

CHAPTER VI

FARM MANAGEMENT PRACTICES

1 INTRODUCTION

Ethiopia is endowed with abundant resources suitable for agriculture. As result of which the agricultural activity in Ethiopia is quite varied being conditioned by such factors as climate, soils topography and... etc which had favored not only the employment of the majority of the countries population but also served as the main source of input (raw material) for the country's large and medium scale industries as well as the main generator of the country's foreign currency earnings.

Though agriculture is the backbone of Ethiopian economy it is characterized by low level of productivity and subsistence farming system which resulted hand to mouth production. Nowadays the problem mentioned has become more acute as a result of two factors. First the number of people is increasing at a rate that points to a doubling of the present population of the country at the end of this century. Secondly this is occurring at a time when the area of new land suitable for cultivation is rapidly diminishing.

Till recently traditional practice such as use of animal dung and crop residue crop rotation and expanding cultivable crop land had helped a lot to increase productivity, however, the problem mentioned above has become more acute and beyond the limits of the traditional practices which of course had already been exhausted. Hence, the scale severity and duration of the country's food and other related problems will be so great that a massive short and long-range innovative efforts will be required to solve it.

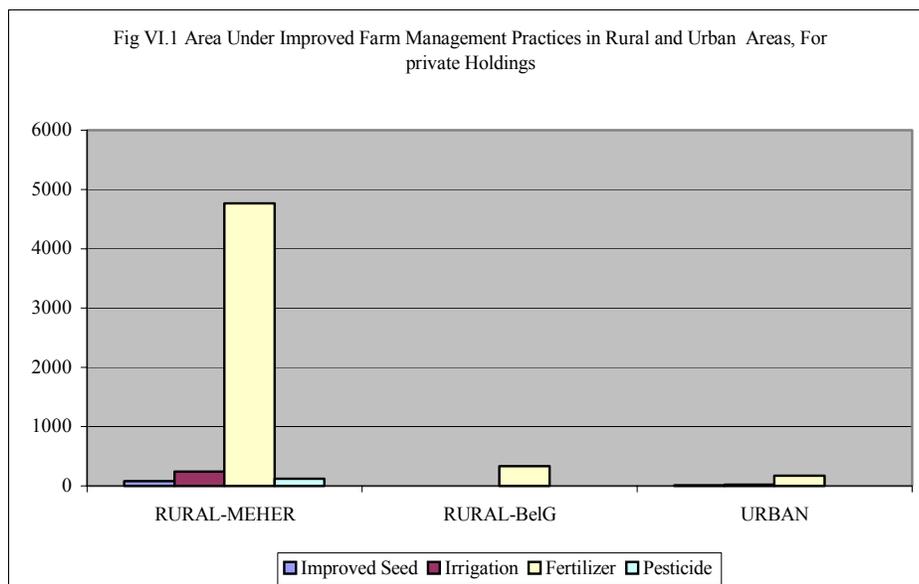
As a result, increasing productivity on various field crops is the only realistic option to raise the living standards of the rural population and to ensure food security and poverty alleviation. There are many modern techniques and technologies of achieving enhanced crop productivity. Accordingly, the major factors behind achieving high level of crop productivity increases are greater and more efficient use of fertilizers, wide spread uses of improved variety seeds, pesticides, expanded use of irrigation and effective extension services. Thus, during the 2001/02 Agricultural Sample Enumeration, basic data on agricultural inputs and practices were collected, processed and the results are presented in this chapter.

This chapter is therefore, deals with the agricultural census data that indicates the type of inputs applied, quantity of inputs applied, the irrigated cropland area, estimates of cropland area damage, number of holders who applied different agricultural inputs and farm management practices, and number of holders covered by extension package programs in Harari Region. Data are presented for private holdings in rural areas for both Meher and Belg seasons, and urban areas of holdings for Meher season. For urban areas, data are collected and presented only to the inputs applied and the irrigated cropland area and number of holders who applied farm inputs. Moreover estimates, standard errors(S.E) and coefficient of variation(C.V) are given in Annex Tables 6.1 and 6.2 for some relevant variables.

2 CROPLAND AREA UNDER AGRICULTURAL INPUTS AND FARM MANAGEMENT PRACTICES

This section deals with the agricultural inputs applied and the irrigated cropland area for both rural and urban areas of Harari Region. Agricultural holders in the sampled households were asked whether they have applied agricultural inputs on their fields or not and the area of all plots operated by the holders were actually measured objectively for private holdings in rural areas. While in urban areas all types of data on farm practices were obtained by interview methods. This helped to estimate area under total crop, irrigated land, fertilizers, pesticides and improved seeds used during the agricultural year. Following data on area under agricultural farm inputs for Harari Region are briefly discussed.

The census data show that Harari Region predominantly produces grain crops and the major crops either in terms of the magnitude of area and volume of production includes sorghum, maize and wheat, that accounted for about 56.36% of the area cultivated under all crops (Summary Table VI.2). On the other hand, vegetables, root crops and permanent crops are not widely grown as grains in the region in terms of both area coverage and production obtained. As a result, the agricultural inputs were applied to a great extent on the area under grain crops in order to increase the volume of production. Among different types of agricultural inputs that were applied, it is found that fertilizers application had relatively high coverage of area under crops. Moreover, the census data indicate that vast majority of agricultural holders have used agricultural inputs on small size of holdings. In general, the holders in the region as a whole have practiced modern agricultural techniques and technologies but in a much smaller extent.



2.1 Fertilized Cropland Areas

Fertilizers refer to anything added to the soil with the intention of increasing the amount of plant nutrients available for crop growth. In the census, data on application, type and quantity of natural and chemical fertilizers were collected. The natural fertilizers consisted of animal dung and compost while chemical fertilizers consisted of DAP (Di-Ammonium phosphate) and UREA (Ammonium Nitrate).

Although fertilizer is one of the very important agricultural inputs to increase the level of production, in Harari Region, fertilizers were applied on 5298 hectares (56.54%) of the total cultivated cropland area. Of this total area fertilized cropland, the share of rural and urban areas was found to be 96.72% and 3.28%, respectively. Moreover, the proportion of total fertilized cropland areas in rural areas for Meher season was 4768 hectares (90.00%) as compared to only 356 hectares (6.72%) for Belg season. Regarding private holdings in urban areas, data are collected and presented only for Meher season. For details, refer to Summary Table VI.1 and Fig VI.1.

Furthermore, out of the total fertilized cropland areas, 60.49% were under cereals, 3.19% under pulses, 8.36% under oil seeds, 1.48% under vegetables and root crops, and 26.45% under permanent crops where fruits and stimulants contributed 3.10% and 23.45%, respectively. Most of the fertilized cropland areas in the region were allotted to cereals in both rural and urban areas (See Summary Table VI.1)

With regard to a specific crop, sorghum is the most important fertilized crop that comprised an area of 48.62% of the total cropland area under fertilizers. The second important fertilized crop is Chat covering 23.88% of the total cropland area under fertilizers. Maize ranks third taking up 10.95% of the total cropland area under fertilizers. For details, refer to Summary Table VI.2.

2.2 Cropland Areas Treated with Pesticides

Pesticides are chemicals that are used for the control of mitigation or elimination of pests that are detrimental to crops. Examples of pesticides are insecticides, herbicides and fungicides. Summary Table VI.1 reveals that the total cropland area treated with pesticides was estimated to be 169 hectares. Of the total cropland areas treated with pesticides, the share of rural areas was found to be 71.60% while the rest is the share of urban areas. Thus, private holdings in rural areas had the highest share, while the contribution of the urban areas to the total pesticide applied cropland area was very limited in scale.

Furthermore, most of the pesticide applied land areas in the region was under permanent crop (about 52.67%), where as about 34.91% of the fields under cereal, pulses, oilseeds, vegetables and root crops were treated with pesticides. Out of all cropland areas on which pesticides are applied, Chat accounts for about 87 hectares followed by sorghum and maize, accounting for about 41 and 18 hectares, respectively. For Details, see Summary Tables VI.1 and VI.2.

2.3 Cropland Areas on which Improved Seeds are Used

Improved seeds are defined as crop varieties that give significantly higher yield and better quality compared to locally produced varieties of seeds. As illustrated in Summary Table VI.1, the total cultivated cropland area was estimated at 9369 hectares. Of this total, only 89 hectares (0.95%) was sown with improved variety of seeds. The share of rural and urban areas was found to be 85.39 percent and 14.61 percent of the total cropland areas on which improved seeds are used, respectively. Like other inputs, the private holdings in the rural areas during Meher season had the highest share; while the contribution of the private holdings in urban areas to the total improved seeds applied cropland area in the region was limited in scale. The share of Belg season to the total improved seed applied cropland area was also found to be negligible (See Fig VI.1)

Summary Table VI.1 also presents the total cropland area with application of improved agricultural practices and inputs by crop category for private holdings in rural and urban areas. The data in this table indicate that the highest area under improved seed was reported for cereal that account for about 82.02% while the remaining 17.98% was reported to be under pulses, oil seeds vegetables, root crops and permanent crops altogether.

2.4 Cropland Areas Under Irrigation

The necessary increase in crop production, to keep pace with the increased population demand, can be achieved among others by the efficient utilization irrigation practices. Moreover irrigation practices make possible the full utilization of advanced technology in farming: these include the proper application of fertilizers, the adoption of good crop rotation practices and the use of the best seed varieties.

Irrigated cropland areas, therefore, refer to the practice where an area of land is purposely and actually provided with water, other than the precipitation obtained from rain to improve the production of crops. The uncontrolled flooding of land by the overflow of rivers or streams is not considered to be as practice of irrigation.

The census data show that the cropland areas that are actually irrigated was reported to be 315 hectares which accounted for about three percent of the total cropland areas. Of the total irrigated cropland areas, the share of the rural and urban areas was found to be 92.06% and 9.74%, respectively. Thus, there is large difference in the size of the total irrigated cropland area between rural and urban area. Moreover, of the total irrigated cropland areas in rural areas, the share of Meher season constituted 78.10 percent compared to 21.90 percent for Belg season.

