AREA, PRODUCTION AND PRODUCTIVITY OF GRAFTED AND SEEDLING VARIETIES OF MANGO IN HIMACHAL PRADESH

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1- INTRODUCTION

Mango has been acknowledged as an excellent fruit from the ancient times and has been liked by adults and infants alike. Among all the fruits, mango occupies a special status being an oldest introduction on the Indian land from the Far East. Originally mango is a native of South Asia. However, this was and continues to be the choicest fruit of this country. In India the mango tree is a part and parcel of rural life. Moreover, it is the only fruit, which is put to multifarious uses right from its first stage of development to maturity and ripening stage. No other fruit has so much diversification in its use. In India, the mango is produced in almost all the states. In the beginning the production of this fruit was confined to few states viz. Uttar Pradesh, Andhra Pradesh, Bihar and Maharashtra, Gujarat, West Bengal, Karnataka and Kerala only. But now most of the states have entered in its cultivation in which Punjab, Haryana and Himachal Pradesh are the new entrants. The main varieties grown in India are Alphonso, Dashehari, Langra, Bombay Green and Chausa etc. In the States of West Bengal, Andhra Pradesh and Tamil Nadu the varieties like Banganpalli, Neelum, Bangalora and Swarnarekha are commonly grown.

Himachal Pradesh by and large is hilly and the agro climatic conditions found in the large part of the state restrict the cultivation of field crops but offer great scope for the development of forestry and horticultural industry. Earlier the state was known for the production of temperate fruits but in the recent past, mango cultivation has gained momentum. Mango is mainly grown in the lower areas of the state such as Bilaspur, Kangra, Hamirpur, Una and parts of Mandi, Solan and Sirmour districts. The main varieties grown in these districts are Dashehari and Langra besides Desi mangoes. In this State the area under this fruit is increasing manifolds day by day as the farmers of lower districts of the Pradesh have started planting new orchards on a large scale and have started switching over from the traditional field crops cultivation to mango cultivation. The basic reasons for such change is that on one hand farmers are facing acute shortage of labour because field crops cultivation is mainly labour intensive and on the other hand returns from mango cultivation are far higher than that of field crops. The farmers of these districts are optimistic that the mango cultivation will help in improving their economy. Keeping in view the importance of mango in the economy

of the farmers the present study has been conducted to analyse the area, production and productivity of grafted and seedling mango in the state.

1.1 Objectives of the Study

The specific objectives of the study are:

i) To study the area under grafted and seedling mangoes;

ii) To study the production and productivity of grafted and seedling mangoes in the study areas;

2 Sampling Design

Multistage stratified random sampling technique has been used to finalize the sample for detailed study. In the first stage four districts of the state were chosen on the basis of area and production of mango. Districts Kangra, Hamirpur, Bilaspur and Mandi were having highest area and production of mango in the state. These four districts formed the primary sampling unit of the study. From the selected districts two development blocks each with largest area under mangoes were selected. The details have been provided in Table 1. From each selected block one revenue village each was randomly selected. From the selected village a random sample of 50 mango orchardists was randomly selected for detailed study. Thus, the study has been based on a random –cum-purposive sample of 400 orchardists located in sixteen villages of eight blocks in four districts.

Table-1: Block wise area and production of mango in selected districts.

Block/District	Area (Hectare)	Production (Mt.)
BILASPUR		
Sadar	1243.71	1334
Ghumarwin	504.76	990
Jhandutta	810.90	600
Total	2559.57	2924
HAMIRPUR		
Bijhri	621.76	650.00
Bhoranj	350.51	210.00
Nadaun	705.28	640.10
Hamirpur	335.09	110.40
Sujanpur	293.40	198.00
Bumson	271.45	198.00
Total	2577.49	2006.50
MANDI		
Sadar	671	270
Balh	441	210
Dharampur	669	275
Drang	475	160
Chauntara	311	140
Sundar nagar	483	890
Gopalpur	401	230
Karsog	68	49
Janjehli	3	-
Gohar	18	-
Total	3540	2224
KANGRA		
Nurpur	3717.11	13670
Sulah	209.6	100
Fatehpur	627.83	90.5
Dehra	1501.17	600
N.Bagwan	198.54	71.25
N.Suriyan	1852.26	198.54
Pragpur	1887.36	150
Kangra	660.03	200
Rait	682.49	370
Lambagaon	1122.95	3760
Indora	6740.31	2500
Baijnath	370.27	105
Panchrukhi	291.27	900
Bhawarna	447.41	125
Total	20308.6	22840.29

2.1Classification of sampled Mango Orchardists**:** The sample of 400 orchardists has been divided into four size classes as per standard size classification. The details have been presented in Table 1. It may be seen from the table that 44 per cent of the sample was classified as marginal having below one hectare land, 35 per cent as small having 1-2 hectares land, 12.5 per cent as medium having 2-4 hectares land and 8.5 percent as large category farmers (having 4 hectares and above land).

Table-2: Size classification of selected mango orchardists.

Category	**Marginal (< 1 ha)**	**Small (1- 2 ha)**	**Medium (2-4 ha)**	**Large (>4 ha)**	**All**
Bilaspur	38 (38.0)	18 (18.0)	18 (18.0)	26 (26.0)	100 (100.0)
Hamirpur	56 (56.0)	40 (40.0)	4 (4.0)	-	100 (100.0)
Kangra	22 (22.0)	46 (46.0)	24 (24.0)	8 (8.0)	100 (100.0)
Mandi	60 (60.0)	36 (36.0)	4 (4.0)	-	100 (100.0)
All	176 (44.0)	140 (35.0)	50 (12.50)	34 (8.50)	400 (100.0)

Note: Figures in parenthesis are the percentages from respective total.

2.2 Data Collection: Data was collected from the selected orchardists on pre-designed and pre-tested schedules by personal interview method. The primary data thus collected was supplemented with secondary data collected mainly from the records of department of Horticulture.

2.3 Data Analysis**:** Tabular analysis has been carried out mainly in order to arrive at the conclusions.

2.4 Reference period**:** The area, production of mango related with the crop of 2007 calendar year.

3. Area and Production of Mango in Himachal Pradesh

Mango is grown in all the districts except Kinnaur and Lahaul-Spiti districts of Himachal Pradesh. The cultivation of Mango is carried out in low hills and valleys of the state. A cursory glance on Table-3 reveals that during 1990-91 to 2002-03 the area under mango in the state has increased by about 57 per cent. The maximum area under mango is in Kangra district, followed by Bilaspur, Mandi, Solan and Sirmour districts. But, the growth in area over the years is highest in Kullu (341%), followed by Sirmour (157%), Shimla (116%) and Una (99%). From the point of view of absolute area, these districts have small proportion to total area of the state and therefore do not affect the total picture significantly. However, this means that other districts have now also started paying more attention to this crop. Over all, area under mango has increased from 19,754 hectares to 30,933 hectares during the period under reference. This growth in area may be attributed to high profitability of mango orchards relative to other farming possibilities.

The production of Mango is too much dependent upon the availability of irrigation, variety and age of plants. Also, mango is an alternative bearing crop, therefore, there can be large fluctuations in its production. Mango production in Himachal Pradesh during the period 1990-91 to 2002-03 has increased significantly from 11,748 metric tones to 25,311 metric tonnes with 115 percent growth over a period of more than two decades. The declining trend in production of mango was observed in Una district. This may be due to the relatively new plantation and low productivity due to certain soil and climatic factors. The production of mango during the period of two decades has recorded higher growth in mango production except in Hamirpur district as compared to the state as a whole. Kangra district alone accounts for 53 percent of total production of the state and the same has increased significantly by 174 per cent growth during the period under study. However the productivity of mango in the state is still much less as compared to the national and international average.

Table-3: Area, production and productivity of mango in H.P.

Districts	1990-91			1991-92			1992-93		
	Area	Production	Productivity	Area	Production	Productivity	Area	Production	Productivity
1.Shimla	90	19	0.21	90	5	0.05	90	10	0.11
2. Kullu	22	2	0.09	22	-	0	22	-	0
3. Mandi	1884	595	0.32	1914	256	0.13	1974	415	0.21
4. Chamba	399	95	0.24	404	31	0.08	432	90	0.20
5. Kinnaur	-	-	-	-	-	-	-	-	-
6. Lahaul & Spiti	-	-	-	-	-	-	-	-	-
7. Kangra	11032	4886	0.44	11716	1260	0.10	12449	7629	0.61
8. Solan	1063	39	0.03	2	25	12.5	-	30	0
9. Sirmour	1141	547	0.48	1410	202	0.14	1651	716	0.43
10. Bilaspur	2158	1047	0.49	2307	278	0.12	2451	559	0.22
11. Una	924	3694	4.00	934	505	0.54	1016	5407	5.32
12. Hamirpur	1041	824	0.80	1128	125	0.11	1251	503	0.40
Total	19754	11748	0.59	21035	2687	0.13	21336	15359	0.72

Contd…….

Table-3: Contd……

Districts	1993-94			1994-95			1995-96		
	Area	Production	Productivity	Area	Production	Productivity	Area	Production	Productivity
1.Shimla	94	-	0	94	3	0.03	99	4	0.04
2. Kullu	22	-	0	25	-	0	43	-	0
3. Mandi	2066	80	0.03	2237	212	0.10	2402	140	0.05
4. Chamba	481	20	0.04	506	119	0.23	553	19	0.03
5. Kinnaur	-	-	-	-	-	-	-	-	-
6. Lahaul & Spiti	-	-	-	-	-	-	-	-	-
7. Kangra	12771	340	0.02	14072	4640	0.32	14965	1682	0.11
8. Solan	1253	9	0.00	1327	-	0	1382	15	0.01
9. Sirmour	1872	172	0.10	2032	397	0.20	2154	255	0.11
10. Bilaspur	2637	90	0.03	2835	40	0.01	3077	392	0.12
11. Una	1070	250	0.23	1246	3670	3.04	1366	1295	0.95
12. Hamirpur	1374	49	0.03	1482	158	0.10	1656	185	0.11
Total	23660	1010		25852	9600		27697	3987	

Contd…

Table-3: Contd…

Districts	1996-97			1997-98			1998-99			1999-2000		
	Area	Production	Productivity	Area	Production	Productivity	Area	Production	Productivity	Area	Production	Productivity
1.Shimla	99	5	0.05	106	8	0.07	128	10	0.07	133	25	0.18
2. Kullu	43	-	-	59	10	0.17	73	16	0.21	77	20	0.25
3. Mandi	2402	130	0.05	2607	168	0.06	2695	311	0.11	2795	480	0.17
4. Chamba	553	19	0.03	570	108	0.18	583	124	0.21	591	116	0.19
5. Kinnaur	-	-	-	-	-	-	-	-	-	-	-	-
6. Lahaul & Spiti	-	-	-	-	-	-	-	-	-	-	-	-
7. Kangra	14966	1650	0.11	14443	9155	0.63	15223	8505	0.55	15833	4040	0.25
8. Solan	1382	14	0.01	1477	92	0.06	1542	26	0.01	1572	103	0.06
9.Sirmour	2154	250	0.11	2279	1014	0.44	2383	1696	0.71	2533	1860	0.73
10.Bilaspur	3076	390	0.12	1879	180	0.09	2386	541	0.22	2686	875	0.32
11. Una	1366	1295	0.95	1377	793	0.57	1485	3627	2.44	1585	945	0.60
12. Hamirpur	1656	185	0.11	1511	177	0.11	1811	2040	1.12	2028	950	0.47
Total	27697	3938		26308	11759		28299	16892		28833	9414	

Contd…

Table-3: Contd..

