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**FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA
CENTRAL STATISTICAL AUTHORITY**

**AGRICULTURAL SAMPLE SURVEY
1991/92 (1984 E.C.)**

REPORT ON

FARM MANAGEMENT PRACTICES FOR

1990/91 (1983 E.C.) AND 1991/92 (1984 E.C.) BELG SEASONS

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(FOR PRIVATE PEASANT HOLDINGS)

*ADDIS ABABA
MARCH, 1996*

CONTENTS

	<u>PAGE</u>
LIST OF TABLES	III
LIST OF SUMMARY TABLES.....	VII
LIST OF FIGURES.....	IX
I INTRODUCTION.....	1
II OBJECTIVE OF THE SURVEY.....	1
III COVERAGE AND CONTENT.....	2
IV METHOD OF DATA COLLECTION	2
V BASIC CONCEPTS AND DEFINITIONS.....	3
VI SUMMARY OF THE SURVEY.....	4
SECTION-1	
ESTIMATES OF AREA UNDER FARM MANAGEMENT	
PRACTICES FOR BELG SEASON CROPS	4
1.1 ESTIMATES OF TOTAL AREA UNDER DIFFERENT	
FARM MANAGEMENT PRACTICES.....	4
1.2 ESTIMATED AREA UNDER FARM MANAGEMENT PRACTICES	
BY CROP TYPE FOR BELG SEASON.....	11
1.3 REGIONAL DISTRIBUTION OF FARM MANAGEMENT	
PRACTICES IN BELG SEASON CROPS.....	12
1.4 TOTAL AREA UNDER FERTILIZER APPLICATION	
BY TYPE OF FERTILIZER	16
A. USE OF NATURAL FERTILIZER.....	17
B. USE OF COMMERCIAL FERTILIZER.....	19
1.5 QUANTITY OF COMMERCIAL FERTILIZER	
APPLIED BY TYPE OF FERTILIZER.....	27
SECTION-2	
ESTIMATES OF TOTAL AREA AND DISTRIBUTION OF	
AREA UNDER DIFFERENT FARM MANAGEMENT PRACTICES	
BY SIZE HOLDINGS FOR BELG SEASON CROPS.....	33

2.1	TOTAL AREA UNDER BELG SEASON CROPS BY SIZE OF HOLDING.....	34
2.2	THE DISTRIBUTION OF AREA UNDER IMPROVED FARM MANAGEMENT PRACTICES BY SIZE OF HOLDINGS.....	41
SECTION-3		
	ESTIMATES OF TOTAL NUMBER OF HOLDERS REPORTING USE OF IMPROVED FARM MANAGEMENT PRACTICES BY AGE AND TYPE OF HOLDING FOR BELG SEASON CROPS.....	43
3.1	TOTAL NUMBER OF HOLDERS BY TYPE OF HOLDINGS	43
3.2	TOTAL NUMBER OF HOLDERS WHO EXERCISE BELG SEASON AGRICULTURAL ACTIVITIES BY AGE AND TYPE OF HOLDING.....	45
3.3	TOTAL NUMBER OF HOLDERS REPORTING USE OF IMPROVED FARM MANAGEMENT PRACTICES.....	49

LIST OF TABLES

PAGE

TABLE 1:-	Different farm management practices for belg season crops of private holdings in Ethiopia, 1990/91 (1983 E.C.).....	7
TABLE 2:-	Different farm management practices for belg season crops of private holdings in Ethiopia, 1991/92 (1984 E.C.).....	8
TABLE 3:-	Estimates of Area under improved farm management practices for belg season crops of private holdings in Ethiopia, 1990/91 (1983 E.C.).....	9
TABLE 4:-	Estimates of Area under improved farm management practices for belg season crops of private holdings in Ethiopia, 1991/92 (1984 E.C.).....	10
TABLE 5:-	Estimates of Area under different farm management practices by Administrative regions for belg season crops of private holdings in Ethiopia, 1990/91 (1983 E.C.).....	14
TABLE 6:-	Estimates of Area under different farm management practices by Administrative regions for belg season crops of private holdings in Ethiopia, 1991/92 (1984 E.C.).....	15
TABLE 7:-	Estimates of Fertilizer applied area and their percent distribution by type of fertilizer for belg season crops of private holdings in Ethiopia, 1990/91 (1983 E.C.).....	22
TABLE 8:-	Estimates of Fertilizer applied area and their percent distribution by type of fertilizer for belg season crops of private holdings in Ethiopia, 1991/92 (1984 E.C.).....	23

TABLE 9:- Estimates of Fertilizer applied area and their percent distribution by type of fertilizer and Administrative region for belg season crops of private holdings in Ethiopia, 1990/91 (1983 E.C.).. 25

TABLE 10:- Estimates of Fertilizer applied area and their percent distribution by type of fertilizer and Administrative region for belg season crops of private holdings in Ethiopia, 1991/92 (1984 E.C.)... 26

TABLE 11:- Estimates of Quantity of Commercial Fertilizer applied by type of fertilizer for belg season crops of private holdings in Ethiopia, 1990/91 (1983 E.C.)..... 29

TABLE 12:- Estimates of Quantity of Commercial Fertilizer applied by type of fertilizer for belg season crops of private (holdings) in Ethiopia, 1991/92 (1984 E.C.)..... 30

TABLE 13:- Estimates of Quantity of Commercial Fertilizer applied by type of fertilizer and administrative region for belg season crops of private holdings in Ethiopia, 1990/91 (1983 E.C.).....31

TABLE 14:- Estimates of Quantity of Commercial Fertilizer applied and their percent distribution by type of fertilizer and administrative region for belg season crops of private holdings in Ethiopia, 1991/92 (1984 E.C.)..... 32

TABLE 15:- Estimate of area under belg season crops and their percent distribution by crop type and size of holding for private holdings in Ethiopia, 1990/91 (1983 E.C.)..... 36

TABLE 16:-	Estimate of area under belg season crops and their percent distribution by crop type and size of holding for private holdings in Ethiopia, 1991/92 (1984 E.C.).....	36
TABLE 17:-	Estimate of area under belg season crops by size of holding for private holdings in Ethiopia, 1990/91 (1983 E.C.).....	37
TABLE 18:-	Estimate of area under belg season crops by size of holding for private holdings in Ethiopia, 1991/92 (1984 E.C.).....	38
TABLE 19:-	Estimate of area under belg season crops by size of holding and administrative region for private holdings in Ethiopia, 1990/91 (1983 E.C.).....	39
TABLE 20:-	Estimate of area under belg season crops by size of holding and administrative region for private holdings in Ethiopia, 1991/92 (1984 E.C.).....	40
TABLE 21:-	Estimate of area under farm management practices by size of holding for belg season crops of private holdings in Ethiopia, 1990/91 (1983 E.C.).....	42
TABLE 22:-	Estimate of area under improved farm management practices by size of holding for belg season crops of private holdings in Ethiopia, 1991/92 (1984 E.C.).....	42
TABLE 23:-	Number of holders and thier perecent distribution by age and type of holding in 1990/91 (1983 E.C.) belg season for private holdings in Ethiopia.....	46

TABLE 24:-	Number of holders and their percent distribution by age and type of holding in 1991/92 (1984 E.C.) belg season for private holdings in Ethiopia.	46
TABLE 25:-	Number of holders and their percent distribution by type of holding and administrative region in 1990/91(1983 E.C.) belg season for private holdings in Ethiopia.....	47
TABLE 26:-	Number of holders and their perecent distribution by type of holding and administrative region in 1991/92(1984 E.C.) belg season for private holdings in Ethiopia.....	48
TABLE 27:-	Number of holders reporting use of improved farm management practices by age of holders for belg season crops of private holdings in Ethiopia, 1990/91 (1983 E.C.).	51
TABLE 28:-	Number of holders reporting use of improved farm management practices by age of holders for belg season crops of private holdings in Ethiopia, 1991/92 (1984 E.C.).....	51
TABLE 29:-	Number of holders reporting use of improved farm management practices by administrative region for belg season crops of private holdings in Ethiopia, 1990/91 (1983 E.C.).....	53
TABLE 30:-	Number of holders reporting use of improved farm management practices by administrative region for belg season crops of private holdings in Ethiopia, 1991/92 (1984 E.C.).....	54

LIST OF SUMMARY TABLES

PAGE

SUMMARY TABLE A:-	Total area under different farm management practices and their percent change for belg season crops of private holdings in Ethiopia, 1990/91 (1983 E.C.) and 1991/92 (1984 E.C.).....	5
SUMMARY TABLE B:-	Total area under different farm management practices and their percent change for belg season crops of private holdings in Ethiopia, 1990/91 (1983 E.C.) and 1991/92 (1984 E.C.).....	11
SUMMARY TABLE C:-	Total area under different farm management practices and their percent distribution by administrative region for belg season crops of private holdings in Ethiopia, 1991/92 (1983 E.C.) and 1991/92 (1984 E.C.).....	13
SUMMARY TABLE D:-	Total area under fertilizer application by type of fertilizer for belg season crops of private holdings in Ethiopia, 1990/91 (1983 E.C.) and 1991/92 (1984 E.C.).....	17
SUMMARY TABLE E:-	Total quantity of applied fertilizer by type of fertilizer and their percent change for belg season crops of private holdings in Ethiopia, 1990/91 (1983 E.C.) and 1991/92 (1984 E.C.).....	27
SUMMARY TABLE F:-	The distribution of total area under belg season crops and their percent change by size of holding for private holdings in Ethiopia, 1990/91 (1983 E.C.) and 1991/92 (1984 E.C.).....	34

SUMMARY TABLE G:- Total area under different farm management practices and their percent distribution for belg season crops of private holdings in Ethiopia, 1990/91 (1983 E.C.) and 1991/92 (1984 E.C.)..... 41

SUMMARY TABLE H:- Total number of holders by type of holding and their percent change for 1990/91 (1983 E.C.) and 1991/92 (1984 E.C.) belg seasons for private holdings in Ethiopia..... 43

SUMMARY TABLE I:- Number of holders reporting use of improved farm management practices and their percent change for belg season crops of private holdings in Ethiopia, 1990/91 (1983 E.C.) and 1991/92 (1984 E.C.)..... 49

LIST OF FIGURES

	<u>PAGE</u>
Figure 1 Total crop area under improved farm management practices used for belg season crops of private holdings in Ethiopia, 1990/91(1983 E.C) and 1991/92 (1984 E.C).....	6
Figure 2 Fertilizer applied area by type of fertilizer for belg season crops of private holdings in Ethiopia, 1990/91 (1983 E.C).....	18
Figure 3 Fertilizer applied area by type of fertilizer for belg season crops of private holdings in Ethiopia, 1991/92 (1984 E.C).....	18
Figure 4 Percentage of commercial fertilizer applied area by type of fertilizer for belg season crops in Ethiopia, 1990/91 (1983 E.C).....	20
Figure 5 Percentage of commercial fertilizer applied area by type of fertilizer for belg season crops in Ethiopia, 1991/92 (1984 E.C).....	20
Figure 6 Quantity of commercial fertilizer applied by type of fertilizer for belg season crops of private holdings in Ethiopia, 1990/91(1983 E.C).....	28
Figure 7 Quantity of commercial fertilizer applied by type of fertilizer for belg season crops of private holdings in Ethiopia, 1991/92(1984 E.C).....	28

Figure 8	Estimate of area under belg season crops by size of holding for private holdings in Ethiopia, 1990/91(1983 E.C) and 1991/92(1984 E.C).....	35
Figure 9	Total number of holders by type of holdings for belg season crops of private holdings in 1990/91(1983 E.C)	44
Figure 10	Total number of holders by type of holdings for belg season crops of private holdings in 1991/92(1984 E.C).....	44
Figure 11	Total number of holders reporting use of improved farm management practices for belg season crops of private holdings in Ethiopia, 1990/91(1983 E.C) and 1991/92 (1984 E.C).....	50

I. INTRODUCTION

Agriculture is the backbone of the Ethiopian economy. The country's economic development highly depends on the development of the agricultural sector. Farmers' interest in the adoption and acceptance of new innovations and modern agricultural techniques and technologies, such as use of fertilizers, irrigation, improved seeds and pesticides, do have influencing impact on the development of the agricultural sector as a whole.

The extent of adopting modern agricultural practices, such as utilization of fertilizer, irrigation, pesticides and improved seeds, by the traditional peasant farmers can be considered as important indicators for estimating the rate of adoption of modern technologies.

This report presents descriptive analysis and quantitative information about the use of modern agricultural inputs for belg season crops of 1990/91(1983 E.C.) and 1991/92 (1984 E.C.) of the private peasant holdings for the country & regions as it was obtained from the results of the agricultural sample survey conducted in 1991/92(1984 E.C.) by the Central Statistical Authority (CSA).

II. OBJECTIVE OF THE SURVEY

The objective of the Agricultural Sample Survey which has been conducted in 1991/92 (1984 E.C.) is to collect basic quantitative information on the nation's agriculture needed in the establishment of national priorities, in development planning as well as in other socio-economic policy formulation. Its aim was to obtain reliable estimates on land area, production, utilization of agricultural practices, livestock and poultry and other agricultural variables for regions and the country as a whole.

III. COVERAGE AND CONTENT

The 1991/92 (1984 E.C.) Agricultural Sample Survey covered 24 former Administrative and one Autonomous regions in which 648 sampled farmers' associations (FAs') were covered in these regions.

This report is subdivided into three sections; where section-1 deals with estimates of total area under different farm management practices, total area under fertilizer application by type of fertilizer and quantity of commercial fertilizer.

Section-2 deals with total area under belg season crops and The distribution of area under different farm management practices by size of holdings.

Section-3 deals with total number of holders who exercise belg season agricultural activities by age and type of holding and Total number of holders reporting use of improved farm management practices in 1990/91(1983 E.C.) and 1991/92(1984 E.C.) belg seasons.

IV. METHOD OF DATA COLLECTION

Information on agricultural practices (use of fertilizer, use of pesticide, use of improved seed and use of irrigation), area and production of major belg season crops were collected subjectively by interviewing the holders in the sampled households.

There are two well known crop production seasons in Ethiopia Meher (Main) and belg seasons. According to generally accepted definitions, Meher season refers to long rainy season, which normally occurs from June to September. While "Belg Season" refers to small rainy season, which normally occurs from February to May. In most cases during Belg period long maturing crops are planted and their harvest can extend to December or January. Most of the time, short maturing crops are planted during Belg period and are harvested in June or July.

However, due to the heterogeneity of belg practices in different parts of the country and the overlapping nature of sowing time for some meher season crops the reports on belg season crops in the past faced problem of identification. Hence, in order to report the two seasons crops separately and also not to overlook or miss agricultural practices performed all the year round, either through irrigation, use of soil moister from dried swampy or marshy areas the following definition has been adopted since 1987/88.

Belg season crops were defined as any crops that are harvested during the months of March to August, while those crops that are harvested during September to February are considered as main (meher) season crops.

V. BASIC CONCEPTS AND DEFINITIONS

Irrigated area: refers to the area of land puposely and actually provided with water, other than by rain, for improving the production of crops. The uncontrolled flooding of land by the over flow of rivers or streams is not categorized as irrigation practice although sometimes farmers use this incidence for production.

Improved Seed: is defined as crop variety which gives significantly higher yield, better quality and/or better benefit compared to traditional varieties of seeds, and usually produced by the Ethiopian Seed Enterprise (ESE) in Ethiopia.

Fertilizer: refers to anything added to the soil intended to increase the amount of plant nutrients available for crop growth. Usually fertilizers are divided into two parts, Natural and Commercial. Examples of natural fertilizers are farmyard manure and wood ashes while commercial fertilizers are DAP (Di-Ammonium Phosphate) and UREA (Ammonium Nitrate).

Pesticide: Pesticides are chemicals useful for the mitigation, control or elimination of pests which are trouble some or harmful

to crops. Insecticides, herbicides and fungicides are all considered as pesticides.

VI. SUMMARY OF THE SURVEY

The results of the Agricultural Sample Survey of 1991/92 (1984 E.C.) on different farm management Practice for Belg Season crops in private peasant holdings are presented in three sections. In each section short descriptive analysis and tables with numerical results for the country and administrative regions are presented. The details are given in each sections.

SECTION-1. ESTIMATES OF AREA UNDER FARM MANAGEMENT PRACTICES FOR BELG SEASON CROPS

In Ethiopia, the use of improved seeds, fertilizers, pesticides, and other inputs are showing rapid increments from year to year. This section presents the estimated area under different farm management practices for belg seasons of 1990/91(1982 E.C.) and 1991/92(1983 E.C.) which indicate the extent of the use of farm management practices.

