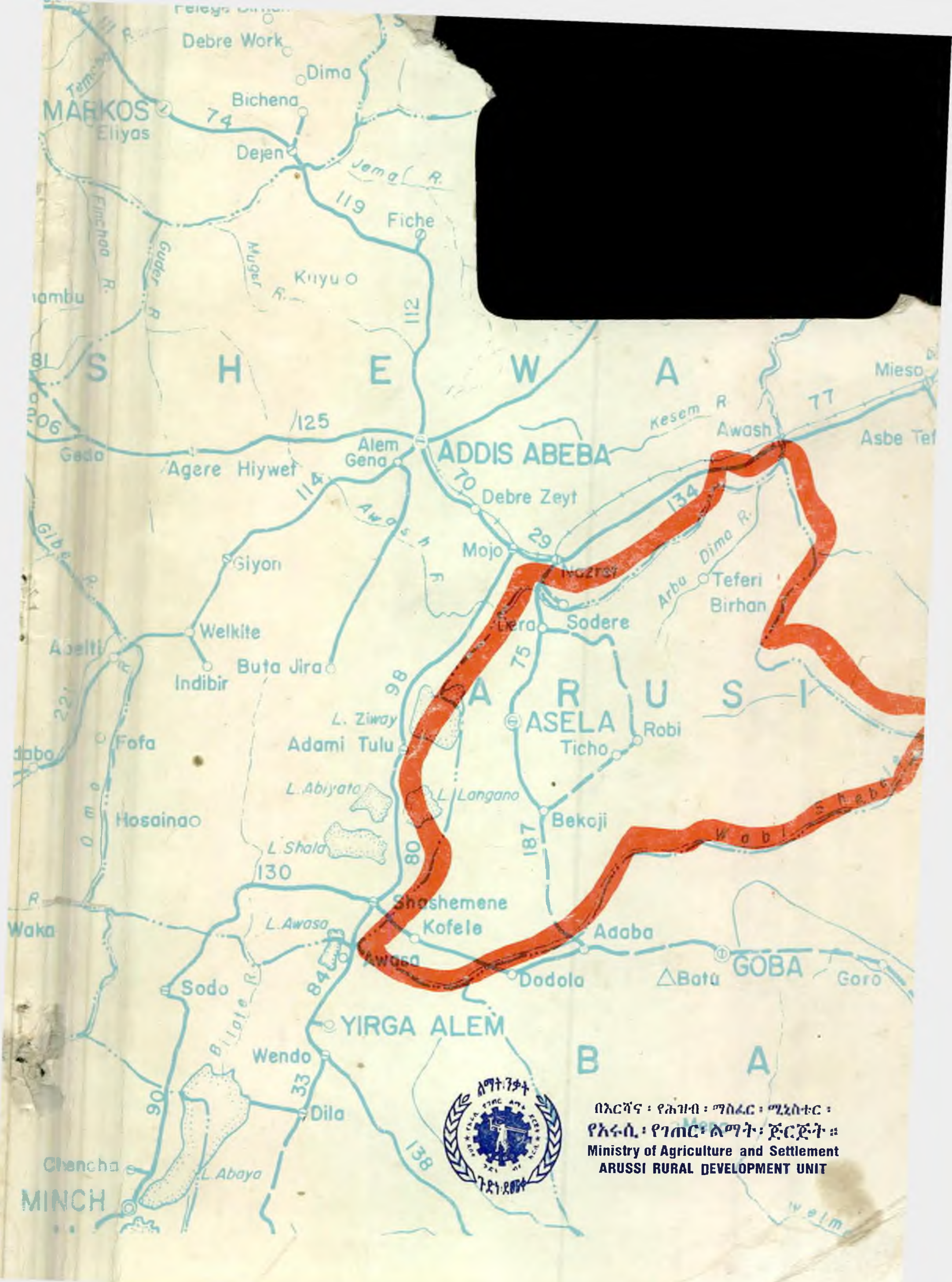

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SUMMARY

SOILS

To study the nutrient contents and soil types of Arssi, several samples have been taken from different ecological regions on which analysis of pH, available phosphorus and texture were tested.

Soils of the highlands (> 2500 m. altitude) are acidic in pH (< 6.0), low in available phospharus, clay to heavy clay in texture and impermeable while that of the lowland areas (< 2000 m.a.s) are neutral to mildly alkaline in pH (> 6.6), medium high in available phosphorus, loamy to sandy loam in texture and highly permeable.

Soils of the medium altitude (2000- 2500 m. altitude) shows that its pH is slightly acidic (6.0 - 6.6), medium in available phosphorus, light clay to loamy in textural content and fairly permeable.

The highland areas includes Ketchema, Asella, Waji, Lukuche and Bilalo, and the low lands includes Doneba, Golba, Koro Degaga, Lekansho, Sedicho and Sheled. The medium altitude areas includes Kulumsa, Gonde and Etheya.

FIELD CROPS

Wheat

In sowing date trials conducted at Bekoji, Diksis and Robe three new bread wheat lines (K6295 - 4A, K6399-3 and Ku 75-11-64) and a commercial variety, Enkoy were included. At Bekoji all the varieties except Enkoy responded very well to the second sowing date (24 June). While at Diksis and Robe all entries did best when planted on the 28 June and 16 July respectively.

Several observations and variety trials were also conducted at different trial sites in Arsi Region. Planted materials were screened for yield, disease resistance, frost and drought tolerance and for relevant agronomic characteristics.

Generally, disease was not a problem during the test period. Yield as high as 74 qt/ha was obtained from a wheat line in one of the trials conducted at Robe. Overall the testing locations Ku75-11-64 and ET12. D.4.L.7 were the best performing lines with a mean yield of 38 qt/ha and 37 qt/ha.

Barley

Of the food barley types IAR/H/485 was found to be one of the top performing varieties with reasonablly good agronomic characteristics for a number of years in succession, and it is a possible food barley variety to be released in the near future.

EH21B/F_3-A-1-A-2L, proved to excell all other malting-barley varieties at all stations, with a mean yield of more than 40 qt/ha.

With regard to diseases the weather didn't favour the high occurence of scald (the most common disease on barley) at almost all stations. The incidence of net blotch & spot blotch was rather high.

Tef

No tef trial was conducted this cropping season (1980/81) since planting materials were not received from the National Coordinating Station.

Maize

Only two sets of maize trial were carried out in the Rift valley at Netle. SR52 was the best yielder with a yield of 81 qt/ha among the intermediate varieties. In the lowland set trial all entries significantly out-performed the check variety, Katumani composite.

Sorghum

Sorghum varieties were tested in some parts of marginal areas of the region at Extension Demonstration sites. (Results of the sorghum trials are included in the Extension Demonstration report 1980/81).

Horsebean

Sowing dates and plant population trials were conducted at Kulumsa and Bekoji Horsebean gave top yield (22 qt/ha) when planting was done on 14 June with a spacing of 30 cm between rows and 5 cm between seeds.

In planting methods and weeding practices trial of horse bean barried out at Kulumsa highest yield (26 qt/ha) was scored when horsebean was row planted and weeded, while the other practices gave yields ranging from 13 to 17 qt/ha.

Attractive yields were obtained from horsebean varieties included in the NYT and PNYT at Gondie. NC 40 and NKT Addis Alem were the best performers in the NYT and PNYT giving a yield of 50 qt/ha and 54 qt/ha.

Of the lines tested for frost tolerance no lone was prefered to the check entry, CS 20 DK. Nevertheless the tolerance of some lines to frost worth further testing of these materials.

Field peas

In field peas best yield (46 qt/ha) was obtained with spacing of 20 cm by 5 cm between rows and between seeds, respectively, at the first sowing date (29 June).

From among the varieties of field peas tested at Bekoji on national basis F/P Mur74F and Parvus appeared on top of others yielding 53 qt/ha and 50 qt/ha respectively. Of the introduction of field peas planted at Bekoji Svalofs Time was found to be the best (52 qt/ha).

