{i=1}^{t_e} a_i$$

Where $\overline{Y}(d)$ = average yield for the district

a_i = area in the i'th taluk.

t_e = number of taluks in the districts.

The estimates of average yield for each category of crops are then pooled to arrive at the estimated average yield for the combined crop at district and State level by using the area under the respective category as weight.

The Sampling error which gives an indication of the limits within which the estimated average yield likely to vary is worked out by using the formula.

$$SE = \sqrt{\overline{Y}_i} = \frac{\left[F\sum_{i=1}^{t_e}\left(a_i^{\,2}/n_i\right) + (E \sim F)\sum_{i=1}^{tc}\left(a_i^{\,2}/n_i\right)\sum_{i=1}^{t_e} n_i^{\,2}/\lambda_i n_i \right]}{\left[\sum_{i=1}^{t_e} a_i\right]^2}$$

Where Y(d) = Estimated district mean yield

n_{ij} = The number of fields with 'j^{th} village of the 'i^{th} taluk..

n_i = Number of experiments conducted in the taluk.

m_i = The number of selected villages in the 'i^{th} taluk

t_e = Number of taluks in the districts.

a_i = Area of the crop in the 'i^{th} taluk.

E = SSBV (i.e) the estimate of the mean square between the field

DF within the village

F = SSWV (i.e) the estimate of the mean square within the village

DF

λ_i= Correction factor

$$= \left[n_i^{\,2} - \sum_{j=1}^{n_i} n_{ij} \right] \Big/ n_i (n_i - 1)$$

The district average is worked out separately for each category such as season of crops, for irrigated and unirrigated categories, as the case may be by making use of the above formula. The district average for the combined crop is arrived at by pooling the estimates for each category on the basis of the area under the respective category. The estimates for the State are obtained by using weighted average method. The district-wise area figures under the crops are used as weight.

In case where crops are grown as mixed crops, the plot yields are estimated in proportion to the percentage of the mixed crop in the experimental field.

CHAPTER III

RESULTS OF THE SURVEY

CHILLIES

It is significant to note that the districts of Ramanathapuram and Virudhunagar put together contribute a large chunk of 53.39 per cent to State aggregate production. According to the Season and Crop Report 2013-14, area under chillies has decreased from 47110 ha. during 2012-13 to 41401 ha. during 2013-14. The decrease being 12.12 percent. During the same period estimated average yield has gone down from 381 to 273 kg/ha., revealing a decline of 28.35 per cent. Estimated production has also decreased from 17950 tonnes to 11294 tonnes, exhibiting a decrease of 37.08 per cent. Relevant information is given below.

Table-2
District Wise Area, Average Yield and Production of Chillies

Year 2013-14

Sl. No.	District	No. of Experiments		Area as per Season and Crop Report (ha.)	Estimated Average Yield (kg./ha)	Estimated Production (tonnes)
		Planned	Analysed			
1	VELLORE	10	10	682	811.029	553
2	SALEM	10	10	602	603.873	364
3	TIRUCHIRAPPALLI	10	10	843	565.934	477
4	KARUR	14	14	295	622.150	184
5	DINDIGUL	10	10	943	554.188	523
6	RAMANATHAPURAM	50	50	17152	273.045	4683
7	VIRUDHUNAGAR	22	22	1416	951.435	1347
8	SIVAGANGAI	22	18(4*)	3968	46.304	184
9	TIRUNELVELI	10	10	758	1011.690	767
10	THOOTHUKUDI	30	30	9951	91.088	906
11	TIRUPPUR	12	12*			
	TOTAL FOR THE DISTRICTS COVERED IN THE STATE	**200**	**184**	**36610**	**272.805**	**9987**
	TOTAL FOR THE ENTIRE STATE	**200**	**184**	**41401**	**272.805**	**11294**

* No crop-16

Chilly crop is predominantly grown in Ramanathapuram District covering 17152 hectare and the estimated average yield of Chillies is 273 kg/hectare.

Adoption of Modern Agricultural Practices

By adopting modern technology in the cultivation of crops, farmers have increased the yield of their crop. Out of 184 Experiments, only 11 per cent used high yielding seeds. About 42 per cent of farmers applied chemical fertilizers and the usage of pesticides is found to be 20 per cent in the cultivation of chillies. As for the experiments in respect of cultivation of chillies, which are untreated by pesticides/insecticides are calculated as high as 80 per cent. Necessary information is furnished in the table below.

Table-3

Extent of Application of High Yield Variety Seeds, Fertilizers and Pesticides.

Crop Chillies **Year: 2013-14.**

Sl. No.	DISTRICT	Percentage of Area under Chillies							
		Seeds			Fertilisers			Pesticides	
		LOCAL SEEDS	IMPROVED SEEDS	HIGH YIELDING SEEDS	CHEMICAL FERTILISER	OTHER MANURES	UN MANURED	TREATMENT OF PESTICIDES / INSECTICIDES	UN-TREATED BY PESTICIDES /INSECTICIDES
1	VELLORE	48	0	52	50	50	0	0	100
2	SALEM	100	0	0	50	50	. 0	0	100
3	TIRUCHIRAPPALLI	0	0	100	40	51	9	0	100
4	KARUR	59	41	0	43	43	14	10	90
5	DINDIGUL	0	0	100	0	0	100	0	100
6	RAMANATHAPURAM	90	5	5	35	31	34	0	100
7	VIRUDHUNAGAR	91	0	9	50	50	0	31	69
8	SIVAGANGAI	89	0	9	32	39	27	0	98
9	TIRUNELVELI	12	0	88	100	0	0	0	100
10	THOOTHUKUDI	100	0	0	57	11	32	64	36
	STATE	**85**	**4**	**11**	**42**	**28**	**30**	**20**	**80**

ONION

Onion is widely used for seasoning the food items and for Medicinal use. Onion have anti-biotic, antiseptic, antimicrobial and carminative properties. Onion is rich in Sulphur, fibres, Potassium, Vitamin B, Vitamin C and it is low in fat cholesterol and Sodium. Onion can be used to prevent cancers. Consumption of onion increases insulin in the body and it is highly useful in treating diabetes as it controls the sugar level in the blood.

Area under onion went up from 24031 ha. during 2012-13 to 24987 ha. during 2013-14, and the increase is 3.98 in terms of percentage. Average yield has increased from 8291 kg/ha to 9620 kg./ha., registering a substantial rise of 16.03 per cent. Hence, total production soared from 199234 tonnes to 240373 tonnes, recording an increase of 20.65 per cent. Relevant details are presented in the table below.