Districts	2000-01			2001-02			2002-03		
	Area	Production	Productivity	Area	Production	Productivity	Area	Production	Productivity
1.Shimla	142	4	0.03	169	9	0.05	194	52	0.27
2. Kullu	83	6	0.07	88	0	0	97	12	0.12
3. Mandi	2931	173	0.06	3035	786	0.26	3165	609	0.19
4. Chamba	603	25	0.04	619	845	1.37	662	546	0.82
5. Kinnaur	-	-	-	-	-	-	-	-	-
6. Lahaul & Spiti	-	-	-	-	-	-	-	-	-
7. Kangra	16277	7514	0.46	16689	19567	1.17	17390	13383	0.77
8. Solan	1637	44	0.03	1705	466	0.27	1804	371	0.21
9.Sirmour	2662	1366	0.51	2806	561	0.20	2932	3250	1.11
10.Bilaspur	2813	596	0.21	3001	1270	0.42	3223	2231	0.69
11. Una	1680	2161	1.29	1698	2190	1.29	1839	3416	1.86
12. Hamirpur	2105	1209	0.57	2227	1050	0.47	2378	1441	0.60
Total	30933	13098		32037	26744		33684	25311	

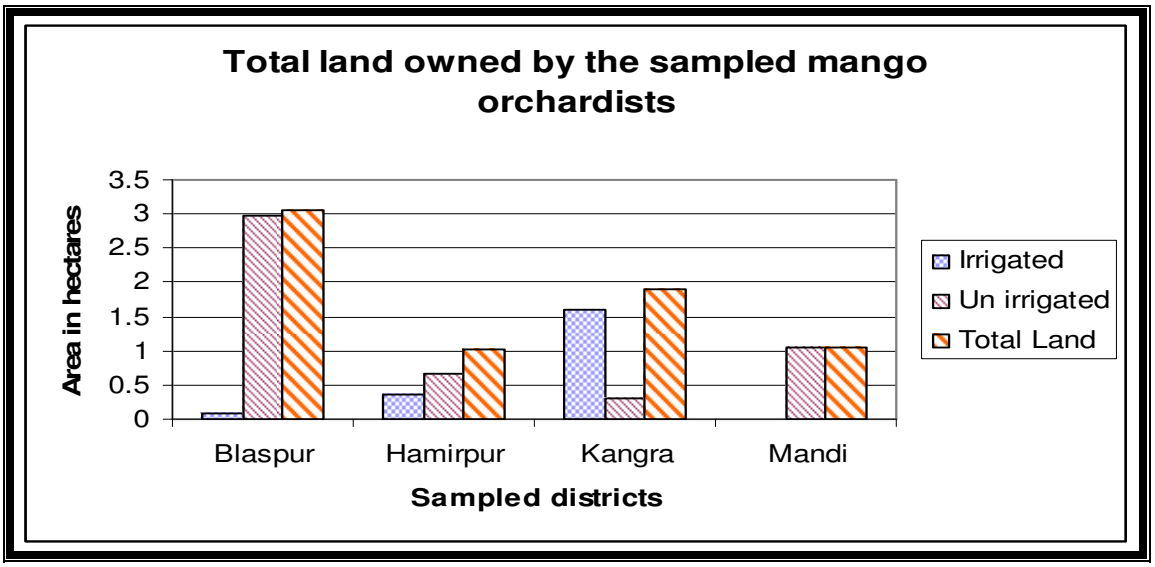
4. Land use pattern of sampled Mango orchardists

The land utilization pattern of the sampled mango orchardists has been presented in Table 4. The table reveals that overall level, the cultivated area was 0.47 hectare per farm. The total land at overall level was 1.76 hectares per farm of which 0.52 hectare was irrigated and the rest 1.24 hectares was unirrigated. Field crops were grown in 0.47 hectare of which 0.15 hectare was irrigated. Orchards in total occupied 0.77 hectare of total land holding and almost 50 percent of this was irrigated. There were no fallow lands and *Ghasni* occupied about 0.42 hectare per farm. The barren land at over level was 0.10 hectare per farm and this was highest among the large farmers.

Land utilization pattern of the sampled mango orchardists in percentages has been presented in Table 5. On an average, about 44 percent of the total land was under orchards and 26 percent was under field crops. The area under *ghasni* and barren land accounted for 24 and 6 percent of total land of sampled farmers under study, respectively. Further table reveals that proportion of area under orchards in total land was relatively higher on marginal farms followed by small, medium and large farms showing direct relation with the land holding.

District wise land utilization pattern shows that the total land was relatively higher (3.07 hectares) in Bilaspur district and lower (1.03 hectares) in Hamirpur district. The area under irrigation was comparatively higher in Kangra district while all land was rainfed in Mandi district. The similar trend has been observed in case of cultivated land and highest cultivated area was found to be in the district Bilaspur (0.65 ha) and the least in the district Hamirpur (0.40 ha). The area under orchard was 1.41 hectares per farm in district Kangra which is higher than other districts under study. The entire land under orchards in Bilaspur and Mandi district was rainfed.

Further table 5 reveals that out of total land about 40 percent each was under field crops in districts Mandi and Hamirpur. In other districts area under field crops was 21.35 percent in Bilaspur district and 22.18 percent of total land in Kangra district. The proportionate area under orchards was relatively higher in Kangra district (74.46%), followed by Hamirpur (54.78%), Mandi (50.53%) and least in Bilaspur district (18.74%).



Land use pattern of sampled mango orchardists

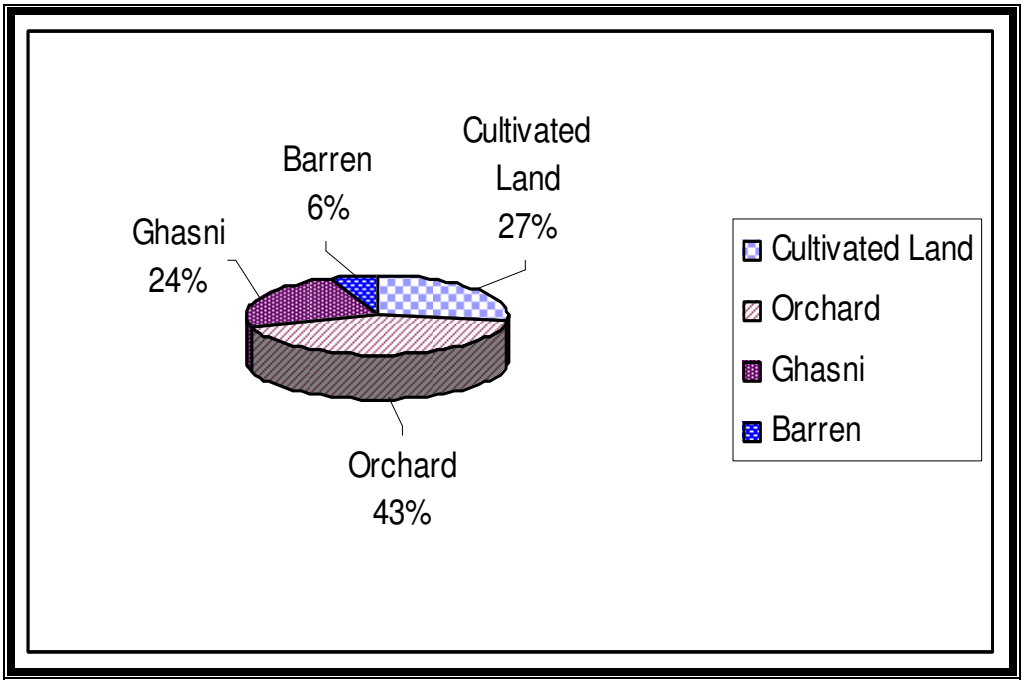


Table-4: Land utilization pattern on sampled farms.