With regard to field peas tested at Merare for winter hardiness the check entry CS 436k and AW-76-119 significantly out performed the rest with a yield of 41 qt/ha and 39 qt/ha respectively.

Haricotbean

Only a set of NYT was conducted on haricotbean at Kulumsa among which variety 15-R-52 was the top yielder (29 qt/ha) followed by Mexican 142.

Lentils

One set each of NYT and PNYT were carried out at Kulumsa. In the NYT only varieties NEL 256 (25 qt/ha) and last Lalibela (24 qt/ha) appeared with better yields than the local check. Simultanously, the local check was the top yielder (30 qt/ha) followed by NEL 355 (28 qt/ha) in the PNYT. These two entries significantly out performed all the rest in the PNYT at 99% confidential level.

Rapeseed

This year's national yield trials on rapeseed included twelve different varieties of brassica charinate types. Of these Dodola and Dorzo were the best yielding varieties. Both gave an average yield of more than 25 qt/ha at all stations.

Linseed

Victory and IAR/Li/157 with yields of 18 qt/ha and 15 qt/ha were the two best yielding varieties during the year. Victory happened to perform fairly good at Kulumsa repeatdly and is a probable candidate for future release around this area.

Noug

One National Yield Trial on Noug comprising twelve different lines was conducted at Kulumsa for the first time. And in general terms a satisfactory performance was observed at the station.

PASTURE AND FORAGE CROPS

Observation trials

At Robe sudan grass, columbus grass, perennial rye grass and vicia dasycarpa showed very good performance. It was not possible to produce any seed from different tropical legumes tried at Kulumsa. Generally very high yields were obtained from Rhodes & colcured Guinea grasses mixed with different tropical legumes.

Oat (pure stand), oat/vicia mixture and perennial rye grass were best under semi waterlogged black clay soil of Diksis.

Cultivated Grasses

Fertilizer trials

Highest herbage yield (6381 kg/ha DM) was obtained at the level of 300 kg/ha urea on Rhodes grass at Kulumsa. The highest seed yield (360 kg/ha) was obtained at the level of 400 kg/ha urea on cocksfort grass at Bekoji.

From the experiments to see the effect of different levels of nitrogen and phosphorous on Rhodes (at Kulumsa) and cocksfoot (at Bekoji) statistically significant responses were observed to nitrogen where as there was no or little responses to phosphorous.

Highest seed yields (125 kg/ha) of Rhodes and 176 kg/ha of cocksfoot were obtained at Kulumsa. Bekoji respectively when urea was topdressed at the middle of July.

Management of Grass Leys

Statistically significant yield differences were observed when grass leys were harvested at different stages between before heading and full heading.

To avoid shattering losses and obtain good quality seed, it was observed best to harvest before three weeks after initial full heading of Rhodes grass at Kulumsa.

Cultivated Legumes

Fertilizer trial

No significant yield differences were observed due to different levels of P_2O_5 on Medicago truncatula at Kulumsa.

Seedings rate trials

No significant yield differences were observed due to different seeding rates on melitotus altissimus at Dherra. Due to moisture stress during the main growth period the yields were low as compared to the previous results.

Time of planting

A trial on Melilotus altissimus for seed production failed due to severe attack of parasitic weed, Orobanche ramosa and moisture stress at flowering stage.

The highest seed yield of vicia dasycarpa (1291 kg/ha) was obtained from the first date of planting (May 29) where as the lowest yield (653 kg/ha) was obtained from the last date of planting (June 29).

Variety trials

Out of the 20 varieties of alfalfa planted in 1980 the highest herbage yield (3168 kg/ha DM from two harvests) was obtained from variety Hunter river and 4401 kg/ha DM(from one harvest) from variety can creep at Robe and Kulumsa respectively.

Over all var. Hairy peruvian was found best adaptive at both stations of the five vetches tried at Kulumsa. Bekoji and Dherra vicia desycarpa var. Manci and vicia atropurpurea were best performing . A seed yield of 3530 kg/ha was obtained from vicia sativa at Bekoji. This was a very high yield as compared to the previous results.

Root Crops

To assess seed yields of fodder beet, different trials were planted at Bekoji, Meraro and Koffele. But due to moisture stress during plantings, floods and attack of porcupine the stands were uneven and no substantial yields were harvested.

Annual forage crops

Seedings rate trials

Herbage yields of 11672 kg/ha at 75/0, 7493 kg/ha at 75/50 and 2758 kg/ha at 100/50 of oat/vicia mixtures were obtained in 1980 at Kulumsa, Bekoji and Dherra respectively.

These trial has been conducted for 5 years 1976-80 continuously under the same design at Kulumsa, Bekoji and Dherra. The conclusion reached was the mixed seeding rates of 75/25, 75/50 and 100/50 were the best under Kulumsa Bekoji and Dherra conditions respectively.

Variety trials

Of the five elite varieties of oat var CI 8251 was best at Robe and Bekoji, 14358 kg/ ha DM and 10144 kg/ha DM respectively and var Jasari at Dherra 2479 kg/ha. Overall, the standard variety Lampton was exceeded by varieties CI 8235, CI 8251 and Jasari. Generally very high yields were obtained at Robe where as lower yields were obtained at Dherra.

Jasari was found to produce high seed yields (above 45 qts) at Kulumsa and Bekoji under microseed increase level.

HORTICULTURAL CROPS

Irish Potato

Different National Yield Trials on this crop were undertaken at various locations using rainfall & irrigation water. Regarding yield at 624 was found to be the best yielding variety across. Locations, yields as high as 60 ton/ha were recorded for this variety at Bekoji and Kulumsa. Again this same variety was among the ones which showed pronounced resistance to late blight at all locations and it is a probable variety to be released to growers in the course of time.

Tomato

Yields were not very impressive because the trial was laid-out during the big rainy seasson which fevoars the incidence of many diseases, however, variety

valent with an average yield of 13.5 ton/ha was the best yielding variety at Kulumsa.

Vegetable Seed Production

Repeated trials on the production of beet root, carrot and cabbage seeds were carried out at Bekoji & Neraro. Satisfactory result was obtained so far and the seeds obtained locally were found to be comparable to the respective standard checks with respect to germinative capacity, yield, quality and general performance.

Fruite Trees

Adeptation trials on three temprate fruit trees (pead, plum & apple) are in progress at Kulumsa & Bekoji considerury growth and adaptation the trial at Bekoji is much better depicting the fact that the higher the altitude, the more suitable it is for the production of these crops.

CROP PROTECTION

Weed Survey

Weed survey in Ticho Awraja was performed where 165 fields were sampled. The major weeds were Polygonum nepalense, Galinsoga paraviflora and Guizota Scabra while Phaleris paradoxa, Snowdenia polystachya and Setaria spp. were among the common grasses.

Generally 48% of the sampled fields were weeded only once, 37% weeded twice and 0.2% weeded thrice while 15% were not weeded at all.

Storage Pest Survey

97 stores having maize, barley, wheat, sorghum, fieldpeas, horsebeans and rye were sampled in may 1981. The degree of grain losses by pests is found to be very serious when one store is used for more than one type of crop. Almost all samples collected have suffered from weevil attack which indicates that the task of protecting stored grain from insects and rodents is a problem for many farmers. Generally sorghum suffered from

storage pests more than other crop and its germination percent was found as low as 20%.

Weed Control

Wheat

Although no significant yield increase was obtained from any of the treatments at Asassa adequate control of weeds was obtained with terbutryne which showed small increase in yield than the weedy check.

At Diksis terbutryne gave adequate control which was reflected in significant yield increase followed by chlorotoluron and toxynil.

Tolerance of wheat to Illoxan was tested at different leaf stages of the crop but no significant yield was obtained between treated and untreated plots.