1.1 ESTIMATES OF TOTAL AREA UNDER DIFFERENT FARM MANAGEMENT PRACTICES

According to the survey results, it was estimated that about 470.16 and 497.31 thousand hectares of land were covered by belg season major crops in 1990/91(1983 E.C.) and 1991/92(1984 E.C.) respectively. Of these totals 101.18 and 137.78 thousand hectares were under the use of improved farm management practices in 1990/91(1983 E.C.) and 1991/92(1984 E.C.) belg seasons, respectively. Of the above mentioned total area under improved farm inputs, in 1990/91 (1983 E.C.) 65.52 thousand hectares (64.76%) was fertilized area (natural and commercial), 20.27 thousand hectares (20.03%) was under irrigation, 10.91 thousand hectares (10.78%) was treated with pesticides and 4.48 thousand

hectares (4.43%) was under improved seeds.

On the other hand, of the total land area under improved farm inputs in the 1991/90(1984 E.C.) belg season, the highest share which was estimated as 120.62 thousand hectares (87.55%) was reported to be under fertilizer application, followed by area under irrigation, which accounted for 9.24 thousand hectares (6.71%) of the total.

Comparing the total area under improved farm inputs of the two years for belg seasons, the total area has increased by 36.17% in the later production year. An increase of 84.10% was also observed as regards to the land area under fertilizer application. However, decreases of 10.94%, 54.42% and 63.98%, were observed for areas under improved seeds, irrigated and pesticides applications, respectively, for the 1991/92(1984 E.C.) belg as compared to that of 1990/91(1983 E.C.) of the same season (for details see Summary Table A and Fig 1).

This shows an increase of about 36% under improved farm management practices in 1991/92 comparing to 1990/90.

SUMMARY TABLE A. TOTAL AREA UNDER DIFFERENT FARM MANAGEMENT PRACTICES AND THEIR PERCENT CHANGE FOR BELG SEASON CROPS OF PRIVATE HOLDINGS IN ETHIOPIA, 1990/91(1983 E.C) AND 1991/92 (1984 E.C)

TYPE OF FARM MANAGEMENT	AREA ('000 HECTARES)				
	1990/91 (1983 E.C)	%	1991/92 (1984 E.C)	%	% CHANGE
IRRIGATION	20.27	20.03	9.24	6.71	-54.42
IMPROVED SEEDS	4.48	4.43	3.99	2.90	-10.94
FERTILIZER	65.52	64.76	120.62	87.55	84.10
PESTICIDES	10.91	10.78	3.93	2.85	-63.98
TOTAL	101.18	100.00	137.78	100.00	36.17

FIG 1 TOTAL CROP AREA UNDER IMPROVED FARM MANAGEMENT PRACTICES FOR BELG SEASON CROPS OF PRIVATE HOLDINGS IN ETHIOPIA, 1990/91(1983 E.C) AND 1991/92(1984 E.C)

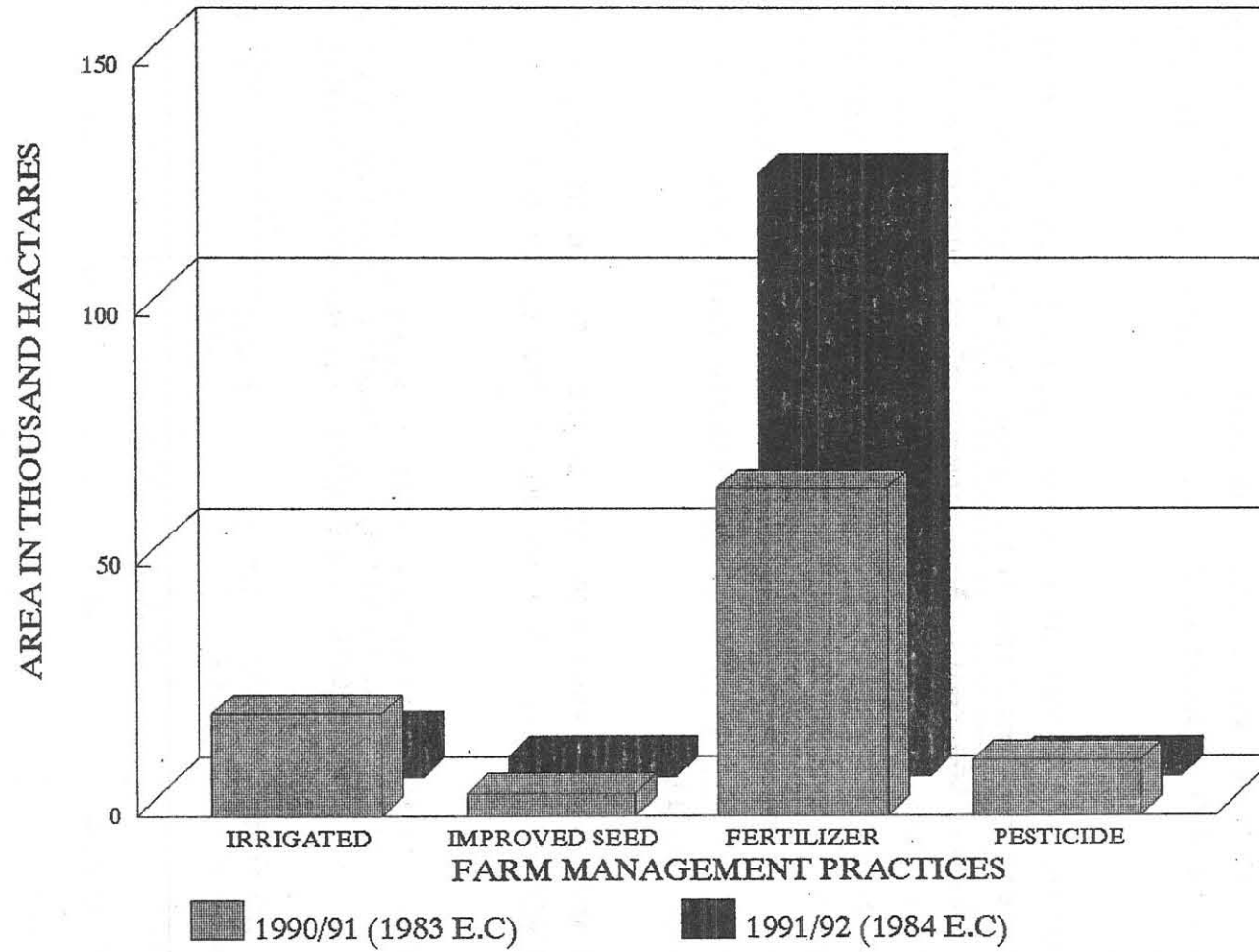


TABLE 1. DIFFERENT FARM MANAGEMENT PRACTICES FOR BELG SEASON CROPS
OF PRIVATE HOLDINGS IN ETHIOPIA, 1990/91(1983 E.C.)

CROP	TOTAL BELG CROP AREA ('000 HA)	PERCENTAGE OF AREA ON WHICH FARM MANAGEMENT PRACTICES WERE USED			
		IRRIGATED	IMPROVED SEEDS	FERTILIZER APPLIED	PESTICIDE APPLIED
CEREALS	441.34	3.74	0.82	12.30	2.24
TEFF	16.41	—	0.08	0.18	0.21
BARLEY	161.60	0.59	0.25	4.32	0.32
WHEAT	19.23	0.03	0.10	0.43	0.33
MAIZE	212.68	3.12	0.31	6.41	1.36
SORGHUM	18.97	—	—	0.67	0.01
MILLET	4.27	—	0.06	—	—
OATS	8.18	—	0.02	0.29	0.01
PULSES	27.53	0.50	0.12	1.63	0.03
HORSE BEANS	1.58	0.05	—	0.06	—
CHICK PEAS	7.82	—	—	—	0.01
HARICOT BEANS	13.78	0.03	0.12	1.37	—
FIELD PEAS	0.89	0.02	—	0.20	0.02
LENTILS	3.32	0.39	—	—	—
VETCH	0.14	0.01	—	—	—
OTHERS	1.29	0.04	—	0.01	0.04
NEUG	0.23	—	—	—	0.03
LINSEED	0.79	—	—	0.01	—
FENUGREEK	0.27	0.04	—	—	0.01
RAPESEED	—	—	—	—	—
TOTAL	470.16	4.28	0.94	13.94	2.31

TABLE 2. DIFFERENT FARM MANAGEMENT PRACTICES FOR BELG SEASON CROPS
OF PRIVATE HOLDINGS IN ETHIOPIA, 1991/92(1984 E.C.)

CROP	TOTAL BELG CROP AREA (^{'000} HA)	AREA (^{'000} HECTARES)			
		PERCENTAGE OF AREA ON WHICH FARM MANAGEMENT PRACTICES WERE USED			
		IRRIGATED	IMPROVED SEEDS	FERTILIZER APPLIED	PESTICIDE APPLIED
CEREALS	468.36	1.92	0.85	24.35	0.84
TEFF	17.17	0.35	2.80	16.83	2.59
BARLEY	142.58	0.97	0.67	15.54	1.69
WHEAT	21.36	0.19	1.26	9.36	0.98
MAIZE	235.37	3.17	0.58	31.77	0.31
SORGHUM	39.10	--	1.97	27.21	0.18
MILLET	0.63	--	--	17.46	--
OATS	12.15	0.33	0.99	6.42	0.58
PULSES	27.77	0.86	0.11	23.69	--
HORSE BEANS	1.36	--	--	11.03	--
CHICK PEAS	5.08	4.44	--	--	--
HARICOT BEANS	15.45	--	0.19	39.03	--
FIELD PEAS	0.45	2.95	--	7.48	--
LENTILS	5.29	--	--	0.38	--
VETCH	0.14	50.00	--	--	--
OTHERS	1.17	--	--	--	--
NEUG	--	--	--	--	--
LINSEED	0.76	--	--	--	--
FENUGREEK	0.40	--	--	--	--
RAPESEED	0.01	--	--	--	--
TOTAL	497.30	1.86	0.80	24.25	0.79

TABLE 3. ESTIMATES OF AREA UNDER IMPROVED FARM MANAGEMENT PRACTICES
FOR BELG SEASON CROPS OF PRIVATE HOLDINGS IN
ETHIOPIA, 1990/91(1983 E.C.)
AREA ('000 HECTARES)

CROP	AREA UNDER FARM MANAGEMENT PRACTICES			
	IRRIGATED	IMPROVED SEEDS	FERTILIZER APPLIED	PESTICIDE APPLIED
CEREALS	17.68	3.90	57.83	10.56
TEFF	0.06	0.37	0.84	1.00
BARLEY	2.77	1.17	20.32	1.52
WHEAT	0.13	0.47	2.01	1.53
MAIZE	14.68	1.48	30.16	6.41
SORGHUM	—	—	3.16	0.06
MILLET	—	0.30	—	—
OATS	0.04	0.11	1.34	0.04
PULSES	2.37	0.58	7.66	0.15
HORSE BEANS	0.24	—	0.26	—
CHICK PEAS	—	0.01	—	0.06
HARICOT BEANS	0.13	0.57	6.45	—
FIELD PEAS	0.11	—	0.95	0.08
LENTILS	1.82	—	—	—
VETCH	0.07	—	—	0.01
OTHERS	0.22	—	0.03	0.20
NEUG	—	—	—	0.16
LINSEED	0.02	—	0.03	—
FENUGREEK	0.20	—	—	0.04
RAPESEED	—	—	—	—
TOTAL	20.27	4.48	65.52	10.91

TABLE 4. ESTIMATES OF AREA UNDER IMPROVED FARM MANAGEMENT PRACTICES
FOR BELG SEASON CROPS OF PRIVATE HOLDINGS IN
ETHIOPIA, 1991/92(1984 E.C.)

CROP	AREA UNDER FARM MANAGEMENT PRACTICES AREA ('000 HECTARES)			
	IRRIGATED	IMPROVED SEEDS	FERTILIZER APPLIED	PESTICIDE APPLIED
CEREALS	9.00	3.96	114.04	3.93
TEFF	0.06	0.48	2.89	0.45
BARLEY	1.39	0.96	22.15	2.41
WHEAT	0.04	0.27	2.69	0.21
MAIZE	7.47	1.36	74.78	0.72
SORGHUM	-	0.77	10.64	0.07
MILLET	-	-	0.11	-
OATS	0.04	0.12	0.78	0.07
PULSES	0.24	0.03	6.58	-
HORSE BEANS	-	-	0.15	-
CHICK PEAS	0.02	-	-	-
HARICOT BEANS	-	0.03	6.03	-
FIELD PEAS	0.15	-	0.38	-
LENTILS	-	-	0.02	-
VETCH	0.07	-	-	-
OTHERS	-	-	-	-
NEUG	-	-	-	-
LINSEED	-	-	-	-
FENUGREEK	-	-	-	-
RAPSEED	-	-	-	-
TOTAL	9.24	3.99	120.62	3.93

1.2 ESTIMATED AREA UNDER FARM MANAGEMENT PRACTICES BY CROP TYPE FOR BELG SEASON

Comparison of total land area under different farm management practices for belg season crops of 1990/91(1983 E.C.) and 1991/92 (1984 E.C.) is presented in Summary Table B. As it is indicated in the summary table, in 1990/91(1983 E.C.) the highest proportion of crop area under different farm management practices was reported to be covered by belg cereals, which accounted for 89.97 thousand hectares (88.92%), while 10.76 thousand hectares (10.63%) and 0.45 thousand hectares (0.44%) were accounted for belg pulses and other crops (mainly oil seeds), respectively.

Of the total area under different farm management practices of belg season crops, the highest area was reported under cereals which accounted for 130.93 thousand hectares (95.03%) followed by pulses 6.85 thousand hectares (4.97%) in 1991/92 (1984 E.C.)

The land area for belg cereals showed an increase of 45.53% for 1991/92 (1984 E.C.) as compared to that of 1990/91 (1983 E.C.); on the other hand a decrease of 36.34% of area under belg pulse was reported for 1991/92 (1984 E.C.) comparing with that of 1990/91 (1983 E.C.) (for details see summary Table B).

SUMMARY TABLE B. TOTAL AREA UNDER DIFFERENT FARM MANAGEMENT PRACTICES AND THEIR PERCENT CHANGE FOR BELG SEASON CROPS OF PRIVATE HOLDINGS IN ETHIOPIA, 1990/91(1983 E.C) AND 1991/92 (1984 E.C)

CROP TYPE	AREA ('000 HECTARES)				
	AREA UNDER FARM MANAGEMENT PRACTICES				
	1990/91 (1983 E.C)	%	1991/92 (1984 E.C)	%	% CHANGE
CEREALS	89.97	88.92	130.93	95.03	45.53
PULSES	10.76	10.63	6.85	4.97	-36.34
OTHERS	0.45	0.44	-	-	-
TOTAL	101.18	100.00	137.78	100.00	36.17

1.3 REGIONAL DISTRIBUTION OF FARM MANAGEMENT PRACTICES IN BELG SEASON CROPS

According to the survey results, in almost all administrative regions of the country, improved farm inputs were utilized for both years. As indicated in Summary Table C, the largest area under belg season crops were reported by Wellega in 1990/91 and North Omo Administrative Region in 1991/92. The second was Sidamo Administrative Region in both years', covering 15.80% (15990 hectares) in 1990/91(1983 E.C.) and 17.66% (24330 hectares) in 1991/92(1984 E.C.). Arsi Administrative Region was third in both years', with 14.60% (14770 hectares) in 1990/91(1983 E.C.) and 6.82% (9400 hectares) in 1991/92(1984 E.C.).

The smallest area under improved farm management practices for belg season were reported for Metekel and Addis Ababa Administrative Regions in 1990/91(1983 E.C.) Keffa and Gambela Administrative Regions in 1991/92(1984 E.C.).