(Ha/farm)

Particulars	Cultivated Land			Orchard			Ghasni			Barren			Total Land		
	IR	UIR	Total	IR	UIR	Total	IR	UIR	Total	IR	UIR	Total	IR	UIR	Total
Bilaspur															
Marginal	0.01	0.20	0.21	-	0.18	0.18	-	0.10	0.10	-	-	-	0.01	0.49	0.50
Small	-	0.56	0.56	-	0.80	0.80	-	0.21	0.21	-	-	-	-	1.57	1.57
Medium	0.13	0.76	0.89	-	0.99	0.99	-	1.51	1.51	-	0.02	0.02	0.13	3.29	3.42
Large	0.20	1.00	1.20	-	0.70	0.70	-	4.25	4.25	-	1.47	1.47	0.20	7.43	7.63
All	0.08	0.57	0.65	-	0.57	0.57	-	1.45	1.45	-	0.38	0.38	0.08	2.99	3.07
Hamirpur															
Marginal	0.03	0.07	0.10	0.16	0.29	0.45	-	0.01	0.01	-	-	-	0.19	0.37	0.56
Small	0.23	0.46	0.69	0.39	0.34	0.73	-	0.12	0.12	-	-	-	0.62	0.92	1.54
Medium	0.36	1.54	1.90	-	0.50	0.50	-	-	-	-	-	-	0.36	2.04	2.40
Large	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All	0.12	0.28	0.40	0.25	0.31	0.56	-	0.05	0.05	-	-	-	0.37	0.66	1.03
Kangra															
Marginal	0.08	-	0.08	0.77	-	0.77	-	-	-	-	-	-	0.85	-	0.85
Small	0.40	-	0.40	1.05	-	1.05	-	-	-	-	-	-	1.46	-	1.46
Medium	0.37	0.07	0.44	1.33	0.51	1.84	-	0.27	0.27	-	-	-	1.70	0.85	2.55
Large	1.40	-	1.40	2.95	1.03	3.98	-	-	-	-	-	-	4.35	1.03	5.38
All	0.40	0.02	0.42	1.21	0.20	1.41	-	0.06	0.06	-	-	-	1.61	0.29	1.90
Mandi															
Marginal	-	0.30	0.30	-	0.41	0.41	-	0.04	0.04	-	-	-	-	0.75	0.75
Small	-	0.52	0.52	-	0.67	0.67	-	0.13	0.13	-	-	-	-	1.32	1.32
Medium	-	1.20	1.20	-	1.00	1.00	-	0.56	0.56	-	0.28	0.28	-	3.04	3.04
Large	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All	-	0.41	0.41	-	0.53	0.53	-	0.09	0.09	-	0.01	0.01	-	1.04	1.04
Overall															
Marginal	0.02	0.17	0.19	0.15	0.27	0.42	-	0.04	0.04	-	-	-	0.17	0.48	0.65
Small	0.20	0.33	0.53	0.46	0.37	0.83	-	0.09	0.09	-	-	-	0.66	0.80	1.46
Medium	0.25	0.53	0.78	0.64	0.72	1.36	-	0.71	0.71	-	0.03	0.03	0.89	1.99	2.88
Large	0.49	0.76	1.25	0.69	0.78	1.47	-	3.25	3.25	-	1.12	1.12	1.18	5.92	7.10
All	0.15	0.32	0.47	0.37	0.40	0.77	-	0.42	0.42	-	0.10	0.10	0.52	1.24	1.76

Table- 5: Percentage of land under different uses on sampled farms.

(Percentages)

Particulars	Cultivated Land			Orchard			Ghasni			Barren			Total Land		
	IR	UIR	Total	IR	UIR	Total	IR	UIR	Total	IR	UIR	T	IR	UIR	Total
Bilaspur															
Marginal	100.0	41.02	42.12	-	37.60	36.97	-	21.37	21.00	-	-	-	100.0	100.0	100.0
Small	-	35.59	35.59	-	50.85	50.85	-	13.56	13.56	-	-	-	-	100.0	100.0
Medium	100.0	23.24	26.23	-	30.27	29.09	-	45.94	44.15	-	0.54	0.52	100.0	100.0	100.0
Large	100.0	13.43	15.81	-	9.45	9.19	-	57.30	55.73	-	19.82	19.27	100.0	100.0	100.0
All	100.0	19.20	21.35	-	19.25	18.74	-	48.66	47.37	-	12.89	12.55	100.0	100.0	100.0
Hamirpur															
Marginal	14.60	19.07	17.51	85.40	77.04	79.95	-	3.89	2.54	-	-	-	100.0	100.0	100.0
Small	36.89	50.0	44.76	63.10	36.64	47.22	-	13.36	8.02	-	-	-	100.0	100.0	100.0
Medium	100.0	75.49	79.17	-	24.51	20.83	-	-	-	-	-	-	100.0	100.0	100.0
Large	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All	32.75	43.50	39.63	67.25	47.75	54.78	-	8.75	5.59	-	-	-	100.0	100.0	100.0
Kangra															
Marginal	9.79	-	9.79	90.21	-	90.21	-	-	-	-	-	-	100.0	-	100.0
Small	27.65	-	27.65	72.35	-	72.35	-	-	-	-	-	-	100.0	-	100.0
Medium	21.92	7.87	17.26	78.08	60.63	72.18	-	31.50	10.46	-	-	-	100.0	100.0	100.0
Large	32.18	-	26.02	67.82	100.0	73.98	-	-	-	-	-	-	100.0	100.0	100.0
All	25.10	5.60	22.18	74.90	71.99	74.46	-	22.41	3.36	-	-	-	100.0	100.0	100.0
Mandi															
Marginal	-	40.11	40.11	-	54.95	54.95	-	4.94	4.94	-	-	-	-	100.0	100.0
Small	-	39.39	39.39	-	50.84	50.85	-	9.76	9.76	-	-	-	-	100.0	100.0
Medium	-	39.47	39.47	-	32.89	32.89	-	18.42	18.42	-	9.21	9.21	-	100.0	100.0
Large	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All	-	39.71	39.71	-	50.53	50.53	-	8.69	8.69	-	1.07	1.07	-	100.0	100.0
Overall															
Marginal	12.50	35.19	29.24	87.50	56.48	64.62	-	8.32	6.14	-	-	-	100.0	100.0	100.0
Small	30.14	41.93	36.64	69.86	46.17	56.80	-	11.90	6.56	-	-	-	100.0	100.0	100.0
Medium	28.67	26.36	27.07	71.46	36.29	47.16	-	35.90	24.81	-	1.44	1.0	100.0	100.0	100.0
Large	41.35	12.88	17.63	58.65	13.16	20.74	-	54.95	45.79	-	19.00	15.84	100.0	100.0	100.0
All	29.43	25.95	26.97	70.57	32.62	43.75	-	33.47	23.65	-	7.96	5.62	100.0	100.0	100.0

5. Area under various fruit on sampled farms

Area under different fruit crops has been presented in Tables 6 and 7. It may be seen from the Table 6 that out of total area of 0.77 ha under all fruits 0.59 ha occupied by the mango (grafted). The next important fruit was Kinnow having 0.09 ha area and Sangtra having 0.06 ha area per farm. The other fruit crops grown by the sampled farmers were Aonla, Papaya, Lime, Galgal, Pomegranate, Pear and Malta. However, area occupied by these fruit was negligible.

The proportion of total fruits area occupied by different fruit crops has been presented in Table 7. The mango crop occupied 76.45 percent of total area under all fruits. The area under Kinnow and Sangtra was 12.19 and 7.85 percent of total area under all fruits. The rest area of all fruits has been devoted to Aonla, Papaya, Lime, Galgal, Pomegranate, Pear and Malta fruit crops.

District wise area under various fruit grown by the sampled farmers indicates that per farm area under mango was relatively higher in case of sampled farmers of Kangra (0.80ha) than Bilaspur (0.54ha), Mandi (0.52ha) and Hamirpur (0.49ha). The cultivation of Aonla and Papaya was observed only on marginal farms of Bilaspur district. Pear and Malta were cultivated only by sampled medium sampled farms in Kangra district. Kinnow and Sangtra were raised by the sampled farmers of Kangra and Hamirpur districts under study. Substantial area under Litchi crop has been observed in case of sampled farmers of Bilaspur district.

As far as proportionate area under various fruit crops is concerned the mango occupied about 97 percent of total fruit area in Mandi, 95 percent in Bilaspur, 87 percent in Hamirpur and 57 percent in Kangra district. In Kangra district 26 percent and 16 percent of total fruit area was under Kinnow and Sangtra. Nearly 3 percent of total fruit area was occupied by Litchi in each Bilaspur and Hamirpur districts. Lime was raised on 3.55 percent of total land under fruits in Hamirpur district.

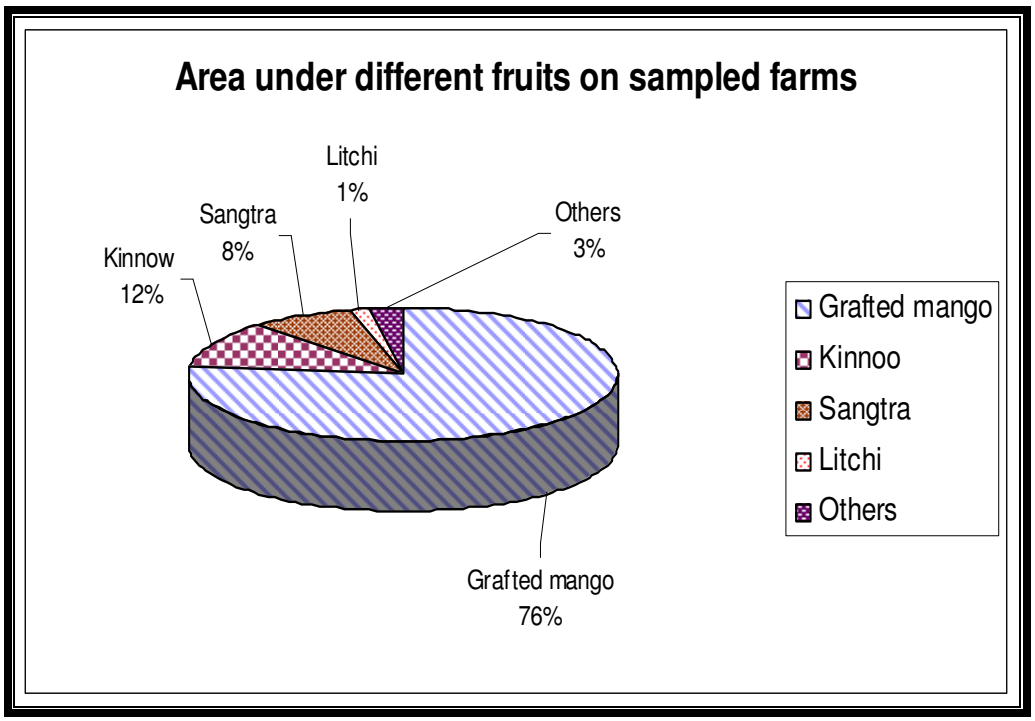

Area under different fruits on sampled farms
Litchi
1%
Sangtra
8%
Others
3%
Kinnow
12%
Grafted mango
76%
Grafted mango
Kinnoo
Sangtra
Litchi
Others

Table- 6: Per farm area under various fruit crops on sampled farms.