Barley

Terbutryne and phenoxalin gave an excellent control of annual grasses and broad leaved weeds when applied pre-emergence to barley while two hand weedinges at 30 and 60 days after planting has also produced satisfactory yield increase.

Tillage Practices

Although especially suitable direct drilling equipments were not used conventional, minimum and no tillage (zero tillage) cultivation techniques were compared on wheat, Rape and teff during 1980.

Direct drilling using only gramaxone has shown appreciable control of all weeds in three of the crops but the effect was not reflected on the yield because, imperfect drilling into thick wheat stubble which affected establishment of the crop could be associated with the apparent yield decrease. Statistically there is no significant yield difference between seed-beds (conventional and minimum) and weeding methods, seed beds and

fertilizer rates in the above mentioned crops however direct drilling of Tef with DAP 50 kg/ha and urea 50 kg/ha gave promising yield increase and weed population was also reduced by 30% than conventional seedbed.

Pest Control

The dressing of barley seed aganist seedling pests is often practiced in Kulumsa and barley growing farmers. To investigate on the persistenc of commonly used insecticides field and laboratory experiment were conducted and showed that there is no significant difference in germination % when dressed barley is planted after a period of one year, however germination decreased with an increasing rate of furadan.

Army Worm

Army worm cut break was observed in the lowlands and medium altitudes of Arssi and the infestation was controlled using DDt, tenitrothion and Endssulphan.

Pyrethrum

Among pyrethrum entries Nc 59 and No 73 were found to be the top yielders 13 and 12 qt DM/ha, respectively.

PART I

INTRODUCTION

In many areas of the world population is growing faster than food production. It has been estimated that 2 of 3 babies are born to a life of poverty, hunger and misery instead of the an abundant world. For example before the Revolution in Ethiopia the annual growth rate in farming was about 2% per year; where as the population growth was estimated at 2.5%. In order to overcome such problems and balance inequalities of growth research in to different agricultural desciplines and applying the relevant findings to potential areas to increase food production has been realised.

ARDU (Arsi Rural Development Unit) has a research component which is linked with multiplication and dissemination of innovetions. The Plant Husbandry Department is responsible for crop research and seed multiplication activities.

To acquaint the reader with the experimental environment, short notes on the stations where field trials have been performed is presented after the introduction which is followed by data on meteorclogical observations.

The second part of the report comprises results of surveys and trials regarding soil, field crops, forage crops, horticultural crops and crop protection. The prestation of results from each investigation normaly starts with a short comment which is followed by tabulated data. The materials and methods and other relevant information are also included with each trial and/or survey.

EXPERIMENTAL STATIONS

Kulumsa (2150m altitude)

This station is situated on a dark clay soil with excellent physical properties, pH around 6.5 and organic matter percentage around 3.5. This is the main experiment station where more than one half of the trials were conducted and it is the main wheat stations.

Bekoji (2,750 m altitude)

The soil is clay and its organic matter content is around 5 and pH around 4.8. The area is heavily infested with wild oats. This is the main station for barley highland pulses and rape seeds. Seeds of some temperate-type vegetables are also produced here.

Asassa (2300 m altitude)

In this station the soil is rather hight, it can best be described as a clay loam soil. Although the phosphorous content is not too low the crops are known to react very favorably to fertilizers at this location.

Dhera (1,650 m altitude)

At this station the amcunt of rainfall is low and the soil is rather light, sandy loam, while its capacity to ratain water is poor. Phosphorus content is rather good as is pH (around 7). This is the station where crops are tested for drought tolerance.

Meraro (2980 m altitude)

Here the soil is clay, susceptible to water-logging. The pH of the soil is around 5.0. This is the station where crops are tested for frost tolerance and seeds of some temperate-type vegetables are produced.

Gondie (2,260 m altitude)

In this station the soil is light clay with excellent physical properties, pH around 6.0 and organic matter around 4.0. It available phosporus content is low to medium.

Diksis (2,740 m altitude)

At this station the amount of rainfall is high and the soil is heavy clay susceptible to water-logging. Its organic matter content around 5.0 and low in available phosphorus. The soil is acidic.

Robe (2,420 m altitude)

The soil is clay susceptible to water-logging and slightly acidic in pH, and its available phosphorus is low to medium.

Sheled (1,700 m altitude)

The soil is loamy to sandy loam with neutral pH. Its available phosphorus is medium to high. Here, vegetable crops are tested under irrigation.

Koffele (2660 m altitude)

The soil is clay in texture with acidic pH. Its available phosphorus is low. At this site forage and pasture crops are tested.

METEOROLOGICAL SURVEYS

Meteorological observations were made at 13 sites of which 3 were first clay stations. All stations observed precipitation and, maximum and minimum temperatures. In addition, the main stations observed rainfall intensity, evaporation wind direction air humidity, sunshine duration, soil temperature at different depth, and wind speed (at Kulumsa).

Except at Asassa, the annual precipitation recorded this year in the whole province was lower than normal. Total precipitation during the big rainy season (June - September) were normal, but not well distributed, especially in the low-lands where crop failure occured.

The mean maximum and minimum temperature recorded in all stations were a little higher than normal. The weather occured during the months of November and December has caused a favourable harvesting period.

Table 1. Annual Meteorological Report at Asaasa (1980)

Months	Air Temperature Mean (°C)		Precipitation		Evaporation (mm)	Hours of Sunshine
	Max	Min	Total (mm)	No. of rainy days		
January	25.0	1.4	37.7	4	x	268.0
February	26.2	1.2	8.9	4	x	237.9
March	x	0.1	4.9	3	x	191.6
April	x	1.6	19.3	5	x	213.0
May	x	2.7	15.6	5	x	x
June	x	7.0	129	15	x	x
July	21.4	9.5	242.0	23	x	168.1
August	20.6	8.2	128.7	15	x	171.8
September	22.1	7.5	50.5	12	x	x
October	22.5	4.0	2.9	2	xx	214.8
November	23.6	1.7	0.6	1	x	237.4
December	24.6	-2.4	1.1	1	x	229.6
Annual Total			642.0	90	x	1932.2

x = Not recorded.

Table 2 Annual Meteorological Report at Kulumsa (1980)

Months	Air Temperature Mean (°C)		Precipitation		Evaporation (mm)	Hours of Sunshine
	Max	Min	Total (mm)	No. of rainy days		
January	26.3	8.4	13.6	4	216.6	255.2
February	27.6	9.8	5.5	3	228.0	241.2
March	x	11.6	56.8	3	212.1	206.5
April	x	12.7	38.3	8	222.9	169.5
May	x	12.4	66.9	6	273.8	246.8
June	x	11.8	99.0	15	129.0	204.3
July	x	11.2	193.9	18	109.6	134.7
August	x	11.0	137.4	18	118.5	164.0
September	22.4	10.5	113.1	18	113.2	147.6
October	23.6	10.2	43.0	5	278.3	235.0
November	19.2	8.9	0.0	0	321.1	261.7
December	24.3	7.0	0.0	0.	291.5	314.2
Annual Total			768.0	98	2514.6	2580.7

x = Not recorded

Table 3 Annual Meteorological Report at Bekoji (1980)

Months	Air Temperature Mean (°C)		Precipitation		Evaporation (mm)	Hours of Sunshine
	Max	Min	Total (mm)	No. of rainy days		
January	21.8	7.1	20.2	4	288.3	248.0
February	23.0	8.4	20.0	4	336.4	278.4
March	x	9.1	39.5	7	328.6	223.2
April	x	9.0	82.1	16	222.0	156.0
May	x	8.3	110.7	11	223.2	195.3
June	x	7.5	82.8	19	117.0	132.0
July	15.4	7.2	216.6	30	71.3	80.6
August	15.6	6.7	118.5	28	77.5	102.3
September	17.4	7.0	45.7	22	141.0	141.0
October	17.6	6.1	30.9	9	164.3	179.8
November	19.1	7.0	4.1	5	228.0	234.0
December	20.0	5.2	1.5	2	251.1	303.8
	Annual Total		772.6	157	2448.7	2274.4

x- Not recorded

Table 4 Annual Meteorological Report at Asella (1980)