Table-4

District-wise Area, Average Yield and Production of Onion

Year: 2013-14

Sl. No.	District	No. of Experiments		Area as per Season and Crop Report (ha.)	Estimated Average Yield (kg./ha)	Estimated Production (tonnes)
		Planned	Analysed			
1	SALEM	22	22	1056	11440.008	12081
2	NAMAKKAL	20	20	2019	11704.724	23632
3	COIMBATORE	10	10	786	16153.372	12697
4	ERODE	10	10	1139	11086.705	12628
5	TIRUCHIRAPPALLI	30	30	3958	8459.769	33484
6	PERAMBALUR	40	40	5621	9393.061	52798
7	MADURAI	10	10	492	8837.244	4348
8	DINDIGUL	20	20	2336	6648.355	15531
9	VIRUDHUNAGAR	12	12	1044	7670.876	8008
10	TIRUNELVELI	12	12	888	12424.887	11033
11	THOOTHUKUDI	12	12	1081	1960.091	2119
12	THIRUPPUR	20	20	2540	12257.098	31133
	TOTAL FOR THE DISTRICTS COVERED IN THE STATE	**218**	**218**	**22960**	**9559.713**	**219491**
	TOTAL FOR THE ENTIRE STATE	**218**	**218**	**24987**	**9619.921**	**240373**

As born out in table above, Perambalur district stands first in the case of area sown, with 5621 hectares, followed by Tiruchy,(3958 ha.) Thirupur (2540 ha) and Dindigul(2336 ha) districts. In respect of the yield, Coimbatore district tops the list with 16153.4 kg/ha, followed by Tirunelveli,(12424.9 kg/ha) Tiruppur(12257.1 kg/ha) and Namakkal (11704.7 kg/ha.).

Adoption of Modern Agricultural Practices

Out of 218 Experiments,about 34 per cent represents traditional variety of seeds, 45 per cent comes under High Yielding Variety seeds, 65 per cent for chemical fertilizers and 61 per cent treated the crop with pesticides. Appropriate quantitative details are provided in the following table.

Table-5

Extent of Application of High Yielding Varieties Seeds, ertilizers and Pesticides.

Year: 2013-14

Onion (Kharif)

Sl. No.	DISTRICT	PERCENTAGE AREA UNDER ONION							
		Seeds			Fertilisers			Pesticides	
		LOCAL SEEDS	IMPROVED SEEDS	HIGH YIELDING SEEDS	CHEMICAL FERTILISER	OTHER MANURES	UN MANURED	TREATMENT OF PESTICIDES / INSECTICIDES	UN-TREATED BY PESTICIDES /INSECTICIDES
1	SALEM	16	0	84	42	58	0	40	60
2	NAMAKKAL	0	0	100	100	0	0	100	0
3	COIMBATORE	0	100	0	86	14	0	17	83
4	ERODE	2	86	12	88	12	0	14	86
5	TIRUCHIRAPPALLI	60	0	0	0	0	100	0	100
6	PERAMBALUR	100	0	0	55	45	0	100	0
7	MADURAI	0	0	100	75	25	0	67	33
8	DINDIGUL	15	0	85	85	0	15	15	85
9	VIRUDHUNAGAR	100	0	0	100	0	0	50	50
10	TIRUNELVELI	32	25	43	61	15	25	61	39
11	THIRUPPUR	0	0	100	50	50	0	100	0
	STATE	34	21	45	65	27	8	61	39

Table-6

Extent of Application of High Yielding Varieties Seeds, Fertilizers and Pesticides

Year: 2013-14
Onion (Rabi)

Sl. No.	DISTRICT	PERCENTAGE AREA UNDER ONION							
		Seeds			Fertilisers			Pesticides	
		LOCAL SEEDS	IMPROVED SEEDS	HIGH YIELDING SEEDS	CHEMICAL FERTILISER	OTHER MANURES	UN MANURED	TREATMENT OF PESTICIDES / INSECTICIDES	UN-TREATED BY PESTICIDES /INSECTICIDES
1	SALEM	0	17	83	43	43	13	0	100
2	NAMAKKAL	29	14	58	43	11	46	0	100
3	TIRUCHIRAPPALLI	48	0	52	2	0	98	0	100
4	PERAMBALUR	100	0	0	50	50	0	0	0
5	MADURAI	0	0	100	50	50	0	0	0
6	DINDIGUL	0	78	22	22	0	78	0	100
7	VIRUDHUNAGAR	100	0	0	42	42	16	0	100
8	THOOTHUKUDI	100	0	0	95	0	5	5	95
9	THIRUPPUR	0	0	100	55	45	0	10	90
	STATE	**55**	**11**	**34**	**37**	**23**	**40**	**1**	**99**

At the State level, out of 218 Experiments, 55 per cent used traditional variety of seeds, 34 per cent used High Yielding Variety of seeds, 37 per cent used chemical fertilizers and 1 per cent used pesticides. Relevant information is given in the above table.

TURMERIC

Turmeric is a ten-month long crop usually sown during May-June and harvested during March-April every year. It is used as a culinary ingredient. The cropping potentiality in respect of turmeric can be noticed in the districts of Erode, Salem and Dharmapuri, because of the presence of enterprising farmers and assured water supply.

Total area under turmeric is accounted for 46151 ha. during 2012-13 and it is declined to 31968 ha. in 2013-14, showing a decrease of 30.73 percent . The reason being that the yield rate of turmeric has come down to 3673 kg/ha during the year 2013-14 from 3787 kg/ha. in 2012-13, revealing a decrease of 3.01 per cent Total production

has also decreased from 174775 tonnes to 117415 tonnes. The decline being 32.82 percent. Relevant information is presented in Table-7.