As indicated in Summary Table VI.1, out of the total irrigated cropland areas in the region 45.40% were under cereals and 27.62% under stimulants while pulses, oil seeds vegetables and root crops covered the remaining 26.98% of the total irrigated area.

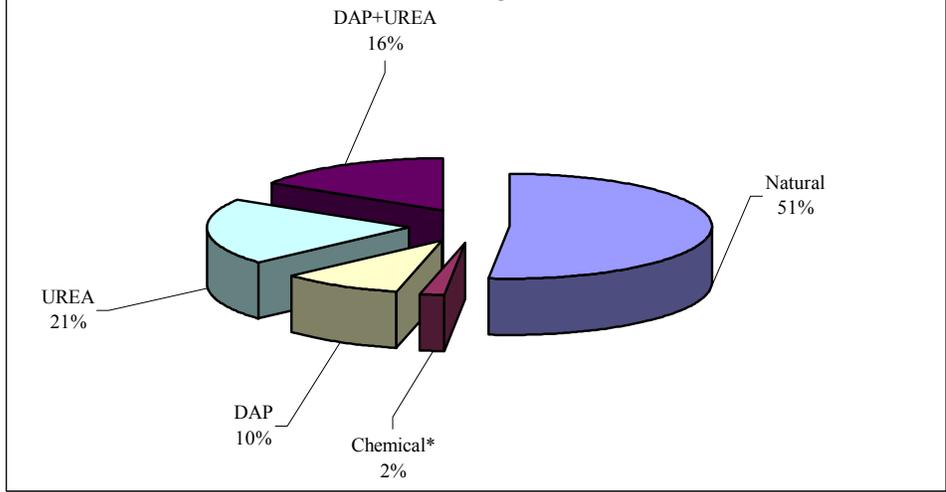
3 HOLDERS APPLYING FERTILIZERS, AREA, AND QUANTITY OF FERTILIZERS APPLIED

In 2001/02 Agricultural Sample Enumeration, the total number of holders applying fertilizers in Harari Regional State, is estimated to be about 11,243. Of these total private holders, about 10,819 holders (96.23%) were in rural and about 3.77% in urban areas. The application of fertilizers in Meher and Belg seasons for private holdings in rural areas shows a great variation, that is, 95.27% of the holders applied fertilizers in Meher season while only 13.03 percent applied in Belg season (See Summary Tables VI.3 and VI.4).

With regard to the type of fertilizers applied, the great majority of holders applied natural fertilizers (8207). When we come to the utilization of chemical fertilizers, about 5614 holders were reported to apply commercial fertilizers in the 2001/02 crop year. However, the application of chemical fertilizers for Belg season was found to be unreliable. In urban areas for private holdings, a total of 424 holders applied natural and chemical fertilizers. Among the types of fertilizers used, natural fertilizers were applied in a larger cultivated area of cropland, which is about 2742 hectares (that is, 52% of fertilized cropland area). Next to natural fertilizers, considerable amount of cropland area was covered by UREA which is 1095 hectares (20.77%) and a mixture of DAP and UREA was applied on 846 hectares (15.97%) and then DAP 508 hectares (9.59%), (See Fig VI.2 and Summary Table VI.3)

Furthermore, the data in Summary Table VI.3 indicated that the total quantity of chemical fertilizers applied by holders in the rural areas was estimated at about 1144 quintals, of which, the share of the DAP and UREA mixture was the highest accounting for about 49.13 percent of the total volume of chemical fertilizers applied. This is followed by UREA accounting for about 35.05 percent and then DAP with about 15.95 percent (See Fig VI.3 and Summary Table VI.3)

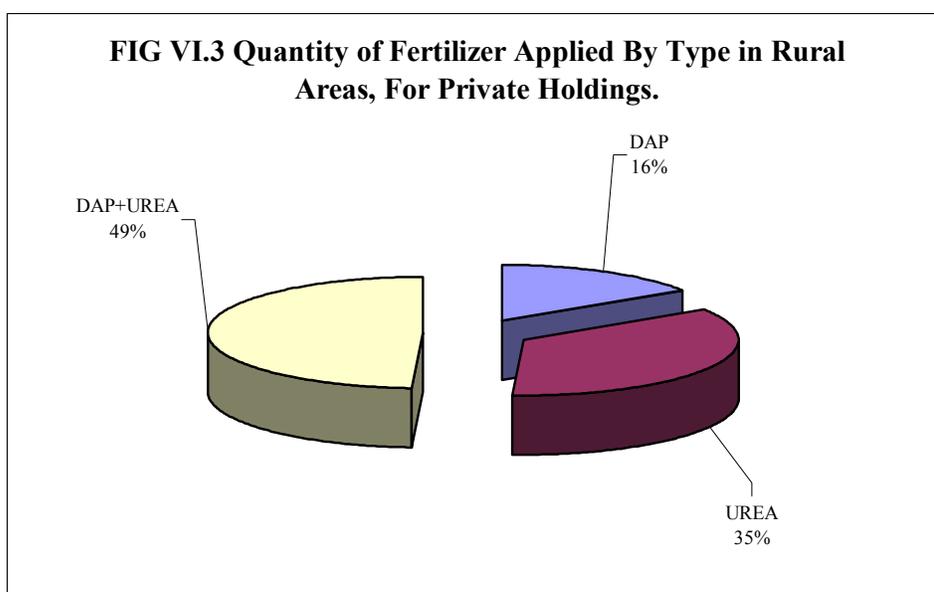
FIG VI.2 Fertilizers Applied Area by type in Rural and Urban Areas For Private Holdings



* Refers to urban areas only

SUMMARY TABLE VI.2: Total Area Under Improved Seed, Irrigation, Fertilizer, and Pesticide
by Type of Crops in Rural and Urban Areas, for Private Holdings

TYPE OF CROP	Total Crop	Improved Seed		Irrigation		Fertilizer		Pesticide	
	Hectares	Hectares	%	Hectares	%	Hectares	%	Hectares	%
TOTAL	9369	89	0.95	315	3.36	5298	56.55	169	1.8
Grain Crops	7061	88	1.25	148	2.1	3816	54.04	77	1.09
Cereals	5301	73	1.38	143	2.7	3205	60.46	59	1.11
Teff	*	-	-	-	-	*	*	-	-
Barley	20	-	-	-	-	13	65	*	*
Wheat	105	*	*	*	*	87	82.86	*	*
Maize	991	46	4.64	*	*	580	58.53	18	1.82
Sorghum	4180	17	0.41	*	*	2523	60.36	41	0.98
Finger millet	*	*	*	-	-	*	*	-	-
Oats ('Aja')	*	-	-	-	-	*	*	-	-
Rice	-	-	-	-	-	-	-	-	-
Pulses	474	-	-	*	*	169	35.65	*	*
Horse beans	1	-	-	*	*	*	*	-	-
Field peas	*	-	-	-	-	2	*	*	*
Haricot beans	458	-	-	*	*	162	35.37	*	*
Chick peas	*	-	-	-	-	*	*	-	-
Lentils	-	-	-	-	-	-	-	-	-
Vetch	-	-	-	-	-	-	-	-	-
Soya	-	-	-	-	-	-	-	-	-
Fenugreek	*	-	-	-	-	*	*	-	-
Gibto	-	-	-	-	-	-	-	-	-
Oil Seeds	1285	*	*	*	*	442	34.4	*	*
Neug	-	-	-	-	-	-	-	-	-
Linseed	-	-	-	-	-	-	-	-	-
Ground nuts	1276	*	*	*	*	440	34.48	*	*
Sufflower	-	-	-	-	-	-	-	-	-
Sesame	*	-	-	-	-	*	*	-	-
Rapeseed	-	-	-	-	-	-	-	-	-
Other Grains	*	-	-	*	*	*	*	-	-
Vegetables	29	*	*	*	*	12	41.38	*	*
Lettuce	*	*	*	*	*	*	*	-	-
Head cabbage	*	*	*	*	*	*	*	-	-
Kale	*	*	*	*	*	*	*	-	-
Tomatoes	*	-	-	*	*	*	*	*	*
Green peppers	*	-	-	*	*	*	*	-	-
Red peppers	*	-	-	*	*	*	*	-	-
Swiss chard	*	-	-	*	*	*	*	-	-
Others	6	-	-	-	-	5	83.33	-	-
Root Crops	112	*	*	*	*	65	58.04	*	*
Beet root	-	-	-	-	-	-	-	-	-
Carrot	-	-	-	-	-	-	-	-	-
Onions	*	*	*	*	*	*	*	-	-
Potatoes	*	-	-	*	*	*	*	*	*
Garlic	-	-	-	-	-	-	-	-	-
Taro	-	-	-	-	-	-	-	-	-
Sweet potatoes	64	-	-	*	*	30	46.88	-	-
Others	*	-	-	-	-	*	*	-	-
Permanent Crops	2167	*	*	145	6.69	1404	64.79	89	4.11
Fruit Crops	338	*	*	*	*	164	48.52	*	*
Avocado	*	-	-	*	*	*	*	-	-
Bananas	12	-	-	1	8.33	*	*	*	*
Guava	69	*	*	*	*	39	56.52	-	-
Lemons	2	-	-	*	*	1	50	-	-
Mangoes	199	-	-	*	*	89	44.72	*	*
Oranges	*	-	-	*	*	*	*	-	-
Papayas	40	*	*	*	*	15	37.5	-	-
Pineapples	-	-	-	-	-	-	-	-	-
Others	14	*	*	*	*	11	78.57	-	-
Stimulant Crops	1790	*	*	87	4.86	1237	69.11	88	4.92
Chat	1752	*	*	84	4.79	1212	69.18	87	4.97
Coffee	35	*	*	*	*	22	62.86	*	*
Hops	*	-	-	-	-	*	*	-	-
Others	-	-	-	-	-	-	-	-	-
Other Permanent	39	-	-	*	*	*	*	*	*
Enset	*	-	-	-	-	*	*	-	-
Sugar Cane	*	-	-	*	*	*	*	-	-
Others	*	-	-	-	-	*	*	*	*



3.1 Application of Natural Fertilizers in the Rural and Urban Areas

According to the census findings, about 7983 holders in rural areas and 224 holders in urban areas applied natural fertilizers on 2568 hectares of cropland (comprising 51.76% of the total fertilized land area). Of the total cropland area on which natural fertilizers are applied, the share of Meher and Belg seasons in rural areas was 44.17 and 6.25 percent, respectively. Moreover, of the total land area on which natural fertilizers are applied 61.23% was under cereals, 5.29% under pulses, and 11.01% under oilseeds, 0.33% under vegetables, 0.95% under root crops, 3.72% under fruits and 17.43% under stimulants. For details, refer to Summary Tables VI.3 and VI.5.