(Area in Hectares)

Particulars	Grafted Mango	Aonla	Papaya	Lime	Galgal	Litchi	Pomgranate	Kinnow	Sangtra	Pear	Malta	All
Bilaspur												
Marginal	0.16	0.01	0.01	Neg.	-	-	-	-	-	-	-	0.18
Small	0.72	-	-	Neg.	Neg.	0.08	-	-	-	-	-	0.80
Medium	0.99	-	-	-	-	0.01	-	-	-	-	-	1.00
Large	0.69	-	-	-	-	0.01	-	-	-	-	-	0.70
All	0.54	Neg.	Neg.	Neg.	Neg.	0.02	-	-	-	-	-	0.58
Hamirpur												
Marginal	0.39	-	-	0.02	0.01	0.02	0.01	-	-	-	-	0.45
Small	0.64	-	-	0.03	0.01	0.02	-	0.01	0.02	-	-	0.73
Medium	0.50	-	-	-	-	-	-	-	-	-	-	0.50
Large	-	-	-	-	-	-	-	-	-	-	-	-
All	0.49	-	-	0.02	0.01	0.02	0.01	0.01	0.01	-	-	0.57
Kangra												
Marginal	0.44	-	-	-	-	-	-	0.14	0.18	-	-	0.77
Small	0.63	-	-	-	-	0.01	-	0.25	0.16	-	-	1.05
Medium	0.99	-	-	-	-	-	-	0.48	0.32	0.02	0.03	1.84
Large	2.20	-	-	-	-	-	-	1.28	0.50	-	-	3.98
All	0.80	-	-	-	-	Neg.	-	0.37	0.23	Neg.	0.01	1.41
Mandi												
Marginal	0.39	-	-	0.01	0.01	Neg.	Neg.	-	-	-	-	0.41
Small	0.80	-	-	-	-	-	-	-	-	-	-	0.80
Medium	0.13	-	-	-	-	-	-	-	-	-	-	0.13
Large	-	-	-	-	-	-	-	-	-	-	-	-
All	0.52	-	-	0.01	0.01	Neg.	Neg.	-	-	-	-	0.54
Overall												
Marginal	0.35	Neg.	Neg.	0.01	0.01	0.01	Neg.	0.02	0.02	-	-	0.42
Small	0.66	-	-	-	Neg.	0.02	-	0.09	0.06	-	-	0.83
Medium	0.95	-	-	-	-	Neg.	-	0.23	0.15	0.01	0.02	1.36
Large	1.05	-	-	-	-	Neg.	-	0.30	0.12	-	-	1.47
All	0.59	Neg.	Neg.	Neg.	Neg.	0.01	Neg.	0.09	0.06	Neg.	Neg.	0.77

Table-7: Percentage area under different fruit crop of sampled farms.

(Percentage)

Particulars	Grafted Mango	Aonla	Papaya	Lime	Galgal	Litchi	Pomgranate	Kinnow	Sangtra	Pear	Malta	All
Bilaspur												
Marginal	86.93	4.26	6.25	2.55	-	-	-	-	-	-	-	100.0
Small	90.00	-	-	-0.14	0.14	9.72	-	-	-	-	-	100.0
Medium	99.10	-	-	-	-	0.90	-	-	-	-	-	100.0
Large	99.12	-	-	-	-	0.88	-	-	-	-	-	100.0
All	95.35	0.52	0.76	0.36	0.03	2.98	-	-	-	-	-	100.0
Hamirpur												
Marginal	85.88	-	-	3.81	1.91	4.28	1.98	2.14	-	-	-	100.0
Small	87.39	-	-	3.56	1.85	2.06	-	1.71	3.43	-	-	100.0
Medium	100.0	-	-	-	-	-	-	-	-	-	-	100.0
Large	-	-	-	-	-	-	-	-	-	-	-	-
All	87.16	-	-	3.55	1.81	2.97	0.89	1.85	1.77	-	-	100.0
Kangra												
Marginal	57.55	-	-	-	-	-	-	18.39	24.06	-	-	100.0
Small	60.14	-	-	-	-	0.49	-	23.88	15.49	-	-	100.0
Medium	53.62	-	-	-	-	-	-	26.35	17.31	0.90	1.82	100.0
Large	55.27	-	-	-	-	-	-	32.16	12.57	-	-	100.0
All	56.69	-	-	-	-	0.18	-	25.86	16.43	0.28	0.56	100.0
Mandi												
Marginal	94.21	-	-	2.09	1.61	0.81	1.28	-	-	-	-	100.0
Small	100.0	-	-	-	-	-	-	-	-	-	-	100.0
Medium	100.0	-	-	-	-	-	-	-	-	-	-	100.0
Large	-	-	-	-	-	-	-	-	-	-	-	-
All	97.28	-	-	0.98	0.76	0.37	0.61	-	-	-	-	100.0
Overall												
Marginal	82.28	0.41	0.59	2.25	1.18	1.73	1.11	4.95	5.50	-	-	100.0
Small	78.95	-	-	0.91	0.48	1.93	-	10.40	7.33	-	-	100.0
Medium	69.68	-	-	-	-	0.24	-	17.09	11.23	0.58	1.18	100.0
Large	71.25	-	-	-	-	0.33	-	20.44	7.98	-	-	100.0
All	76.45	0.09	0.15	0.88	0.47	1.25	0.26	12.19	7.85	0.13	0.25	100.0

6. Area under mango on sampled farms

6.1 Per farm area under Grafted and Seedling Mango

Per farm area under grafted and seedling mango has been presented in Table 8. It can be seen from the table that on an average, per farm area under grafted mango was 0.52 ha which was higher on medium farms. In case of seedling mango per farm area was 0.004ha which is directly related with the size of farms. Further, table reveals that per farm area under grafted mango was comparatively higher in case of sampled farms of Kangra district (0.77 ha) followed by farmers of Hamirpur district (0.47 ha), Mandi (0.45 ha) and lesser in Bilaspur district. Per farm area under seedling mango was relatively higher in case of sampled farms of Mandi district, followed by farmers of Bilaspur, Hamirpur and Kangra districts.

6.2 Per farm production of Grafted and Seedling mango

On an average, per farm annual production of mango was 41.25 quintal out of which 40.72 quintals was grafted mango and rest 0.53 quintal was seedling mango. Farm size wise production of mango ranges between 28.27 quintals on marginal farms to 50.32 quintals on medium farms. Further, per farm mango production was relatively higher on sampled farms of Kangra district than farms of other district. The details of production of mango on different categories of farms have been presented in table 8.

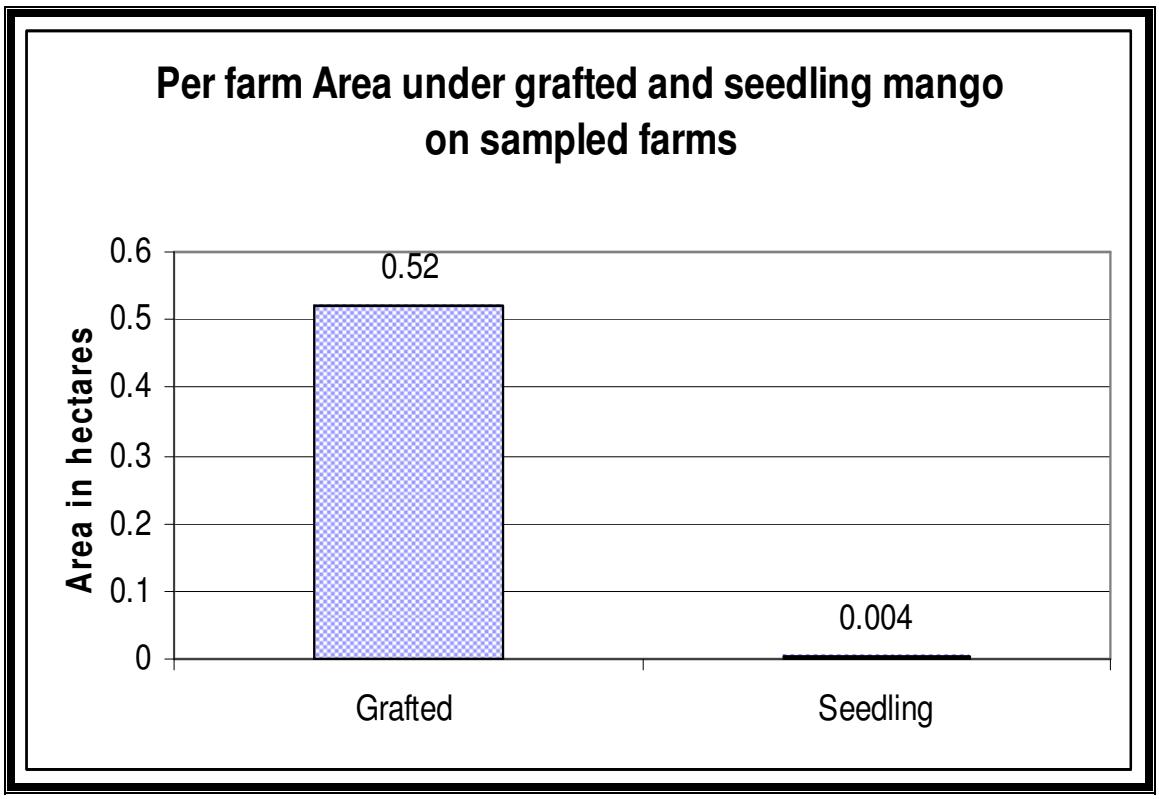
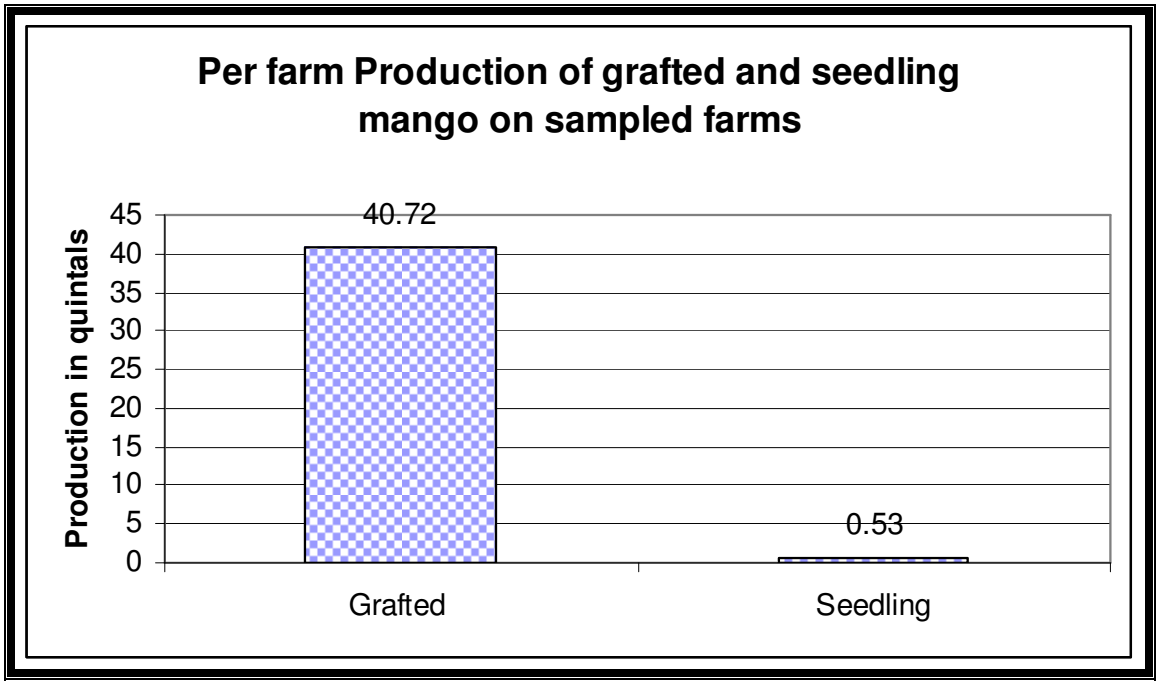

Per farm Area under grafted and seedling mango on sampled farms
Area in hectares
0.6
0.5
0.4
0.3
0.2
0.1
0
0.52
0.004
Grafted
Seedling

Table-8: Per farm area and production of grafted and seedling mango.