Table-7

District-wise Area, Average Yield and Production of Turmeric

Year 2013-14

Sl. No.	District	No. of Experiments		Area as per Season and Crop Report (ha.)	Estimated Average Yield (kg./ha)	Estimated Production (tonnes)
		Planned	Analysed			
1	VILLUPURAM	20	20	2252	2237.796	5040
2	VELLORE	10	10	739	6377.214	4713
3	THIRUVANNAMALAI	10	10	638	4010.988	2559
4	SALEM	30	30	6230	3186.017	19849
5	NAMAKKAL	20	20	2054	5737.856	11786
6	DHARMAPURI	30	30	5759	1848.470	10645
7	COIMBATORE	10	10	1203	5380.114	6472
8	ERODE	30	30	8179	4968.938	40641
9	TIRUCHIRAPPALLI	10	10	986	3235.455	3190
10	KARUR	10	10	267	4899.189	1308
11	PERAMBALUR	10	10	943	2866.312	2703
12	KRISHNAGIRI	10	10	1188	3282.078	3899
13	THIRUPPUR	20	20	1011	2674.542	2704
	TOTAL FOR THE DISTRICTS COVERED IN THE STATE	**220**	**220**	**31449**	**3672.884**	**115509**
	TOTAL FOR THE ENTIRE STATE	**220**	**220**	**31968**	**3672.884**	**117415**

Adoption of Modern Agricultural Practices

A glance at state level data reveals that out of 220 sample Experiments, 44 per cent of farmers used high yielding seeds, 50 per cent used chemical fertilizers and 8 per cent treated the crop with pesticides. The district wise information in this regard is presented in Table-8.

Table -8

Extent of Application of High Yielding Varieties, Seeds, Fertilizers and Pesticides

Year: 2013-14

Sl. No.	DISTRICT	Percentage of Area Under Turmeric							
		Seeds			Fertilisers			Pesticides	
		LOCAL SEEDS	IMPROVED SEEDS	HIGH YIELDING SEEDS	CHEMICAL FERTILISER	OTHER MANURES	UN MANURED	TREATMENT OF PESTICIDES / INSECTICIDES	UN-TREATED BY PESTICIDES /INSECTICIDES
1	VILLUPURAM	0	62	38	69	31	0	0	100
2	VELLORE	100	0	0	50	50	0	0	100
3	THIRUVANNAMALAI	82	0	18	88	12	0	0	100
4	SALEM	32	0	68	52	48	0	14	86
5	NAMAKKAL	13	0	87	57	34	9	7	93
6	DHARMAPURI	42	58	0	35	46	19	7	93
7	COIMBATORE	100	0	0	50	50	0	0	100
8	ERODE	42	0	58	54	46	0	14	86
9	TIRUCHIRAPPALLI	100	0	0	10	10	80	0	100
10	KARUR	100	0	0	50	50	0	0	100
11	PERAMBALUR	0	0	100	50	50	0	0	100
12	KRISHNAGIRI	40	0	60	50	38	13	0	100
13	THIRUPPUR	43	0	57	50	50	0	0	100
	STATE	**41**	**15**	**44**	**50**	**43**	**7**	**8**	**92**

TAPIOCA

Tapioca is an annual crop. It is used for many purposes. It can be used for consumption and production of starch. This crop is predominantly grown in the districts of Namakkal, Salem and Dharmapuri.

Total area has gone up from 81027 ha. during 2012-13 to 83526 ha. during 2013-14, showing a hike of 3.08 per cent. The yield rate has declined from 34180 kg/ha. to 29922 kg/ha., and the decrease being 12,46 percent Hence, total production has also dropped from 2769471 tonnes to 2499279 tonnes. The decline being 9.76 per cent. Relevant information is presented below:

Table-9

District-wise Area, Average Yield and Production of Tapioca

Year: 2013-14

Sl. No.	District	No. of Experiments		Area as per Season and Crop Report (ha.)	Estimated Average Yield (kg./ha)	Estimated Production (tonnes)
		Planned	Analysed			
1	CUDDALORE	14	14	3252	38348.839	124710
2	VILLUPURAM	30	30	12705	25842.430	328328
3	THIRUVANNAMALAI	10	10	2404	37154.812	89320
4	SALEM	20	20	14419	22035.268	317727
5	NAMAKKAL	40	40	16872	34737.338	586088
6	DHARMAPURI	30	30	17635	23214.804	409393
7	ERODE	10	10	4794	37722.917	180844
8	TIRUCHIRAPPALLI	10	10	4573	39325.000	179833
9	KARUR	10	10	1113	29944.692	33328
10	PERAMBALUR	10	10	1369	65710.733	89958
11	THENI	10	10	899	60203.571	54123
12	KANYAKUMARI	10	10	1038	34973.611	36303
13	KRISHNAGIRI	10	4(6*)	429	21187.500	9089
14	THIRUPPUR	10	10	229	28487.500	6524
	TOTAL FOR THE DISTRICTS COVERED IN THE STATE	**224**	**218**	**81731**	**29922.167**	**2445569**
	TOTAL FOR THE ENTIRE STATE	**224**	**218**	**83526**	**29922.167**	**2499279**

* No crop - 6

Adoption of Modern Agricultural Practices

Out of 218 Sample Experiments, 25 per cent represents High Yield variety of seeds, 50 per cent in the case of chemical fertilizers and a meagre of 4 percent of experiments wherein the crop is treated with pesticides. About 96 percent of total experiments meant for Tapioca crop, the absence of treating the crop with pesticides was noticed. Relevant details are exhibited below:

Table -10

Extent of Application of High Yielding Varieties Seeds, Fertilizers and Pesticides.

Year 2013-14

Sl.No.	DISTRICT	Percentage of Area Under Tapioca							
		Seeds			Fertilisers			Pesticides	
		LOCAL SEEDS	IMPROVED SEEDS	HIGH YIELDING SEEDS	CHEMICAL FERTILISER	OTHER MANURES	UN MANURED	TREATMENT OF PESTICIDES / INSECTICIDES	UN-TREATED BY PESTICIDES /INSECTICIDES
1	CUDDALORE	6	88	6	36	45	18	46	54
2	VILLUPURAM	17	83	0	46	46	7	9	91
3	THIRUVANNAMALAI	46	39	16	50	50	0	0	100
4	SALEM	58	19	23	40	60	0	0	100
5	NAMAKKAL	0	30	68	44	55	1	0	100
6	DHARMAPURI	34	66	0	57	8	35	0	100
7	ERODE	100	0	0	100	0	0	0	100
8	TIRUCHIRAPPALLI	0	0	60	43	29	29	0	100
9	KARUR	100	0	0	58	42	0	52	48
10	PERAMBALUR	0	0	100	50	50	0	0	100
11	THENI	20	80	0	83	17	0	0	100
12	KANYAKUMARI	80	20	0	20	60	20	0	100
13	KRISHNAGIRI	0	100	0	0	50	50	0	100
14	THIRUPPUR	0	20	80	59	41	0	0	100
	STATE	**30**	**45**	**25**	**50**	**38**	**12**	**4**	**96**

POTATO

Potato is mainly grown in the districts of Dindigul and The Nilgiris. It is raised during two seasons viz. Summer and Winter. Summer crop is sown during May and June, whereas winter crop is raised during October and November.