3.2 Application of DAP in the Rural Areas

As illustrated in Summary Table VI.3, about 5388 holders in rural areas have applied chemical fertilizers on a total of 2453 hectares of cultivated crop land area, of which DAP on about 508 hectares, which is about 9.59% of the total fertilized land area. The application of DAP quantity varied markedly from one group of crops to another, i.e., 56.06% of the total DAP was applied for cereals, while 7.60 3.08 and 29.16% of the total DAP were applied for oil seeds, fruits and stimulants in that order. Variations with respect to specific crops are also considerable, i.e., relatively higher for sorghum at 213 hectares and Chat at 141 hectares (For details, refer to Summary Tables VI.3 and VI.4).

Furthermore, the total quantity of DAP applied in rural areas is estimated to be about 182 quintals, which is 15.90% of the total quantity of chemical fertilizers applied. In general, the quantity of DAP applied was the highest for cereals which was about 98 quintals followed by stimulant crops that amounted to 42 quintals and then fruit amounted 15 quintals, during the 2001/02(1994 E.C) Meher season only.

3.3 Application of UREA in the Rural Areas

Since chemical fertilizers have been widely promoted, about 2774 holders in rural areas have applied UREA, and the cropland areas under UREA application occupied 1095 hectares, which is 20.67% of the total fertilizers applied. Out of this total UREA applied area, it is reported that 60.82 % was under cereals 6.12% under oil seeds, 2.92% was under fruits and 29.32% under stimulants. Among all crops, the largest UREA applied area was under sorghum at 536 hectares and then 312 and 109 hectares under Chat and maize respectively. Moreover, the data in the table show that the total quantity of UREA applied was about 401 quintals in which the highest amount was applied for cereals at 239 quintals followed by stimulants at 100 quintals and the fruits at 27 quintals during the 2001/02(1994 E.C) Meher season only (See Summary Table VI.3).

3.4 Application of a Mixture of DAP and UREA in the Rural Areas

The census findings depicts the fact that quite significant number of holders have applied a mixture of DAP and UREA on their crop fields. As presented in Summary Table VI.5 there were about 2015 holders in rural areas who applied a mixture of DAP and UREA on 846 hectares, which is 15.97% of the total area on which fertilizers were applied. The application of a mixture of DAP and UREA to cereals and stimulants was on 525 and 261 hectares respectively. It was observed that the application of a mixture of UREA and DAP is low in other crops relative to cereals and stimulants. For instance, the application of a mixture of DAP and UREA for pulses, oilseeds, root crops and fruit crops were only 2, 34, 8, and 15 hectares, respectively.

In addition, out of the total quantity of chemical fertilizers applied, the amount of a mixture of DAP and UREA was 562 quintals, which is 49.13% of the total quantity of chemical fertilizers. The application of a mixture of DAP and UREA to cereals, fruits and stimulants crops amounted

to about 484,14 and 50 quintals, in that order. Of the total quantity of mixed chemical fertilizers applied, maize took the highest proportion accounting for about 6.05% (34 quintals). For details, refer to Summary Table VI.3.

4 HOLDERS UTILIZING IMPROVED SEEDS AND QUANTITY OF IMPROVED SEEDS USED

In the 2001/02 Agricultural Sample Enumeration, data on number of holders that have used improved seeds and quantity of seeds used was collected. Hence, the number of holders that have used improved variety seeds and quantity of improved cereals, pulses and oil seeds are presented in Summary Table VI.6.

4.1 Number of Holders using Improved Seeds.

As presented in Summary Table VI.6 the use of improved seeds is limited to only 840 in rural and 83 holders in urban areas of the region. Of the total holders using improved seeds, 54.88% utilized improved maize seed, 22.62% improved sorghum seed, 17.62% improved variety of ground nuts.

4.2 Quantity of Improved Seeds Used

Information on quantity of improved varieties of seeds is also limited to grain crops. As can be seen from Summary Table VI.6, the total quantity of improved seeds was estimated to be 45 quintals. The total quantity of improved seeds used has been low for private holdings in

SUMMARY TABLE VI.3: Number of Holders Applying Fertilizers, Area Under Fertilizers
and Quantity of Fertilizers Applied by Type in Rural and Urban Areas, for Private Holdings

Type of Fertilizer	Number of Holders Applying Fertilizer by Type										
	Total	Grains					Vegetables	Root Crops	Permanent Crops		
		Cereals	Pulses	Oilseeds	Others	Fruits			Stimulant	Other	
Rural and Urban	11243	10803	1653	3458	*	773	1457	4805	8197	*	
Percent..	100										
Natural	8207	7029	1459	2312	-	503	672	3232	4474	*	
Chemical	5614	5467	337	1238	-	270	822	1998	4532	*	
DAP	1429	1224	*	294	-	*	*	483	1011	-	
UREA	2774	2741	163	661	-	177	215	928	2251	*	
DAP+UREA	2015	1871	108	270	*	*	307	628	1689	*	
Urban	424	395	*	63	-	13	9	22	162	*	
Percent..	3.77										
Natural	224	188	*	34	-	11	*	18	66	*	
Chemical	226	214	*	29	-	*	*	*	98	*	
Rural Meher	10711	10359	565	3378	*	695	1368	4783	8035	*	
Percent..	95.27										
Natural	7425	6494	310	2261	-	455	643	3214	4408	*	
Chemical	5348	5253	275	1210	*	240	747	1993	4434	*	
DAP	1373	1224	*	294	-	*	*	483	1011	-	
UREA	2774	2741	*	661	-	149	215	928	2251	*	
DAP+UREA	2015	1871	108	270	*	*	307	628	1689	*	
Rural Belg	1465	705	1257	*	-	*	*	-	-	-	
Percent	13.03										
Natural	1324	705	1211	*	-	*	*	-	-	-	
Chemical	*	-	*	-	-	-	-	-	-	-	
DAP	*	-	*	-	-	-	-	-	-	-	
UREA	*	-	*	-	-	-	-	-	-	-	
DAP+UREA	-	-	-	-	-	-	-	-	-	-	
Area in Hectares											
Rural and Urban	5298	3205	169	442	*	12	65	164	1237	*	
Percent..	100	60.49	3.19	8.34	*	0.23	1.23	3.1	23.35	*	
Natural	2742	1679	145	302	-	9	26	102	478	*	
Percent..	51.76	61.23	5.29	11.01	-	0.33	0.95	3.72	17.43	*	
Chemical	2556	1526	-	140	-	-	-	62	760	-	
Percent..	48.24	59.7	-	5.48	-	-	-	2.43	29.73	-	
Urban	174	105	*	5	-	*	*	*	58	*	
Percent..	3.28	60.34	*	2.87	-	*	*	*	33.33	*	
Natural	71	43	*	*	-	*	*	*	*	*	
Percent..	1.34	60.56	*	*	-	*	*	*	*	*	
Chemical (Urban)	102	62	*	2	-	*	*	*	*	*	
Percent..	1.93	60.78	*	1.96	-	*	*	-	*	*	
Rural Meher	4768	2920	12	433	*	5	52	163	1179	*	
Percent..	90.00	61.24	0.25	9.08	*	0.1	1.09	3.42	24.73	*	
Natural	2340	1456	7	295	-	3	21	101	455	*	
Percent..	44.17	62.22	0.3	12.61	-	0.13	0.9	4.32	19.44	*	
Chemical	2428	1464	5	138	*	2	*	62	724	*	
Percent..	45.83	60.3	0.21	5.68	*	0.08	*	2.55	29.82	*	
DAP	508	273	*	37	-	*	*	15	142	-	
Percent..	9.59	56.06	*	7.6	-	*	*	3.08	29.16	-	
UREA	1095	666	*	67	-	*	4	32	321	*	
Percent..	20.67	60.82	*	6.12	-	*	0.37	2.92	29.32	*	
DAP+UREA	846	525	2	34	*	*	8	15	261	*	
Percent..	15.97	62.06	0.24	4.02	*	*	0.95	1.77	30.85	*	
Rural Belg	356	*	153	*	-	*	*	-	-	-	
Percent..	6.72	*	42.98	*	-	*	*	-	-	-	
Natural	331	*	138	*	-	*	*	-	-	-	
Percent..	6.25	*	41.69	*	-	*	*	-	-	-	
Chemical	*	-	*	-	-	*	*	-	-	-	
Percent..	*	-	*	-	-	*	*	-	-	-	
DAP	*	-	*	-	-	*	*	-	-	-	
Percent..	*	-	*	-	-	*	*	-	-	-	
UREA	*	-	*	-	-	*	*	-	-	-	
Percent..	*	-	*	-	-	*	*	-	-	-	
DAP+UREA	*	-	*	-	-	*	*	-	-	-	
Percent..	*	-	*	-	-	*	*	-	-	-	

SUMMARY TABLE VI.3: Cont.

	Quantity in Quintals									
Rural Meher.....	1144	821	*	29	8	*	56	192	*	
Percent..	100	71.77	*	2.53	0.7	*	4.9	16.78	*	
DAP	182	98	*	*	*	*	15	42	*	
Percent..	15.91	53.85	*	*	*	*	8.24	23.08	*	
UREA.....	401	239	*	21	4	6	27	100	*	
Percent..	35.05	59.6	*	5.24	1	1.5	6.73	24.94	*	
DAP+UREA.....	562	484	*	*	*	*	14	50	*	
Percent..	49.13	86.12	*	*	*	*	2.49	8.9	*	
Rural Belg.....	*	*	*	*	*	*	*	*	*	
Percent..	*	*	*	*	*	*	*	*	*	
DAP	*	*	*	*	*	*	*	*	*	
Percent..	*	*	*	*	*	*	*	*	*	
UREA.....	*	*	*	*	*	*	*	*	*	
Percent..	*	*	*	*	*	*	*	*	*	
DAP+UREA.....	-	-	-	-	-	-	-	-	-	
Percent..	-	-	-	-	-	-	-	-	-	

To avoid duplication number of holders that applied fertilizers in rural and urban areas for private holdings do not add up to the totals. Hence, the sum of estimates may not be equal to the totals.

rural areas of the region. As can be seen from the data, the utilization of improved seeds is very low that indicates the holders continued reliance on low yielding local/traditional seeds.