SUMMARY TABLE C. TOTAL AREA UNDER DIFFERENT FARM MANAGEMENT PRACTICES AND THEIR PERCENT DISTRIBUTION BY ADMINISTRATIVE REGION FOR BELG SEASON CROPS OF PRIVATE HOLDINGS IN ETHIOPIA, 1990/91(1983 E.C) AND 1991/92 (1984 E.C)

REGION	AREA ('000 HECTARES)			
	AREA UNDER FARM MANAGEMENT PRACTICES			
	1990/91 (1983 E.C)	%	1991/92 (1984 E.C)	%
ARSI	14.77	14.60	9.40	6.82
BALE	10.84	10.71	7.70	5.59
NORTH OMO	12.2	12.06	66.47	48.24
SOUTH OMO	-	-	-	-
EAST GOJAM	0.26	0.26	0.04	0.03
WEST GOJAM	0.53	0.52	0.42	0.30
METEKEL	0.04	0.04	-	-
NORTH GONDER	0.78	0.77	-	-
SOUTH GONDER	0.78	0.77	0.78	0.57
DIRE DAWA	-	-	-	-
EAST HARARGHE	4.47	4.42	-	-
WEST HARARGHE	1.24	1.23	-	-
GAMBELA	-	-	0.01	0.01
ILLUBABOR	9.52	9.41	1.27	0.92
KEFFA	0.88	0.87	0.01	0.01
ADDIS ABABA	0.04	0.04	0.22	0.16
EAST SHEWA	-	-	-	-
NORTH SHEWA	2.69	2.66	0.36	0.26
SOUTH SHEWA	2.73	2.70	7.21	5.23
WEST SHEWA	3.02	2.98	3.67	2.66
BORENA	-	-	0.15	0.11
SIDAMO	15.99	15.80	24.33	17.66
ASSOSA	0.69	0.68	0.51	0.37
WELLEGA	16.46	16.27	5.54	4.02
NORTH WOLLO	0.7	0.69	3.33	2.42
SOUTH WOLLO	2.55	2.52	6.36	4.62
TOTAL	101.18	100.00	137.78	100.00

TABLE 5 ESTIMATES OF AREA UNDER DIFFERENT FARM MANAGEMENT PRACTICES BY ADMINISTRATIVE REGION FOR BELG SEASON CROPS OF PRIVATE HOLDINGS IN ETHIOPIA, 1990/91(1983 E.C.)

REGION	TOTAL BELG CROP AREA	%	AREA UNDER FARM MANAGEMENT PRACTICES							
			IRRIGATED	%	IMPROVED SEEDS	%	FERTILIZER APPLIED	%	PESTICIDE APPLIED	%
ARSI	36.39	7.74	0.29	1.43	0.04	0.89	13.26	20.24	1.18	10.82
BALE	48.26	10.26	0.21	1.04	0.82	18.30	6.69	10.21	3.12	28.60
NORTH OMO	62.65	13.33	0.40	1.97	0.31	6.92	11.43	17.45	0.06	0.55
SOUTH OMO	0.56	0.12	-	-	-	-	-	-	-	-
EAST GOJAM	0.26	0.06	0.26	1.28	-	-	-	-	-	-
WEST GOJAM	1.83	0.39	-	-	-	-	0.53	0.81	-	-
METEKEL	0.02	0.00	0.02	0.10	-	-	0.02	0.03	-	-
NORTH GONDER	4.37	0.93	0.13	0.64	0.20	4.46	0.45	0.69	-	-
SOUTH GONDER	4.56	0.97	0.61	3.01	-	-	0.17	0.26	-	-
DIRE DAWA	-	-	-	-	-	-	-	-	-	-
EAST HARARGHE	12.26	2.61	2.87	14.16	-	-	1.60	2.44	-	-
WEST HARARGHE	14.01	2.98	0.69	3.40	0.11	2.46	0.44	0.67	-	-
GAMBELA	0.26	0.06	-	-	-	-	-	-	-	-
ILLUBABOR	35.41	7.53	0.18	0.89	0.32	7.14	8.68	13.25	0.34	3.12
KEFFA	40.95	8.71	-	-	0.71	15.85	0.01	0.02	0.16	1.47
ADDIS ABABA	4.79	1.02	0.01	0.05	0.03	0.67	-	-	-	-
EAST SHEWA	-	-	-	-	-	-	-	-	-	-
NORTH SHEWA	15.56	3.31	2.60	12.83	-	-	0.09	0.14	-	-
SOUTH SHEWA	4.19	0.89	-	-	0.05	1.12	2.47	3.77	0.21	1.92
WEST SHEWA	3.73	0.79	1.86	9.18	-	-	1.16	1.77	-	-
BORENA	31.77	6.76	-	-	-	-	-	-	-	-
SIDAMO	45.72	9.72	-	-	0.60	13.39	14.76	22.53	0.63	5.77
ASSOSA	8.07	1.72	0.22	1.09	0.07	1.56	-	-	0.40	3.67
WELLEGA	36.67	7.80	9.39	46.32	0.33	7.37	1.93	2.95	4.81	44.09
NORTH WOLLO	20.23	4.30	0.13	0.64	0.22	4.91	0.35	0.53	-	-
SOUTH WOLLO	37.64	8.01	0.40	1.97	0.67	14.96	1.48	2.26	-	-
TOTAL	470.16	100.00	20.27	100.00	4.48	100.00	65.52	100.00	10.91	100.00

TABLE 6 ESTIMATES OF AREA UNDER DIFFERENT FARM MANAGEMENT PRACTICES BY ADMINSTRATIVE REGION FOR BELG SEASON CROPS OF PRIVATE HOLDINGS IN ETHIOPIA, 1991/92(1984 E.C.)

REGION	TOTAL BELG CROP AREA	%	AREA ('000 HECTARES)							
			IRRIGATED		IMPROVED SEEDS		FERTILIZER APPLIED		PESTICIDE APPLIED	
				%		%		%		%
ARSI	20.25	4.07	-	-	-	-	7.12	5.90	2.28	58.02
BALE	46.36	9.32	-	-	0.14	3.51	7.33	6.08	0.23	5.85
NORTH OMO	153.91	30.95	-	-	1.26	31.58	64.61	53.56	0.60	15.27
SOUTH OMO	9.64	1.94	-	-	-	-	-	-	-	-
EAST GOJAM	0.68	0.14	0.04	0.43	-	-	-	-	-	-
WEST GOJAM	1.38	0.28	-	-	-	-	0.42	0.35	-	-
METEKEL	-	-	-	-	-	-	-	-	-	-
NORTH GONDER	0.16	0.03	-	-	-	-	-	-	-	-
SOUTH GONDER	4.57	0.92	0.61	6.60	-	-	0.17	0.14	-	-
DIRE DAWA	-	-	-	-	-	-	-	-	-	-
EAST HARARGHE	-	-	-	-	-	-	-	-	-	-
WEST HARARGHE	-	-	-	-	-	-	-	-	-	-
GAMBELA	0.11	0.02	-	-	-	-	0.01	0.01	-	-
ILLUBABOR	40.02	8.05	0.10	1.08	0.41	10.28	0.75	0.62	0.01	0.25
KEFFA	20.98	4.22	-	-	0.01	0.25	-	-	-	-
ADDIS ABABA	5.76	1.16	-	-	0.09	2.26	0.04	0.03	0.09	2.29
EAST SHEWA	-	-	-	-	-	-	-	-	-	-
NORTH SHEWA	10.65	2.14	0.36	3.90	-	-	-	-	-	-
SOUTH SHEWA	10.1	2.03	-	-	-	-	6.93	5.75	0.28	7.12
WEST SHEWA	4.27	0.86	3.28	35.50	0.14	3.51	0.25	0.21	-	-
BORENA	3.46	0.70	-	-	0.15	3.76	-	-	-	-
SIDAMO	46.48	9.35	0.22	2.38	0.16	4.01	23.90	19.81	0.05	1.27
ASSOSA	7.77	1.56	-	-	-	-	0.51	0.42	-	-
WELLEGA	21.52	4.33	3.39	36.69	0.26	6.52	1.64	1.36	0.25	6.36
NORTH WOLLO	22.87	4.60	0.58	6.28	0.15	3.76	2.59	2.15	0.01	0.25
SOUTH WOLLO	66.36	13.34	0.66	7.14	1.22	30.58	4.35	3.61	0.13	3.31
TOTAL	497.30	100.00	9.24	100.00	3.99	100.00	120.62	100.00	3.93	100.00

1.4 TOTAL AREA UNDER FERTILIZER APPLICATION BY TYPE OF FERTILIZER

The results of the survey indicate that land area under both natural and commercial fertilizers were estimated to be 65.52 and 120.62 thousand hectares, covering 13.94 % and 24.25% of the total area of belg seasons crops of private holdings in 1990/91 (1983 E.C.) and 1991/92 (1984 E.C.), respectively. Of these totals, in 1990/91 (1983 E.C.) 21.05 thousand hectares (32.13%) was reported to be the area under natural fertilizers. The coverage of commercial fertilizers was estimated to be 44.47 thousand hectares (67.87%), constituting of 54.11% Dap, 11.25% Urea and 2.52% mix of the two fertilizers (DAP+UREA) (For details see Summary Table D).

On the other hand, in 1991/92 (1984 E.C.), the area under natural fertilizer was estimated to be 57.84 thousand hectares (47.95%). About 63 thousand hectares (52.02%) of area was estimated to be under commercial fertilizers, in which 49.88 thousand hectares (41.35%) and 12.86 thousand hectares (10.66%) were under DAP and Urea, respectively. The remaining, 0.04 (0.03%) thousand hectares was under the mix of the two types of fertilizers (DAP+UREA).

As shown in Table D, comparison was made for the total fertilized area of 1990/91 (1983 E.C.) and 1991/92 (1984 E.C.) by type of fertilizer for belg season crops. The survey results show that in 1991/92 (1984 E.C.) total area under both (natural+commercial) fertilizers has increased by 84.10% as compared to that of 1990/91(1983 E.C.) estimate.

Even though the overall increase of 174.77% was reported for area under natural fertilizer, an increase by 41.17% was also reported for area under commercial fertilizer. The increase ranges from 40.71% for Urea to 74.49% for DAP. However, the only decrease in area under commercial fertilizer, was reported for the mix of the two commercial fertilizers (DAP+UREA) (For details see Summary Table D, Fig 2 and 3).

SUMMARY TABLE D. TOTAL AREA UNDER FERTILIZER APPLICATION BY TYPE OF FERTILIZER FOR BELG SEASON CROPS OF PRIVATE HOLDINGS IN ETHIOPIA, 1990/91(1983 E.C) AND 1991/92(1984 E.C)

SR. NO	TYPE OF FERTILIZER	AREA ('000 HECTARES)				
		AREA UNDER FERTILIZER APPLICATION				
		1990/91 (1983 E.C)	%	1991/92 (1984 E.C)	%	% CHANGE
1	NATURAL	21.05	32.13	57.84	47.95	174.77
2	COMMERCIAL	44.47	67.87	62.78	52.05	41.17
2.1	DAP	35.45	54.11	49.88	41.35	40.71
2.2	UREA	7.37	11.25	12.86	10.66	74.49
2.3	DAP + UREA	1.65	2.52	0.04	0.03	-97.58
	TOTAL	65.52	100.00	120.62	100.00	84.10

A. USE OF NATURAL FERTILIZERS

Natural fertilizers are fertilizers, such as farm yard manure, crop residue, and wood ashes etc. which are commonly used by private peasants of Ethiopia as a means of maintaining and upgrading their farm plots fertility to attain higher productivity.

In general the application of natural fertilizers for belg season crops in 1990/91(1983 E.C.) and 1991/92(1984 E.C.), varies from crop to crop. Of the total natural fertilizer applied in both years, the highest proportion was reported for maize crop which was estimated at 14.13 thousand hectares (67.13%) in 1990/91(1983 E.C.), and 34.91 thousand hectares (60.36%) in 1991/92(1984 E.C.). The fertilized area (natural fertilizer) under sorghum was estimated to be 3.16 thousand hectares in 1990/91(1983 E.C.), while area under barely was 10.64 in 1991/92(1984 E.C.). The smallest area under natural fertilizer was for wheat i.e. below 1% in 1990/91(1983 E.C.), and for lentils in 1991/92(1984 E.C.) (for the details see Tables 7 and 8).

FIG 2 FERTILIZER APPLIED AREA BY TYPE OF FERTILIZER FOR BELG SEASON CROPS OF PRIVATE HOLDINGS IN ETHIOPIA.1990/91(1983 E.C)

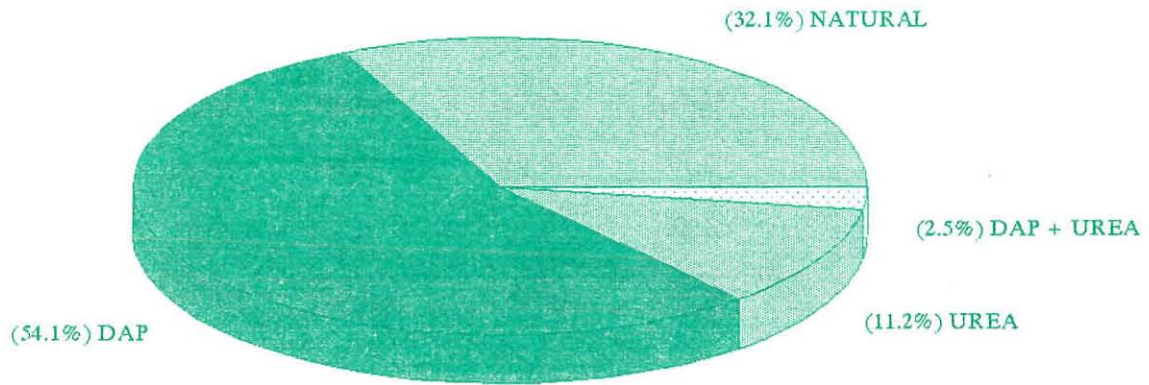
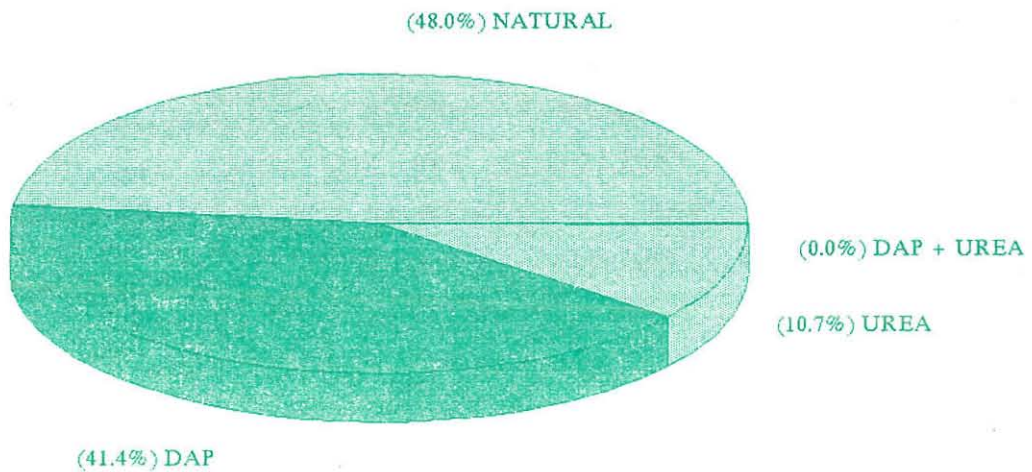


FIG 3 FERTILIZER APPLIED AREA BY TYPE OF FERTILIZER FOR BELG SEASON CROPS OF PRIVATE HOLDINGS IN ETHIOPIA.1991/92(1984 E.C)



B. USE OF COMMERCIAL FERTILIZERS

Commercial fertilizer refers to industrially produced fertilizers; such as UREA, DAP and POTASH etc. Data on use of both natural and commercial fertilizers were collected by interviewing the sampled holders. In Ethiopia the two most commonly used commercial fertilizers have distinct colors in which peasants could easily tell the color of commercial fertilizer they used. The names and color of the two commonly used commercial fertilizers are:-

I. Di-Ammonium Phosphate (DAP) which is Grey in color, and

II. Ammonium Nitrate (UREA) which is White in color.

Out of the total land area under commercial fertilizers in 1990/91(1983 E.C.) belg season, the coverage by DAP was the highest which accounted for 79.7%, followed by UREA 16.6%, while the mix of the two fertilizers (DAP+Urea) was covering 3.7% of the land area (see Fig 4.).

The same trend followed in 1991/92(1984 E.C.). Of the total area under commercial fertilizers, the area under Dap was the highest which accounted for 79.5%, followed by Urea 20.5% and 0.1% of area under the mix of the two fertilizers (DAP+UREA) (see Fig 5.).

Tables 7 and 8 present the estimated area under commercial fertilizers by crop type for belg seasons. In 1990/91(1983 E.C.), of the total area under commercial fertilizers, the highest area was reported for barely at 18.06 thousand hectares (40.61%). Moreover, the area reported under commercial fertilizers for maize and haricot beans were 16.03 thousand hectares (36.05%) and 5.91 thousand hectares (13.29%), respectively.