Potato (Summer)

The area covered under the crop as per Season and Crop Report for 2013-14 was 3875 ha. as against 2801 ha. in 2012-13. The area under cultivation substantially increased by 38.34 per cent. The estimated yield per hectare stood at 18118 kg/ha. during 2013-14 as against 15645 kg/ha. in 2012-13. The yield rate has increased by 15.81 per cent. The estimated production for 2013-14 was at 70207 tonnes against 43822 tonnes in 2012-13 recording a phenomenal increase of 60.21 per cent.

Potato (Winter)

The winter area as per Season and Crop Report for 2013-14 was put at 2044 ha. against 1467 ha. in the previous year. The area under cultivation has shot up by 39.33 per cent. The estimated yield per hectare was 25700 kg./ha. in 2013-14 against 22054 kg./ha in 2012-13, the increase being 16.53 per cent.

The estimated production for 2013-14 was at 52531 tonnes against 32354 tonnes in 2012-13 the increase being 62.36 per cent. The increase in the production was due to a significant increase in the area.

Potato (Combined)

The area under potato in both seasons combined together for the State was at 5919 ha.during 2013-14 as against 4268 ha.in 2012-13,recording an increase of 38.68 per cent. With respect to yield rate, it has increased by 16.18 per cent from 17848 kg/ha. to 20736 kg/ha. Estimated total production has increased by 61.12 per-cent from 76176 tonnes to 122738 tonnes. Relevant information is in Table-11.

Table- 11

District-wise Area, Average Yield and Production of Potato

Year : 2013-14

District	No. of Experiments		Area as per Season & Crop Report (ha.)	Estimated Average Yield *(kg/ha)*	Estimated Production *(tonnes)*
	Planned	Analysed			
POTATO *(Summer)*					
ERODE	14	14	411	16488.571	6777
DINDIGUL	30	30	1716	13176.667	22611
THE NILGIRIS	22	22	1098	26449.885	29042
TOTAL FOR THE DISTRICTS COVERED IN THE STATE	**66**	**66**	**3225**	**18117.810**	**58430**
TOTAL FOR THE ENTIRE STATE	**66**	**66**	**3875**	**18117.810**	**70207**
POTATO *(Winter)*					
DINDIGUL	20	12(8*)	513	12100.000	6207
THE NILGIRIS	20	20	449	26784.490	12026
KRISHNAGIRI	16	16	1081	31703.750	34272
TOTAL FOR THE DISTRICTS COVERED IN THE STATE	**56**	**48**	**2043**	**25700.093**	**52505**
TOTAL FOR THE ENTIRE STATE	**56**	**48**	**2044**	**25700.093**	**52531**
POTATO *(Combined)*					
ERODE	14	14	411	16488.571	6777
DINDIGUL	50	42(8*)	2229	12928.874	28818
THE NILGIRIS	42	42	1547	26547.000	41068
KRISHNAGIRI	16	16	1729	26611.969	46012
TOTAL FOR THE DISTRICTS COVERED IN THE STATE	**122**	**114**	**5916**	**20736.235**	**122676**
TOTAL FOR THE ENTIRE STATE	**122**	**114**	**5919**	**20736.189**	**122738**

- No crop – 8

Adoption of Modern Agricultural Practices during summer season

Out of 66 Sample Experiments, about 86 per cent represents High Yield Variety seeds, 23 per cent stands for chemical fertilizers. No Pesticides were used. Relevant information is furnished below:

Table-12

(Potato kharif)

Extent of Application of High Yielding Varieties Seeds, Fertilizers and Pesticides **Year: 2013-14**

Sl. No.	DISTRICT	Percentage of Area Under							
		Seeds			Fertilisers			Pesticides	
		LOCAL SEEDS	IMPROVED SEEDS	HIGH YIELDING SEEDS	CHEMICAL FERTILISER	OTHER MANURES	UN MANURED	TREATMENT OF PESTICIDES / INSECTICIDES	UN-TREATED BY PESTICIDES /INSECTICIDES
1	ERODE	0	100	0	50	50	0	0	100
2	DINDIGUL	0	0	100	0	0	100	0	100
3	THE NILGIRIS	0	3	97	50	0	50	0	100
	STATE	**0**	**14**	**86**	**23**	**7**	**70**	**0**	**100**

Adoption of Modern Agricultural Practices during winter season.

Out of 48 Sample Experiments, the usage of high yielding variety seed is calculated as high as 100 per cent and the application of chemical fertilizer is arrived at 16 per cent. No pesticides were used. Connected details are furnished below:

Table -13 **(Potato Rabi)**

Extent of Application of High Yielding Varieties Seeds, Fertilizers and Pesticides.

Year: 2013-14

Sl. No.	DISTRICT	**Percentage of Area Under**							
		Seeds			**Fertilisers**			**Pesticides**	
		LOCAL SEEDS	IMPROVED SEEDS	HIGH YIELDING SEEDS	CHEMICAL FERTILISER	OTHER MANURES	UNMANURED	TREATMENT OF PESTICIDES / INSECTICIDES	UN-TREATED BY PESTICIDES /INSECTICIDES
1	DINDIGUL	0	0	100	0	0	100	0	100
2	THE NILGIRIS	0	0	100	74	13	13	0	100
3	KRISHNAGIRI	0	0	100	0	0	100	0	100
	STATE	**0**	**0**	**100**	**16**	**3**	**81**	**0**	**100**

GINGER

The Ginger crop requires copious and well-distributed rainfall. The crop is predominantly raised in The Nilgiris District. Generally this crop is planted during April-May and harvested in January-February. The area under the crop as per Season and Crop Report stood at 304 ha. in 2013-14 as against 322 ha. in 2012-13. The decrease in area was 5.59 per cent.