5 FARM MANAGEMENT PRACTICES AND EDUCATIONAL ATTAINMENT OF HOLDERS

This section of the report presents data on educational attainment of holders in relation to their farm management practices. At the time of enumeration all holders in the sampled households were asked to state their educational attainment. As presented in Summary Table VI.7 data on literacy status and highest grade completed for literate holders were collected.

The census findings indicate that the level of educational attainment of the holders in Harari Region is very low and this may have a direct impact on the level of awareness of the holders with respect to improved farming activities and is a typical characteristic of peasant community in developing countries. A large number of holders (71.58% in rural and 47.60 % in urban areas) were found to be illiterate while 13.29% in rural and 10.48% in urban areas have participated in informal education. Moreover, the data shows that 13.21% of the holders in rural and 23.3% of holders in urban areas have completed grades 1 to 6 and only 1.04% of the holders in rural and 16.89 % in urban areas have completed grades 7-12. These estimates show that holders in urban areas are relatively more literate than those in the rural

SUMMARY TABLE VI.4: Number of Holders Applying Fertilizers, Fertilized Area,

and Quantity of Fertilizers by Crop Type in Rural Areas, for Private Holdings

CROP	Application of total Fertilizers		Application of Fertilizers by Type and Quantity				
	Holders	Hectares	Natural		Chemical – DAP		
			Holders	Hectares	Holders	Hectares	Quintals
TOTAL	10820	5124	7983	2670	1429	508	202
Grain Crops	10552	3703	7276	2080	1255	323	113
Cereals	10409	3100	6840	1636	1224	273	98
Teff	*	*	-	-	*	*	*
Barley	309	*	*	*	*	*	*
Wheat	1292	83	101	4	211	*	*
Maize	7084	525	4288	289	653	41	19
Sorghum	9375	2478	5794	1340	993	213	61
Finger millet	*	*	*	*	*	*	*
Oats ('Aja')	*	*	*	*	-	-	-
Rice	-	-	-	-	-	-	-
Pulses	1631	165	1452	145	*	*	*
Horse beans	*	*	*	*	*	*	*
Field peas	111	*	*	*	-	-	-
Haricot beans	1376	160	1288	143	*	*	*
Chick peas	*	*	*	*	-	-	-
Lentils	-	-	-	-	-	-	-
Vetch	-	-	-	-	-	-	-
Soya	-	-	-	-	-	-	-
Fenugreek	*	*	-	-	-	-	-
Gibto	-	-	-	-	-	-	-
Oil Seeds	3395	437	2278	299	294	37	*
Neug	-	-	-	-	-	-	-
Linseed	-	-	-	-	-	-	-
Ground nuts	3395	435	2278	299	294	37	*
Sunflower	-	-	-	-	-	-	-
Sesame	*	*	*	*	-	-	-
Rapeseed	-	-	-	-	-	-	-
Other Grains	*	*	-	-	-	-	-
Vegetables	760	12	492	9	*	*	*
Lettuce	-	-	-	-	-	-	-
Head cabbage	*	*	-	-	-	-	-
Kale	*	*	*	*	-	-	-
Tomatoes	*	*	*	*	-	-	-
Green peppers	*	*	*	*	-	-	-
Red peppers	*	*	*	*	-	-	-
Swiss chard	-	-	-	-	-	-	-
Others	615	5	439	3	*	*	*
Root Crops	1448	64	669	25	*	*	*
Beet root	-	-	-	-	-	-	-
Carrot	-	-	-	-	-	-	-
Onions	-	-	-	-	-	-	-
Potatoes	464	*	140	*	*	*	*
Garlic	-	-	-	-	-	-	-
Taro ('Godere')	-	-	-	-	-	-	-
Sweet potatoes	1006	28	523	18	*	*	*
Others	*	*	*	*	-	-	-
Permanent Crops	8966	1345	5757	557	1080	157	58
Fruit Crops	4783	163	3214	101	483	15	15
Avocado	*	*	*	*	*	*	*
Bananas	687	*	474	2	-	-	-
Guava (Zeytuna)	1364	39	645	22	125	1	*
Lemons	189	1	108	*	*	*	*
Mangoes	1928	89	1327	60	184	*	*
Oranges	*	*	*	*	*	*	*
Papayas	1335	15	948	12	*	*	*
Pineapples	-	-	-	-	-	-	-
Others	851	10	568	4	*	*	*
Stimulant Crops	8035	1179	4408	455	1011	142	42
Chat	7787	1154	4194	441	950	141	40
Coffee	877	22	531	13	*	*	*
Hops	*	*	-	-	-	-	-
Others	-	-	-	-	-	-	-
Other Permanent	*	*	*	*	-	-	-
Enset	*	*	*	*	-	-	-
Sugar Cane	*	*	*	*	-	-	-
Others	*	*	*	*	-	-	-

areas. This could probably be due to better access to school and/or better awareness of the importance of education among the holders in the urban than those in the rural areas.

Moreover, the total number of holders participating in the agricultural extension package programs was 657, which is only about 4.60 percent of the total holders in the region. Of the total holders participating in the extension programs, 657 were in Meher season. The distribution of extension package program participants by educational status shows that 63.77% were illiterate, and 0.15% have each completed grades 1 to 6 and grade 7 - 12.

As a result of insignificant number of holders who have been exposed to extension packages as well as to education the impact of education on the use of improved farm practices was not clearly exhibited by the census data. The data indicates that out of all holders who have used improved seeds, practiced irrigation, and applied fertilizers and pesticides, 67.82, 64.58, 69.23 and 58.21 percents were illiterate, respectively (For details, refer to Summary Table VI.7).

6 DAMAGED CROPLAND AREAS AND SIZE OF HOLDINGS IN RURAL AREAS

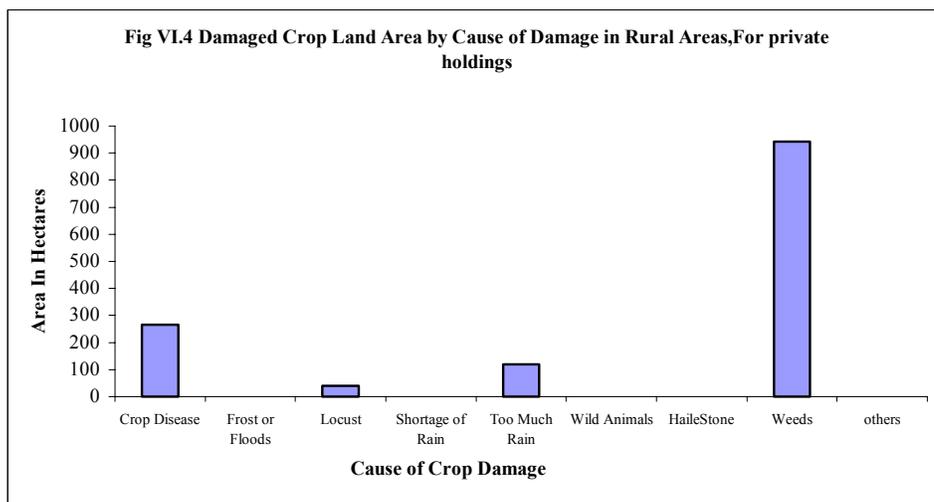
This section of the chapter deals with the estimates of damaged cropland areas by size of holdings in Harari Region. Cropland area damage includes any cropland planted or sown with intention to harvest crops, but failed to produce crop partly or fully due to various reasons. Out of the total cultivated cropland area, 15.21% in Meher and less than one percent in Belg seasons were affected by crop damage. The cropland area damage that accounted for 35.74% fall under holders in rural areas who had holding size that ranges from 0.51 to 1 hectares. On the other hand, holders in rural areas who had holding size of between 1.01 and 2 hectare accounted for 34.28 % of the total cropland area damaged. With regard to the causes of crop damage, it is reported that 65.51% was damaged due to weeds, 18.50% was caused by crop disease, 8.34% was due to too much rain, 2.78 due to locust (For details see Summary Table VI.8 and Fig VI.3).