FIG 4 PERCENTAGE OF COMMERCIAL FERTILIZER APPLIED AREA BY TYPE OF FERTILIZER FOR BELG SEASON CROPS OF PRIVATE HOLDINGS IN ETHIOPIA, 1990/91(1983 E.C)

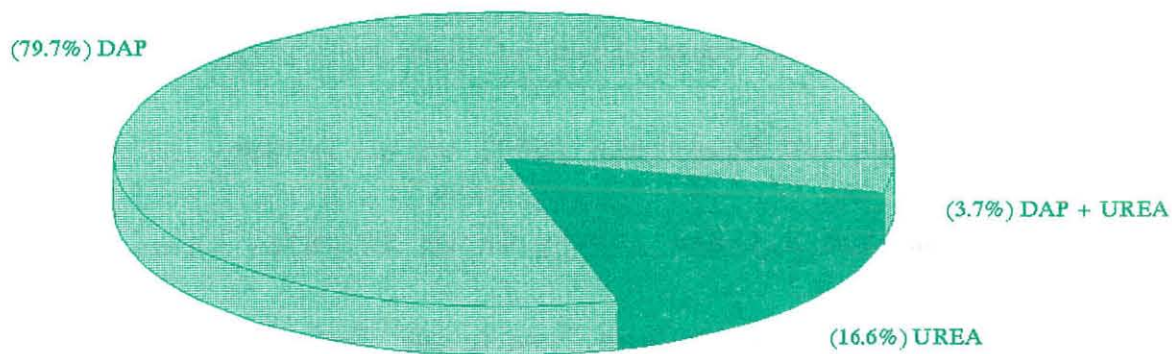
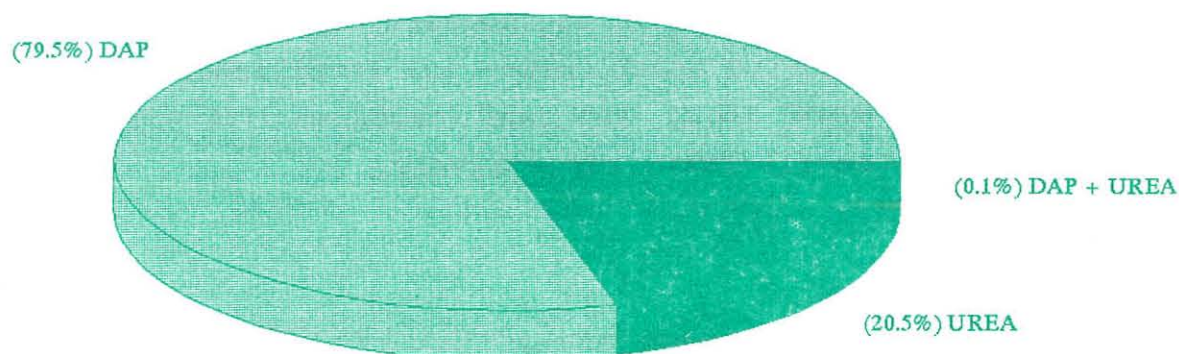


FIG 5 PERCENTAGE OF COMMERCIAL FERTILIZER APPLIED AREA BY TYPE OF FERTILIZER FOR BELG SEASON CROPS OF PRIVATE HOLDINGS IN ETHIOPIA, 1991/92(1984 E.C)



Similarly in 1991/92(1984 E.C.), of the total area under commercial fertilizer the highest area was reported for maize, at 39.86 thousand hectares (63.49%). Barley and haricot beans stood second and third occupying 14.20 thousand hectares (22.62%) and 4.08 thousand hectares (6.50%), respectively.

The smallest land area under the application of commercial fertilizer was reported for horse beans in 1990/91(1983 E.C.), and for field peas in 1991/92(1984 E.C.) (For details see Tables 7 and 8).

TABLE 7 ESTIMATES OF FERTILIZER APPLIED AREA AND THEIR PERCENT DISTRIBUTION BY TYPE OF FERTILIZER FOR BELG SEASON CROPS OF PRIVATE HOLDINGS IN ETHIOPIA, 1990/91(1983 E.C.)

CROP	AREA('000 HECTARES)											
	TOTAL (NA.+COM.)	%	NATURAL	%	COMM- ERCIAL	%	DAP	%	UREA	%	DAP +UREA	%
CEREALS	57.83	88.26	20.18	95.87	37.65	84.66	29.03	81.89	6.97	94.57	1.65	100.00
TEFF	0.84	1.28	0.43	2.04	0.41	0.92	0.21	0.59	0.20	2.71	-	-
BARLEY	20.32	31.01	2.26	10.74	18.06	40.61	14.53	40.99	3.53	47.90	-	-
WHEAT	2.01	3.07	0.06	0.29	1.95	4.38	0.89	2.51	1.06	14.38	-	-
MAIZE	30.16	46.03	14.13	67.13	16.03	36.05	12.79	36.08	1.59	21.57	1.65	100.00
SORGHUM	3.16	4.82	3.16	15.01	-	-	-	-	-	-	-	-
MILLET	-	-	-	-	-	-	-	-	-	-	-	-
OATS	1.34	2.05	0.14	0.67	1.20	2.70	0.61	1.72	0.59	8.01	-	-
PULSES	7.66	11.69	0.87	4.13	6.79	15.27	6.42	18.11	0.37	5.02	-	-
HORSE BEANS	0.26	0.40	0.25	1.19	0.01	0.02	-	-	0.01	0.14	-	-
CHICK PEAS	-	-	-	-	-	-	-	-	-	-	-	-
HARICOT BEANS	6.45	9.84	0.54	2.57	5.91	13.29	5.71	16.11	0.20	2.71	-	-
FIELD PEAS	0.95	1.45	0.08	0.38	0.87	1.96	0.71	2.00	0.16	2.17	-	-
LENTILS	-	-	-	-	-	-	-	-	-	-	-	-
VETCH	-	-	-	-	-	-	-	-	-	-	-	-
OTHERS	0.03	0.05	-	-	0.03	0.07	-	-	0.03	0.41	-	-
NEUG	-	-	-	-	-	-	-	-	-	-	-	-
LINSEED	0.03	0.05	-	-	0.03	0.07	-	-	0.03	0.41	-	-
FENUGREEK	-	-	-	-	-	-	-	-	-	-	-	-
RAPESEED	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	65.52	100.00	21.05	100.00	44.47	100.00	35.45	100.00	7.37	100.00	1.65	100.00

TABLE 8 ESTIMATES OF FERTILIZER APPLIED AREA AND THEIR PERCENT DISTRIBUTION BY TYPE OF FERTILIZER FOR BELG SEASON CROPS OF PRIVATE HOLDINGS IN ETHIOPIA, 1991/92(1984 E.C.)

CROP	AREA ('000 HECTARES)											
	TOTAL (NA.+COM.)	%	NATURAL	%	COMM- ERCIAL	%	DAP	%	UREA	%	DAP + UREA	%
CEREALS	114.04	94.54	55.72	96.33	58.32	92.90	46.92	94.07	11.36	88.34	0.04	100.00
TEFF	2.90	2.40	1.33	2.30	1.57	2.50	0.76	1.52	0.81	6.30	-	-
BARLEY	22.14	18.36	7.94	13.73	14.20	22.62	11.76	23.58	2.44	18.97	-	-
WHEAT	2.70	2.24	0.61	1.05	2.09	3.33	1.08	2.17	1.01	7.85	-	-
MAIZE	74.77	61.99	34.91	60.36	39.86	63.49	33.00	66.16	6.82	53.03	0.04	100.00
SORGHUM	10.64	8.82	10.64	18.40	-	-	-	-	-	-	-	-
MILLET	0.11	0.09	0.11	0.19	-	-	-	-	-	-	-	-
OATS	0.78	0.65	0.18	0.31	0.60	0.96	0.32	0.64	0.28	2.18	-	-
PULSES	6.58	5.46	2.12	3.67	4.46	7.10	2.96	5.93	1.50	11.66	-	-
HORSE BEANS	0.15	0.12	0.15	0.26	-	-	-	-	-	-	-	-
CHICK PEAS	-	-	-	-	-	-	-	-	-	-	-	-
HARICOT BEANS	6.03	5.00	1.95	3.37	4.08	6.50	2.75	5.51	1.33	10.34	-	-
FIELD PEAS	0.38	0.32	-	-	0.38	0.61	0.21	0.42	0.17	1.32	-	-
LENTILS	0.02	0.02	0.02	0.03	-	-	-	-	-	-	-	-
VETCH	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	120.62	100.00	57.84	100.00	62.78	100.00	49.88	100.00	12.86	100.00	0.04	100.00

The regional distribution of both natural and commercial fertilizers application varied from region to region. For instance, of the total area under both (Natural + Commercial) fertilizers, the highest was reported for Sidamo Administrative Region which accounted for to 14760 hectares, (22.53%) in 1990/91 (1983 E.C.), while North Omo Administrative Region reported 64610 hectares, (53.56%) in 1991/92 (1984 E.C.). Arsi was the second highest in 1990/91 (1983 E.C.) to report 13260 (20.24%) hectares, under fertilizer while Sidamo was second highest in 1991/92 (1984 E.C.) to report 23900 (19.81%) hectares under both (natural + commercial) fertilizers.

TABLE 9 ESTIMATES OF FERTILIZER APPLIED AREA AND THEIR PERCENT DISTRIBUTION BY TYPE OF FERTILIZER AND ADMINISTRATIVE REGION FOR BELG SEASON CROPS OF PRIVATE HOLDINGS IN ETHIOPIA, 1990/91(1983 E.C.)

REGION	AREA ('000 HECTARES)											
	TOTAL (NA.+COM.)	%	NATURAL	%	COMM- ERCIAL	%	DAP	%	UREA	%	DAP + UREA	%
ARSI	13.26	20.24	0.06	0.29	13.20	29.68	12.60	35.54	0.60	8.14	-	-
BALE	6.69	10.21	-	-	6.69	15.04	2.23	6.29	4.46	60.52	-	-
NORTH OMO	11.43	17.45	10.91	51.83	0.52	1.17	-	-	0.52	7.06	-	-
SOUTH OMO	-	-	-	-	-	-	-	-	-	-	-	-
EAST GOJAM	-	-	-	-	-	-	-	-	-	-	-	-
WEST GOJAM	0.53	0.81	-	-	0.53	1.19	0.53	1.50	-	-	-	-
METEKEL	0.02	0.03	0.02	0.10	-	-	-	-	-	-	-	-
NORTH GONDER	0.45	0.69	-	-	0.45	1.01	0.34	0.96	0.11	1.49	-	-
SOUTH GONDER	0.17	0.26	-	-	0.17	0.38	0.17	0.48	-	-	-	-
DIRE DAWA	-	-	-	-	-	-	-	-	-	-	-	-
EAST HARARGHE	1.60	2.44	1.56	7.41	0.04	0.09	-	-	0.04	0.54	-	-
WEST HARARGHE	0.44	0.67	0.44	2.09	-	-	-	-	-	-	-	-
GAMBELA	-	-	-	-	-	-	-	-	-	-	-	-
ILLUBABOR	8.68	13.25	1.73	8.22	6.95	15.63	6.84	19.29	0.11	1.49	-	-
KEFFA	0.01	0.02	0.01	0.05	-	-	-	-	-	-	-	-
ADDIS ABABA	-	-	-	-	-	-	-	-	-	-	-	-
EAST SHEWA	-	-	-	-	-	-	-	-	-	-	-	-
NORTH SHEWA	0.09	0.14	0.09	0.43	-	-	-	-	-	-	-	-
SOUTH SHEWA	2.47	3.77	0.23	1.09	2.24	5.04	0.98	2.76	0.06	0.81	1.20	72.73
WEST SHEWA	1.16	1.77	0.50	2.38	0.66	1.48	0.37	1.04	-	-	0.29	17.58
BORENA	-	-	-	-	-	-	-	-	-	-	-	-
SIDAMO	14.76	22.53	3.03	14.39	11.73	26.38	10.42	29.39	1.15	15.60	0.16	9.70
ASSOSA	-	-	-	-	-	-	-	-	-	-	-	-
WELLEGA	1.93	2.95	0.97	4.61	0.96	2.16	0.64	1.81	0.32	4.34	-	-
NORTH WOLLO	0.35	0.53	0.35	1.66	-	-	-	-	-	-	-	-
SOUTH WOLLO	1.48	2.26	1.15	5.46	0.33	0.74	0.33	0.93	-	-	-	-
TOTAL	65.52	100.00	21.05	100.00	44.47	100.00	35.45	100.00	7.37	100.00	1.65	100.00

TABLE 10 ESTIMATES OF FERTILIZER APPLIED AREA AND THEIR PERCENT DISTRIBUTION BY TYPE OF FERTILIZER AND ADMINISTRATIVE REGION FOR BELG SEASON CROPS OF PRIVATE HOLDINGS IN ETHIOPIA, 1991/92(1984 E.C)

REGION	AREA('000 HECTARES)											
	TOTAL (NA.+COM.)	%	NATURAL	%	COMM- ERCIAL	%	DAP	%	UREA	%	DAP + UREA	%
ARSI	7.12	5.90	0.28	0.48	6.84	10.90	6.42	12.87	0.42	3.27	-	-
BALE	7.33	6.08	-	-	7.33	11.68	4.40	8.82	2.93	22.78	-	-
NORTH OMO	64.61	53.56	41.10	71.06	23.51	37.45	15.44	30.95	8.07	62.75	-	-
SOUTH OMO	-	-	-	-	-	-	-	-	-	-	-	-
EAST GOJAM	-	-	-	-	-	-	-	-	-	-	-	-
WEST GOJAM	0.42	0.35	-	-	0.42	0.67	0.42	0.84	-	-	-	-
METEKEL	-	-	-	-	-	-	-	-	-	-	-	-
NORTH GONDER	-	-	-	-	-	-	-	-	-	-	-	-
SOUTH GONDER	0.17	0.14	-	-	0.17	0.27	0.17	0.34	-	-	-	-
DIRE DAWA	-	-	-	-	-	-	-	-	-	-	-	-
EAST HARARGHE	-	-	-	-	-	-	-	-	-	-	-	-
WEST HARARGHE	-	-	-	-	-	-	-	-	-	-	-	-
GAMBELA	-	-	-	-	-	-	-	-	-	-	-	-
ILLUBABOR	0.75	0.62	0.06	0.10	0.69	1.10	0.69	1.38	-	-	-	-
KEFFA	-	-	-	-	-	-	-	-	-	-	-	-
ADDIS ABABA	0.04	0.03	0.04	0.07	-	-	-	-	-	-	-	-
EAST SHEWA	-	-	-	-	-	-	-	-	-	-	-	-
NORTH SHEWA	-	-	-	-	-	-	-	-	-	-	-	-
SOUTH SHEWA	6.93	5.75	4.46	7.71	2.47	3.93	2.31	4.63	0.15	1.17	0.01	25.00
WEST SHEWA	0.25	0.21	-	-	0.25	0.40	0.25	0.50	-	-	-	-
BORENA	-	-	-	-	-	-	-	-	-	-	-	-
SIDAMO	23.90	19.81	3.63	6.28	20.27	32.29	19.33	38.75	0.91	7.08	0.03	75.00
ASSOSA	0.51	0.42	0.51	0.88	-	-	-	-	-	-	-	-
WELLEGA	1.64	1.36	0.81	1.40	0.83	1.32	0.45	0.90	0.38	2.95	-	-
NORTH WOLLO	2.60	2.16	2.60	4.50	-	-	-	-	-	-	-	-
SOUTH WOLLO	4.35	3.61	4.35	7.52	-	-	-	-	-	-	-	-
TOTAL	120.62	100.00	57.84	100.00	62.78	100.00	49.88	100.00	12.86	100.00	0.04	100.00

1.5 QUANTITY OF COMMERCIAL FERTILIZER APPLICATION BY TYPE

According to the survey results, the total quantity of commercial fertilizer used for belg season crop production was estimated at 39570 and 43810 quintals in 1990/91(1983 E.C.) and 1991/92(1984 E.C.), respectively. Of these totals, the share of DAP was the highest accounting for 69.12% in 1990/91(1983 E.C.) and 85.87% in 1991/92(1984 E.C.). Urea was the second highest sharing 30.70% in 1991/92 (1984 E.C.) and 14.04% in 1991/92(1984 E.C.). The mix of the two types of fertilizers (DAP+UREA) stood third sharing 0.13% and 0.09% in 1990/91(1983 E.C.) and 1991/92 (1984 E.C.) respectively (For details see Fig 6 and 7.).

As shown in Table E, comparison was made for quantity of commercial fertilizers applied in 1990/91 (1983 E.C.) and 1991/92 (1984 E.C.). Accordingly the quantity of commercial fertilizer used in 1991/92 (1984 E.C.) has increased by 10.72% when compared to the former year. An increase of 37.55% in the quantity applied was reported for DAP. Nevertheless, decreases of 49.47 and 20% in the quantity used were reported for Urea and the mix of the two types of fertilizers (DAP+Urea) respectively (for details see Summary Table E.).