The estimated average yield per hectare went down to 6962 kg/ha. during 2013-14 from 9605 kg/ha. in 2012-13. The yield rate sharply fell by 27.52 per cent. The estimated production for 2013-14 was put at 2117 tonnes as against 3093 tonnes in 2012-13, the fall being 31.56 per cent. Relevant information is furnished below

Table-14

Area, Average Yield and Production of Ginger

Year : 2013-14

District	No. of Experiments		Area as per Season & Crop Report (ha.)	Estimated Average Yield *(kg/ha)*	Estimated Production *(tonnes)*
	Planned	Analysed			
THE NILGIRIS	20	20	283	6962.437	1970
TOTAL FOR THE DISTRICTS COVERED IN THE STATE	30	20(10*)	283	6962.437	1970
TOTAL FOR THE ENTIRE STATE	**30**	**20**	**304**	**6962.437**	**2117**

* No crop – 10

Adoption of Modern Agricultural Practices

Out of 20 Sample Experiments, 45 per cent stands for local varieties, 55 per cent for chemical fertilizers. The biggest porition of 100 per cent of experiments were untreated by pesticides with respect to ginger crop. Relevant information is provided in Table-15.

Table-15

Extent of Application of High Yielding Varieties Seeds, Fertilizers and Pesticides

Year:2013-14

Sl. No.	DISTRICT	Percentage of Area Under Ginger							
		Seeds			Fertilisers			Pesticides	
		LOCAL SEEDS	IMPROVED SEEDS	HIGH YIELDING SEEDS	CHEMICAL FERTILISER	OTHER MANURES	UN MANURED	TREATMENT OF PESTICIDES / INSECTICIDES	UN-TREATED BY PESTICIDES /INSECTICIDES
1	THE NILGIRIS	45	0	55	55	45	0	0	100
	STATE	**45**	**0**	**55**	**55**	**45**	**0**	**0**	**100**

CORIANDER

Coriander crop is mainly grown in the districts of Thoothukudi, Ramanathapuram and Virudhunagar. Coriander is mainly grown as an unirrigated crop and usually raised during the month of October-November, ie North East Monsoon period and the crop is harvested in January-February.

Total area under coriander fell down from 8171 ha. during 2012-13 to 7527 ha. during 2013-14, recording a decrease of 7.88 per cent Yield rate has increased by 286.23 per cent from 90 kg/ha. to 347.61 kg/ha. Total production increased from 739 tonnes in 2012-13 to 2616 tonnes in 2013-14, the increase is appreciably significant with 253.99 per cent. Relevant information is in Table-16.

Table-16

District-wise Area, Average Yield and Production of Coriander

Year 2013-14

Sl. No.	District	No. of Experiments		Area as per Season and Crop Report (ha.)	Estimated Average Yield (kg/ha)	Estimated Production (tonnes)
		Planned	Analysed			
1	TIRUCHIRAPPALLI	12	12	126	571.268	72
2	RAMANATHAPURAM	10	10	1418	377.477	535
3	VIRUDHUNAGAR	20	20	1173	617.561	724
4	THOOTHUKUDI	30	30	2237	71.218	159
5	THIRUPPUR	10	10	423	894.002	378
	TOTAL FOR THE DISTRICTS COVERED IN THE STATE	**82**	**82**	**5377**	**347.614**	**1869**
	TOTAL FOR THE ENTIRE STATE	**82**	**82**	**7527**	**347.614**	**2616**

Adoption of Modern Agricultural Practices

Out of 82 Sample Experiments, 100 per cent of farmers used local varieties, 15 per cent applied chemical fertilizers & 4 per cent used pesticides.

Table -17

Extent of Application of High Yielding Varieties Seeds, Fertilizers and Pesticides.

Year: 2013-14

Sl. No.	DISTRICT	Percentage of Area Under Coriander							
		Seeds			Fertilisers			Pesticides	
		LOCAL SEEDS	IMPROVED SEEDS	HIGH YIELDING SEEDS	CHEMICAL FERTILISER	OTHER MANURES	UN MANURED	TREATMENT OF PESTICIDES / INSECTICIDES	UN-TREATED BY PESTICIDES /INSECTICIDES
1	TIRUCHIRAPPALLI	88	12	0	8	27	65	0	100
2	RAMANATHAPURAM	100	0	0	7	93	0	0	100
3	VIRUDHUNAGAR	100	0	0	6	94	0	0	100
4	THOOTHUKUDI	100	0	0	29	0	71	0	100
5	THIRUPPUR	100	0	0	0	0	100	50	50
	STATE	**100**	**0**	**0**	**15**	**46**	**39**	**4**	**96**

CASHEWNUT

Cashew nut is a commercial and value added crop. It is bound to earn substantial foreign exchange. Since the crop is xerophytic by nature, it requires minimum care and maintenance. This crop is dominant in the districts of Ariyalur and Cuddalore.

Cashew nut prevents Cancer, it contains low fat content when compared to other nuts, which is very healthy for heart. Cashew nut lowers the blood pressure . Daily intake of cashew nuts can reduce the risk of developing gallstones. Also it is good for healthy teeth as well as strong gums to hold them.

Total area fell from 93302 ha. during 2012-13 to 92138 ha. during 2013-14. The decrease being 1.25 per cent. Yield rate has increased from 211 kg/ha. to 285 kg/ha. showing an increase of 35.07 per cent. Total production has increased from 19730 tonnes, to 26274 tonnes, the increase being 33.17 percent. Detailed information is presented in the table below:

Table-18

District-wise Area, Average Yield and Production of Cashewnut

Year 2013-14

SL. NO	District	No of Experiments		Area as per Season & Crop Report (Ha.)	Estimated Average Yield (Kg/ha)	Estimated Production (tonnes)
		Planned	Analysed			
1	CUDDALORE	30	30	30146	398.772	12021
2	VILLUPURAM	20	20	5103	472.017	2409
3	THANJAVUR	12	12	1819	231.916	422
4	NAGAPATTINAM	12	12	1693	390.704	661
5	PUDUKOTTAI	30	30	7393	101.450	750
6	THENI	20	20	4729	384.865	1820
7	SIVAGANGAI	24	24	3432	70.660	243
8	TIRUNELVELI	20	20	3795	64.019	243
9	ARIYALUR	30	30	30152	218.901	6600
	TOTAL FOR THE DISTRICTS COVERED IN THE STATE	**198**	**198**	**88262**	**285.165**	**25169**
	TOTAL FOR THE ENTIRE STATE	**198**	**198**	**92138**	**285.165**	**26274**

Chapter IV

TIME SERIES DATA

Area, yield and production for the past 10 years are furnished in the following Tables.

Trend in Area

(in ha.)