7 FARM MANAGEMENT PRACTICES OF HOLDERS IN RURAL AREAS

In order to obtain more detailed information concerning the various types of farm practices of holders in rural areas, data were collected subjectively by interviewing sampled agricultural holders on the sources of water for irrigation schemes, method to improve soil fertility, method of plowing and soil conservation, participation in extension package

SUMMARY TABLE VI.7: Holders Applying Agricultural Inputs and Participating in Extension Programs by Level of Education in Rural and Urban Areas, for Private Holdings

Place of Residence/Season	Total		Educational Level of Holder									
			Illiterate		Literate, but no Formal Education		Grade 1 – 6		Grade 7 – 12		Above Grade 12	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
All Crop Holders												
Rural and Urban	14220	100	9983	70.20	1866	13.12	1962	13.80	339	2.38	*	*
Rural	13408	100	9597	71.58	1782	13.29	1771	13.21	140	1.04	*	*
Meher	13273	100	9574	72.13	1669	12.57	1771	13.34	140	1.05	*	*
Belg	3275	100	1928	58.87	665	20.31	398	12.15	1	0.03	*	*
Urban	811	100	386	47.60	85	10.48	189	23.30	137	16.89	*	*
Improved Seeds												
Rural and Urban	923	6.49	626	67.82	98	10.62	11	1.19	7	0.76	*	*
Rural	840	6.26	598	71.19	86	10.24	1	0.12	1	0.12	*	*
Meher	812	6.12	598	73.65	86	10.59	1	0.12	1	0.12	*	*
Belg	*	*	*	*	*	*	1	*	1	*	*	*
Urban	83	10.23	28	33.73	12	14.46	11	13.25	7	8.43	*	*
Irrigation												
Rural and Urban	1722	12.11	1112	64.58	304	17.65	1	0.06	14	0.81	*	*
Rural	1602	11.95	1061	66.23	291	18.16	1	0.06	1	0.06	*	*
Meher	1377	10.37	949	68.92	179	13.00	1	0.07	1	0.07	*	*
Belg	*	*	*	*	*	*	1	*	1	*	*	*
Urban	119	14.67	51	42.86	*	*	16	13.45	14	11.76	*	*
Fertilizer												
Rural and Urban	11243	79.06	7783	69.23	1541	13.71	1612	14.34	297	2.64	*	*
Rural	10820	80.70	7607	70.30	1501	13.87	1489	13.76	224	2.07	*	*
Meher	10711	80.70	7573	70.70	1477	13.79	1436	13.41	224	2.09	*	*
Belg	1465	44.73	722	49.28	361	24.64	343	23.41	*	*	*	*
Urban	424	52.28	176	41.51	41	9.67	123	29.01	73	17.22	*	*
Pesticides												
Rural and Urban	828	5.82	482	58.21	132	15.94	1	0.12	1	0.12	*	*
Rural	767	5.72	468	61.02	128	16.69	1	0.13	1	0.13	*	*
Meher	692	5.21	422	60.98	*	*	1	0.14	1	0.14	*	*
Belg	*	*	*	*	*	*	1	*	1	*	*	*
Urban	61	7.52	14	22.95	*	*	1	1.64	1	1.64	*	*
Extension Program												
Rural	657	4.62	419	63.77	*	*	1	0.15	1	0.15	*	*
Meher	657	4.90	419	63.77	*	*	1	0.15	1	0.15	*	*
Belg	*	*	*	*	*	*	1	*	1	*	*	*



programs, as well as use of credit and/or advisory services. Hence, the total number of holders reporting different farm management practices and their percentage distribution by type of farm management practices is presented in Summary Table VI.9. Following are discussions of the major findings with respect to these data.

7.1 Sources of Water for Irrigation Schemes

In a country like Ethiopia, where the amount, timing and distribution of rainfall is irregular, use of irrigation would significantly improve and raise the level of production. However, irrigation is not extensive in Harari Region. As presented earlier, Chat, sorghum and maize are relatively sizable crops that are grown by irrigation in this region. The census data reveals that of the total crop holder in the rural areas only 18.81% reported to have used irrigation practices. Among these holders who practice different sources of water 45.5 percent and 17.19 percent of the holders have used rivers and ponds, respectively. Utilization of other sources of water for irrigation is very limited in the region. It should be noted that data on the number of holders who practice irrigation schemes and the number of holders reporting the sources of water for irrigation were collected in different period of time during the 2001/02 agricultural activities. In an enumeration area a total of 30 house holds were systematically sampled that mainly resulted about 30 holders. Thus, the data on number of holders practicing irrigation was collected in September (for ten households) and December (for twenty households). However, the data on the holders reporting the sources of water for irrigation was collected only in March. Hence, some discrepancy is observed in the total numbers of holders who have reported the use of irrigation practices presented in Summary Table VI.7 and VI.9.

During the 2001/02 EASE, an attempt has also been made to assess the extent of irrigation practice in urban areas. Thus, sources of water for irrigation under permanent crops in urban areas for Meher season have been assessed and the data are presented in Summary Table VI.9. The data in the table shows that only 14.67 percent of the total holders reported as practicing irrigation during the Meher season and of these holders the sources of water for irrigation for 7.77, 2.71, 0.99 and 1.11 percent were from rivers, lakes, tap water and other sources, respectively. However, holders that use well are very few. In the same summary table, out of the total holders, it is found that only 104 (12.82 percent) holders in urban areas practiced Belg crop production in the past three years prior to 2001/02 (1994 E.C.).

7.2 Methods Used to Improve Soil Fertility

The fertility of the soil in Ethiopia is being depleted slowly as time passes because of continuous cropping. In the census, holders were asked to state their method of improving soil fertility, that is whether they use crop rotation or burning of soil. Hence, the data showed that of the total holders about 10.08% have reported practicing crop rotation, while very few holders reported practicing burning of soil as their main method for improving soil fertility.

7.3 Application of Chemical Fertilizer and reason for not applying Fertilizers

In order to gauge the attitude of holders who did not use chemical fertilizers, sampled households were asked the reasons for not using chemical fertilizers. The data in Summary Table VI.8, indicate that the majority of the holders did not use chemical fertilizers due to

Various reasons. A total of about 5433 holders which is the highest did not use chemical fertilizers due to shortage of money, about 1290 holders due to high cost of fertilizers 664 holders due to lack of knowledge about the advantage, about 174 holders due to insufficient supply of fertilizers in their area, 140 holders reported suspecting the efficiency of the fertilizers and about 1003 holders mentioned “other reasons” for not using chemical fertilizers.

7.4 Method of Ploughing

One aspect to increase agricultural production is through mechanization. The replacement of hand digging and ox/horse driven ploughing method by tractor is of paramount importance for increasing the volume of agricultural production. In light of this, an attempt has been made to collect some basic information on method of ploughing by the holders at the time of the census enumeration. Thus, the majority of the holders (46.73%) reported to have used hand digging method and 15.46% of the holders that used ox/horse driven ploughing methods. Nevertheless, holders who used both hand dug and ox/horse driven methods accounted for about 33%.

7.5 Methods Used for Soil Conservation

According to the data in Summary Table VI.9, the majority of the holders reported using different methods of soil conservation. Of which, 60, 13.55, 5.62 and 1.45 percent of holders have practiced terracing, water catchments, plowing along the contour and afforestation, respectively. On the other hand only few holders reported that they have other methods for soil conservation.

7.6 Extension Packages, and Use of Agricultural Credit and Advisory Services

Extension packages are outreach programs operating in rural areas for private holdings aiming to transfer modern agricultural technologies to increase crop and livestock productivity. The programs are usually undertaken through close follow-up and advisory services by the agricultural development agents. A holder is said to be a participant of this program if and only if he/she obtains agricultural advices, apply the recommended inputs and other related services such as close follow up by the extension agent, supervision by wereda and zonal agricultural bureaus...etc on a regular basis. The prevalence of different types of extension packages were

assessed during the enumeration, these include, rain shortage areas package, rain abundant areas packages, post harvest technology packages, ...etc. Thus, the data showed that about 2.34% of the agricultural holders were covered by rain abundant areas extension packages. The total agricultural holders covered by all other types of extension packages listed in the table are insignificant. In response to why they have not been covered by these extension packages since the program started, holders reported the reasons as follows 28.55% of the holders reported shortage of money, 31.01% reported no knowledge about the advantage, 7.49% reported program not available, 8.66% each were suspicious of its efficiency and other reasons, and 12.12% reported not sufficient arable land available and 4.58% due to other reasons.

In the rural Ethiopia, there are institutions that provide credit and assist peasants by furnishing short and intermediate term loans for the purchase of chemical fertilizers, improved variety seeds, and pesticides. These institutions not only give great emphasis to providing loans to peasants but also aiding them with advice on farming practices. Then, data are collected by interviewing sampled holders on use of credit and advisory services and are presented in Summary Table VI.9. Thus, the data in this table showed that about 17.19 percent of the holders have obtained advice on agricultural practices on the other hand the number of holders reporting the use of credit services was insignificant showing that the use of credit and advisory services were limited in scope.

7.7 SOURCES AND COST OF CHEMICAL FERTILIZERS.

As illustrated in Summary Table VI.11, it is estimated that a total of 3955 holders (29.20%) reported "Government" as their major sources of chemical fertilizers, while about 2875 (21.27%) and 178 (1.32%) holders mentioned traders and private organization as their major sources of chemical fertilizers, respectively. Regardless of the source, the average cost was 277.89 Birr/Quintal for DAP and 248.05 Birr/Quintal for UREA.

8 USES OF CROP SPECIFIC EXTENSION PACKAGE PROGRAMS

Extension package is one of the means by which productivity improves and thereby food production increases. Moreover, Agricultural Development Agents (ADA) assist the peasants by operating demonstration plots to provide information to agricultural holders on improved seed varieties, on use of fertilizers and pesticides, and improvements in production

practices to increase yields. Further, advisory services are provided to holders to those who are willing to participate in the extension package programs.

8.1 Holders Participating in Crop Specific Extension Package Programs

In rural areas the distributions of holders participating in crop specific extension package programs are presented in Summary Table VI.12. Accordingly, about 565 holders have been participating in crop specific package, that is, sorghum, followed by about 206 and 128 holders who considered maize and ground nut, respectively.

8.2 Area Under Crop Specific Extension Package Programs

In the 2001/02 EASE, data on cropland area under extension package programs was collected. Thus, Summary Table VI.12 shows that a total of 95 hectares (1.01% of the total cropland area) was under extension package programs. Out of the total cropland area under extension package programs, 61.05% was observed under sorghum while maize, ground nut, potato and sweet potatoes contributed about 38.95% altogether. For details, see Summary Table VI.12.