(Area in Ha, qty in Qtls)

Category	Grafted		Seedling		All	
Bilaspur	**Area**	**Production**	**Area**	**Production**	**Area**	**Production**
Marginal	0.13	9.89	-	-	0.13	9.89
Small	0.62	57.88	-	-	0.62	57.88
Medium	0.66	17.00	0.01	1.11	0.67	18.11
Large	0.42	17.23	0.01	1.07	0.43	18.30
All	0.39	21.72	0.004	0.48	0.39	22.20
Hamirpur						
Marginal	0.38	20.03	0.002	0.29	0.38	20.32
Small	0.61	25.25	0.005	0.60	0.62	25.85
Medium	0.44	30.0	0.03	2.50	0.47	32.50
Large	-	-	-	-	-	-
All	0.47	22.52	0.004	0.50	0.48	23.02
Kangra						
Marginal	0.41	39.64	-	-	0.41	39.64
Small	0.63	60.48	0.002	0.22	0.63	60.69
Medium	0.96	71.16	0.008	0.91	0.97	72.08
Large	2.00	148.00	0.02	2.00	2.02	150.0
All	0.77	65.46	0.004	0.48	0.77	65.94
Mandi						
Marginal	0.32	42.83	0.003	0.33	0.32	43.17
Small	0.60	67.50	0.007	1.00	0.61	68.50
Medium	0.97	80.0	0.02	2.50	1.00	82.50
Large	-	-	-	-	-	-
All	0.45	53.20	0.005	0.66	0.45	53.86
Overall						
Marginal	0.31	28.06	0.002	0.20	0.31	28.27
Small	0.62	51.88	0.004	0.50	0.62	38.10
Medium	0.81	49.08	0.01	1.24	0.82	50.32
Large	0.79	48.0	0.01	1.29	0.80	49.29
All	0.52	40.72	0.004	0.53	0.53	41.25


Per farm Production of grafted and seedling mango on sampled farms
Production in quintals
45
40
35
30
25
20
15
10
5
0
40.72
0.53
Grafted
Seedling

7. Variety wise area under grafted mango

Per farm variety wise area under different varieties of grafted mango has been given in Table 9 wherein it may be seen that the Dashehari variety occupies maximum area of 0.46 ha followed by Langra variety 0.04 ha and Chausa variety 0.008 ha per farm. The area under Dashehari variety was higher on medium category of farms and lesser on marginal farms. In case of Langra variety the area was more on large farms and less on marginal farms. Per farm area and farm size is directly related in case of area under Chausa variety of mango.

District wise area under various varieties of grafted mango is also presented in the Table 8. It may be seen from the Table that per farm area under Dashehari variety was 0.72 ha, 0.35 ha each and 0.44 ha on sampled farms of Kangra, Bilaspur, Hamirpur and Mandi district respectively. On an average, per farm area under Langra variety was 0.03 ha on sampled farms of Bilaspur district, 0.11ha in Hamirpur and 0.03 ha on sampled farms of Kangra district. Cultivation of Langra variety was not found on sampled farms of Mandi district. Cultivation of Chausa variety was observed in case of sampled farmers of Hamirpur and Kangra districts only. In Hamirpur cultivation of Chausa variety was carried out only by the sampled marginal farmers. The area devoted to this variety by this category of farmers was 0.02 ha. In Kangra district, except marginal farmers all other farmers planted the orchard of Chausa variety. On an average, per farm area under Chausa variety on sampled farms of Kangra district was 0.02 ha in case of small farms, 0.03 ha in case of medium farms and 0.05 ha in case of large farms.

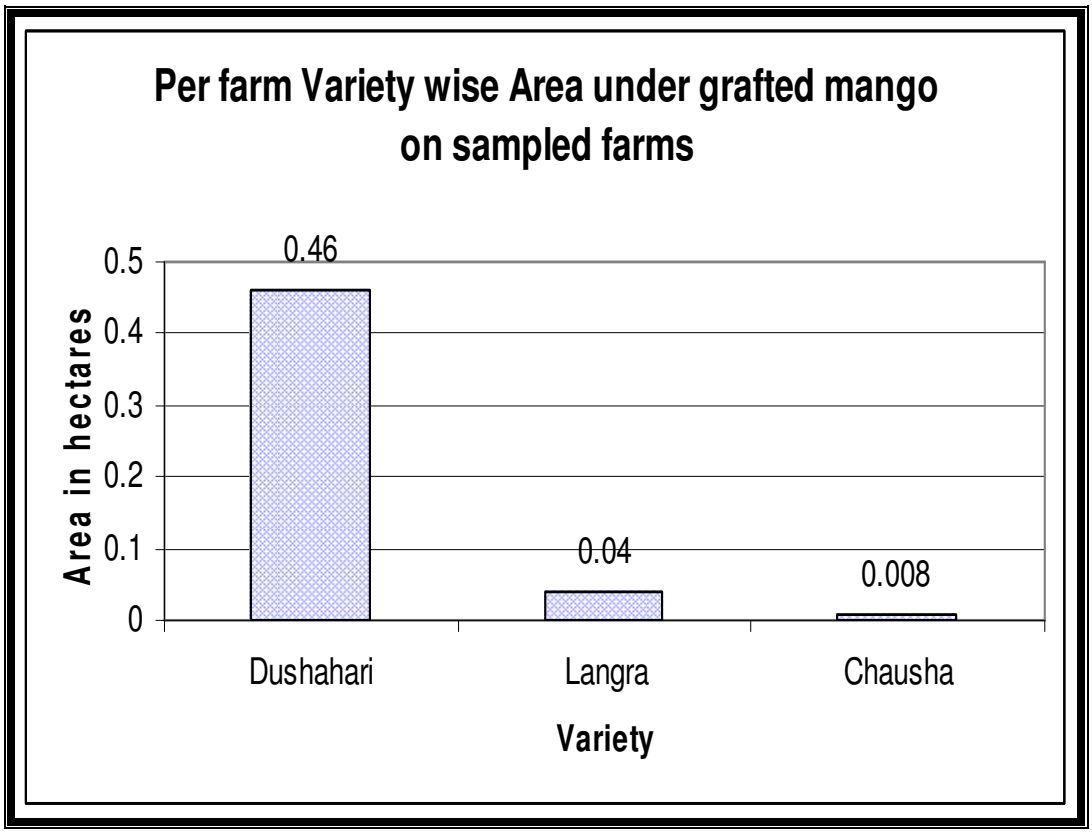

Per farm Variety wise Area under grafted mango on sampled farms
Area in hectares
0.5
0.4
0.3
0.2
0.1
0
0.46
0.04
0.008
Dushahari
Langra
Chausha
Variety

Table- 9: Per farm area under different variety of grafted mango on sampled farms.

(Area in Ha)

Category	Dashehari	Langra	Chausa	All
Bilaspur				
Marginal	0.13	-	-	0.13
Small	0.53	0.09	-	0.62
Medium	0.60	0.06	-	0.66
Large	0.39	0.03	-	0.42
All	0.35	0.03	-	0.39
Hamirpur				
Marginal	0.28	0.07	0.02	0.38
Small	0.45	0.15	-	0.61
Medium	0.32	0.12	-	0.44
Large	-	-	-	-
All	0.35	0.11	0.01	0.47
Kangra				
Marginal	0.41	-	-	0.41
Small	0.59	0.01	0.02	0.63
Medium	0.91	0.03	0.03	0.96
Large	1.75	0.20	0.05	2.00
All	0.72	0.03	0.02	0.77
Mandi				
Marginal	0.32	-	-	0.32
Small	0.60	-	-	0.60
Medium	0.97	-	-	0.97
Large	-	-	-	-
All	0.44	-	-	0.44
Overall				
Marginal	0.27	0.02	0.007	0.30
Small	0.55	0.06	0.008	0.62
Medium	0.75	0.04	0.01	0.81
Large	0.70	0.07	0.01	0.79
All	0.46	0.04	0.008	0.52

8. Variety wise production of grafted mango

Per farm variety wise annual production of grafted mango has been presented in Table 10. It may be seen from the Table that out of total production of 40.72 quintals 38.56 quintals was of Dashehari variety, 1.68 quintals of Langra variety and 0.47 quintal was Chausa variety. Per farm production of Dashehari variety ranges between 27.11 quintals on marginal farms to 48.71 quintals on small farms. In case of Langra variety the production varied between 0.67 quintals per farm on marginal category to 3.82 quintals on large category of farmers. Per farm production of Chausa variety ranges between 0.28 quintal on marginal farms to 0.71 quintal on small farms.