Year	Chillies	Onion	Turmeric	Tapioca	Potato	Ginger	Coriander	Cashew-nut
2004-05	66990	26491	21616	110589	5034	574	19350	104659
2005-06	49033	29169	25970	127122	5005	660	21062	106059
2006-07	61418	29587	30528	139628	5190	669	17425	103968
2007-08	67408	29809	27303	140092	4066	625	13288	101309
2008-09	65412	30255	29875	124301	4367	817	14139	99168
2009-10	58476	31024	33366	118647	4611	864	15977	99043
2010-11	53626	31959	51446	119618	4624	587	10824	96710
2011-12	56442	34912	67246	105349	4673	635	10804	97033
2012-13	47110	24031	46151	81027	4268	322	8171	93302
2013-14	41401	24987	31968	83526	5919	304	7527	92138

Trend in Average Yield

(in kg/ha)

Year	Chillies	Onion	Turmeric	Tapioca	Potato	Ginger	Coriander	Cashew-nut
2004-05	666.2	9677.2	5479.6	41267.9	15705.1	19296.3	433.6	425.2
2005-06	649.1	8015.3	5520.0	38210.9	14903.8	19293.8	305.1	413.5
2006-07	695.5	8731.3	5745.2	40360.4	14921.8	18637.5	325.8	491.1
2007-08	505.6	9635.0	5347.8	42203.0	16765.6	19037.5	385.3	571.6
2008-09	503.4	9453.4	5768.9	36470.8	18438.4	20000.0	340.6	520.5
2009-10	534.1	9752.5	5067.2	34468.2	18365.4	16050.0	395.2	500.0
2010-11	404.5	9365.3	5403.3	32448.5	19232.6	9845.5	418.7	413.6
2011-12	436.6	10797.1	5478.6	37662.9	19731.9	11042.5	467.3	263.1
2012-13	381.0	8290.7	3787.0	34179.6	17848.2	9605.4	90.4	211.5
2013-14	272.8	9619.9	3672.9	29922.2	20736.2	6962.4	347.6	285.2

Trend in Production

(in tonnes)

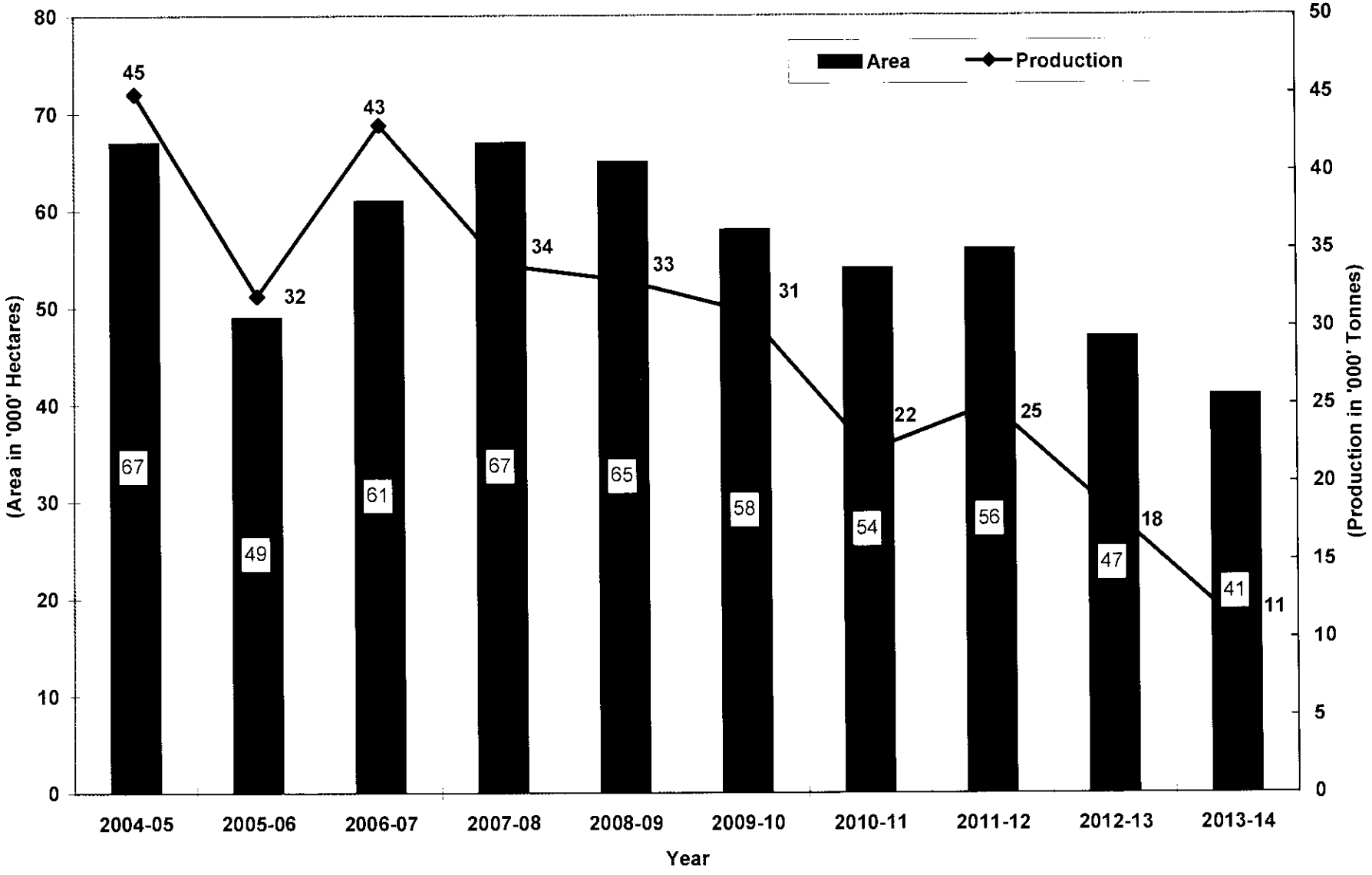
Year	Chillies	Onion	Turmeric	Tapioca	Potato	Ginger	Coriander	Cashew nut
2004-05	44631	256359	118447	4563776	79060	11076	8391	4449
2005-06	31830	233796	143358	4857440	74593	12735	6425	4385
2006-07	42719	258333	175388	5635436	77443	12468	5676	5105
2007-08	34084	287210	146008	5912307	68169	11898	5120	5790
2008-09	32924	286040	172334	4533359	80539	16340	4817	5166
2009-10	31230	302563	169071	4089545	84683	13867	6315	4954
2010-11	21691	299304	277979	3881425	88932	5779	4532	3999
2011-12	24640	376947	368411	3967751	92207	7012	5049	2553
2012-13	17950	199234	174775	2769471	76176	3093	739	1973
2013-14	11294	240373	117415	2499279	122738	2117	2616	2627

Glancing through the time series data, it reveals that wide variations are found in area coverage, production and yield rate for all crops during the 10 year period under reference. Due to wide variations in area coverage, many oscillations are noticed in the level of production and yield rate for all crops.