Months	Air Temperature Mean °C		Precipitation		Evaporation
	Max	Min	Total(mm)	No. of Rainy days	
January	20.6	6.0	18.7	6	146.5
February	22.1	7.7	16.4	4	139.4
March	22.5	8.0	109.6	9	145.9
April	x	x	x	x	x
May	x	x	x	x	x
June	19.9	10.1	133.7	29	76.9
July	17.8	10.2	209.7	30	45.0
August	18.7	9.8	173.0	30	26.8
September	19.2	9.0	167.1	28	34.9
October	19.7	7.2	66.8	12	98.7
November	20.7	4.5	127.0	5	115.4
December	20.8	2.6	0.0	0	156.0
	Annual Total		1022.0	153	985.5

x - Not recorded

Table 5 Annual Meteorological Report [illegible] (1980)

Months	Air Temperature Mean °C		Precipitation		Evaporation
	Max	Min	Total (mm)	No. of Rainy days	
January	27.0	12.1	28.		332.2
February	27.9	13.9	0.		350.6
March	28.9	13.2	7.		378.8
April	29.5	13.7	24.		330.1
May	30.6	x	39.		510.1
June	29.2	x	73.		252.9
July	26.6	14.7	151.		165.6
August	26.4	14.6	110.		197.0
September	27.0	14.7	71.		272.6
October	28.0	x	49.		338.5
November	28.1	x	5.		382.3
December	27.0	x	0.		361.1
	Annual Total		559.	68	3871.8

x - Not recorded

Table 6 Annual Meteorological Report [illegible] (1980)

Months	Air Temperature Mean °C		Precipitation		Evaporation
	Max	Min	Total (mm)	No. of Rainy days	
January	x	x	x	x	x x
February	25.6	10.6	2.		234.4
March	27.4	12.0	31.	7	301.9
April	26.6	11.0	70.	9	266.7
May	27.9	7.2	52.	6	296.0
June	25.8	7.6	96.	16	207.7
July	22.8	8.7	162.	22	146.9
August	23.3	8.8	122.	17	162.6
September	23.2	7.8	172.	21	138.2
October	x	x	x	x	x
November	x	x	x	x	x
December	x	x	x	x	x
	Annual Total		710.	96	1754.4

x - Not recorded

Table 7 Annual Meteorological Report at Koffele (1980)

Months	Air Temperature, Mean °C		Precipitation	
	Max.	Min	Total(mm)	No. of rainy days
January	21.7	6.0	46.1	4
February	x	5.8	34.1	5
March	x	7.1	122.2	15
April	x	7.3	129.7	14
May	x	7.0	83.7	13
June	x	7.1	112.0	16
July	16.1	7.3	174.6	29
August	17.4	7.1	114.3	20
September	18.8	7.1	80.4	16
October	19.3	5.7	57.3	12
November	21.3	5.2	27.1	7
December	20.3	3.8	0.0	0
Annual Total			981.5	151

Table 8 Annual Meteorological Report Ogelcho (1980)

Months	Air Temperature Mean °C		Precipitation		Evaporation
	Max	Min	Total (mm)	No.of rainy days	
January	30.5	11.1	0.0	0	331.8
February	30.3	13.2	4.5	3	288.1
March	x	x	x	x	x
April	x	x	x	x	x
May	x	x	x	x	x
June	x	x	x	x	x
July	x	x	x	x	x
August	x	x	x	x	x
September	x	x	x	x	x
October	27.2	12.4	35.1	4	300.0
November	28.4	12.4	1.6	1	399.2
December	28.1	9.5	0.0	0	387.8

x - Not recorded

Table 9 Annual Meteorological Report [illegible] (1980)

Months	Air Temperature Mean °C		Precipitation	
	Max	Min	(mm)	No. of rainy days
January	24.1	[illegible]	[illegible]	0
February	23.2	[illegible]	[illegible]	1
March	x	x	[illegible]	x
April	25.8	x	[illegible]	14
May	22.9	x	[illegible]	6
June	x	[illegible]	[illegible]	5
July	x	7.8	[illegible]	23
August	x	9.0	[illegible]	21
September	x	7.7	[illegible]	9
October	x	6.2	[illegible]	8
November	x	3.7	[illegible]	4
December	x	1.4	[illegible]	0
Annual Total			[illegible]	91

Table 10 Annual Meteorological [illegible] Data (1980)

Months	Air Temperature Mean °C		Precipitation	
	Max	Min	(mm)	No. of rainy days
January	x	x	[illegible]	x
February	x	x	[illegible]	x
March	x	x	[illegible]	x
April	x	x	[illegible]	x
May	x	x	[illegible]	x
June	x	x	0.5	17
July	x	x	.1	18
August	x	x	.4	7
September	x	x	.7	11
October	x	x	.3	5
November	x	x	0.0	0
December	x	x	0.0	0

x - Not recorded

Table 11 Annual Meteorological Report at Gobessa (1980)

Months	Air Temperature Mean °C		Total(mm)	No. of rainy days
	Max	Min		
January	x	x	x	x
February	x	x	x	x
March	x	x	x	x
April	x	x	x	x
May	x	x	x	x
June	x	x	x	x
July	21.4	9.3	159.2	26
August	21.3	9.8	146.2	24
September	20.9	9.1	84.6	25
October	20.1	7.3	35.7	12
November	21.2	6.1	27.0	6
December	x	x	2.8	1

Table 12 Annual Meteorological Report at Arboye (1980)

Months	Air Temperature Mean °C		Precipitation	
	Max	Min	Total (mm	No. of rainy days
January	x	x	x	x
February	x	x	x	x
March	x	x	x	x
April	x	x	x	x
May	x	x	x	x
June	x	x	x	x
July	22.8	x	123.8	15
August	22.7	x	108.1	14
September	22.7	x	105.9	12
October	x	x	-	-
November	21.3	x	20.6	3
December	22.1	x	0.0	0

x - Not recorded

Table 13 Annual Meteorological Report for Cinna (1980)