SUMMARY TABLE E. TOTAL QUANTITY OF APPLIED FERTILIZER BY TYPE OF FERTILIZER AND THEIR PERCENT CHANGE FOR BELG SEASON CROPS OF PRIVATE HOLDINGS IN ETHIOPIA, 1990/91(1983 E.C) AND 1991/92 (1984 E.C)

TYPE OF FERTILIZER	QUANTITY('000 QUINTAL)				
	1990/91 (1983 E.C)	%	1991/92 (1984 E.C)	%	% CHANGE
DAP	27.35	69.12	37.62	85.87	37.55
UREA	12.17	30.76	6.15	14.04	-49.47
DAP+UREA	0.05	0.13	0.04	0.09	-20.00
TOTAL	39.57	100.00	43.81	100.00	10.72

FIG 6 QUANTITY OF COMM. FERTILIZER APPLIED BY TYPE OF FERTILIZER FOR BELG SEASON CROPS OF PRIVATE HOLDINGS IN ETHIOPIA,1990/91(1983 E.C)

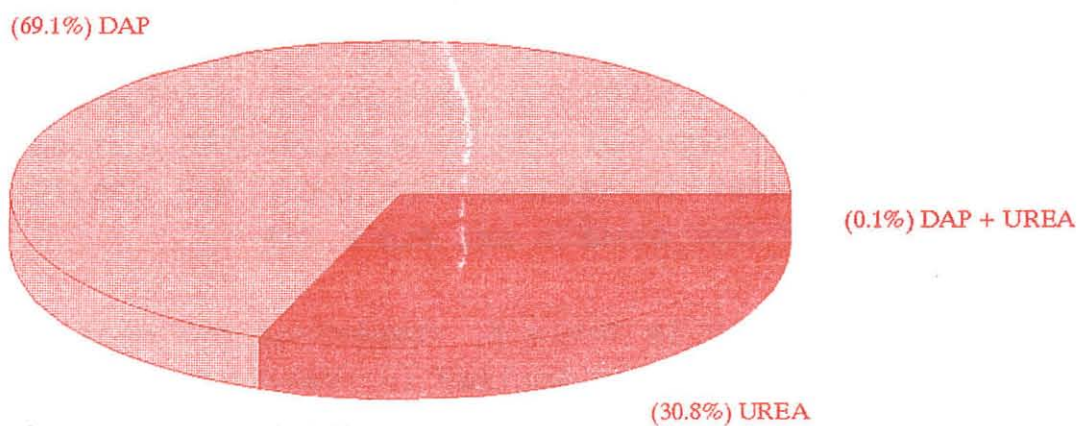


FIG 7 QUANTITY OF COMM. FERTILIZER APPLIED BY TYPE OF FERTILIZER FOR BELG SEASON CROPS OF PRIVATE HOLDINGS IN ETHIOPIA,1991/92(1984 E.C)

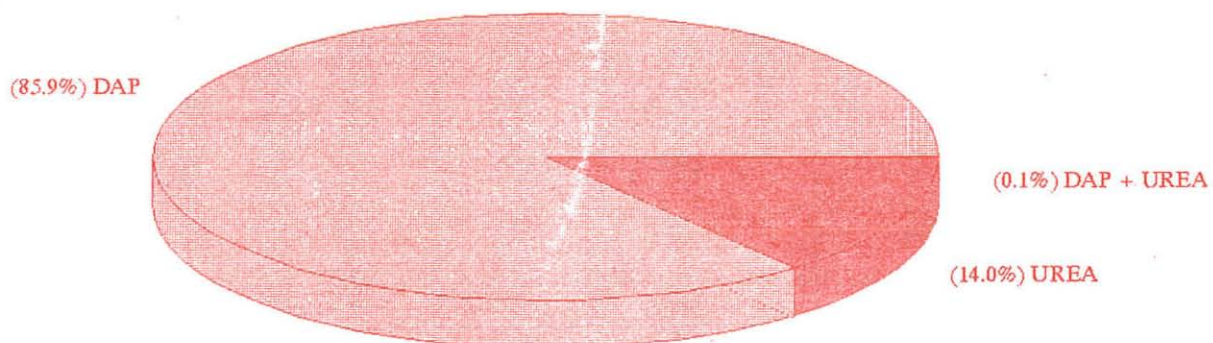


TABLE 11 ESTIMATES OF QUANTITY OF COMMERCIAL FERTILIZER APPLIED
BY TYPE OF FERTILIZER FOR BELG SEASON CROPS OF PRIVATE
HOLDINGS IN ETHIOPIA, 1990/91(1983 E.C.)

CROP	QUANTITY('000 QUINTALS)			
	TOTAL QUANTITY APP.	DAP	UREA	DAP +UREA
CEREALS	32.47	20.60	11.83	0.05
TEFF	0.44	0.12	0.32	—
BARLEY	20.95	11.35	9.60	—
WHEAT	1.31	0.74	0.58	—
MAIZE	8.83	7.89	0.89	0.05
SORGHUM	—	—	—	—
MILLET	—	—	—	—
OATS	0.94	0.50	0.44	—
PULSES	7.08	6.75	0.33	—
HORSE BEANS	0.01	—	0.01	—
CHICK PEAS	—	—	—	—
HARICOT BEANS	6.55	6.32	0.23	—
FIELD PEAS	0.52	0.43	0.09	—
LENTILS	—	—	—	—
VETCH	—	—	—	—
OTHERS	0.02	—	0.02	—
NEUG	—	—	—	—
LINSEED	0.02	—	0.02	—
FENUGREEK	—	—	—	—
RAPSEED	—	—	—	—
TOTAL	39.57	27.35	12.17	0.05

TABLE 12 ESTIMATES OF QUANTITY OF COMMERCIAL FERTILIZER APPLIED
BY TYPE OF FERTILIZER FOR BELG SEASON CROPS OF PRIVATE
HOLDINGS IN ETHIOPIA, 1991/92(1984 E.C.)

CROP	QUANTITY('000 QUINTALS)			
	TOTAL QUANTITY APP.	DAP	UREA	DAP +UREA
CEREALS	41.10	35.68	5.38	0.04
TEFF	0.45	0.22	0.23	—
BARLEY	8.47	6.76	1.71	—
WHEAT	1.00	0.47	0.53	—
MAIZE	30.65	27.91	2.70	0.04
SORGHUM	—	—	—	—
MILLET	—	—	—	—
OATS	0.53	0.32	0.21	—
PULSES	2.71	1.94	0.77	—
HORSE BEANS	—	—	—	—
CHICK PEAS	—	—	—	—
HARICOT BEANS	2.22	1.52	0.7	—
FIELD PEAS	0.49	0.42	0.07	—
LENTILS	—	—	—	—
VETCH	—	—	—	—
TOTAL	43.81	37.62	6.15	0.04

TABLE 13

ESTIMATES OF QUANTITY OF COMMERCIAL FERTILIZER APPLIED BY TYPE OF FERTILIZER
AND ADMINISTRATIVE REGION FOR BELG SEASON CROPS OF PRIVATE
HOLDINGS IN ETHIOPIA 1990/91 (1983 E.C.)

REGION	QUANTITY ('000 QUINTALS)							
	TOTAL QUANTITY APP.	%	DAP	%	UREA	%	DAP + UREA	%
ARSI	9.35	23.62	8.93	32.64	0.42	3.45	—	—
BALE	4.48	11.31	2.16	7.88	2.32	19.06	—	—
NORTH OMO	0.89	2.25	—	—	0.89	7.30	—	—
SOUTH OMO	—	—	—	—	—	—	—	—
EAST GOJAM	—	—	—	—	—	—	—	—
WEST GOJAM	0.59	1.49	0.59	2.16	—	—	—	—
METEKEL	—	—	—	—	—	—	—	—
NORTH GONDER	0.17	0.44	0.12	0.45	0.05	0.40	—	—
SOUTH GONDER	0.09	0.22	0.09	0.31	—	—	—	—
DIRE DAWA	—	—	—	—	—	—	—	—
EAST HARARGHE	0.00	0.01	—	—	0.00	0.02	—	—
WEST HARARGHE	—	—	—	—	—	—	—	—
GAMBELA	—	—	—	—	—	—	—	—
ILLUBABOR	7.97	20.14	7.77	28.42	0.20	1.60	—	—
KEFFA	—	—	—	—	—	—	—	—
ADDIS ABABA	—	—	—	—	—	—	—	—
EAST SHEWA	—	—	—	—	—	—	—	—
NORTH SHEWA	—	—	—	—	—	—	—	—
SOUTH SHEWA	1.15	2.91	1.00	3.65	0.10	0.83	0.05	98.15
WEST SHEWA	0.10	0.25	0.10	0.36	—	—	—	—
BORENA	—	—	—	—	—	—	—	—
SIDAMO	6.98	17.63	6.52	23.84	0.45	3.73	0.00	1.85
ASSOSA	—	—	—	—	—	—	—	—
WELLEGA	7.71	19.48	0.07	0.24	7.64	62.78	—	—
NORTH WOLLO	—	—	—	—	—	—	—	—
SOUTH WOLLO	0.10	0.25	—	—	0.10	0.82	—	—
TOTAL	39.57	100.00	27.35	100.00	12.17	100.00	0.05	100.00

TABLE 14 ESTIMATES OF QUANTITY OF COMMERCIAL FERTILIZER APPLIED AND THEIR PERCENT DISTRIBUTION BY TYPE OF FERTILIZER AND ADMINISTRATIVE REGION FOR BELG SEASON CROPS OF PRIVATE HOLDINGS IN ETHIOPIA, 1991/92(1984 E.C.)

REGION	TOTAL QUANTITY APP.	%	QUANTITY('000 QUINTALS)					
			DAP	%	UREA	%	DAP + UREA	%
ARSI	1.96	4.47	1.75	4.65	0.21	3.41	-	-
BALE	4.78	10.91	3.26	8.67	1.88	30.57	-	-
NORTH OMO	11.77	26.87	8.79	23.37	2.98	48.46	-	-
SOUTH OMO	-	-	-	-	-	-	-	-
EAST GOJAM	-	-	-	-	-	-	-	-
WEST GOJAM	0.59	1.35	0.59	1.57	-	-	-	-
METEKEL	-	-	-	-	-	-	-	-
NORTH GONDER	-	-	-	-	-	-	-	-
SOUTH GONDER	0.09	0.21	0.09	0.24	-	-	-	-
DIRE DAWA	-	-	-	-	-	-	-	-
EAST HARARGHE	-	-	-	-	-	-	-	-
WEST HARARGHE	-	-	-	-	-	-	-	-
GAMBELA	-	-	-	-	-	-	-	-
ILLUBABOR	0.40	0.91	0.04	0.11	-	-	-	-
KEFFA	-	-	-	-	-	-	-	-
ADDIS ABABA	-	-	-	-	-	-	-	-
EAST SHEWA	-	-	-	-	-	-	-	-
NORTH SHEWA	-	-	-	-	-	-	-	-
SOUTH SHEWA	1.83	4.18	1.73	4.60	0.09	1.46	0.01	25.00
WEST SHEWA	0.02	0.05	0.02	0.05	-	-	-	-
BORENA	-	-	-	-	-	-	-	-
SIDAMO	21.87	49.92	20.98	55.77	0.86	13.98	0.03	75.00
ASSOSA	-	-	-	-	-	-	-	-
WELLEGA	0.50	1.14	0.37	0.98	0.13	2.11	-	-
NORTH WOLLO	-	-	-	-	-	-	-	-
SOUTH WOLLO	-	-	-	-	-	-	-	-
TOTAL	43.81	100.00	37.62	100.00	6.15	100.00	0.04	100.00

SECTION-2. ESTIMATES OF TOTAL AREA AND DISTRIBUTION OF AREA
UNDER DIFFERENT FARM MANAGEMENT PRACTICE BY SIZE
OF HOLDINGS FOR BELG SEASON CROPS.

Before proceeding to the detail discussion of this section, the following important definitions are given.

a, Holding :- is an economic unit of agricultural production comprising all livestock kept and all land used wholly or partially for agricultural purposes and operated under the management of one person or more, regardless of title, legal form, size or location.

b, Size of holding :- in this report size of holding is determined by total area under crop which is mainly land area under major crops (temporary crops).

For the purpose of a systematic presentation of this report, size of holdings have been classified in to seven groups, holding being area under crop land. These groupings are:

- Group 1 - under 0.10 hectare
- Group 2 - 0.10 - 0.50 hectare
- Group 3 - 0.51 - 1.00 hectare
- Group 4 - 1.01 - 2.00 hectare
- Group 5 - 2.01 - 5.00 hectare
- Group 6 - 5.01 - 10.00 hectare
- Group 7 - 10.01 and above hectares

2.1 TOTAL AREA UNDER BELG SEASON CROPS BY SIZE OF HOLDING.

According to the survey results, it was estimated that a total of 470.16 and 497.31 thousand hectares were under belg season major crops in 1990/91(1983 E.C.) and 1991/92(1984 E.C.), respectively. By these groupings, as presented in Table F most of the holdings 57.81% fall in group 2 for 1990/91 (1983 E.C.) which followed by group 3 16.29% and group 1 9.94%.

Similarly, in 1991/92 (1984 E.C.), of the total area under belg season crops, most of the holdings 60.64% fall in group 2 followed by group 3 19.04% and group 1 10.25% (For details see Summary Table F.).

Comparison was also made for holdings classified into groups in the two mentioned years and presented in the same table. Accordingly in 1991/92 (1984 E.C.) increases were observed in the total area under belg season crops by 24.97%, 23.65%, 10.94% and 9.05% in group 4, 3, 2 and 1 size of holdings, respectively. Nevertheless, in the same year decreases of 93.47% and 65.04% were reported for group 6 and 5 size of holdings, in that order (for details see Summary Table F and Fig 8.).

SUMMARY TABLE F. THE DISTRIBUTION OF TOTAL AREA UNDER BELG SEASON CROPS AND THEIR PERCENT CHANGE BY SIZE OF HOLDING FOR PRIVATE HOLDINGS IN ETHIOPIA, 1990/91(1983 E.C) AND 1991/92 (1984 E.C)

SIZE OF HOLDING (HECTARES)	AREA('000 HECTARES)				
	TOTAL AREA UNDER BELG SEASON CROPS				
	1990/91 (1983 E.C)	%	1991/92 (1984 E.C)	%	% CHANGE
UNDER 0.10	46.74	9.94	50.97	10.25	9.05
0.10 -0.50	271.82	57.81	301.55	60.64	10.94
0.51-1.00	76.57	16.29	94.68	19.04	23.65
1.01-2.00	33.60	7.15	41.99	8.44	24.97
2.01-5.00	21.05	4.48	7.36	1.48	-65.04
5.01-10.00	11.63	2.47	0.76	0.15	-93.47
10.01 AND ABOVE	8.75	1.86	-	-	-
TOTAL	470.16	100.00	497.31	100.00	5.77

FIG 8 ESTIMATE OF AREA UNDER BELG SEASON CROPS BY SIZE OF HOLDING FOR PRIVATE HOLDINGS IN ETHIOPIA, 1990/91 (1983 E.C) AND 1991/92 (1984 E.C)