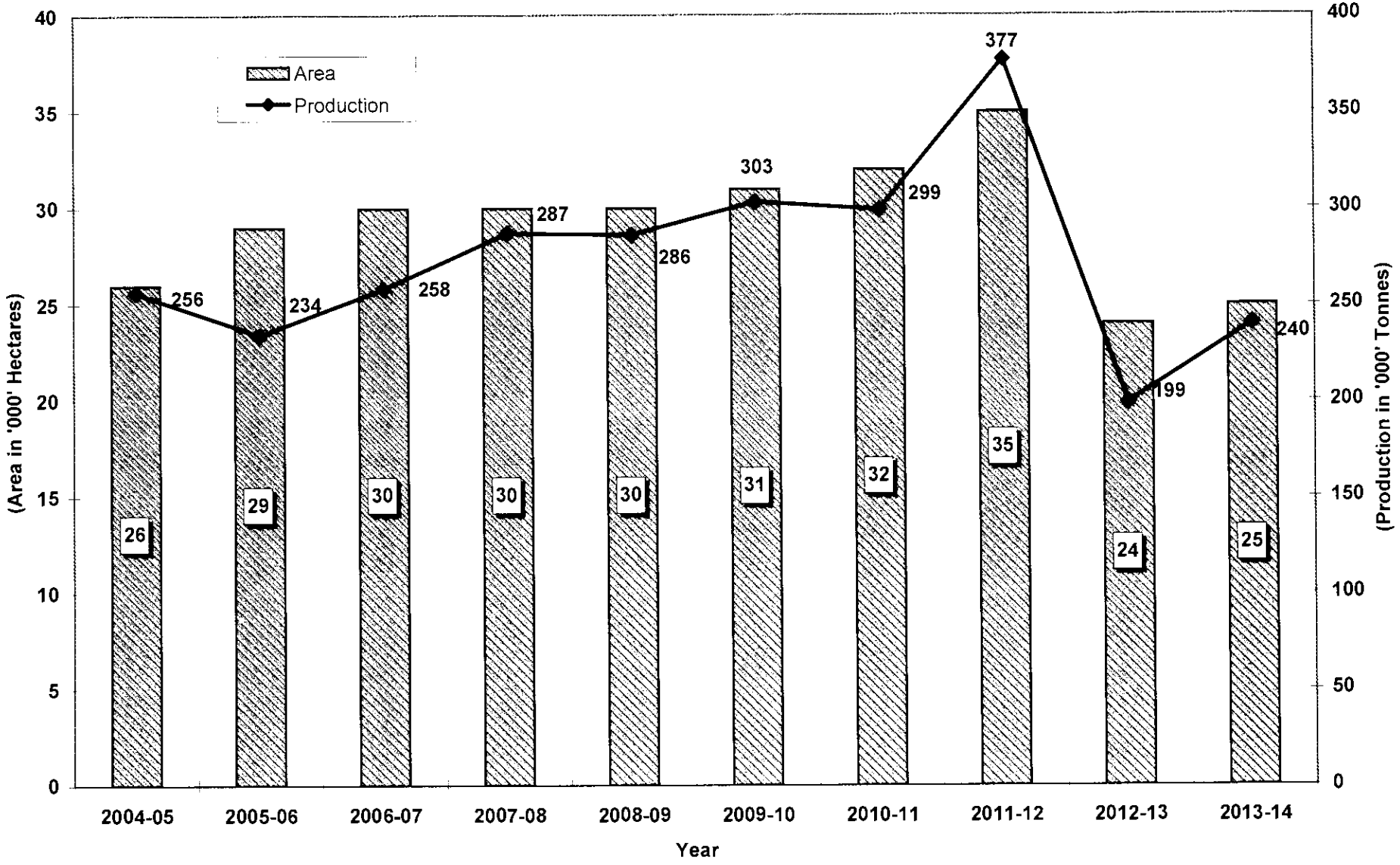
Conclusion:

In general, due to changing socio economic scenario in the State the area under cultivation of Minor Crops shows varying fluctuation over a period of time. Inspite of these fluctuation the production of these crops can be increased by using advanced techniques and modern applications.