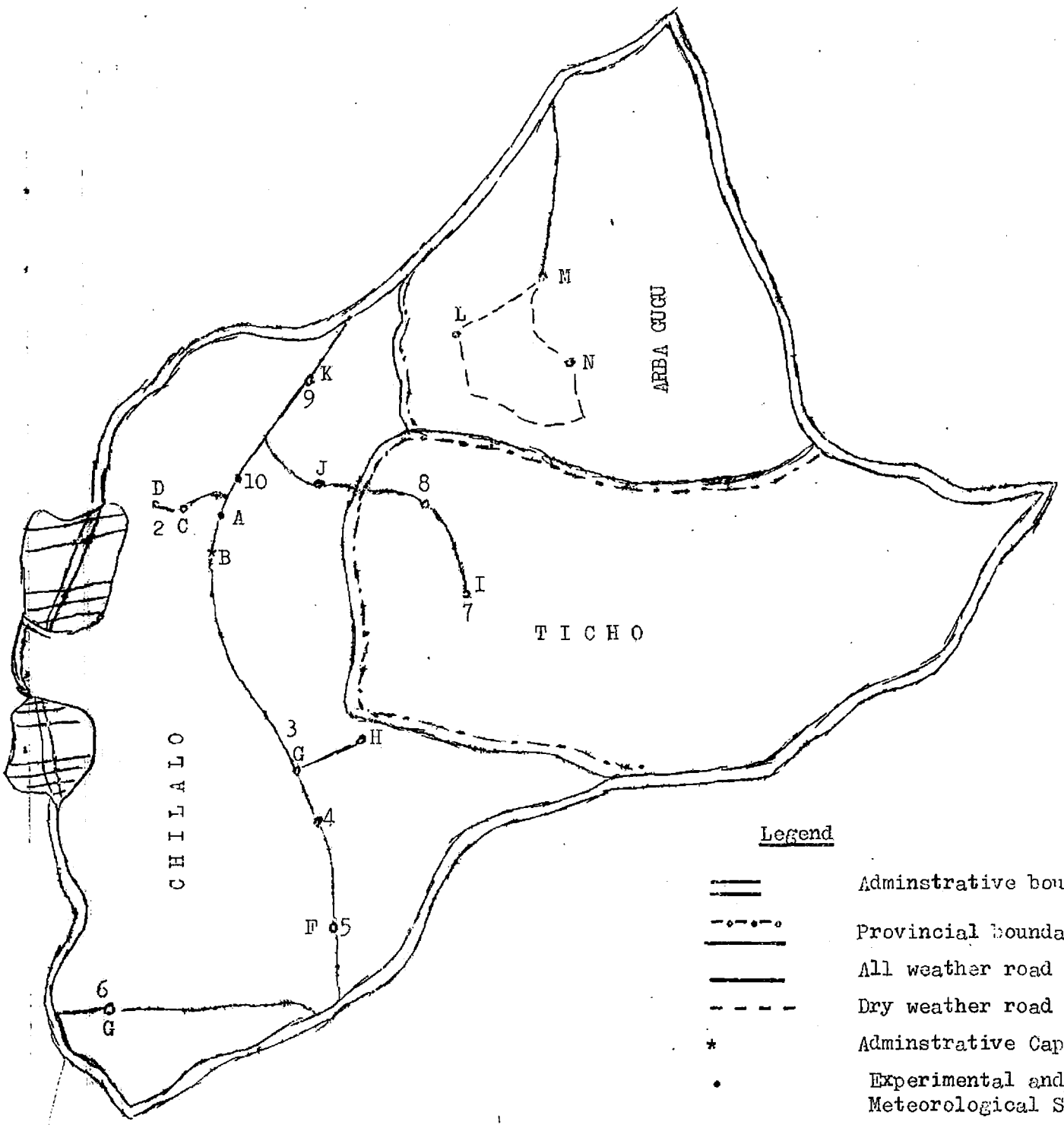
Months	Air Temperature Mean °C		Precipitation	
	Max	Min	Total (mm)	No. of rainy days
January	x	x		x
February	x	x		x
March	x	x		x
April	x	x		x
May	x	x		x
June	x	10.8		13
July	x	9.7		22
August	x	9.0		25
September	x	10.1		24
October	x	9.8		13
November	x	8.0		3
December	x	7.6		1

Table 14 Annual Meteorological Report for Abomsa (1980)

Months	Air Temperature Mean °C		Precipitation	
	Max	Min	Total (mm)	No. of rainy days
January	x	x	x	x
February	x	x	x	x
March	x	x	x	x
April	x	x	x	x
May	x	x	x	x
June	x	x	31.0	6
July	x	x	77.0	4
August	x	x	126.8	13
September	x	x	137.8	14
October	x	x	0.0	0
November	x	x	0.0	0
December	x	x	0.0	0

x - Not recorded

Map of Experimental and Meteorological Station



Legend

- Adminstrative boundary
- Provincial boundary
- All weather road
- Dry weather road
- * Adminstrative Capital
- • Experimental and/or Meteorological Statins

Experimental Stations

1. Kulumsa
2. Sheled
3. Bekoji
4. Meraro
5. Asassa
6. Kofelle
7. Robe
8. Diksis
9. Dhera
10. Gonde

Met. Stations

A. Kulumsa
B. Asella
C. Arata
D. Ogolcho
E. Bekoji
F. Asassa
G. Kofelle
H. Gobena
I. Robe
J. Huruta
K. Dhera
L. Deju
M. Dhomsa
N. Gana

P A R T II

RESULTS OF TRIALS AND OBSERVATION

SOILS

001 - 1 SOIL SURVEY

In the season 1980, about 800 soil samples were collected from six Farmers Producers Co-operatives (Koro-Degaga, Sheled, Deneba, Golbe, Lekensho and Sedicho) and from ARDU Seed Multiplication Farms (Gonde and Etheya Shaki). Out of these samples, 780 were tested for PH and available Phosphorus contents. Physical analysis, such as, permeability, texture, and organic matter were also performed on some of the above samples.

Different soil samples were also taken from Lukuche plain where pulp plantation is being established to test its permeability for drainage problems. Analysis results of the above soil samples are presented in tables 1 - 3.

001-1a PH Test at Different sites

Name of sampling areas	No of samples in different PH ranges							
	5.5	5.6-6.0	6.1-6.5	6.6-7.3	7.4-7.8	7.9-8.4	8.5	Total
Deneba	-	-	21	75	12	-	-	108
Golbe	-	-	-	-	1	5	8	14
Koro Degaga	-	-	-	11	83	86	-	180
Lekamsho	-	-	2	43	12	7	-	64
Sedicho	-	-	-	1	23	11	1	36
Sheled	-	-	-	55	20	-	-	75
Chilalo	-	6	8	20	6	-	-	40
Gonde	-	2	45	11	2	-	-	60
Etheya	-	11	70	25	-	-	-	106
Kulumsa	-	9	15	-	-	-	-	24
Lukuche	8	13	8	2	-	-	-	31

Remarks: PH range from 5.5 Strongly acid
5.6-6.0 Medium acid
6.1-6.5 Slightly "
6.6-7.3 Neutral
7.4-7.8 Mildly Alkaline
7.9-8.4 Moderately Alkaline
8.5 Strongly "

001-1b Soil Phosphorus Analysis at Different sites

Name of Sampling area	No of Samples in different phosphorus ranges						
	P.ppm 0-10	P.ppm 11-20	P.ppm 21-40	P.ppm 41-80	P.ppm 81-120	P.ppm 121-250	Total
Deneba	-	-	14	38	40	16	108
Golbe	-	-	1	10	1	2	14
Koro Degaga	-	5	86	89	-	-	180
Lekamsho	-	-	20	42	2	-	64
Sedicho	-	-	-	25	9	2	36
Sheled	-	-	12	63	-	-	75
Chilalo	-	15	20	2	1	2	40
Gonde	-	-	53	7	-	-	60
Etheya	-	-	17	80	6	3	106
Kulumsa	-	-	-	24	-	-	24
Lukuche	-	8	21	2	-	-	31

Remarks: Available Phosphorus range from:-

0-10 ppm	Very low
11-20 "	Low
21-40 "	Medium
41-80 "	Medium High
81-120 "	High
121-250 "	Very High

001-1c Texture analysis of samples taken from Bilalo Awraja

Place	Depth (cm)	Texture content			
		% Sa	% Silt	% Clay	Classes
Kechema	Top	25.	24.3	49.8	Clay
	30	13.	24.9	61.9	"
	0-70	13.	13.1	73.4	"
	110-155	19.	34.2	46.1	"
Bilalo	A	21.	29.8	49.0	"
	B	13.	16.9	70.6	"
Waji	Top	9.0	15.0	75.5	"
	0-30	15.	22.4	62.0	"
Near Chebi	0-20	24.	32.3	43.0	"
	0-80	14.	13.4	72.3	"
Chebi	Top	23.	25.0	51.7	"
	30-50	26.	49.0	24.5	Loam
	90-110	20.	45.7	34.0	Silty clay loam
S.Asella	30-50	19.	17.5	62.5	Clay
	60-80	18.	23.9	57.9	"
E. Asella	0-30	11.	19.9	68.4	"
	30-60	18.	10.8	70.9	"
	0-20	24.	15.1	60.7	"
	20-40	18.	17.2	64.2	"
	35-60	8.	15.4	75.7	"
Deneba	30-60	21.	42.7	35.5	Clay loam
	60-110	25.	34.1	40.5	" "
	0-25	26.	36.3	37.6	" "
Kulumsa	0-30	20.	30.7	48.6	Clay
	50-90	12.	16.8	70.8	"

Fertilizer Trial

004 - 1 Effect of DAP on Water logged area (Diksis).