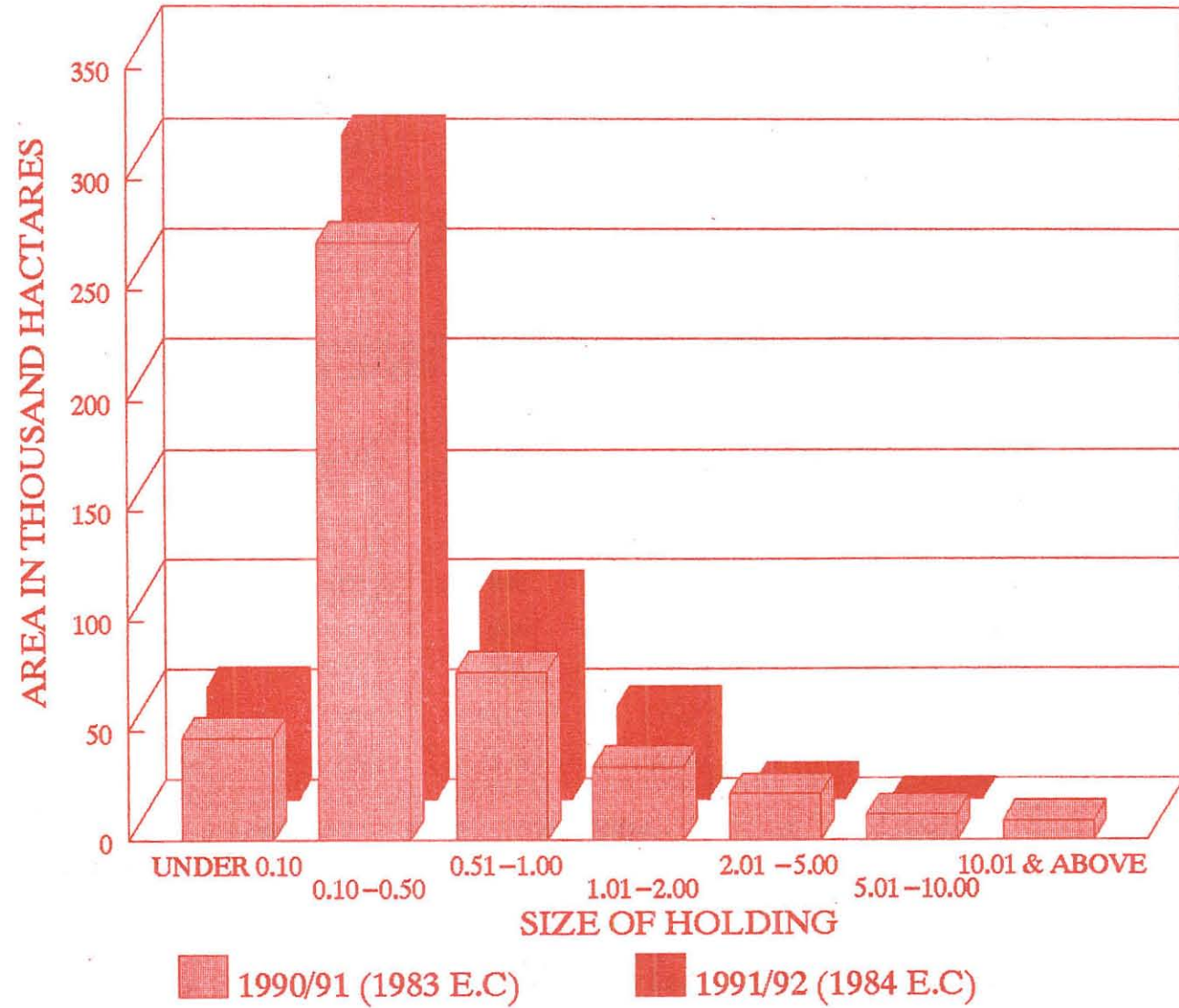


TABLE 15 ESTIMATES OF AREA UNDER BELG SEASON CROPS AND THEIR PERCENT DISTRIBUTION BY CROP TYPE AND SIZE OF HOLDING FOR PRIVATE HOLDINGS IN ETHIOPIA, 1990/91(1983 E.C)

SIZE OF HOLDING (HECTARES)	AREA('000 HECTARES)							
	CLASSIFIED CROP TYPES							
	CEREALS	%	PULSES	%	OTHERS	%	TOTAL	%
UNDER 0.10	43.22	9.79	3.49	12.68	0.03	2.31	46.74	9.94
0.10 - 0.50	251.87	57.07	19.24	69.89	0.71	54.62	271.82	57.81
0.51 - 1.00	72.36	16.40	4.08	14.82	0.13	10.00	76.57	16.29
1.01 - 2.00	33.17	7.52	-	0.00	0.43	33.08	33.60	7.15
2.01 - 5.00	20.33	4.61	0.72	2.62	-	0.00	21.05	4.48
5.01 - 10.00	11.63	2.64	-	0.00	-	0.00	11.63	2.47
10.01 AND ABOVE	8.75	1.98	-	0.00	-	0.00	8.75	1.86
TOTAL	441.33	100.00	27.53	100.00	1.30	100.00	470.16	100.00

TABLE 16 ESTIMATES OF AREA UNDER BELG SEASON CROPS AND THEIR PERCENT DISTRIBUTION BY CROP TYPE AND SIZE OF HOLDING FOR PRIVATE HOLDINGS IN ETHIOPIA, 1991/92(1984 E.C.)

SIZE OF HOLDING (HECTARES)	AREA('000 HECTARES)							
	CLASSIFIED CROP TYPES							
	CEREALS	%	PULSES	%	OTHERS	%	TOTAL	%
UNDER 0.10	42.15	9.00	8.4	30.25	0.42	35.90	50.97	10.25
0.10 - 0.50	281.85	60.18	18.95	68.24	0.75	64.10	301.55	60.64
0.51 - 1.00	94.42	20.16	0.26	0.94	-	-	94.68	19.04
1.01 - 2.00	41.83	8.93	0.16	0.58	-	-	41.99	8.44
2.01 - 5.00	7.36	1.57	-	-	-	-	7.36	1.48
5.01 - 10.00	0.76	0.16	-	-	-	-	0.76	0.15
10.01 AND ABOVE	-	0.00	-	-	-	-	-	-
TOTAL	468.37	100.00	27.77	100.00	1.17	100.00	497.31	100.00

TABLE 17 ESTIMATES OF AREA UNDER BELG SEASON CROPS BY SIZE OF HOLDING FOR PRIVATE HOLDINGS IN ETHIOPIA, 1990/91(1983 E.C.)

CROP	AREA('000 HECTARES)							TOTAL
	SIZE OF HOLDING IN HECTARES							
	UNDER 0.10	0.10-0.50	0.51-1.00	1.01-2.00	2.01-5.00	5.01-10.00	10.01 & ABOVE	
CEREALS	43.22	251.87	72.36	33.17	20.33	11.63	8.75	441.33
TEFF	3.66	6.55	1.16	1.12	2.10	1.82	-	16.41
BARLEY	9.91	101.23	22.47	9.98	6.18	8.61	3.21	161.59
WHEAT	1.17	9.66	7.50	0.33	0.56	-	-	19.22
MAIZE	24.93	121.05	31.31	18.04	10.61	1.20	5.54	212.68
SORGHUM	0.68	7.73	7.40	2.28	0.88	-	-	18.97
MILLET	0.24	0.57	2.04	1.42	-	-	-	4.27
OATS	2.63	5.08	0.48	-	-	-	-	8.19
PULSES	3.49	19.24	4.08	-	0.72	-	-	27.53
HORSE BEANS	0.24	0.86	0.47	-	-	-	-	1.57
CHICK PEAS	0.18	0.65	0.06	-	-	-	-	0.89
HARICOT BEANS	2.22	7.78	3.08	-	0.72	-	-	13.80
FIELD PEAS	0.53	6.82	0.47	-	-	-	-	7.82
LENTILS	0.26	3.05	-	-	-	-	-	3.31
VETCH	0.06	0.08	-	-	-	-	-	0.14
OTHERS	0.03	0.71	0.13	0.43	-	-	-	1.30
NEUG	-	0.24	-	-	-	-	-	0.24
LINSEED	0.02	0.21	0.13	0.43	-	-	-	0.79
FENUGREEK	0.01	0.26	-	-	-	-	-	0.27
RAPESEED	-	-	-	-	-	-	-	-
TOTAL	46.74	271.82	76.57	33.60	21.05	11.63	8.75	470.16

TABLE 18 ESTIMATES OF AREA UNDER BELG SEASON CROPS BY SIZE OF HOLDING FOR PRIVATE HOLDINGS IN ETHIOPIA, 1991/92(1984 E. C.)

CROP	AREA('000 HECTARES)							TOTAL
	SIZE OF HOLDING IN HECTARES							
	UNDER 0.10	0.10-0.50	0.51-1.00	1.01-2.00	2.01-5.00	5.01-10.00	10.01 & ABOVE	
CEREALS	42.15	281.85	94.42	41.83	7.36	0.76	-	468.37
TEFF	4.19	9.90	1.89	0.72	0.47	-	-	17.17
BARLEY	12.26	90.70	22.54	13.09	3.23	0.76	-	142.58
WHEAT	1.54	9.29	8.52	2.02	-	-	-	21.37
MAIZE	20.37	154.55	44.99	13.03	2.43	-	-	235.37
SORGHUM	0.48	10.83	14.62	12.73	0.44	-	-	39.10
MILLET	0.02	0.41	0.20	-	-	-	-	0.63
OATS	3.29	6.17	1.66	0.24	0.79	-	-	12.15
PULSES	8.40	18.95	0.26	0.16	-	-	-	27.77
HORSE BEANS	0.46	0.74	-	0.16	-	-	-	1.36
CHICK PEAS	0.07	0.26	0.12	-	-	-	-	0.45
HARICOT BEANS	5.11	10.34	-	-	-	-	-	15.45
FIELD PEAS	0.60	4.34	0.14	-	-	-	-	5.08
LENTILS	2.09	3.20	-	-	-	-	-	5.29
VETCH	0.07	0.07	-	-	-	-	-	0.14
OTHERS	0.42	0.75	-	-	-	-	-	1.17
NEUG	-	-	-	-	-	-	-	-
LINSEED	0.02	0.74	-	-	-	-	-	0.76
FENUGREEK	0.40	-	-	-	-	-	-	0.40
RAPE SEED	-	-	-	-	-	-	-	-
SESAME	-	0.01	-	-	-	-	-	0.01
TOTAL	50.97	301.55	94.68	41.99	7.36	0.76	-	497.31

TABLE 19

ESTIMATES OF AREA UNDER BELG SEASON CROPS BY SIZE OF HOLDING AND ADMINISTRATIVE REGION FOR PRIVATE HOLDINGS IN ETHIOPIA, 1990/91(1983 E.C.)

REGION	AREA('000 HECTARES)							TOTAL
	SIZE OF HOLDING IN HECTARES							
	UNDER 0.10	0.10-0.50	0.51-1.00	1.01-2.00	2.01-5.00	5.01-10.00	10.01 & ABOVE	
ARSI	0.68	29.88	5.61	-	-	-	0.22	36.39
BALE	0.79	25.65	18.14	2.63	1.05	-	-	48.26
NORTH OMO	5.41	30.80	18.45	6.63	1.36	-	-	62.65
SOUTH OMO	0.01	0.55	-	-	-	-	-	0.56
EAST GOJAM	0.04	0.22	-	-	-	-	-	0.26
WEST GOJAM	0.14	1.69	-	-	-	-	-	1.83
METEKEL	-	0.02	-	-	-	-	-	0.02
NORTH GONDER	0.35	3.37	0.65	-	-	-	-	4.37
SOUTH GONDER	0.25	2.45	1.09	0.77	-	-	-	4.56
DIRE DAWA								
EAST HARARGHE	1.23	11.03	-	-	-	-	-	12.26
WEST HARARGHE	2.13	10.10	1.78	-	-	-	-	14.01
GAMBELA	0.01	0.25	-	-	-	-	-	0.26
ILLUBABOR	6.83	23.84	4.74	-	-	-	-	35.41
KEFFA	2.65	17.69	7.67	6.78	6.01	-	0.15	40.95
ADDIS ABABA	0.04	1.48	0.20	0.08	-	-	2.99	4.79
EAST SHEWA	-	-	-	-	-	-	-	-
NORTH SHEWA	1.00	13.63	0.93	-	-	-	-	15.56
SOUTH SHEWA	0.50	2.35	0.14	-	-	1.20	-	4.19
WEST SHEWA	-	3.44	0.29	-	-	-	-	3.73
BORENA	0.42	5.65	4.81	4.93	7.78	8.18	-	31.77
SIDAMO	8.59	21.55	3.62	5.99	4.85	-	1.12	45.72
ASSOSA	0.01	6.12	1.59	0.35	-	-	-	8.07
WELLEGA	4.66	25.13	2.26	0.35	-	-	4.27	36.67
NORTH WOLLO	1.88	7.23	4.60	4.27	-	2.25	-	20.23
SOUTH WOLLO	9.12	27.70	-	0.82	-	-	-	37.64
TOTAL	46.74	271.82	76.57	33.60	21.05	11.63	8.75	470.16

TABLE 20

ESTIMATES OF AREA UNDER BELG SEASON CROPS BY SIZE OF HOLDING AND ADMINISTRATIVE REGION FOR PRIVATE HOLDINGS IN ETHIOPIA, 1991/92(1984 E.C.)

REGION	AREA('000 HECTARES)							TOTAL
	SIZE OF HOLDING IN HECTARES							
	UNDER 0.10	0.10-0.50	0.51-1.00	1.01-2.00	2.01-5.00	5.01-10.00	10.01 & ABOVE	
ARSI	0.89	14.50	3.22	1.64	-	-	-	20.25
BALE	0.54	24.78	18.07	2.97	-	-	-	46.36
NORTH OMO	11.35	84.94	36.17	20.16	1.29	-	-	153.91
SOUTH OMO	0.49	6.37	2.40	0.38	-	-	-	9.64
EAST GOJAM	-	0.68	-	-	-	-	-	0.68
WEST GOJAM	0.12	1.26	-	-	-	-	-	1.38
METEKEL	-	-	-	-	-	-	-	-
NORTH GONDER	-	0.16	-	-	-	-	-	0.16
SOUTH GONDER	0.25	2.92	1.40	-	-	-	-	4.57
DIRE DAWA	-	-	-	-	-	-	-	-
EAST HARARGHE	-	-	-	-	-	-	-	-
WEST HARARGHE	-	-	-	-	-	-	-	-
GAMBELA	0.01	0.10	-	-	-	-	-	0.11
ILLUBABOR	3.80	30.86	3.44	0.88	1.04	-	-	40.02
KEFFA	3.19	13.62	2.75	0.90	0.52	-	-	20.98
ADDIS ABABA	0.05	4.17	0.67	0.12	-	0.76	-	5.77
EAST SHEWA	-	-	-	-	-	-	-	-
NORTH SHEWA	1.11	6.92	0.52	-	2.10	-	-	10.65
SOUTH SHEWA	1.62	8.14	0.34	-	-	-	-	10.10
WEST SHEWA	0.15	3.50	0.62	-	-	-	-	4.27
BORENA	0.01	0.66	2.23	0.56	-	-	-	3.46
SIDAMO	7.40	27.04	9.36	2.68	-	-	-	46.48
ASSOSA	0.07	5.45	2.10	0.15	-	-	-	7.77
WELLEGA	4.39	15.11	2.02	-	-	-	-	21.52
NORTH WOLLO	1.84	7.70	4.37	7.81	1.15	-	-	22.87
SOUTH WOLLO	13.69	42.67	5.00	3.74	1.26	-	-	66.36
TOTAL	50.97	301.55	94.68	41.99	7.36	0.76	-	497.31

2.2 THE DISTRIBUTION OF AREA UNDER DIFFERENT FARM MANAGEMENT PRACTICES BY SIZE OF HOLDINGS.

According to the survey results, the total land area under different farm management practices were estimated to be 101.18 and 137.78 thousand hectares (i.e. 21.52% and 27.69% of the total area under belg crop) in 1990/91(1983 E.C.) and 1991/92(1984 E.C.) belg seasons, respectively.

Of these totals, the highest 61.84% land area under improved farm management practices in 1990/91(1983 E.C.) and 65.39% in 1991/92 (1984 E.C.) were exercised by group 2 size of holding. Second and third by rank were group 3 and group 1 size of holdings, covering 15.69% and 10.51% in 1990/91(1983 E.C.), respectively. In addition the same groups mentioned above ranked second and third covering 16.97% and 9.10% in 1991/92 (1984 E.C.), respectively.

SUMMARY TABLE G. TOTAL AREA UNDER DIFFERENT FARM MANAGEMENT PRACTICES AND THEIR PERCENT DISTRIBUTION FOR BELG SEASON CROPS OF PRIVATE HOLDINGS IN ETHIOPIA, 1990/91(1983 E.C) AND 1991/92 (1984 E.C)

SIZE OF HOLDING (HECTARES)	AREA('000 HECTARES)			
	1990/91 (1983 E.C)	%	1991/92 (1984 E.C)	%
UNDER 0.10	10.63	10.51	12.54	9.10
0.10 -0.50	62.57	61.84	90.09	65.39
0.51-1.00	15.88	15.69	23.38	16.97
1.01-2.00	1.76	1.74	10.39	7.54
2.01-5.00	-	-	1.38	1.00
5.01-10.00	1.2	1.19	-	-
10.01 AND ABOVE	9.14	9.03	-	-
TOTAL	101.18	100.00	137.78	100.00

More over, estimates of land area under different improved farm inputs for belg season crops by categories of size of holdings of the 1990/91 (1983 E.C.) and 1991/92 (1984 E.C.) belg seasons are presented in Tables 21 & 22.

TABLE 21 ESTIMATES OF AREA UNDER IMPROVED FARM MANAGEMENT PRACTICES BY SIZE OF HOLDINGS FOR BELG SEASON CROPS OF PRIVATE HOLDINGS IN ETHIOPIA, 1990/91(1983 E.C.)

SIZE OF HOLDING (HECTARES)	IRRIGATED AREA	IMPROVED SEEDS AREA	AREA ('000 HECTARES)			PESTICIDE
			FERTILIZER APPLIED AREA			
			TOTAL	NATURAL	COMM-ERCIAL	
UNDER 0.10	1.96	0.53	7.80	4.24	3.56	0.34
0.10 -0.50	13.21	3.10	42.22	12.34	29.88	4.04
0.51-1.00	0.83	0.46	12.32	3.27	9.05	2.27
1.01-2.00	-	0.39	1.37	-	1.37	-
2.01-5.00	-	-	-	-	-	-
5.01-10.00	-	-	1.20	1.20	-	-
10.01 & ABOVE	4.27	-	0.61	-	0.61	4.26
TOTAL	20.27	4.48	65.52	21.05	44.47	10.91

TABLE 22 ESTIMATES OF AREA UNDER IMPROVED FARM MANAGEMENT PRACTICES BY SIZE OF HOLDINGS FOR BELG SEASON CROPS OF PRIVATE HOLDINGS IN ETHIOPIA, 1991/92(1984 E.C.)