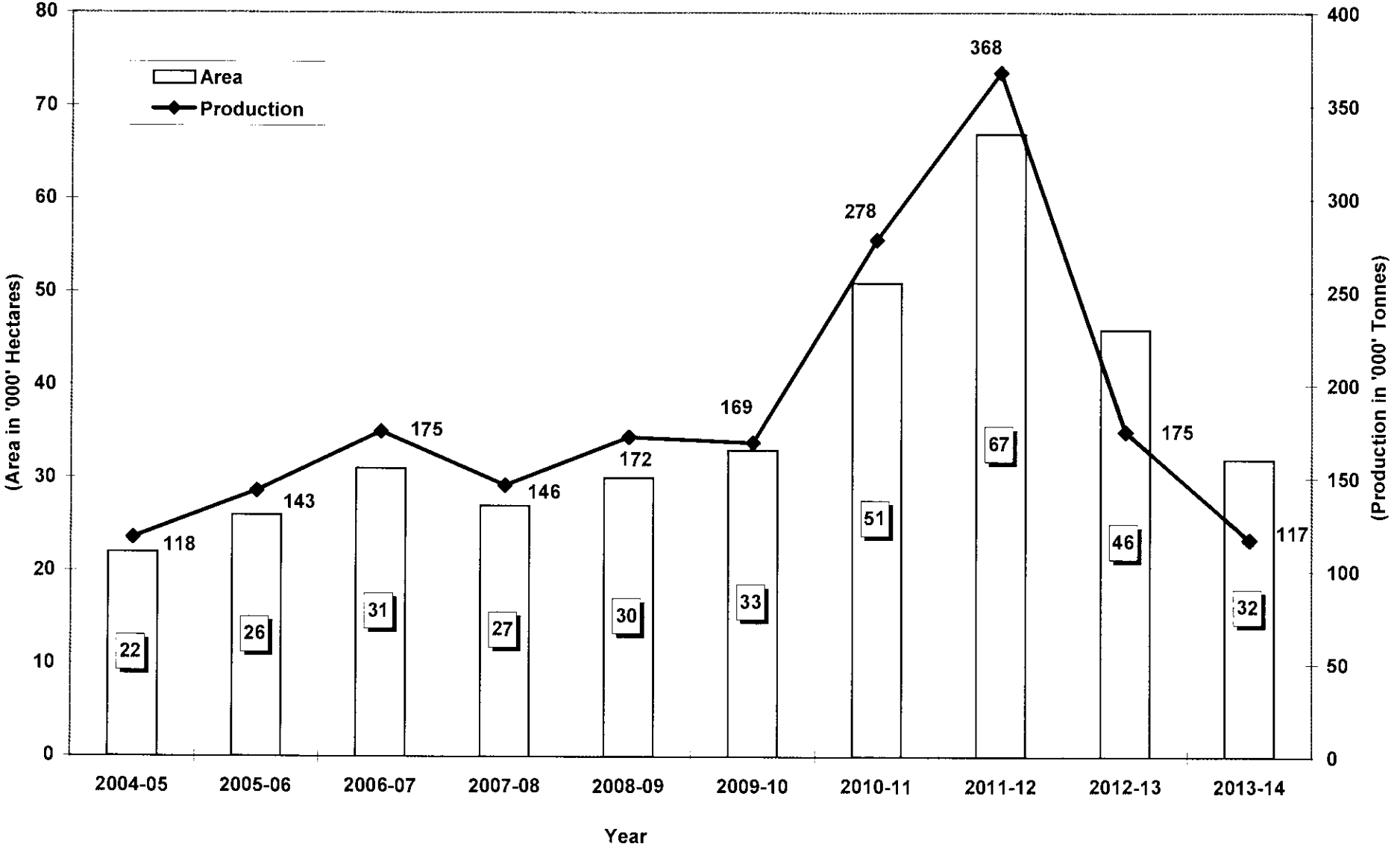
AREA AND PRODUCTION OF CHILLIES 2004-05 2013-14



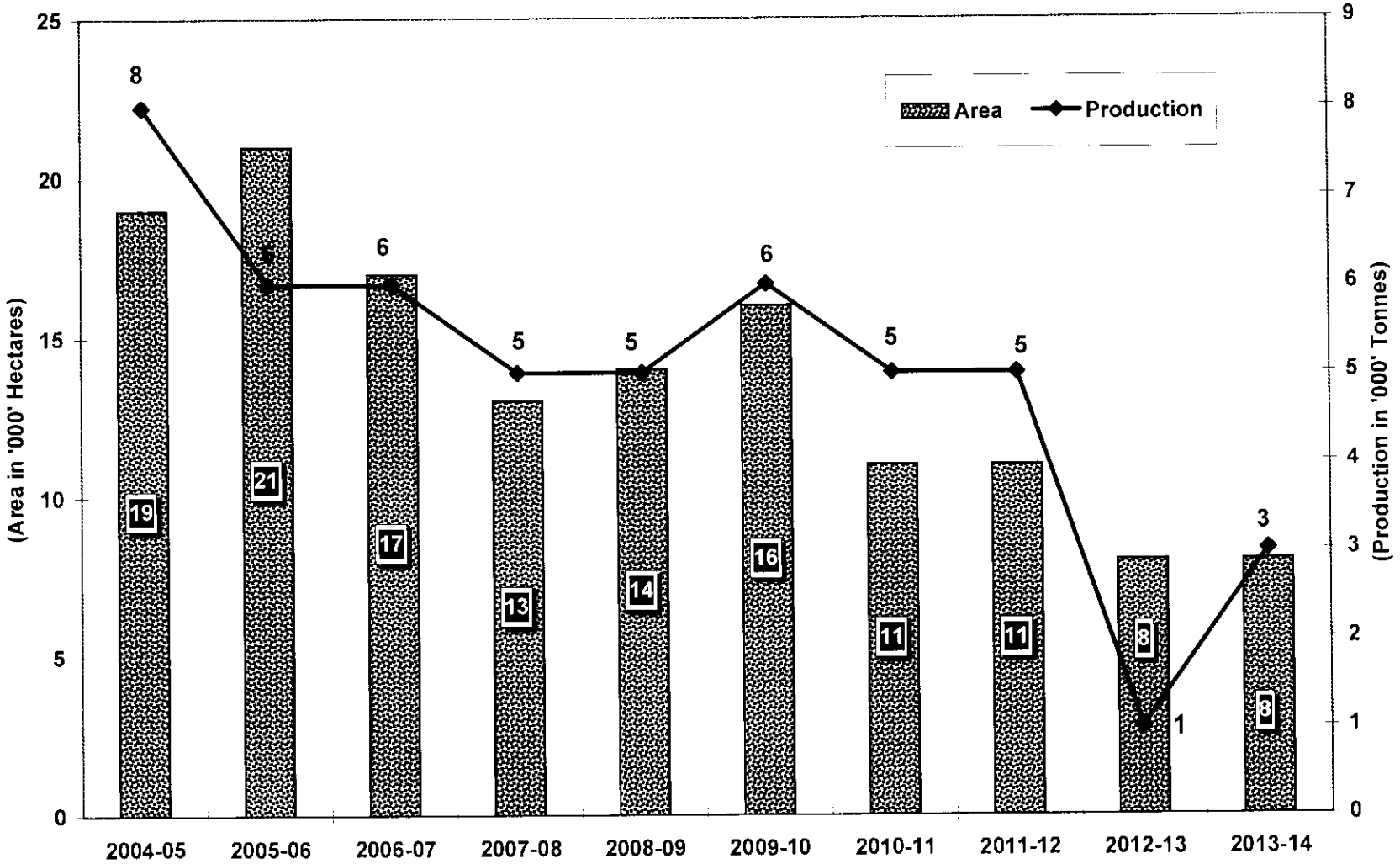
AREA AND PRODUCTION OF ONION 2004-05 TO 2013-14



AREA AND PRODUCTION TURMERIC 2004-05 TO 2013-14



AREA AND PRODUCTION OF CORIANDER 2004-05 TO 2013-14



AREA AND PRODUCTION OF CASHEWNUT 2004-05 TO 2013-14