A fertilizer trial was conducted at Diksis State Farm on water-logged heavy clay soil. The fertilizer used was DAP at five levels of fertilization. It was found that as the rate of DAP increased, the yield of wheat also increased. Even though the general performance and yields were poor due to high water-logging of non-beded field, application of DAP at 150 kg/ha gave the highest yield while the check plot indicates no yield.

004-1 Yields of wheat on water logged area (Diksis) at different rates of DAP application.

Rate of fertilizer (DAP) kg/ha	Yield of wheat kg/ha
0	0
50	342
100	492
150	927
175	931
200	907

Statistically, high C.V. % was observed from this trial.

CEREALS

Wheat

113 -1 - 3 Date of sowing Wheat Varieties (Bekoji, Diksis, Robe)

The objective of this trial is to establish optimum sowing dates at different location for three promising varieties of wheat about to reach farmers. Enkoy, the already released variety was included throughout the locations. Four seeding dates at two weeks interval were compared at Bekoji and Robe, while the same varieties were tested with five sowing dates at Diksis.

At Diksis plant population was extremely low for the first sowing date due to low precipitation which finally resulted in low yields. Stripe rust infestation was serious at the same station on lines Ku75-11-64 & K6399-3, but low only at later sowing on the latter.

At Bekoji all the new varieties responded best to the second date (24 June). From this year's result end of June seems to be the best sowing time for all the varieties at Diksis. At Robe the second sowing date (16 July) appeared as the optimum date for all varieties tested.

In all testing sites the response of the varieties to different sowing dates was very much similar probably due to a reason that the varieties are similar in maturity.

Differences in response to the different sowing dates were not statistically proved because of some missing yield data.

.../..

113 - 1 Date of sowing Wheat Varieties (Bekoji)

Yield Kg/ha

Sowing dates	Varieties				Date Mean
	K6295-4A	Ku75-11-64	K6399-3	Enkoy	
10 June	4990	5850	5040	4940	5210
24 June	5750	6040	5440	4810	5510
8 July	4350	4770	4500	3820	4360
22 "	3480	3920	3680	3340	3610
Variety mean	4640	5150	4670	4230	

113-1 Some Agronomic Date

Variety	Sowing date	Stand %	Days to		Diseases				Height cm.	1000-seed Wt. gm.	Hl-Weigh Kg.
			Heading	Maturity	Stripe rust	Leaf rust%	Stem rust%	Septoria (0-9/0-9)			
K6295-4A	10 June	79	90	170	-	0	0	3/7	108	37.8	80.8
	24 "	87	97	153	-	10 MS	0	4/8	113	34.3	80.3
	8 July	90	85	139	-	10MR	0	4/8	111	35.5	84.4
	22 "	90	-	124	50S	0	25S	4/8	109	35.3	80.8
Ku75-11-64	10 June	74	90	176	-	tr	0	4/8	96	45.0	81.0
	24 "	80	100	152	10S	0	0	4/8	101	42.5	78.4
	8 July	81	84	135	-	0	0	4/8	104	40.8	77.5
	22 "	85	-	116	-	0	0	4/8	108	41.3	79.8
K6399-3	10 June	87	88	167	-	5MR	0	4/8	104	39.5	80.6
	24 "	78	90	155	-	30MR	0	4/8	111	35.5	81.2
	8 July	88	76	139	10MS	30MR	20MS	2/3	103	32.5	79.6
	22 "	81	48	-	-	30MR	0	2/4	108	36.8	81.2
Enkoy	10 June	89	85	164	-	40MR	0	3/8	106	34.8	81.6
	24 "	81	88	147	-	50R	0	4/8	108	30.8	80.6
	8 July	87	78	142	-	40R	0	4/8	96	29.3	80.8
	22 "	79	51	121	-	0	0	4/8	105	30.5	80.8

Plot size, M^2 = 4.0

Fertilizer, kg/ha = 150 DAP

Seeding rate, kg/ha = 125

113-2 Date of sowing Wheat varieties (Diksis)

Yield kg/ha

Sowing date	Varieties				Date Mean
	K6295-4A	Ku75-11-64	K6399-3	Enkoy	
30 May	400	400	790	850	610
14 June	1890	1690	2230	3010	2210
28 June	4240	4880	4060	4260	4360
15 July	4070	3730	2720	3540	3520
29 "	2280	1180	1400	2280	1810
Variety Mean	2580	2380	2260	2790	

113 - 2 Some Agronomic Data

Variety	Sowing dates	Stand % at harvest	Days to Heading	Diseases		Lodging %	Height cm.	1000-seed Wt. gm.	HL.Wt. kg.
				Septoria 0-9	Stripe rust 0-9/0-5				
K6295-4A	30 May	5	82	7	0	0	100	32.5	79.4
	14 June	43	77	4	0	0	110	37.8	81.8
	28 "	95	79	1	0	0	118	39.3	83.4
	15 July	90	78	3	0	0	115	39.5	84.2
	29 July	63	-	3	8/2	0	113	36.3	82.6
Ku75-11-64	30 May	7	84	8	9/5	0	88	35.0	76.2
	14 June	30	83	6	-	-	85	37.8	79.8
	28 June	80	81	5	9/4	0	95	39.3	79.6
	15 July	80	80	5	9/5	0	103	46.8	81.4
	29 July	67	-	4	9/5	0	88	38.8	74.8
K6399-3	30 May	5	85	8	0	0	89	25.8	73.2
	14 June	77	79	8	0	0	98	30.5	78.8
	28 June	95	75	4	0	10	105	33.3	81.2
	15 July	85	76	3	9/1	30	103	30.5	80.4
	29 July	53	77	3	9/2	0	95	34.3	79.8
Enkoy	30 May	10	83	7	0	0	100	32.8	80.4
	14 June	63	77	5	0	0	105	35.0	82.2
	28 June	93	75	2	0	0	113	35.3	83.8
	15 July	88	72	3	0	0	105	35.8	81.6
	29 July	73	76	1	0	0	98	34.8	84.2

Plot size, m^2 = 4.0
Fertilizer, kg/ha = 150 DAP
Seeding rate, kg/ha = 125

113-3 Date of Sowing Wheat varieties (Robe)

Sowing Date	Varieties				Date Mean
	K6295-4A	Ku75-11-64	K6399-3	Enkoy	
2 July	3080	3310	3020	2880	3070
16 July	3340	3650	3300	3570	3470
30 July	2380	3440	3080	3340	3060
14 August	1880	1730	1950	2390	1990
Variety mean	2670	3030	2840	3050	

Some agronomic data

Variety	Sowing date	Days to heading	Height cm.
K6295-4A	2 July	63	93
	16 "	67	95
	30 "	66	83
	14 "	71	80
Ku75-11-64	2 July	68	77
	16 "	68	78
	30 "	71	72
	14 "	73	63
K6399-3	2 July	59	88
	16 "	66	78
	30 "	63	78
	14 "	60	75
Enkoy	2 July	67	92
	16 "	61	92
	30 "	64	85
	14 "	58	80

Plot size, M^2 = 4.0

Fertilizer Kg/ha = 150 DAP

Seeding rate, kg/ha = 125

115-1, 2, 4 - 11 Micro Yield Trial of Wheat (Kulumsa, Asassa, Bekoji, Diksis, Dhera)

Lines of wheat tested in this trial were selects from the 1978 and 1979 Nurseries and Observation. Three sets of [illegible] but consisting of different lines were conducted at Kulumsa while two sets each were carried out at Asassa, Bekoji and Diksis. At Dhera a set comprising [illegible] eight tolerant lines were tested.