District wise per farm production of different varieties of grafted mango is also presented in Table 10 wherein it may be seen that the production of grafted mango was relatively higher on sampled farms of Kangra district followed by Mandi, Hamirpur and Bilaspur district. The variety wise and farm size wise per farm production details are also given in the Table

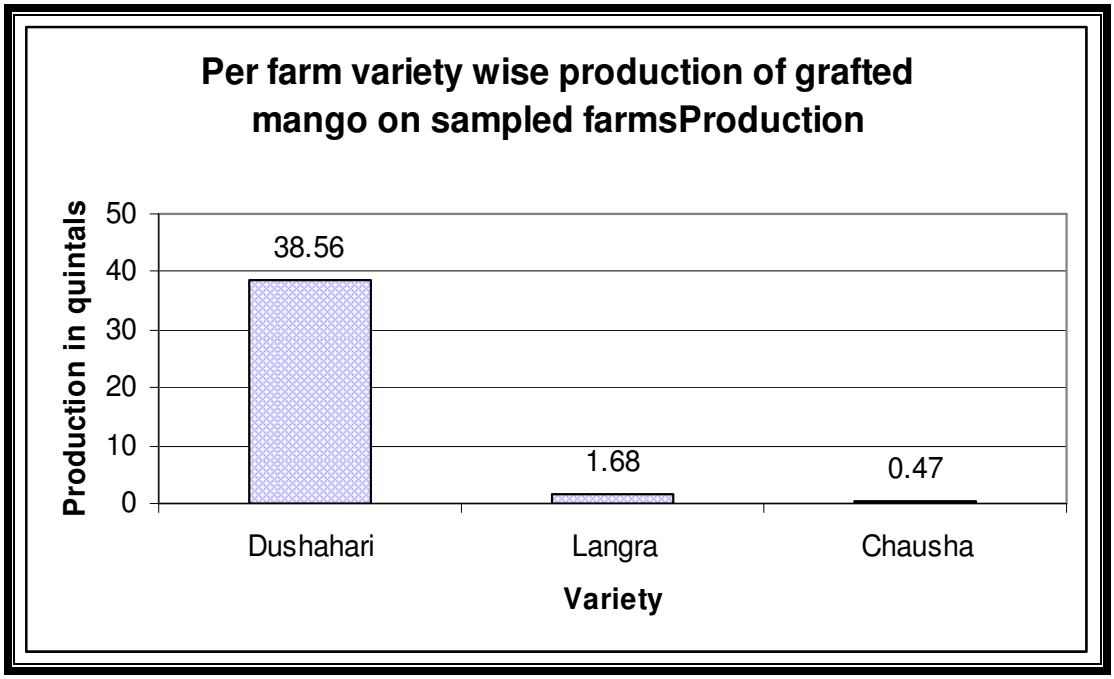

Per farm variety wise production of grafted mango on sampled farmsProduction
Production in quintals
50
40
30
20
10
0
38.56
1.68
0.47
Dushahari
Langra
Chausha
Variety

Table-10: Per farm production of different variety of grafted mango on sampled farms.

(Qty in qtls)

Category	Dashehari	Langra	Chausa	All
Bilaspur				
Marginal	9.89	-	-	9.89
Small	51.44	6.44	-	57.88
Medium	14.66	2.33	-	17.00
Large	16.23	1.00	-	17.23
All	19.88	1.84	-	21.72
Hamirpur				
Marginal	17.03	2.10	0.89	20.03
Small	20.90	4.35	-	25.25
Medium	27.50	2.50	-	30.0
Large	-	-	-	-
All	19.0	3.02	0.50	22.52
Kangra				
Marginal	39.63	-	-	39.63
Small	57.13	1.17	2.17	60.47
Medium	69.00	1.25	0.92	71.16
Large	132.75	13.00	2.25	148.0
All	62.18	1.88	1.40	65.46
Mandi				
Marginal	42.83	-	-	42.83
Small	67.50	-	-	67.50
Medium	80.0	-	-	80.0
Large	-	-	-	-
All	53.20	-	-	53.20
Overall				
Marginal	27.11	0.67	0.28	28.06
Small	48.71	2.45	0.71	51.88
Medium	47.00	1.64	0.44	49.08
Large	43.64	3.82	0.52	48.00
All	38.56	1.68	0.47	40.72

9. Age wise area under different variety of grafted mango

Per farm age wise and variety wise area under grafted variety of mango is given in Table 11. The entire productive life of the grafted mango trees has been grouped into three age groups i.e. 5-15 years, 15-25 years and 25-60 years. On the whole, per farm average area of Dashehari variety was 0.27 ha, 0.18 ha and 0.01 ha in the age group of 5-15 years, 15-25 years and 25-60 years, respectively. In case of Langra variety, the area under age group of 5-15 years was 0.03 ha per farm and 0.008 ha was in the age group of 15-25 years. There was no orchard of Langra variety having age above the 25 years on sampled farms under study. The orchards of Chausa variety were in the age group of 5-15 years only and on an average, per farm area was 0.008 ha. Further, analysis reveals that the majority of the plants of grafted mango in the orchards in state are in the age group 5-15 years followed by the age group of 15-25 and 25-60 years.

District wise area of grafted varieties under different ages indicates that the maximum orchards of Dashehari variety in Bilaspur district were young having age up to 25 years. In case of Langra variety all the sampled orchards were in the age group of 5-15 years. In case of Hamirpur district the majority of the Dashehari variety orchards were in the age group of 5-15 years. The Langra variety orchards were in the age group of 5-15 and 15-25 years. In case of Chausa variety the sampled orchards were in the age group of 5-15 years in this district. The same trend is observed in district Kangra. In Mandi district farmers raised only Dashehari variety of grafted mango. The area under the age of 5-15 years was 0.22 ha, in the age of 15-25 years was 0.22 and in the age group of 25-60 the area was 0.003 ha per farm.

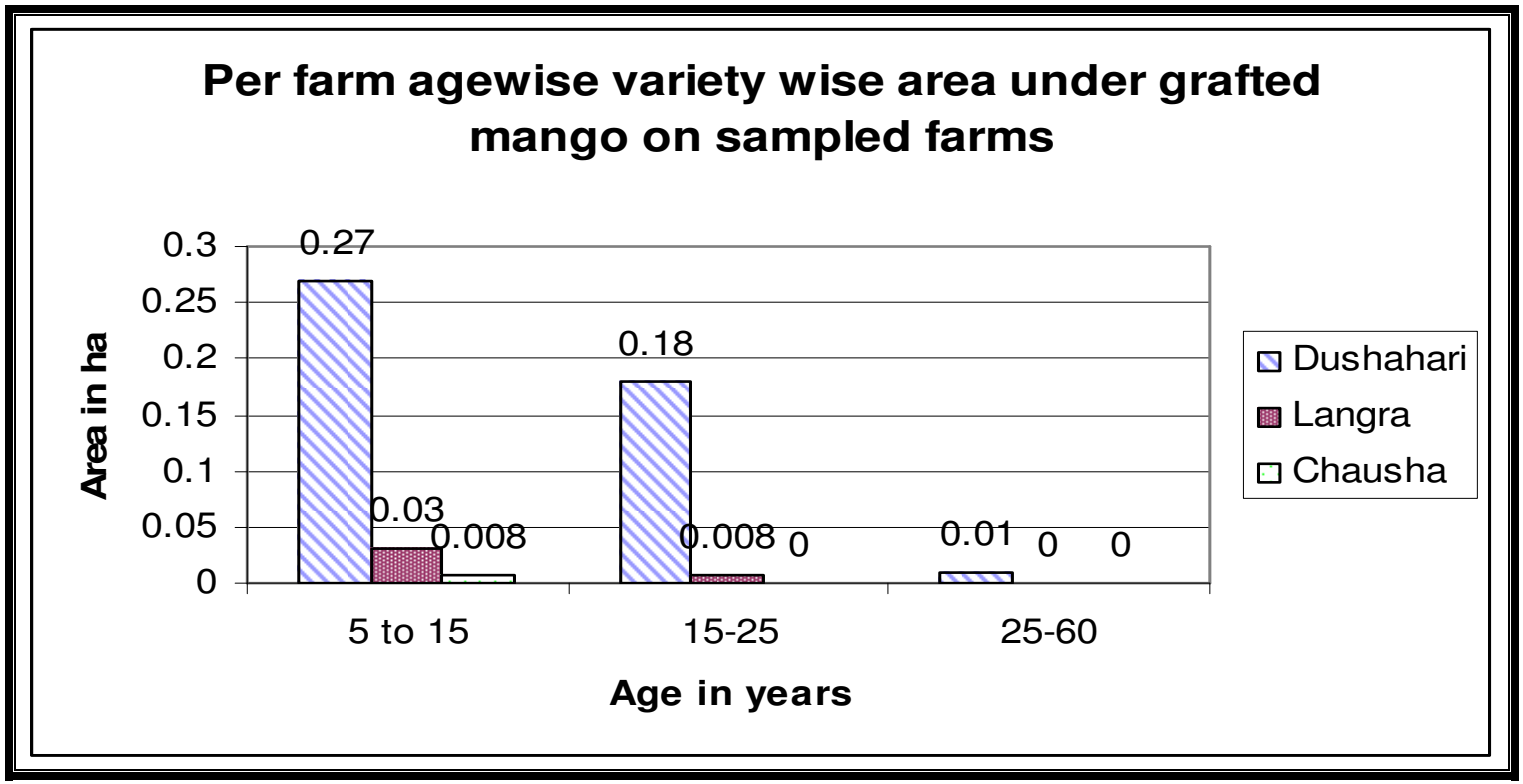

Per farm agewise variety wise area under grafted mango on sampled farms
Area in ha
0.3
0.25
0.2
0.15
0.1
0.05
0
0.27
0.03
0.008
0.18
0.008
0
0.01
0
0
5 to 15
15-25
25-60
Age in years
Dushahari
Langra
Chausha

Table- 11: Per farm age-wise and variety wise area of grafted mango.