SUMMARY TABLE VI.9: Number of Holders by Type of Farm Management Practices
in Rural Areas, for Private Holdings

Farm Practices	Number of Holders Reporting	Percentage
Total Crop Holders	13516	100
Source of Water for Irrigation		
Holders who Practice Irrigation	2542	18.81
River	1158	45.55
Lake	*	*
Pond	437	17.19
Other	*	*
Method to Improve Soil Fertility		
Crop Rotation	1363	10.08
Burning of Soil	*	*
Reason for Not Using Chemical Fertilizer		
Do Not Know Advantages	664	
Too Expensive	1290	
Shortage of Money	5433	
Insufficient Supply	174	
No Credit Service	-	
Suspicious of Efficacy	140	
Other	1003	
Method of Plowing		
Hand Dug	6316	46.73
Ox/Horse Driven	2090	15.46
Tractor	*	*
Hand Dug and Ox/Horse Driven	4416	32.67
Tractor and Ox/Horse Driven	*	*
Method of Soil Conservation		
Terracing	8109	60
Water Catchments	1831	13.55
Afforestation	196	1.45
Plowing Along the Contour	760	5.62
Others	*	*
All Holders	14039	100
Participation in Extension Package by Type		
Rain Shortage Areas Package	*	*
Rain Abundant Areas Package	328	2.34
Post Harvest Technology Package	-	-
Livestock Development Package	-	-
Economically Important Crops Package	*	*
Any Two or More Packages	-	-
Reason For Not Participating in Extension Packages		
Do Not Know the Advantages	4353	31.01
Shortage of Money	4008	28.55
Suspicious of Efficacy	1216	8.66
Programs Not Available	1052	7.49
Not Sufficient Arable Land	1702	12.12
Others	643	4.58
Use of Credit or Advisory Services		
Credit Services	*	*
Advisory Services	437	17.19

Summary Table VI.10 Holders who Practice Irrigation by Sources of Water in Meher Season and Holders who Practice Belg From 1999/2000 to 2001/02 in Urban Areas

Sources of Water	Number of Holders	Percent
Those who Practice Irrigation in Meher Season (2001/02)		
Crop Holders.....	811	100.00
Holders who Practice Irrigation Sources	119	14.67
River.....	63	7.77
Lake.....	22	2.71
Well.....	*	*
Tap Water.....	8	0.99
Others.....	9	1.11
Not Stated.....	*	*
Those who Practice Belg from 1999/2000 to 2001/02		
Crop Holders.....	811	100
Holders who Practice Belg.....	104	12.82
Male.....	67	8.26
Female.....	37	4.56

Summary Table VI.11: Holders by Sources of Chemical Fertilizers and Cost of Chemical Fertilizers in Rural Areas for Private Holdings.

Sources and Type of Fertilizers	Number of Holders	Percent
Crop Holders.....	13516	100
Sources		
Government.....	3955	29.26
Private Organization	178	1.32
Traders.....	2875	21.27
Others.....	-	
Do not Buy.....	6414	47.45
Not Reported.....	-	
Type of Fertilizers	Cost in Birr/Quintal	
DAP.....	277.89	
UREA.....	248.05	

TABLE 6.1: AREA OF CROPLAND UNDER IMPROVED FARM MANAGEMENT PRACTICES BY TYPE OF CROPS IN RURAL AREAS, BOTH SEASONS, FOR PRIVATE HOLDINGS

TYPE OF CROP	Total Crop		Improved Seed		Irrigation		Fertilizer		Pesticide	
	Hectares	Hectares	%	Hectares	%	Hectares	%	Hectares	%	
TOTAL	9062	76	0.84	290	3.2	5124	56.54	120	1.32	
Grain Crops	6850	75	1.09	136	1.99	3703	54.06	62	0.91	
Cereals	5115	61	1.19	133	2.6	3100	60.61	46	0.9	
Teff.....	*	-	-	-	-	*	*	-	-	
Barley.....	18	-	-	-	-	*	*	-	-	
Wheat.....	100	*	*	*	*	83	83	-	-	
Maize.....	894	37	4.14	*	*	525	58.72	*	*	
Sorghum.....	4098	14	0.34	*	*	2478	60.47	36	0.88	
Finger millet.....	*	*	*	-	-	*	*	-	-	
Oats ('Aja').....	*	-	-	-	-	*	*	-	-	
Rice	-	-	-	-	-	-	-	-	-	
Pulses	470	-	-	*	*	165	35.11	*	*	
Horse beans.....	*	-	-	*	*	*	*	-	-	
Field peas.....	*	-	-	-	-	*	*	-	-	
Haricot beans.....	455	-	-	-	-	160	35.16	*	*	
Chick peas.....	*	-	-	-	-	*	*	-	-	
Lentils	-	-	-	-	-	-	-	-	-	
Vetch.....	-	-	-	-	-	-	-	-	-	
Soya.....	-	-	-	-	-	-	-	-	-	
Fenugreek.....	*	-	-	-	-	*	*	-	-	
Gibto	-	-	-	-	-	-	-	-	-	
Oil Seeds	1264	*	*	*	*	437	34.57	*	*	
Neug.....	-	-	-	-	-	-	-	-	-	
Linseed.....	-	-	-	-	-	-	-	-	-	
Ground nuts.....	1255	*	*	*	*	435	34.66	*	*	
Sufflower	-	-	-	-	-	-	-	-	-	
Sesame	*	-	-	-	-	*	*	-	-	
Rapeseed.....	-	-	-	-	-	-	-	-	-	
Other Grains	*	-	-	*	*	*	*	-	-	
Vegetables	25	*	*	*	*	12	48	*	*	
Lettuce.....	-	-	-	-	-	-	-	-	-	
Head cabbage.....	*	*	*	*	*	*	*	-	-	
Kale.....	*	-	-	-	-	*	*	-	-	
Tomatoes.....	*	-	-	*	*	*	*	*	*	
Green peppers.....	*	-	-	-	-	*	*	-	-	
Red peppers.....	*	-	-	-	-	*	*	-	-	
Swiss chard.....	-	-	-	-	-	-	-	-	-	
Others.....	6	-	-	-	-	5	83.33	-	-	
Root Crops.....	110	*	*	*	*	64	58.18	*	*	
Beet root.....	-	-	-	-	-	-	-	-	-	
Carrot	-	-	-	-	-	-	-	-	-	
Onions.....	*	*	*	*	*	*	*	*	*	
Potatoes.....	*	-	-	-	-	*	*	*	*	
Garlic.....	-	-	-	-	-	-	-	-	-	
Taro ('Godere').....	-	-	-	-	-	-	-	-	-	
Sweet potatoes.....	62	-	-	*	*	28	45.16	-	-	
Others.....	*	-	-	-	-	*	*	-	-	
Permanent Crops.....	2078	*	*	137	6.59	1345	64.73	56	2.69	
Fruit Crops.....	335	*	*	*	*	163	48.66	*	*	
Avocado.....	*	-	-	*	*	*	*	-	-	
Bananas.....	11	-	-	*	*	*	*	*	*	
Guava (Zeytuna).....	69	-	-	*	*	39	56.52	-	-	
Lemons.....	2	-	-	*	*	1	50	-	-	
Mangoes.....	198	-	-	*	*	89	44.95	*	*	
Oranges.....	*	-	-	*	*	*	*	-	-	
Papayas.....	*	*	*	*	*	15	*	-	-	
Pineapples.....	-	-	-	-	-	-	-	-	-	
Others.....	13	*	*	*	*	10	76.92	-	-	
Stimulant Crops.....	1704	*	*	81	4.75	1179	69.19	*	*	
Chat.....	1666	-	-	78	4.68	1154	69.27	*	*	
Coffee.....	34	*	*	*	*	22	64.71	*	*	
Hops.....	*	-	-	-	-	*	*	-	-	
Others.....	-	-	-	-	-	-	-	-	-	
Other Permanent Crops.....	39	-	-	*	*	*	*	*	*	
Enset.....	*	-	-	-	-	*	*	-	-	
Sugar Cane.....	*	-	-	*	*	*	*	-	-	
Others.....	*	-	-	-	-	*	*	-	-	

TABLE 6.3: NUMBER OF HOLDERS APPLYING FERTILIZERS, FERTILIZED AREA, AND QUANTITY OF FERTILIZERS BY CROP TYPE IN RURAL AREAS FOR BOTH SEASON

CROP	Application of total Fertilizers		Application of Fertilizers by Type and Quantity				
			Natural		Chemical – DAP		
	Holders	Hectares	Holders	Hectares	Holders	Hectares	Quintals
TOTAL	10820	5124	7983	2670	1429	508	202
Grain Crops	10552	3703	7276	2080	1255	323	113
Cereals	10409	3100	6840	1636	1224	273	98
Teff	*	*	-	-	*	*	*
Barley	309	*	*	*	*	*	*
Wheat	1292	83	101	4	211	*	*
Maize	7084	525	4288	289	653	41	19
Sorghum	9375	2478	5794	1340	993	213	61
Finger millet	*	*	*	*	-	-	-
Oats ('Aja')	*	*	*	*	-	-	-
Rice	-	-	-	-	-	-	-
Pulses	1631	165	1452	145	*	*	*
Horse beans	*	*	*	*	*	*	*
Field peas	111	*	*	*	*	*	*
Haricot beans	1376	160	1288	143	*	*	*
Chick peas	*	*	*	*	-	-	-
Lentils	-	-	-	-	-	-	-
Vetch	-	-	-	-	-	-	-
Soya	-	-	-	-	-	-	-
Fenugreek	*	*	-	-	-	-	-
Gibto	-	-	-	-	-	-	-
Oil Seeds	3395	437	2278	299	294	37	*
Neug	-	-	-	-	-	-	-
Linseed	-	-	-	-	-	-	-
Ground nuts	3395	435	2278	299	294	37	*
Sufflower	-	-	-	-	-	-	-
Sesame	*	*	*	*	-	-	-
Rapeseed	-	-	-	-	-	-	-
Other Grains	*	*	-	-	-	-	-
Vegetables	760	12	492	9	*	*	*
Lettuce	*	*	-	-	-	-	-
Head cabbage	*	*	*	*	-	-	-
Kale	*	*	*	*	-	-	-
Tomatoes	*	*	*	*	-	-	-
Green peppers	*	*	*	*	-	-	-
Red peppers	*	*	*	*	-	-	-
Swiss chard	-	-	-	-	-	-	-
Others	615	5	439	3	*	*	*
Root Crops	1448	64	669	25	*	*	*
Beet root	-	-	-	-	-	-	-
Carrot	-	-	-	-	-	-	-
Onions	-	-	-	-	-	-	-
Potatoes	464	*	140	*	*	*	*
Garlic	-	-	-	-	-	-	-
Taro ('Godere')	-	-	-	-	-	-	-
Sweet potatoes	1006	28	523	18	*	*	*
Others	*	*	*	*	-	-	-
Permanent Crops	8966	1345	5757	557	1080	157	58
Fruit Crops	4783	163	3214	101	483	15	15
Avocado	*	*	*	*	*	*	*
Bananas	687	*	474	2	-	-	-
Guava (Zeytuna)	1364	39	645	22	125	1	*
Lemons	189	1	108	*	*	*	*
Mangoes	1928	89	1327	60	184	*	*
Oranges	*	*	*	*	*	*	*
Papayas	1335	15	948	12	*	*	*
Pineapples	-	-	-	-	-	-	-
Others	851	10	568	4	*	*	*
Stimulant Crops	8035	1179	4408	455	1011	142	42
Chat	7787	1154	4194	441	950	141	40
Coffee	877	22	531	13	*	*	*
Hops	*	*	-	-	-	-	-
Others	-	-	-	-	-	-	-
Other Permanent Crops	*	*	*	*	-	-	-
Enset	*	*	-	-	-	-	-
Sugar Cane	*	*	*	*	-	-	-
Others	*	*	*	*	-	-	-

TABLE 6.3 CONTD.