Weather conditions during the growing period were not in favour of diseases to develop. Some of the entries manifested attractive yield potentials at different locations which has been considered as the most desirable criteria for this harvest to advance some of the lines to the next testing cycle as there was no serious disease epidemic.

115 - 1 Micro Yield Trial of Wheat (Kulumsa)

Variety/Treatment	Yield 87.5% DM kg/ha	Stand % Early Stage	Days to heading	Diseases Septoria 0-5/0-9	Diseases Leaf rust %	Diseases Stem rust %	Shattr-ing %	Height cm .	1000-seed Wt.gm.	Hl.Wt kg.
Ku 78-11-73	4200	90	60	3/7	tMR	0	3	75	34.5	84.9
" -86	3700	85	60	0	15MS	0	3	75	33.5	85.2
" -85	3450	83	66	1/6	0	0	8	75	39.0	84.1
" -114	3350	100	62	1/6	tMS	0	23	65	34.0	85.0
" -95	3230	75	68	0	0	0	0	73	41.0	84.1
" -118	3200	85	64	0	60MS	0	50	93	39.0	82.8
" -102	3050	83	63	1/6	0	0	5	68	33.5	83.2
" -101	3030	85	68	1/6	0	0	0	83	36.0	83.0
" -87	3000	80	68	1/6	-	-	0	75	38.5	84.6
" -100	3000	90	66	2/5	0	0	8	85	38.0	82.8
" -1	2850	88	62	0	0	0	10	68	34.5	83.1
" -80	2830	88	59	2/5	-	-	0	75	39.0	85.1
" -27	2750	80	65	2/7	0	0	5	80	37.5	84.0
" -90	2500	78	64	0	tMS	0	18	65	42.0	85.4
" -21	2430	80	60	2/7	0	0	0	80	50.0	85.4
" -22	2030	80	60	4/7	0	0	5	83	48.0	85.0

Plot size, M^2 : 2.0
Fertilizer, kg/ha : 100 DAP (18/46)
Planting date : 7 July, 1980
Seeding rate, kg/ha: 125

L.S.D. 5% = 765 Kg/ha
L.S.D. 1% = 1054 "
C.V. = 11.8 %

115 - 2 Micro Yield Trial of Wheat (Mesa)

Variety/Treatment	Yield 87.5% DM kg/ha	Stand % at harvest	Days to heading	Days to maturity	Disease Leaf blotch 1C-5%-9	Height cm.	100C-seed Wt. gm	HL. Wt. kg
Ku78-11-86	5980	70	70		3/8	80	31.0	85.
" -100	5880	95	75		4/7	115	39.5	81.
" -101	5500	90	76		4/7	110	36.5	82.
" -85	5400	75	79		3/7	85	40.5	83.
" -27	5100	70	79		2/6	95	35.0	81.
Ku79-11-90	5030	70	78		3.5/7	105	40.5	83.
" -95	4930	70	82		3/6	85	38.0	82.
Ku78-11-114	4830	98	73		3.5/7	110	33.5	85.
Ku79-11-87	4750	78	79		3.5/7	80	37.0	83.
" -73	4580	80	70		4/7	90	33.0	83.
Ku79-11-94	4500	73	79		3/7	85	38.0	83.
Ku78-11-80	4500	85	70		4.5/8	90	35.0	83.
" -118	3950	93	79		3/6	120	31.5	82.
" -22	3780	83	75		3.5/7	100	47.5	82.
" -102	3750	80	77		4.5/8	90	37.0	82.
" -21	3730	70	75		4/7	90	47.0	82.
" - 1	3380	70	76		4/8	80	36.5	1.

Plot size, M^2 : 2.0
Fertilizer, kg/ha : 150 D
Planting date : 14 Ju 19
Seeding rate, kg/ha: 125

L.S.D. 5% = 1447 kg/ha
L.S.D. 1 % = NS
C.V. = 14.6 %

115 - 4 Micro Yield Trial of Wheat (Diksis)

Variety/Treatment	Yield 87.5% DM kg/ha	Stand %	Days to heading	Lodging% Late	Height cm.	1000-seed Wt.gm.	HL-Weight kg.
Ku 78-11-90	4050	70	70	0	105	46.8	68.8
" -78	3700	70	69	0	113	36.5	79.6
" - 3	3700	75	82	0	95	34.0	87.0
" -109	3630	70	81	5	155	36.5	79.2
" - 28	3380	85	84	0	85	-	-
" - 23	3080	75	86	0	103	-	-
" - 25	2625	75	89	0	90	32.0	83.2
" - 74	2580	70	80	0	78	34.0	82.0
" - 77	2480	75	83	0	73	27.5	73.4
" - 103	2480	75	81	0	85	28.3	76.0
" - 116	2100	73	87	90	140	30.3	45.2

Plot size, M^2 : 2.0
Fertilizer, kg/ha : 80 DAP
Planting date : 27 June, 1980
Seeding rate, kg/ha: 125

L.S.D. 5% = 1159 kg/ha
L.S.D. 1% = NS
C.V. = 17.0 %

115 - 5 Micro Yield Trial of Wheat (Bek

Variety/Treatment	Yield 87.5 DM kg/ha	Stand %	Da... hea...	...	Lodging Late %	Height cm.	1000-seed wt/gm	HL-Wt. kg.
Ku78-11-28	5380	75		12	0	103	36.8	79.0
" -74	5380	73		11	0	90	42.3	84.3
" -77	5000	85		12	0	83	33.0	83.0
" -23	4380	73		12	0	103	29.3	83.9
" -25	4330	70		12	0	98	40.0	82.0
" -90	4200	73		14	0	100	44.5	71.0
" -103	4130	78		12	0	93	35.0	80.6
" -109	3630	93		6	13	118	30.8	79.9
" -79	3650	75		9	0	110	34.0	78.9
" - 3	3630	83		10	0	95	38.8	79.0
" -116	3350	93		9	44	132	28.5	78.9

Plot size, M^2 : 2.0
Fertilizer, kg/ha: 100 DAP
Planting date : 20 June, 1980
Seeding rate, kg/ha: 125

L.S.D. 5% = 900 kg/ha
L.S.D. 1% = 1280 "
C.V. = 9.4 %

115 - 6 Micro Yield Trial of Wheat (Kulumsa)

Variety/Treatment	Yield 87.5% DM kg/ha	Stand % early stage	Days to heading	Diseases Leaf rust	Diseases Septoria 0-5/0-9	Shattering	Height cm.	1000-seed Wt.gm.	Hl-Wt kg.
Ku 78-11-90	3950	73	51	20MS	2/6	0	88	43.0	76.1
" -77	3650	88	64	70S	3/6	0	65	37.0	85.0
" -74	3400	80	62	tMS	1/9	5	78	38.0	84.1
" -23	3100	80	67	0	1/9	0	80	31.0	84.7
" -103	2880	80	65	20MS	2/7	8	70	34.5	83.5
" - 8	2700	78	67	0	1/9	5	78	36.5	83.6
" - 3	3100	80	63	30MR	0	10	80	42.0	84.8
" -116	2400	93	71	0	0	0	113	37.5	83.6
" -78	2700	83	58	40MR	1/6	23	98	36.5	78.0
" -109	2150	90	67	0	0	30	105	38.5	83.6
" - 25	2030	43	70	0	0	0	80	34.5	81.2

Plot size, M^2 : 2.0
Fertilizer, kg/ha: 100 DAP (18/46)
Planting date : 7 July, 1980
Seeding rate, kg/ha: 125

L.S.D. 5% = 838 kg/ha
L.S.D. 1 % = 1192 "
C.V. = 13.2%

115 - 7 Micro Yield Trial of Wheat (Kulumsa)