(Area in Hectares, Age in years)

Particulars	Dashehari			Langra			Chausa			All		
	5-15	15-25	25-60	5-15	15-25	25-60	5-15	15-25	25-60	5-15	15-25	25-60
Bilaspur												
Marginal	0.13	-	-	-	-	-	-	-	-	0.13	-	-
Small	0.51	0.03	-	0.09	-	-	-	-	-	0.59	0.03	-
Medium	0.44	0.15	-	0.06	-	-	-	-	-	0.50	0.15	-
Large	0.33	0.06	-	0.03	-	-	-	-	-	0.36	0.06	-
All	0.30	0.05	-	0.03	-	-	-	-	-	0.34	0.05	-
Hamirpur												
Marginal	0.16	0.13	-	0.07	-	-	0.022	-	-	0.26	0.13	-
Small	0.35	0.08	0.02	0.14	0.02	-	-	-	-	0.49	0.10	0.02
Medium	0.28	0.04	-	0.12	-	-	-	-	-	0.40	0.04	-
Large	-	-	-	-	-	-	-	-	-	-	-	-
All	0.24	0.10	0.01	0.10	0.01	-	0.01	-	-	0.35	0.11	0.01
Kangra												
Marginal	0.26	0.14	-	-	-	-	-	-	-	0.26	0.14	-
Small	0.24	0.35	-	0.006	0.008	-	0.02	-	-	0.27	0.36	-
Medium	0.50	0.34	0.06	0.003	0.02	-	0.03	-	-	0.53	0.37	0.06
Large	0.55	0.75	0.45	-	0.20	-	0.05	-	-	0.60	0.95	0.45
All	0.33	-	-	-	-	-	-	-	-	-	-	-
Mandi												
Marginal	0.15	0.16	-	-	-	-	-	-	-	0.15	0.16	-
Small	0.32	0.27	0.008	-	-	-	-	-	-	0.32	0.27	0.008
Medium	-	-	-	-	-	-	-	-	-	-	-	-
Large	-	-	-	-	-	-	-	-	-	-	-	-
All	0.22	0.22	0.003	-	-	-	-	-	-	0.22	0.22	0.003
Overall												
Marginal	0.16	0.11	-	0.02	-	-	0.007	-	-	0.19	0.11	-
Small	0.33	0.21	0.008	0.05	0.008	-	0.008	-	-	0.39	0.22	0.008
Medium	0.44	0.28	0.03	0.03	0.01	-	0.014	-	-	0.49	0.29	0.03
Large	0.38	0.22	0.10	0.025	0.05	-	0.01	-	-	0.42	0.27	0.10
All	0.27	0.18	0.01	0.03	0.008	-	0.008	-	-	0.32	0.19	0.01

10 Age wise and variety wise production of Grafted mango on sampled farms

Per farm age wise annual production of different variety of grafted mango is presented in Table 12. On an average, per farm production of Dashehari variety in the age group of 5-15 years was 16.62 quintals, in the age group of 15-25 years was 20.75 quintal and in the age group of 25-60 years was 1.19 quintals. In case of Langra variety the production in the age group of 5-15 years was 1.26 quintals and in the age group of 15-25 years was 0.42 quintal. The per farm production of Chausa variety in the age group of 5-15 years was 0.47 quintal.

Districtwise per farm production of grafted mango in different age groups is also given in the Table 11 wherein it can be seen that the average production per farm was 16.38 quintals, 3.50 quintals in the age groups of 5-15 years and 15-25 years, respectively in Dashehari variety. The production of Langra variety in the age group of 5-15 years was 1.84 quintal. In Hamirpur district age wise production of Dashehari variety was 9.72 quintals in the age group of 5-15 years, 9.16 quintals in the age group of 15-25 and 0.12 quintal in the age group of 25-60 years. Per farm production of Langra variety was 2.94 quintals in the age group of 5-15 years and 0.08 quintal in the age group of 15-25 years. The production of Chausa variety in the age group of 5-15 years was 0.50 quintal. In Kangra district per farm production of Dashehari variety was 23.66 quintals, 34.28 quintals and 4.24 quintals in the age groups of 5.-15 years, 15-25 years and 25-60 years respectively. In case of Langra variety per farm production was 0.28 quintal in the age group of 5-15 years and 1.60 quintals in the age group of 15-25 years. Per farm annual production in the age group of 5-15 years was 1.40 quintals. In Mandi district age wise per farm annual production was 16.72 quintals in the age of 5-15 years, 36.08 quintals in the age of 15-25 years and 0.40 quintal in the age of 25-60 years.

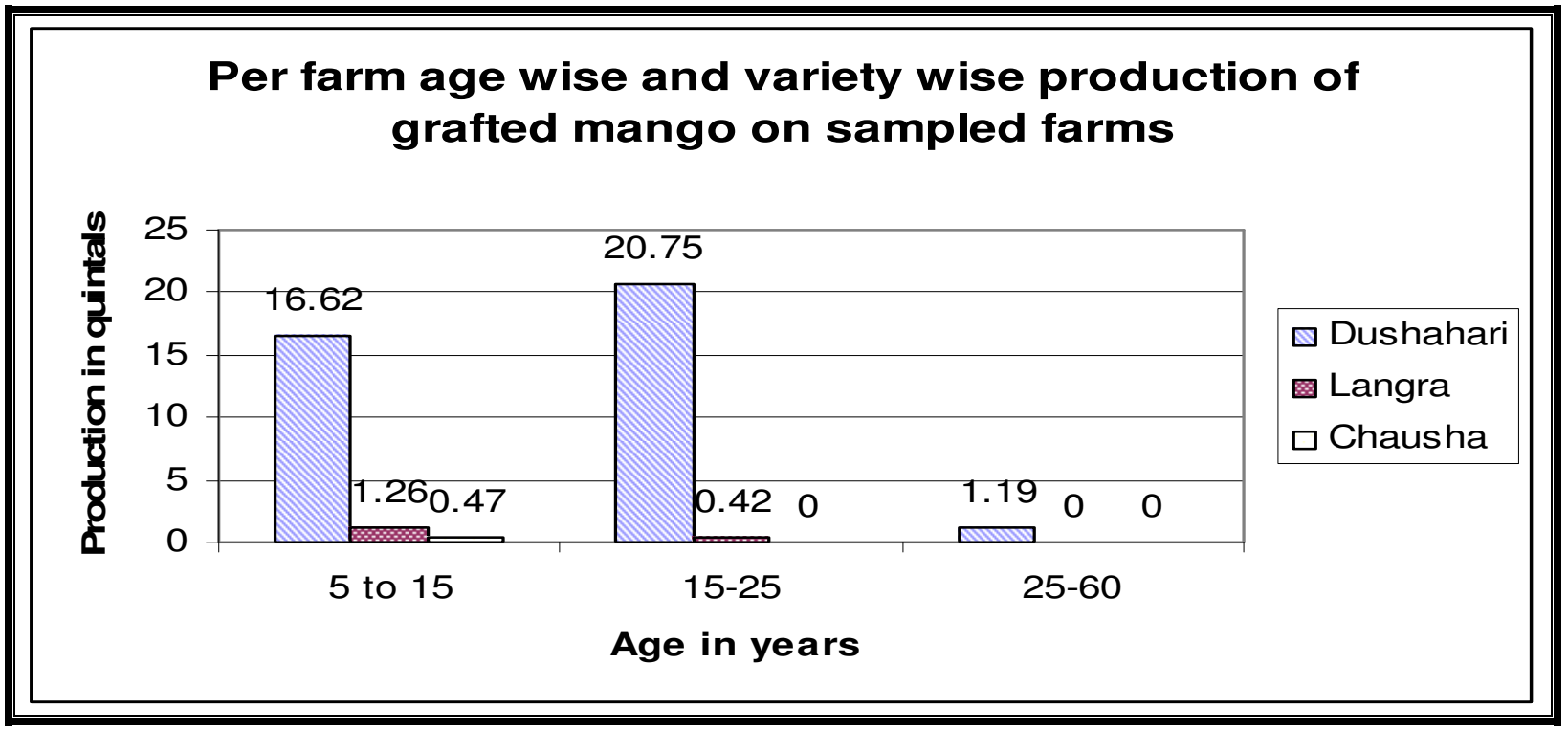

Per farm age wise and variety wise production of grafted mango on sampled farms
Production in quintals
25
20
15
10
5
0
16.62
1.26
0.47
20.75
0.42
0
1.19
0
0
5 to 15
15-25
25-60
Age in years
Dushahari
Langra
Chausha

Table-12: Per farm age wise and variety wise production of grafted mango.

(qty in Qtls, Age in years)

Particulars	Dashehari			Langra			Chausa			All		
	5-15	15-25	25-60	5-15	15-25	25-60	5-15	15-25	25-60	5-15	15-25	25-60
Bilaspur												
Marginal	9.89	-	-	-	-	-	-	-	-	9.89	-	-
Small	47.00	4.44	-	6.44	-	-	-	-	-	53.44	4.44	-
Medium	9.33	5.33	-	2.33	-	-	-	-	-	11.67	5.33	-
Large	9.54	6.69	-	1.00	-	-	-	-	-	10.53	6.69	-
All	16.38	3.50	-	1.84	-	-	-	-	-	18.22	3.50	-
Hamirpur												
Marginal	6.07	10.96	-	2.10	-	-	0.89	-	-	9.07	10.96	-
Small	13.25	7.35	0.30	4.15	0.20	-	-	-	-	17.40	7.55	0.30
Medium	25.50	2.00	-	2.50	-	-	-	-	-	28.00	2.00	-
Large	-	-	-	-	-	-	-	-	-	-	-	-
All	9.72	9.16	0.12	2.94	0.08	-	0.50	-	-	13.16	9.24	0.12
Kangra												
Marginal	23.09	16.54	-	-	-	-	-	-	-	23.09	16.54	-
Small	18.65	38.47	-	0.39	0.78	-	2.17	-	-	21.22	39.26	-
Medium	31.83	32.00	5.17	0.42	0.83	-	0.92	-	-	33.16	32.83	5.17
Large	29.50	65.75	37.50	-	13.00	-	2.25	-	-	31.75	78.75	37.50
All	23.66	34.28	4.24	0.28	1.60	-	1.40	-	-	25.34	35.88	4.24
Mandi												
Marginal	11.23	31.60	-	-	-	-	-	-	-	11.23	31.60	-
Small	25.94	40.44	1.11	-	-	-	-	-	-	25.94	40.44	1.11
Medium	16.00	64.00	-	-	-	-	-	-	-	16.00	64.00	-
Large	-	-	-	-	-	-	-	-	-	-	-	-
All	16.72	36.08	0.40	-	-	-	-	-	-	16.72	36.08	0.40
Overall												
Marginal	10.78	16.33	-	0.67	-	-	0.28	-	-	11.73	16.33	-
Small	22.63	25.71	0.37	2.14	0.31	-	0.71	-	-	25.48	26.02	0.37
Medium	21.96	22.56	2.48	1.24	0.40	-	0.44	-	-	23.64	22.96	2.48
Large	14.23	20.58	8.82	0.76	3.05	-	0.53	-	-	15.53	23.65	8.82
All	16.62	20.75	1.19	1.26	0.42	-	0.47	-	-	18.36	21.17	1.19