CROP	Application of Fertilizers by Type and Quantity					
	Chemical – UREA			Chemical - DAP & UREA		
	Holders	Hectares	Quintals	Holders	Hectares	Quintals
TOTAL	2774	1099	406	2015	846	562
Grain Crops	2741	738	266	1871	562	488
Cereals	2741	666	239	1871	525	484
Teff	-	-	-	-	-	-
Barley	-	-	-	104	2	*
Wheat	430	18	11	632	46	*
Maize	1720	109	78	1200	87	34
Sorghum	2234	536	147	1711	390	*
Finger millet	*	*	-	-	-	-
Oats ('Aja')	-	-	-	*	*	*
Rice	-	-	-	-	-	-
Pulses	163	*	*	108	2	*
Horse beans	*	*	*	*	*	-
Field peas	*	*	*	*	*	-
Haricot beans	*	*	*	*	*	*
Chick peas	*	*	*	*	*	*
Lentils	-	-	-	-	-	-
Vetch	-	-	-	-	-	-
Soya	-	-	-	-	-	-
Fenugreek	*	*	*	-	-	-
Gibto	-	-	-	-	-	-
Oil Seeds	661	67	21	270	34	*
Neug	-	-	-	-	-	-
Linseed	-	-	-	-	-	-
Ground nuts	661	66	21	270	34	*
Sufflower	-	-	-	-	-	-
Sesame	*	*	-	-	-	-
Rapeseed	-	-	-	-	-	-
Other Grains	-	-	-	*	*	-
Vegetables	177	*	6	*	*	*
Lettuce	-	-	-	-	-	-
Head cabbage	*	*	*	-	-	-
Kale	-	-	-	-	-	-
Tomatoes	*	*	*	-	-	-
Green peppers	-	-	-	*	*	*
Red peppers	*	*	*	-	-	-
Swiss chard	-	-	-	-	-	-
Others	109	*	*	*	*	*
Root Crops	215	4	6	307	8	*
Beet root	-	-	-	-	-	-
Carrot	-	-	-	-	-	-
Onions	-	-	-	-	-	-
Potatoes	*	*	*	*	*	*
Garlic	-	-	-	-	-	-
Taro ('Godere')	-	-	-	-	-	-
Sweet potatoes	177	*	5	229	5	*
Others	-	-	-	*	*	*
Permanent Crops	2386	354	128	1787	276	64
Fruit Crops	928	32	27	628	15	14
Avocado	*	*	*	*	*	*
Bananas	*	*	*	*	*	*
Guava (Zeytuna)	441	13	9	154	*	*
Lemons	*	*	*	-	-	-
Mangoes	228	*	*	247	8	*
Oranges	*	*	*	-	-	-
Papayas	244	1	5	*	*	*
Pineapples	-	-	-	-	-	-
Others	*	*	*	136	*	*
Stimulant Crops	2251	321	100	1689	261	50
Chat	2158	312	93	1658	260	49
Coffee	*	*	*	84	*	*
Hops	*	*	*	-	-	-
Others	-	-	-	-	-	-
Other Permanent Crops	*	*	*	*	*	-
Enset	*	*	*	-	-	-
Sugar Cane	-	-	-	-	-	-
Others	*	*	*	*	*	-

TABLE 6.3.1: RURAL MEHER

CROP	Application of total Fertilizers		Application of Fertilizers by Type and Quantity				
			Natural		Chemical – DAP		
	Holder	Hectares	Holder	Hectares	Holder	Hectares	Quintals
TOTAL	10820	5124	7983	2670	1429	508	202
Grain Crops	10552	3703	7276	2080	1255	323	113
Cereals	10409	3100	6840	1636	1224	273	98
Teff.....	*	*	-	-	*	*	*
Barley.....	309	*	*	*	*	*	*
Wheat.....	1292	83	101	4	211	*	*
Maize.....	7084	525	4288	289	653	41	19
Sorghum.....	9375	2478	5794	1340	993	213	61
Finger millet.....	*	*	*	*	-	-	-
Oats ('Aja').....	*	*	*	*	-	-	-
Rice.....	-	-	-	-	-	-	-
Pulses.....	1631	165	1452	145	*	*	*
Horse beans.....	*	*	*	*	*	*	*
Field peas	111	*	*	*	-	-	-
Haricot beans.....	1376	160	1288	143	*	*	*
Chick peas.....	*	*	*	*	-	-	-
Lentils.....	-	-	-	-	-	-	-
Vetch.....	-	-	-	-	-	-	-
Soya.....	-	-	-	-	-	-	-
Fenugreek.....	*	*	-	-	-	-	-
Gibto.....	-	-	-	-	-	-	-
Oil Seeds.....	3395	437	2278	299	294	37	*
Neug.....	-	-	-	-	-	-	-
Linseed.....	-	-	-	-	-	-	-
Ground nuts.....	3395	435	2278	299	294	37	*
Sufflower.....	-	-	-	-	-	-	-
Sesame.....	*	*	*	*	-	-	-
Rapeseed.....	-	-	-	-	-	-	-
Other Grains.....	*	*	-	-	-	-	-
Vegetables	760	12	492	9	*	*	*
Lettuce.....	-	-	-	-	-	-	-
Head cabbage.....	*	*	-	-	-	-	-
Kale.....	*	*	*	*	-	-	-
Tomatoes.....	*	*	-	-	-	-	-
Green peppers.....	*	*	*	*	-	-	-
Red peppers.....	*	*	*	*	-	-	-
Swiss chard.....	-	-	-	-	-	-	-
Others.....	615	5	439	3	*	*	*
Root Crops.....	1448	64	669	25	*	*	*
Beet root.....	-	-	-	-	-	-	-
Carrot.....	-	-	-	-	-	-	-
Onions.....	-	-	-	-	-	-	-
Potatoes.....	464	*	140	*	*	*	*
Garlic.....	-	-	-	-	-	-	-
Taro ('Godere').....	-	-	-	-	-	-	-
Sweet potatoes.....	1006	28	523	18	*	*	*
Others.....	*	*	*	*	-	-	-
Permanent Crops.....	8966	1345	5757	557	1080	157	58
Fruit Crops.....	4783	163	3214	101	483	15	15
Avocado.....	*	*	*	*	*	*	*
Bananas.....	687	*	474	2	-	-	-
Guava (Zeytuna).....	1364	39	645	22	125	1	*
Lemons.....	189	1	108	*	*	*	*
Mangoes.....	1928	89	1327	60	184	*	*
Oranges.....	*	*	*	*	-	-	-
Papayas.....	1335	15	948	12	*	*	*
Pineapples.....	-	-	-	-	-	-	-
Others.....	851	10	568	4	*	*	*
Stimulant Crops.....	8035	1179	4408	455	1011	142	42
Chat.....	7787	1154	4194	441	950	141	40
Coffee	877	22	531	13	*	*	*
Hops.....	*	*	-	-	-	-	-
Others.....	-	-	-	-	-	-	-
Other Permanent Crops.....	*	*	*	*	-	-	-
Enset.....	*	*	-	-	-	-	-
Sugar Cane.....	*	*	*	*	-	-	-
Others.....	*	*	*	*	-	-	-

TABLE 6.3.1 CONTD.

CROP	Application of Fertilizers by Type and Quantity					
	Chemical – UREA			Chemical - DAP & UREA		
	Holders	Hectares	Quintals	Holders	Hectares	Quintals
TOTAL	2774	1099	406	2015	846	562
Grain Crops	2741	738	266	1871	562	488
Cereals	2741	666	239	1871	525	484
Teff	-	-	-	-	-	-
Barley	*	*	*	104	2	*
Wheat	430	18	11	632	46	*
Maize	1720	109	78	1200	87	34
Sorghum	2234	536	147	1711	390	*
Finger millet	*	*	-	-	-	-
Oats ('Aja')	-	-	-	*	*	*
Rice	-	-	-	-	-	-
Pulses	163	*	*	108	2	*
Horse beans	*	*	*	*	*	*
Field peas	*	*	*	*	*	*
Haricot beans	*	*	*	*	*	*
Chick peas	*	*	*	*	*	*
Lentils	-	-	-	-	-	-
Vetch	-	-	-	-	-	-
Soya	-	-	-	-	-	-
Fenugreek	*	*	*	-	-	-
Gibto	-	-	-	-	-	-
Oil Seeds	661	67	21	270	34	*
Neug	-	-	-	-	-	-
Linseed	-	-	-	-	-	-
Ground nuts	661	66	21	270	34	*
Sufflower	-	-	-	-	-	-
Sesame	*	*	-	-	-	-
Rapeseed	-	-	-	-	-	-
Other Grains	-	-	-	*	*	*
Vegetables	177	*	6	*	*	*
Lettuce	-	-	-	-	-	-
Head cabbage	*	*	*	-	-	-
Kale	-	-	-	-	-	-
Tomatoes	*	*	*	-	-	-
Green peppers	-	-	-	*	*	*
Red peppers	*	*	*	-	-	-
Swiss chard	-	-	-	-	-	-
Others	109	*	*	*	*	*
Root Crops	215	4	6	307	8	*
Beet root	-	-	-	-	-	-
Carrot	-	-	-	-	-	-
Onions	-	-	-	-	-	-
Potatoes	*	*	*	*	*	*
Garlic	-	-	-	-	-	-
Taro ('Godere')	-	-	-	-	-	-
Sweet potatoes	177	*	5	229	5	*
Others	-	-	-	*	*	*
Permanent Crops	2386	354	128	1787	276	64
Fruit Crops	928	32	27	628	15	14
Avocado	*	*	*	*	*	*
Bananas	*	*	*	*	*	*
Guava (Zeytuna)	441	13	9	154	*	*
Lemons	*	*	*	-	-	-
Mangoes	228	*	*	247	8	*
Oranges	*	*	*	-	-	-
Papayas	244	1	5	*	*	*
Pineapples	-	-	-	-	-	-
Others	*	*	*	136	*	*
Stimulant Crops	2251	321	100	1689	261	50
Chat	2158	312	93	1658	260	49
Coffee	*	*	*	84	*	*
Hops	*	*	*	-	-	-
Others	-	-	-	-	-	-
Other Permanent Crops	*	*	*	*	*	*
Enset	*	*	*	-	-	-
Sugar Cane	-	-	-	-	-	-
Others	*	*	*	*	*	*