SIZE OF HOLDING (HECTARES)	IRRIGATED AREA	IMPROVED SEEDS AREA	AREA ('000 HECTARES)			PESTICIDE
			FERTILIZER APPLIED AREA			
			TOTAL	NATURAL	COMM-ERCIAL	
UNDER 0.10	1.78	0.21	10.06	7.07	2.99	0.49
0.10 -0.50	6.53	2.25	78.63	35.37	43.26	2.68
0.51-1.00	0.93	0.58	21.11	7.44	13.67	0.76
1.01-2.00	-	0.48	9.91	7.05	2.86	-
2.01-5.00	-	0.47	0.91	0.91	-	-
5.01-10.00	-	-	-	-	-	-
10.01 & ABOVE	-	-	-	-	-	-
TOTAL	9.24	3.99	120.62	57.84	62.78	3.93

SECTION- 3. ESTIMATES OF TOTAL NUMBER OF HOLDERS REPORTING USE OF FARM MANAGEMENT PRACTICES BY AGE AND TYPE OF HOLDING FOR BELG SEASON CROPS

An attempt has been made to classify the number of agricultural households by age and type of holding. The concept of type of holding mainly refers to the holders' mainstay (crop only livestock only or both. According to this concept the type of holdings were classified in to three categories as follows:

- Category 1 - crop holding only
- Category 2 - livestock holding only
- Category 3 - both, crop and livestock holding

3.1 TOTAL NUMBER OF HOLDERS BY TYPE OF HOLDINGS

According to the survey results, as shown in Summary Table H, it was estimated that a total number of 1,923,160 and 2,619,010 holders were engaged in the three types of holdings in 1990/91 (1983 E.C.) and 1991/92 (1984 E.C.) belg seasons, respectively. In both years, over 80% of holders were engaged in mixed farming.

Around 15% in 1990/91 (1983 E.C.) and 12.8% in 1991/92 (1984 E.C.) holders were engaged in the production of crop only while less than 0.5% of holders were engaged in livestock holding only (for details see Summary Table H, Fig 9 & 10).

SUMMARY TABLE H. TOTAL NUMBER OF HOLDERS BY TYPE OF HOLDING AND THEIR PERCENT CHANGE FOR 1990/91(1983 E.C) AND 1991/92 (1984 E.C) BELG SEASONS FOR PRIVATE HOLDINGS IN ETHIOPIA.

TYPE OF HOLDING	NUMBER IN THOUSANDS				
	NUMBER OF HOLDERS				
	1990/91 (1983 E.C)	%	1991/92 (1984 E.C)	%	% CHANGE
CROP ONLY	298.11	15.50	335.43	12.81	12.52
LIVESTOCK	1.85	0.10	9.48	0.36	412.43
BOTH	1623.20	84.40	2274.10	86.83	40.10
TOTAL	1923.16	100.00	2619.01	100.00	36.18

FIG 9 TOTAL NUMBER OF HOLDERS BY TYPE OF HOLDINGS FOR BELG SEASON OF PRIVATE HOLDINGS IN ETHIOPIA, 1990/91 (1983 E.C)

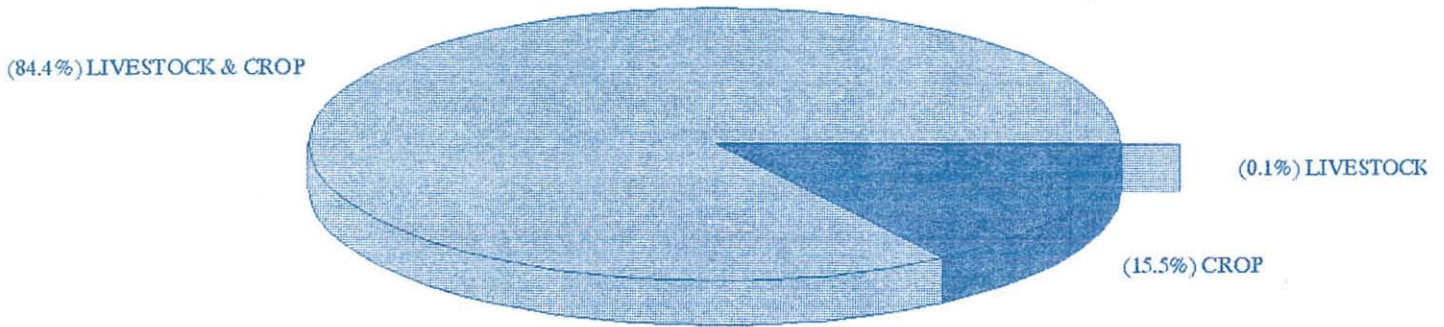
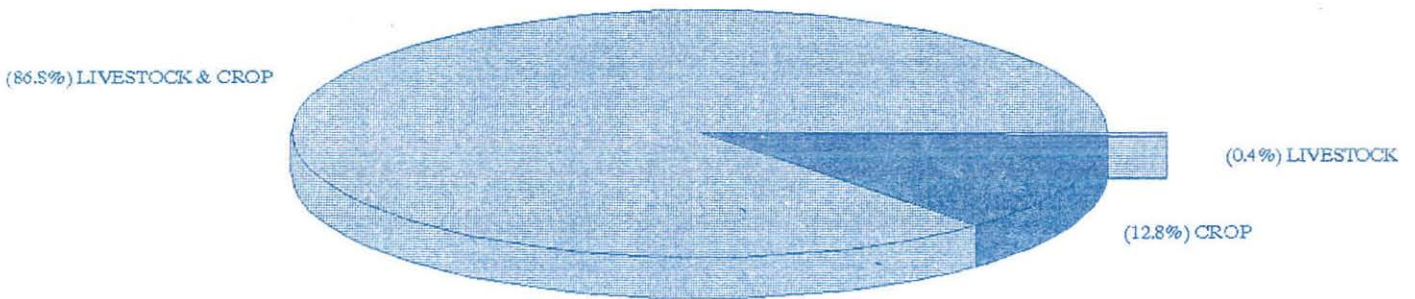


FIG 10 TOTAL NUMBER OF HOLDERS BY TYPE OF HOLDINGS FOR BELG SEASON OF PRIVATE HOLDINGS IN ETHIOPIA, 1991/92 (1984 E.C)



3.2. TOTAL NUMBER OF HOLDERS WHO EXERCISE BELG SEASON AGRICULTURAL
ACTIVITIES BY AGE AND TYPE OF HOLDING

For the purpose of preparing this report holders' ages have been categorized in to nine groups, as follows.

The group categories by age

group 1	-	under 18 years
group 2	-	18 - 20 years
group 3	-	21 - 24 years
group 4	-	25 - 29 years
group 5	-	30 - 39 years
group 6	-	40 - 49 years
group 7	-	50 - 59 years
group 8	-	60 years & above
group 9	-	not stated

According to the results of the survey, it was estimated that a total of 1.9 and 2.6 million holders were engaged in the over all belg season agricultural activities in 1990/91(1983 E.C.)and 1991/92(1984 E.C.), respectively. However, these holders further categorized in to nine age groups and three types of holdings, based on the age of the holder and type of holdings the holders engaged with, the details are presented in Tables 23 and 24.

TABLE 23 NUMBER OF HOLDERS AND THEIR PERCENT DISTRIBUTION BY AGE AND TYPE OF HOLDING IN 1990/91(1983 E.C.) BELG SEASON FOR PRIVATE HOLDINGS IN ETHIOPIA

AGE OF HOLDERS IN YEARS	NUMBER IN THOUSANDS							
	HOLDERS WITH CROP ONLY	%	HOLDERS WITH LIVESTOCK ONLY	%	HOLDERS WITH LIVESTOCK AND CROP	%	TOTAL NUMBER OF HOLDERS	%
UNDER 18	5.22	1.75	-	-	20.86	1.29	26.08	1.36
18-20	12.52	4.20	-	-	40.59	2.50	53.11	2.76
21-24	17.76	5.96	0.19	10.27	66.07	4.07	84.02	4.37
25-29	41.96	14.08	0.93	50.27	162.15	9.99	205.04	10.66
30-39	78.46	26.32	-	-	403.24	24.84	481.70	25.05
40-49	59.79	20.06	-	-	388.90	23.96	448.69	23.33
50-59	32.52	10.91	0.19	10.27	268.19	16.52	300.90	15.65
60 & ABOVE	49.88	16.73	0.54	29.19	247.85	15.27	298.27	15.51
NOT STATED	-	-	-	-	25.35	1.56	25.35	1.32
TOTAL	298.11	100.00	1.85	100.00	1623.20	100.00	1923.16	100.00

TABLE 24 NUMBER OF HOLDERS AND THEIR PERCENT DISTRIBUTION BY AGE AND TYPE OF HOLDING IN 1991/92(1984 E.C.) BELG SEASON FOR PRIVATE HOLDINGS IN ETHIOPIA

AGE OF HOLDERS IN YEARS	NUMBER IN THOUSANDS							
	HOLDERS WITH CROP ONLY	%	HOLDERS WITH LIVESTOCK ONLY	%	HOLDERS WITH LIVESTOCK AND CROP	%	TOTAL NUMBER OF HOLDERS	%
UNDER 18	6.83	2.04	-	-	11.88	0.52	18.71	0.71
18-20	11.26	3.36	-	-	29.43	1.29	40.69	1.55
21-24	24.76	7.38	-	-	89.73	3.95	114.49	4.37
25-29	49.93	14.89	1.28	13.50	260.34	11.45	311.55	11.90
30-39	75.17	22.41	2.01	21.20	537.56	23.64	614.74	23.47
40-49	68.99	20.57	3.55	37.45	554.11	24.37	626.65	23.93
50-59	42.59	12.70	1.24	13.08	382.66	16.83	426.49	16.28
60 & ABOVE	55.90	16.67	1.40	14.77	408.39	17.96	465.69	17.78
NOT STATED	-	-	-	-	-	-	-	-
TOTAL	335.43	100.00	9.48	100.00	2274.10	100.00	2619.01	100.00

TABLE 25 NUMBER OF HOLDERS AND THEIR PERCENT DISTRIBUTION BY TYPE OF HOLDING AND ADMINISTRATIVE REGION IN 1990/91(1983 E.C) BELG SEASON FOR PRIVATE HOLDINGS IN ETHIOPIA.

REGION	NUMBER IN THOUSANDS							
	HOLDERS WITH CROP ONLY	%	HOLDERS WITH LIVESTOCK ONLY	%	HOLDERS WITH LIVESTOCK AND CROP	%	TOTAL NUMBER OF HOLDERS	%
ARSI	8.49	2.85	—	—	125.57	7.74	134.06	6.97
BALE	14.92	5.00	0.69	37.30	98.22	6.05	113.83	5.92
NORTH OMO	46.33	15.54	—	—	209.61	12.91	255.94	13.31
SOUTH OMO	0.41	0.14	—	—	1.61	0.10	2.02	0.11
EAST GOJAM	—	0.00	—	—	2.76	0.17	2.76	0.14
WEST GOJAM	1.82	0.61	—	—	8.24	0.51	10.06	0.52
METEKEL	—	0.00	—	—	0.05	0.00	0.05	0.00
NORTH GONDER	1.65	0.55	0.38	20.54	18.48	1.14	20.51	1.07
SOUTH GONDER	1.00	0.34	—	—	11.79	0.73	12.79	0.67
DIRE DAWA	—	—	—	—	—	—	—	—
EAST HARARGHE	2.83	0.95	—	—	31.92	1.97	34.75	1.81
WEST HARARGHE	5.91	1.98	0.43	23.24	78.33	4.83	84.67	4.40
GAMBELA	1.03	0.35	—	—	0.66	0.04	1.69	0.09
ILLUBABOR	28.64	9.61	—	—	174.85	10.77	203.49	10.58
KEFFA	22.58	7.57	0.16	8.65	120.08	7.40	142.82	7.43
ADDIS ABABA	2.30	0.77	—	—	18.24	1.12	20.54	1.07
EAST SHEWA	—	—	—	—	—	—	—	—
NORTH SHEWA	0.92	0.31	—	—	58.21	3.59	59.13	3.07
SOUTH SHEWA	1.22	0.41	—	—	38.90	2.40	40.12	2.09
WEST SHEWA	0.82	0.28	—	—	16.27	1.00	17.09	0.89
BORENA	3.82	1.28	—	—	35.57	2.19	39.39	2.05
SIDAMO	61.08	20.49	—	—	195.60	12.05	256.68	13.35
ASSOSA	4.14	1.39	—	—	11.67	0.72	15.81	0.82
WELLEGA	47.69	16.00	0.19	10.27	169.15	10.42	217.03	11.29
NORTH WOLLO	19.14	6.42	—	—	56.41	3.48	75.55	3.93
SOUTH WOLLO	21.37	7.17	—	—	141.01	8.69	162.38	8.44
TOTAL	298.11	100.00	1.85	100.00	1623.20	100.00	1923.16	100.00

TABLE 26 NUMBER OF HOLDERS AND THEIR PERCENT DISTRIBUTION BY TYPE OF HOLDING AND ADMINISTRATIVE REGION IN 1991/92(1984 E.C) BELG SEASON FOR PRIVATE HOLDINGS IN ETHIOPIA.

REGION	NUMBER IN THOUSANDS							
	HOLDERS WITH CROP ONLY	%	HOLDERS WITH LIVESTOCK ONLY	%	HOLDERS WITH LIVESTOCK AND CROP	%	TOTAL NUMBER OF HOLDERS	%
ARSI	4.82	1.44	-	-	89.58	3.94	94.40	3.60
BALE	7.86	2.34	0.61	6.43	126.47	5.56	134.94	5.15
NORTH OMO	84.28	25.13	0.30	3.16	585.21	25.73	669.79	25.57
SOUTH OMO	8.18	2.44	-	-	23.31	1.03	31.49	1.20
EAST GOJAM	-	-	-	-	5.83	0.26	5.83	0.22
WEST GOJAM	1.82	0.54	-	-	8.24	0.36	10.06	0.38
METEKEL	-	-	-	-	-	-	-	-
NORTH GONDER	0.35	0.10	-	-	0.78	0.03	1.13	0.04
SOUTH GONDER	1.59	0.47	-	-	18.73	0.82	20.32	0.78
DIRE DAWA	-	-	-	-	-	-	-	-
EAST HARARGHE	-	-	-	-	-	-	-	-
WEST HARARGHE	-	-	-	-	-	-	-	-
GAMBELA	0.07	0.02	-	-	0.53	0.02	0.60	0.02
ILLUBABOR	20.66	6.16	-	-	203.87	8.96	224.53	8.57
KEFFA	22.74	6.78	0.34	3.59	106.79	4.70	129.87	4.96
ADDIS ABABA	2.15	0.64	-	-	18.32	0.81	20.47	0.78
EAST SHEWA	-	-	-	-	-	-	-	-
NORTH SHEWA	0.84	0.25	-	-	55.99	2.46	56.83	2.17
SOUTH SHEWA	4.05	1.21	-	-	101.30	4.45	105.35	4.02
WEST SHEWA	1.63	0.49	-	-	17.85	0.78	19.48	0.74
BORENA	0.45	0.13	0.28	2.95	9.69	0.43	10.42	0.40
SIDAMO	61.40	18.30	7.95	83.86	229.84	10.11	299.19	11.42
ASSOSA	5.73	1.71	-	-	19.88	0.87	25.61	0.98
WELLEGA	37.57	11.20	-	-	141.64	6.23	179.21	6.84
NORTH WOLLO	15.40	4.59	-	-	65.14	2.86	80.54	3.08
SOUTH WOLLO	53.84	16.05	-	-	445.11	19.57	498.95	19.05
TOTAL	335.43	100.00	9.48	100.00	2274.10	100.00	2619.01	100.00

3.3 TOTAL NUMBER OF HOLDERS REPORTING USE OF IMPROVED FARM MANAGEMENT PRACTICES

Based on the survey results, the number of holders reporting use of farm management practices and their percent distribution for belg season crops of private holdings in 1990/91(1983 E.C.) and 1991/92(1984 E.C.) is presented in the Summary Table J. As it is indicated in Summary Table I, it was estimated that a total of 421710 and 724200 holders (about 21.93 % and 27.65 % of the total) reported the use of improved farm management practices in their holdings during 1990/91(1983 E.C.) and 1991/92(1984 E.C.) belg seasons, respectively.