11. Age wise and variety wise productivity of grafted mango on sampled farms

The Age wise and varietywise productivity of grafted mango on sampled farms is given in Table 13. On an average, age wise yield of Dashehari variety was 60.38 quintals, 116.50 quintals and 77.27 quintal in the age of 5-15 years, 15-25 years and 25-60 years respectively. In case of Langra variety the yield was 35.73 quintals in the age of 5-15 year and 50.0 quintals in the age group of 15-25 years. The yield of Chausa variety in the age group of 5-15 years was 54.59 quintals. On the whole, yield of grafted mango was relatively higher in the age group of 15-25 years, followed by the age group of 25-60 years and lesser in the age group of 5-15 years. The same trend has been observed in case of age wise variety wise yield rates. Further, analysis reveals that the average yield of grafted mango was higher on marginal farms followed by small, medium and large farms showing direct relation with the size of farms. Districtwise yield rates show that the yield of Dashehari variety in the age of 5-15 years was relatively higher in Mandi district followed by Kangra, Bilaspur and lesser in Hamirpur district. In case of age group of 15-25 years the yield was higher in Mandi district and lesser in Bilaspur district. In case of Langra variety the yield in the age group of 5-15 years was maximum in Kangra district and minimum in Hamirpur district. The yield rates of Chausa variety were relatively higher in Kangra and lesser in Hamirpur district. On the whole, yield of grafted mango was 55.49 quintals on sampled farms of Bilaspur district, 47.27 quintals in Hamirpur, 84.96 quintal in Kangra district and 118.90 quintals in Mandi district.

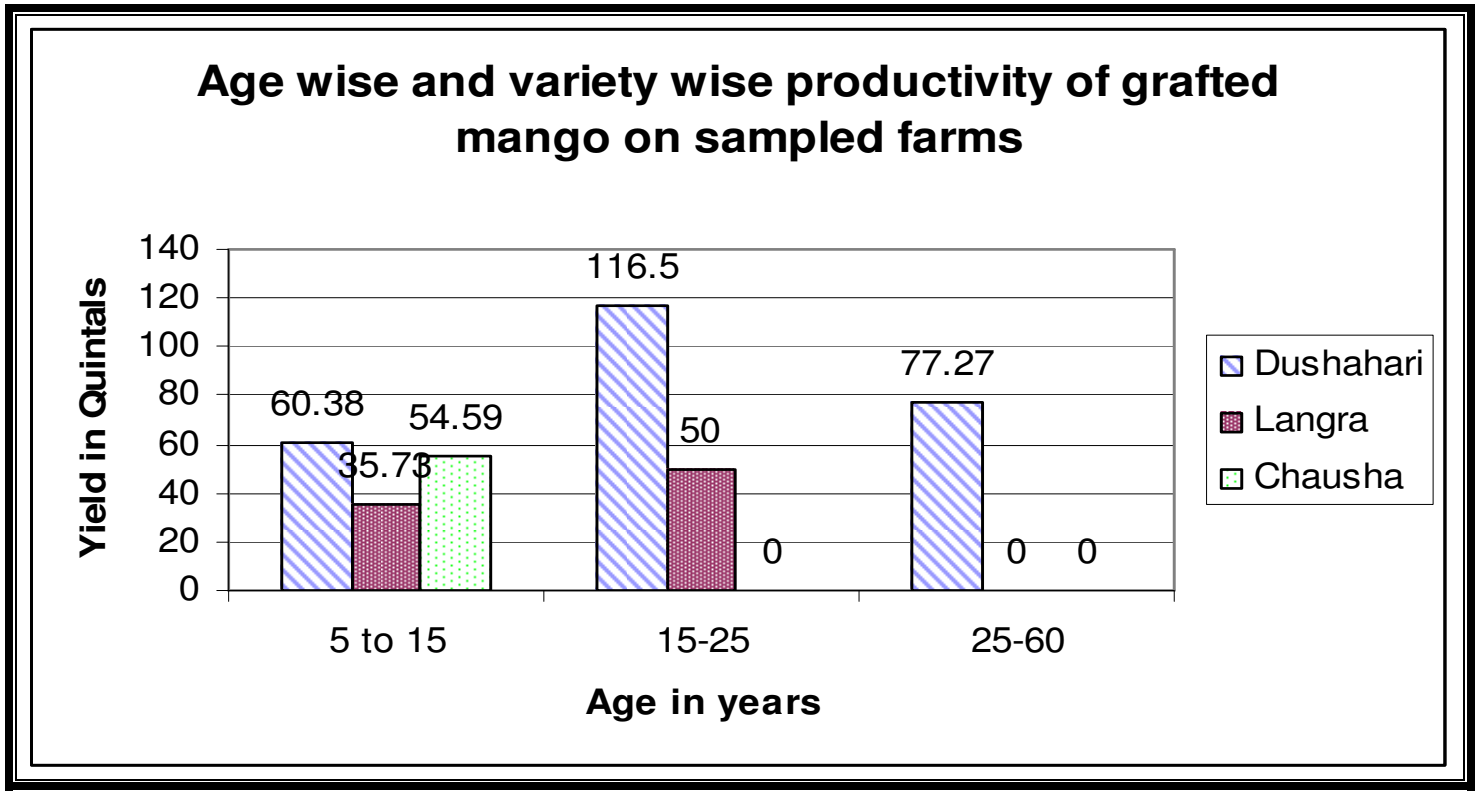

Age wise and variety wise productivity of grafted mango on sampled farms
Yield in Quintals
140
120
100
80
60
40
20
0
60.38
35.73
54.59
116.5
50
0
77.27
0
0
5 to 15
15-25
25-60
Age in years
Dushahari
Langra
Chausha

Table-13: Age-wise and variety wise productivity of grafted mango.

(Qty.in Qtls.)

Category	Dashehari			Langra			Chausa			All			Overall
	5-15	15-25	25-60	5-15	15-25	25-60	5-15	15-25	25-60	5-15	15-25	25-60	
BILASPUR													
Marginal	73.72	-	-	-	-	-	-	-	-	73.72	-	-	73.72
Small	92.76	166.67	-	72.50	-	-	-	-	-	89.73	166.67	-	93.03
Medium	21.00	34.28	-	40.38	-	-	-	-	-	23.23	34.28	-	25.84
Large	29.24	108.75	-	29.54	-	-	-	-	-	29.27	108.75	-	41.48
All	53.35	71.72	-	52.27	-	-	-	-	-	53.18	71.72	-	55.49
HAMIRPUR													
Marginal	38.63	86.23	-	27.83	-	-	40.32	-	-	35.57	86.23	-	52.43
Small	37.21	94.23	15.00	30.07	10.00	-	-	-	-	35.22	92.35	15.00	42.65
Medium	89.28	50.00	-	20.83	-	-	-	-	-	70.00	50.00	-	68.18
Large	-	-	-	-	-	-	-	-	-	-	-	-	-
All	40.23	88.07	15.00	28.71	10.00	-	40.32	-	-	36.92	82.50	15.00	47.27
KANGRA													
Marginal	86.98	116.67	-	-	-	-	-	-	-	86.98	116.66	-	97.32
Small	78.28	109.52	-	56.25	90.00	-	89.28	-	-	78.70	109.05	-	96.06
Medium	63.45	92.75	86.11	125.00	35.71	-	30.55	-	-	61.99	125.33	86.11	73.87
Large	53.63	87.66	83.33	-	65.00	-	45.00	-	-	52.92	82.89	83.33	74.00
All	71.18	102.14	84.13	70.00	62.50	-	62.50	-	-	72.23	97.12	84.13	84.96
MANDI													
Marginal	73.26	191.90	-	-	-	-	-	-	-	73.26	191.90	-	133.85
Small	79.96	149.18	125.00	-	-	-	-	-	-	79.96	149.18	125.00	111.67
Medium	57.14	92.08	-	-	-	-	-	-	-	57.14	92.08	-	82.05
Large	-	-	-	-	-	-	-	-	-	-	-	-	-
All	76.00	160.92	125.00	-	-	-	-	-	-	76.00	160.92	125.00	118.90
OVERALL													
Marginal	65.58	142.84	-	27.83	-	-	40.32	-	-	60.02	142.84	-	90.57
Small	68.86	121.95	46.42	40.32	36.67	-	89.28	-	-	65.39	118.62	46.42	84.07
Medium	49.28	80.45	86.11	38.75	35.71	-	30.55	-	-	40.05	78.74	86.11	60.71
Large	37.57	92.10	83.33	29.54	65.00	-	45.00	-	-	37.29	87.39	83.33	60.53
All	60.38	116.50	77.27	35.73	50.00	-	54.59	-	-	57.49	113.51	77.23	78.12

EXECUTIVE TABLE OF THE MAIN FINDINGS

Particulars	Bilaspur	Hamirpur	Kangra	Mandi	Over all
Sampled mango orchards	100	100	100	100	400
Average size of farm ha	3.07	1.03	1.90	1.04	1.76
Area under orchards	0.57	0.56	1.41	0.53	0.77
% area under					
Grafted mango	95.35	87.16	56.69	97.28	76.45
Kinnow	0	1.85	25.86	0	12.19
Sangtra	0	1.77	16.43	0	7.85
Litchi	2.98	2.97	0.18	0.37	1.25
Per farm Area under					
Grafted mango (ha)	0.39	0.47	0.77	0.45	0.52
Seedling mango (ha)	0.004	0.004	0.004	0.005	0.004
Per farm production of					
Grafted mango (qtls)	21.72	22.52	65.46	53.20	40.72
Seedling mango(qtls)	0.48	0.50	0.48	0.66	0.53
% Area under different variety					
Dashehari	89.8	74.5	93.5	100	88.5
Langra	7.7	23.4	3.9	0	7.7
Chausa	0	2.1	2.6	0	1.5
% area of grafted mango under different age					
5-15 years	87.2	74.5	46.7	49.7	61.5
15-25 years	12.8	23.4	46.7	49.7	36.5
25-60 years	-	2.1	6.5	0.6	2.0
Age wise yield of Grafted Mango (qtls/ha)					
5-15 years	53.18	36.92	72.23	76.00	57.49
15-25 years	71.72	82.50	97.12	160.92	113.51
25-60 years	-	15.00	84.13	125.00	77.23
Over all yield	55.49	47.27	84.96	118.90	78.12