TABLE 6.3.2: RURAL BELG

CROP	Application of total Fertilizers		Application of Fertilizers by Type and Quantity				
			Natural		Chemical – DAP		
	Holders	Hectares	Holders	Hectares	Holders	Hectares	Quintals
TOTAL	1465	356	1324	331	*	*	*
Grain Crops	1357	338	1310	322	*	*	*
Cereals	705	*	705	*	-	-	-
Teff	-	-	-	-	-	-	-
Barley	-	-	-	-	-	-	-
Wheat	-	-	-	-	-	-	-
Maize	555	68	555	68	-	-	-
Sorghum	450	*	450	*	-	-	-
Finger millet	-	-	-	-	-	-	-
Oats ('Aja')	-	-	-	-	-	-	-
Rice	-	-	-	-	-	-	-
Pulses	1257	153	1211	138	*	*	*
Horse beans	-	-	-	-	-	-	-
Field peas	-	-	-	-	-	-	-
Haricot beans	1257	153	1211	138	*	*	*
Chick peas	-	-	-	-	-	-	-
Lentils	-	-	-	-	-	-	-
Vetch	-	-	-	-	-	-	-
Soya	-	-	-	-	-	-	-
Fenugreek	-	-	-	-	-	-	-
Gibto	-	-	-	-	-	-	-
Oil Seeds	*	*	*	*	-	-	-
Neug	-	-	-	-	-	-	-
Linseed	-	-	-	-	-	-	-
Ground nuts	*	*	*	*	-	-	-
Sufflower	-	-	-	-	-	-	-
Sesame	-	-	-	-	-	-	-
Rapeseed	-	-	-	-	-	-	-
Other Grains	-	-	-	-	-	-	-
Vegetables	*	*	*	*	-	-	-
Lettuce	-	-	-	-	-	-	-
Head cabbage	-	-	-	-	-	-	-
Kale	*	*	*	*	-	-	-
Tomatoes	*	*	-	-	-	-	-
Green peppers	-	-	-	-	-	-	-
Red peppers	-	-	-	-	-	-	-
Swiss chard	-	-	-	-	-	-	-
Others	-	-	-	-	-	-	-
Root Crops	*	*	*	*	*	*	*
Beet root	-	-	-	-	-	-	-
Carrot	-	-	-	-	-	-	-
Onions	-	-	-	-	-	-	-
Potatoes	*	*	*	*	*	*	*
Garlic	-	-	-	-	-	-	-
Taro ('Godere')	-	-	-	-	-	-	-
Sweet potatoes	-	-	-	-	-	-	-
Others	-	-	-	-	-	-	-
Permanent Crops	1465	356	1324	331	*	*	*
Fruit Crops	1357	338	1310	322	*	*	*
Avocado	705	*	705	*	-	-	-
Bananas	-	-	-	-	-	-	-
Guava (Zeytuna)	-	-	-	-	-	-	-
Lemons	-	-	-	-	-	-	-
Mangoes	555	68	555	68	-	-	-
Oranges	450	*	450	*	-	-	-
Papayas	-	-	-	-	-	-	-
Pineapples	-	-	-	-	-	-	-
Others	-	-	-	-	-	-	-
Stimulant Crops	1257	153	1211	138	*	*	*
Chat	-	-	-	-	-	-	-
Coffee	-	-	-	-	-	-	-
Hops	1257	153	1211	138	*	*	*
Others	-	-	-	-	-	-	-
Other Permanent Crops	-	-	-	-	-	-	-
Enset	-	-	-	-	-	-	-
Sugar Cane	-	-	-	-	-	-	-
Others	-	-	-	-	-	-	-

Annex - TABLE 6.1: AREA UNDER FARM MANAGEMENT PRACTICES WITH THEIR STANDARD ERRORS AND COEFFICIENT OF VARIATION IN RURAL AREAS FOR MEHER SEASON

Type of crop	Improved Seed Applied			Irrigation			Fertilizer Applied			Pesticide Applied		
	Hectare	S.E	C.V	Hectare	S.E	C.V	Hectare	S.E	C.V	Hectare	S.E	C.V
TOTAL	8073	623	8	76	22	29	246	90	37	4768	400	8
Grains Crops	5900	575	10	75	22	29	101	43	42	3366	316	9
Cereals	4625	379	8	61	18	30	97	41	42	2920	292	10
Teff	3	2	68	-	-	-	-	-	-	-	-	103
Barley	18	9	49	-	-	-	-	-	-	11	6	51
Wheat	100	34	34	9	6	65	-	-	106	83	29	35
Maize	668	78	12	37	14	37	36	19	53	458	45	10
Sorghum	3835	353	9	14	6	42	61	33	53	2366	279	12
Millet	1	1	72	-	-	108	-	-	-	1	1	72
Oats	1	1	70	-	-	-	-	-	-	1	1	84
Rice	-	-	-	-	-	-	-	-	-	-	-	-
Pulse	26	7	26	-	-	-	-	-	106	12	4	30
Horse beans	1	1	59	-	-	-	-	-	106	-	-	74
Field peas	3	2	70	-	-	-	-	-	-	1	1	53
Haricot beans	11	4	34	-	-	-	-	-	-	7	3	45
Chick peas	10	5	56	-	-	-	-	-	-	3	2	63
Lentiles	-	-	-	-	-	-	-	-	-	-	-	-
Vetch	-	-	-	-	-	-	-	-	-	-	-	-
Soya	-	-	-	-	-	-	-	-	-	-	-	-
Fenugreek	1	1	76	-	-	-	-	-	-	1	1	76
Gibto	-	-	-	-	-	-	-	-	-	-	-	-
Oile seed	1249	293	23	15	9	59	3	2	64	433	90	21
Nueg	-	-	-	-	-	-	-	-	-	-	-	-
Linseed	-	-	-	-	-	-	-	-	-	-	-	-
Ground nuts	1240	292	24	15	9	59	3	2	64	431	89	21
Sunflower	-	-	-	-	-	-	-	-	-	-	-	-
Sesame	9	5	54	-	-	-	-	-	-	2	1	73
Rapeseed.	-	-	-	-	-	-	-	-	-	-	-	-
Other Grain	1	1	84	-	-	-	1	1	109	1	1	109
Vegetables.	7	2	31	-	-	106	-	-	106	5	2	31
Lettuce	-	-	-	-	-	-	-	-	-	-	-	-
Cabbage	-	-	106	-	-	106	-	-	106	-	-	106
Kale	-	-	-	-	-	-	-	-	-	-	-	-
Tomatoes	-	-	-	-	-	-	-	-	-	-	-	-
Green pepper	-	-	77	-	-	-	-	-	-	-	-	83
Red paper	-	-	106	-	-	-	-	-	-	-	-	106
Swiss chard	-	-	-	-	-	-	-	-	-	-	-	-
Others	6	2	32	-	-	-	-	-	-	5	1	31
Root Crops	88	24	27	-	-	-	8	7	90	52	19	36
Beet root	-	-	-	-	-	-	-	-	-	-	-	-
Carrot	-	-	-	-	-	-	-	-	-	-	-	-
Onion	-	-	-	-	-	-	-	-	-	-	-	-
Potatoes	27	19	72	-	-	-	-	-	-	23	17	74
Garlic	-	-	-	-	-	-	-	-	-	-	-	-
Godere	-	-	-	-	-	-	-	-	-	-	-	-
Sweet potatoes	61	16	26	-	-	-	8	7	90	28	8	29
Others	-	-	69	-	-	-	-	-	-	-	-	70
Permanet crops	2078	182	9	1	1	88	137	48	35	1345	165	12
Fruit Crops	335	52	16	1	1	92	36	23	63	163	28	17
Avocado	2	1	93	-	-	-	-	-	105	-	-	72
Bannas	11	5	44	-	-	-	1	-	64	7	4	57
Guava(Zeytuna)	69	15	22	-	-	-	4	3	70	39	9	23
Lemons	2	1	42	-	-	-	-	-	102	1	1	48
Mangos	198	44	22	-	-	-	10	5	56	89	26	29
Oranges	-	-	48	-	-	-	-	-	101	-	-	60
Papayas	40	20	50	-	-	73	22	19	88	15	4	24
Pineapples	-	-	-	-	-	-	-	-	-	-	-	-
Others	13	5	35	1	1	93	-	-	95	10	4	38
Stimulant Crop	1704	197	12	-	-	106	81	34	42	1179	166	14
Chat	1666	197	12	-	-	-	78	34	43	1154	164	14
Coffee	34	10	29	-	-	106	3	2	76	22	8	35
Gesho.	3	4	108	-	-	-	-	-	-	3	4	108
Others	-	-	-	-	-	-	-	-	-	-	-	-
Other Permanent	39	19	49	-	-	-	20	14	69	2	2	65
Enset	1	1	96	-	-	-	-	-	-	1	1	105
Sugar Cane	36	19	53	-	-	-	20	14	69	1	1	101
Others	2	1	68	-	-	-	-	-	-	1	1	83