Of these totals, the highest number of holders reporting use of improved farm management practices were estimated to be 122750 (29.11%) in 1990/91(1983 E.C.) and 176240 (24.34%) holders in 1991/92(1984 E.C.) who fall in the age group 30-39 in both years'. Moreover, in 1990/91 (1983 E.C.) the age groups 40-49 and 50-59 ranked second and third, respectively. In 1991/92, holders in the age group of 40-49 ranked second (for details see Summary Table I).

SUMMARY TABLE I. NUMBER OF HOLDERS REPORTING USE OF IMPROVED FARM MANAGEMENT PRACTICES & THEIR PERCENT CHANGE FOR BELG SEASON CROPS OF PRIVATE HOLDINGS IN ETHIOPIA, 1990/91(1983 E.C) AND 1991/92 (1984 E.C)

AGE OF HOLDERS IN YEARS	NUMBER IN THOUSANDS				
	1990/91 (1983 E.C)	%	1991/92 (1984 E.C)	%	% CHANGE
UNDER 18	2.30	0.55	2.32	0.32	0.87
18-20	10.03	2.38	11.47	1.58	14.36
21-24	14.52	3.44	28.30	3.91	94.90
25-29	46.78	11.09	90.91	12.55	94.34
30-39	122.75	29.11	176.24	24.34	43.58
40-49	100.82	23.91	177.67	24.53	76.22
50-59	68.83	16.32	106.20	14.66	54.29
60 & ABOVE	55.68	13.20	131.09	18.10	135.43
NOT STATED	-	-	-	-	-
TOTAL	421.71	100.00	724.20	100.00	71.73

FIG 11 TOTAL NUMBER OF HOLDERS REPORTING USE OF IMPROVED FARM MANAGEMENT PRACTICES FOR BELG SEASON CROPS OF PRIVATE HOLDINGS IN ETHIOPIA, 1990/91 (1983 E.C) AND 1991/92 (1984 E.C)

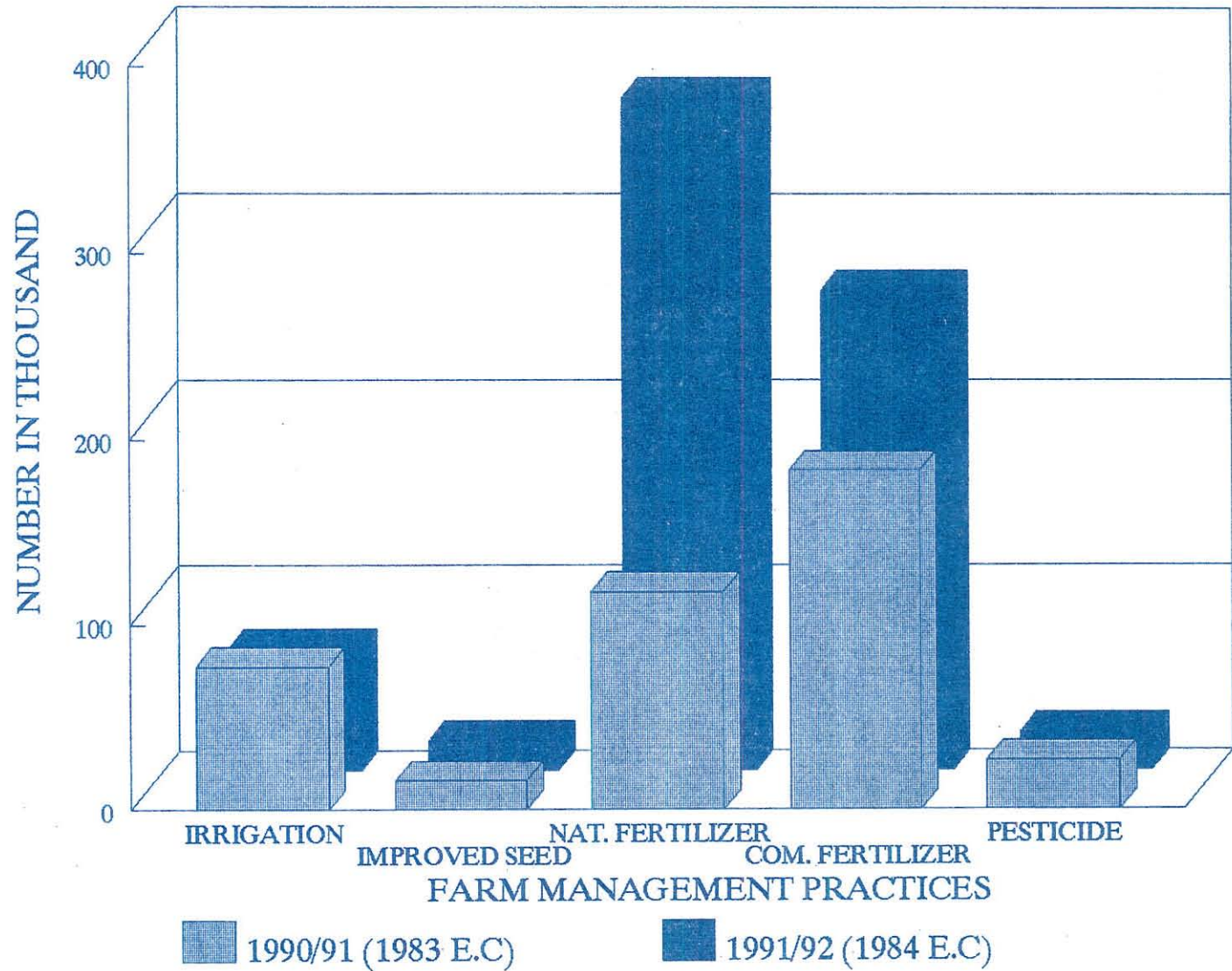


TABLE 27

NUMBER OF HOLDERS REPORTING USE OF IMPROVED FARM MANAGEMENT
PRACTICES BY AGE OF HOLDERS FOR BELG SEASON CROPS OF PRIVATE
HOLDINGS IN ETHIOPIA. 1990/91 (1983 E.C.)
NUMBER IN THOUSANDS

AGE OF HOLDERS IN YEARS	NUMBER OF HOLDERS REPORTING USE OF				
	IRRIGATION	IMPROVED SEEDS	NATURAL FERTILIZER	COMMER. FERTILIZER	PESTICIDE
UNDER 18	0.41	—	1.00	0.89	—
18-20	3.58	—	1.58	4.81	0.06
21-24	0.92	0.93	5.54	6.56	0.57
25-29	8.72	1.28	10.33	23.31	3.14
30-39	27.60	4.14	36.65	49.17	5.19
40-49	13.71	3.52	34.95	43.42	5.22
50-59	13.97	4.93	20.27	25.51	4.15
60 & ABOVE	8.96	0.78	7.51	29.70	8.73
NOT STATED	—	—	—	—	—
TOTAL	77.87	15.58	117.83	183.37	27.06

TABLE 28

NUMBER OF HOLDERS REPORTING USE OF IMPROVED FARM MANAGEMENT
PRACTICES BY AGE OF HOLDERS FOR BELG SEASON CROPS OF PRIVATE
HOLDINGS IN ETHIOPIA. 1991/92 (1984 E.C.)
NUMBER IN THOUSANDS

AGE OF HOLDERS IN YEARS	NUMBER OF HOLDERS REPORTING USE OF				
	IRRIGATION	IMPROVED SEEDS	NATURAL FERTILIZER	COMMER. FERTILIZER	PESTICIDE
UNDER 18	—	—	0.99	0.87	0.46
18-20	2.39	0.56	6.37	1.93	0.22
21-24	1.26	0.74	16.12	9.90	0.28
25-29	5.70	1.76	46.35	33.58	3.52
30-39	19.22	1.47	86.87	63.14	5.54
40-49	15.70	2.51	81.37	74.64	3.45
50-59	10.89	3.82	53.34	36.45	1.70
60 & ABOVE	10.61	5.62	71.08	38.39	5.39
NOT STATED	—	—	—	—	—
TOTAL	65.77	16.48	362.49	258.90	20.56

The total number of holders who reported the use of improved agricultural practices varies from one administrative region to the other. The highest number of holders reporting use of irrigation, improved seeds, fertilizers (both natural and commercial), and pesticides were observed in Sidamo, North Omo and Arsi in 1990/91 (1983 E.C.). Similarly in North Omo, Sidamo and South Shewa the highest numbered of holders reported to use improved farm inputs in 1991/92 (1984 E.C.).

TABLE 29 NUMBER OF HOLDERS REPORTING USE OF IMPROVED FARM MANAGEMENT PRACTICES BY ADMINISTRATIVE REGION FOR BELG SEASON CROPS OF PRIVATE HOLDINGS IN ETHIOPIA, 1990/91 (1983 E.C.)

NUMBER IN THOUSANDS

REGION	NUMBER OF HOLDERS REPORTING USE OF				
	IRRIGATION	IMPROVED SEEDS	NATURAL FERTILIZER	COMMER. FERTILIZER	PESTICIDE
ARSI	1.49	0.03	0.72	47.42	5.84
BALE	0.39	—	—	16.87	11.23
NORTH OMO	1.90	2.36	55.60	4.08	0.24
SOUTH OMO	—	—	—	—	—
EAST GOJAM	2.76	—	—	—	—
WEST GOJAM	—	—	—	2.05	—
METEKEL	0.05	—	0.05	—	—
NORTH GONDER	0.30	0.74	—	1.79	—
SOUTH GONDER	3.96	—	—	1.31	—
DIRE DAWA	—	—	—	—	—
EAST HARARGHE	9.74	—	4.52	0.17	—
WEST HARARGHE	5.30	0.43	3.60	—	—
GAMBELA	—	—	—	—	—
ILLUBABOR	0.79	1.12	9.56	18.94	1.22
KEFFA	—	1.20	0.09	—	0.46
ADDIS ABABA	0.07	0.07	—	—	—
EAST SHEWA	—	—	—	—	—
NORTH SHEWA	7.65	—	0.43	—	—
SOUTH SHEWA	0.43	—	3.96	12.50	2.18
WEST SHEWA	8.22	0.39	1.19	1.54	—
BORENA	—	—	—	—	—
SIDAMO	—	5.02	21.42	72.88	1.72
ASSOSA	0.34	0.08	—	—	0.71
WELLEGA	31.50	2.39	5.61	2.88	3.46
NORTH WOLLO	1.45	—	0.89	—	—
SOUTH WOLLO	1.53	1.75	10.19	0.94	—
TOTAL	77.87	15.58	117.83	183.37	27.06

TABLE 29 NUMBER OF HOLDERS REPORTING USE OF IMPROVED FARM MANAGEMENT PRACTICES BY ADMINISTRATIVE REGION FOR BELG SEASON CROPS OF PRIVATE HOLDINGS IN ETHIOPIA, 1990/91 (1983 E.C.)

NUMBER IN THOUSANDS

REGION	NUMBER OF HOLDERS REPORTING USE OF				
	IRRIGATION	IMPROVED SEEDS	NATURAL FERTILIZER	COMMER. FERTILIZER	PESTICIDE
ARSI	1.49	0.03	0.72	47.42	5.84
BALE	0.39	—	—	16.87	11.23
NORTH OMO	1.90	2.36	55.60	4.08	0.24
SOUTH OMO	—	—	—	—	—
EAST GOJAM	2.76	—	—	—	—
WEST GOJAM	—	—	—	2.05	—
METEKEL	0.05	—	0.05	—	—
NORTH GONDER	0.30	0.74	—	1.79	—
SOUTH GONDER	3.96	—	—	1.31	—
DIRE DAWA	—	—	—	—	—
EAST HARARGHE	9.74	—	4.52	0.17	—
WEST HARARGHE	5.30	0.43	3.60	—	—
GAMBELA	—	—	—	—	—
ILLUBABOR	0.79	1.12	9.56	18.94	1.22
KEFFA	—	1.20	0.09	—	0.46
ADDIS ABABA	0.07	0.07	—	—	—
EAST SHEWA	—	—	—	—	—
NORTH SHEWA	7.65	—	0.43	—	—
SOUTH SHEWA	0.43	—	3.96	12.50	2.18
WEST SHEWA	8.22	0.39	1.19	1.54	—
BORENA	—	—	—	—	—
SIDAMO	—	5.02	21.42	72.88	1.72
ASSOSA	0.34	0.08	—	—	0.71
WELLEGA	31.50	2.39	5.61	2.88	3.46
NORTH WOLLO	1.45	—	0.89	—	—
SOUTH WOLLO	1.53	1.75	10.19	0.94	—
TOTAL	77.87	15.58	117.83	183.37	27.06

TABLE 30

NUMBER OF HOLDERS REPORTING USE OF IMPROVED FARM MANAGEMENT
PRACTICES BY ADMINISTRATIVE REGION FOR BELG SEASON CROPS OF
PRIVATE HOLDINGS IN ETHIOPIA, 1991/92 (1984 E.C.)

NUMBER IN THOUSANDS

REGION	NUMBER OF HOLDERS REPORTING USE OF				
	IRRIGATION	IMPROVED SEEDS	NATURAL FERTILIZER	COMMER. FERTILIZER	PESTICIDE
ARSI	—	—	1.83	27.03	8.27
BALE	—	0.42	—	18.87	0.92
NORTH OMO	0.58	4.22	234.16	103.92	2.46
SOUTH OMO	—	—	—	—	—
EAST GOJAM	5.83	—	—	—	—
WEST GOJAM	—	—	—	2.05	—
METEKEL	—	—	—	—	—
NORTH GONDER	—	—	—	—	—
SOUTH GONDER	2.45	—	—	1.34	—
DIRE DAWA	—	—	—	—	—
EAST HARARGHE	—	—	—	—	—
WEST HARARGHE	—	—	—	—	—
GAMBELA	—	—	—	0.04	—
ILLUBABOR	0.80	1.68	0.45	6.81	0.58
KEFFA	—	0.15	0.03	—	—
ADDIS ABABA	—	0.27	0.31	—	0.32
EAST SHEWA	—	—	—	—	—
NORTH SHEWA	6.38	—	—	—	—
SOUTH SHEWA	—	—	42.41	25.63	1.71
WEST SHEWA	12.99	0.41	—	0.78	—
BORENA	0.29	—	—	—	—
SIDAMO	2.20	1.56	43.51	69.43	1.48
ASSOSA	—	—	2.63	—	—
WELLEGA	23.12	1.73	5.14	2.79	3.11
NORTH WOLLO	5.63	1.39	3.27	0.21	0.05
SOUTH WOLLO	5.50	4.65	28.75	—	1.66
TOTAL	65.77	16.48	362.49	258.90	20.56

TABLE 30

NUMBER OF HOLDERS REPORTING USE OF IMPROVED FARM MANAGEMENT
PRACTICES BY ADMINISTRATIVE REGION FOR BELG SEASON CROPS OF
PRIVATE HOLDINGS IN ETHIOPIA, 1991/92 (1984 E.C.)

NUMBER IN THOUSANDS

REGION	NUMBER OF HOLDERS REPORTING USE OF				
	IRRIGATION	IMPROVED SEEDS	NATURAL FERTILIZER	COMMER. FERTILIZER	PESTICIDE
ARSI	—	—	1.83	27.03	8.27
BALE	—	0.42	—	18.87	0.92
NORTH OMO	0.58	4.22	234.16	103.92	2.46
SOUTH OMO	—	—	—	—	—
EAST GOJAM	5.83	—	—	—	—
WEST GOJAM	—	—	—	2.05	—
METEKEL	—	—	—	—	—
NORTH GONDER	—	—	—	—	—
SOUTH GONDER	2.45	—	—	1.34	—
DIRE DAWA	—	—	—	—	—
EAST HARARGHE	—	—	—	—	—
WEST HARARGHE	—	—	—	—	—
GAMBELA	—	—	—	0.04	—
ILLUBABOR	0.80	1.68	0.45	6.81	0.58
KEFFA	—	0.15	0.03	—	—
ADDIS ABABA	—	0.27	0.31	—	0.32
EAST SHEWA	—	—	—	—	—
NORTH SHEWA	6.38	—	—	—	—
SOUTH SHEWA	—	—	42.41	25.63	1.71
WEST SHEWA	12.99	0.41	—	0.78	—
BORENA	0.29	—	—	—	—
SIDAMO	2.20	1.56	43.51	69.43	1.48
ASSOSA	—	—	2.63	—	—
WELLEGA	23.12	1.73	5.14	2.79	3.11
NORTH WOLLO	5.63	1.39	3.27	0.21	0.05
SOUTH WOLLO	5.50	4.65	28.75	—	1.66
TOTAL	65.77	16.48	362.49	258.90	20.56