Variety/ Treatment	Yield 87.5% DM kg/ha	Stand % at seedling	Days to heading	% Shattering	1000-Seed Weight gm.	HL-Weight kg.
Ku78-11-41	4100	85	65	30	41.0	85.0
" -45	3400	83	63	10	37.5	85.1
" -5	3180	78	66	8	39.0	82.8
" -151	3100	88	75	8	36.5	83.4
" -18	3030	80	62	0	35.5	84.7
" -42	2850	75	66	5	41.5	85.7
" -152	2850	88	65	8	35.0	85.5
" -149	2680	83	62	15	39.0	85.2
" -140	2650	78	64	8	39.0	85.0
" -150	2650	83	64	25	42.5	85.0
" -134	2530	80	64	8	38.5	85.8

Plot size, M^2 : 2.0
Fertilizer, kg/ha : 100 DAP
Planting date : 7 July, 1980
Seeding rate, kg/ha: 125

L.S.D. 5% = 557 kg/ha
L.S.D. 1% = 792 "
C.V. = 8.3 %

115 - 8 Micro Yield Trial of Wheat (Bekoji)

Variety/Treatment	Yield 87.5% DM kg/ha	Stand %	Days to heading	Days to Maturity	Diseases Septoria 0-5/0-9	Lodging % Late	Height cm.	1000-Seed wt. gm.	HL-Weight kg.
Ku 78-11-41	6530	83	98	154	5/9	0	95	35.0	82.5
Ku 78-11-149	4900	83	97	152	4/8	7	115	34.5	81.5
Ku 78-11-140	4900	78	99	156	4/8	7	125	29.0	81.6
Ku 78-11-42	4750	73	97	151	5/9	0	93	35.0	83.5
Ku 78-11-134	4750	90	99	154	4/8	8	120	32.5	82.0
Ku 78-11-38	4700	78	98	156	4/8	0	95	32.0	81.0
Ku 78-11-18	4680	85	94	151	5/9	0	90	30.5	82.3
Ku 78-11-59	4650	73	106	155	3/8	0	98	29.0	81.9
Ku 77-11-45	4630	83	95	152	5/9	0	83	32.0	82.5
Ku 78-11- 5	4550	78	99	155	4/8	0	103	32.5	82.7
Ku78-11-133	4480	73	96	151	3/8	8	113	31.0	79.3
Ku 78-11-151	4330	83	104	152	3/8	14	113	35.0	80.5
" -150	4300	80	98	154	3/8	16	123	29.5	78.3
" -152	4080	85	104	156	3/8	7	115	24.0	78.0
" -44	3850	80	98	156	3/8	0	95	33.0	76.0

Plot size M^2 .... 2.0

Fertilizer, kg/ha : 100 DAP

Planting date : 20 June, 1980

Seeding rate, kg/ha: 125

L.S.D. 5% = 1073 kg/ha

L.S.D. 1% = NS

C.V. = 10.6

115 - 9 Micro Yield Trial of Wheat (Asassa)

Variety / Treatment	Yield 87.5% DM kg/ha	Stand %	Days to Heading	Days to Maturity	Disease Septoria 0-5/0-9	Lodging Late %	Height cm.	1000-seed wt. gm.	Hl-Weight kg.
Ku 78 -11-150	5800	80	81	138	3/5	75	130	37.0	81.0
" -41	5150	83	78	135	4.5/8	0	95	31.0	80.5
" - 5	4680	80	75	137	4/8	0	110	36.0	80.0
" -42	4630	75	80	137	4/8	0	108	33.0	80.1
" -133	4530	78	75	134	4/8	25	120	34.5	80.2
" -151	4400	85	83	144	3/7	0	123	32.3	83.0
" -18	4230	88	74	135	5/8	0	93	25.0	76.0
" -134	4150	83	80	136	4/8	25	120	34.0	81.6
" -45	4130	75	78	137	5/8	0	88	27.8	79.5
" -140	4130	68	79	138	3/6	0	138	33.3	82.9
" -149	4080	75	76	138	4/8	0	125	33.8	83.3
" -152	3680	95	79	143	1/2	0	128	27.3	83.0
Pichi Chuala 'S'	3600	70	78	134	5/8	0	88	27.8	79.0

Plot size, M^2 : 2.0
Fertilizer, kg/ha : 150 DAP
Planting date : 12 June, 1980
Seeding rate : 125

L.S.D. 5% = NS
C.V. = 14.1 %

115 - 10 Micro Yield Trial of Wheat (Diksis)

Variety / Treatment	Yield 87.5% DM		Stand %	Days to heading	Days to maturity	Septoria Disease (0-9)	Lodging %		Height cm	1000-seed Weight gm	Hl-Weight kg.
	kg/ha	Rel.					Late				
Ku 78-11-1	4650	186	83	94	149	4	0		90	35.5	84.4
" -138	3580	143	83	86	-	6	0		98	36.5	82.3
" -55	3480	139	78	88	144	7	0		90	35.8	82.8
" -19	3480	139	80	81	140	3	0		90	27.5	79.4
" -139	3050	122	80	91	-	3	0		123	37.0	83.7
" -148	3000	120	80	86	136	1	0		105	38.3	85.7
" -60	2950	118	73	94	144	4	0		88	30.5	82.0
" -56	2630	105	80	89	150	3	0		100	34.0	79.1
Local variety(check)	2500	100	78	85	145	6	75		113	35.0	78.1
Ku 78 - 11-4	2150	86	75	89	-	3	0		105	38.8	82.2
" -44	1800	72	75	84	136	8	0		85	20.3	73.0

Plot size, M^2 : 2.0 L.S.D. 5% = 1154 kg/ha
Fertilizer, kg/ha: 80 DAP L.S.D. 1% = NS
Planting date : 27 June'80 C.V. = 17.3 %
Seeding rate, kg/ha: 125

115 - 11 Micro Yield Trial of Wheat (Dher)

Variety / Treatment	Yield 87.5% DM kg/ha	Stand at see	Days to Maturity	Height cm.	1000-seed wt gm.	Hl-Wt. kg.
Ku 78 - 11 - 19	1400	70	47	81	60	31.5	79.6
" - 138	1250	73	48	81	60	30.5	78.4
" - 139	1150	68	46	89	83	33.0	80.8
Ku 74 - 11 - 42	1130	68	49	81	60	30.8	78.6
78 - 11 - 55	1100	83	50	81	65	30.0	80.6
" - 1	730	73	58	81	63	27.5	77.2
" - 60	700	70	59	-	68	30.8	80.0
" - 56	580	65	56	-	53	32.5	80.0
" - 148	580	63	59	-	65	31.5	-
" - 57	400	75	56	-	60	30.8	-

Plot size, M^2 : [illegible]
Fertilizer, kg/ha : [illegible] DAP
Planting date : [illegible] July 1980
Seeding rate, kg/ha: [illegible]

I.S.D. 5% = NS
C.V. = 46.5 %

115 - 13 & 14 Observation Trial of Wheats (Kulumsa, Asassa)

Lines of wheat included in this observation were selects from the 1979 nurseries. 21 and 33 lines were tested at Kulumsa and Asassa respectively. A local variety was included as a check at Asassa.

Septoria leaf blotch was the only disease observed on most entries at both sites. Attractive yields were recorded for some lines at Asassa. Ku 79-11-12 was the best yielder at both testing locations with notable higher yield at Asassa. Top yielding lines at both locations should further be tested to arrive at good selections.

115 - 13 Observation Trial of Wheat (Kulumsa)

Variety / Treatment	Yield kg/ha	Stand % at seedling	Days to heading	Leaf rust 0-5/0-9	Shattering %	1000-seed wt. gm.	HL-Weight kg.
Ku 79-11-12	4250	65	74	1/6	15	43.0	84.2
" -45	4250	85	64	1/6	0	35.5	84.8
" -11	3850	75	63	2/6	10	41.5	85.0
" -41	3650	65	73	0	5	34.5	85.4
" -10	3550	70	65	1/6	0	39.0	83.8
" -24	3350	50	70	1/5	0	33.0	85.6
" -42	3300	85	63	2/7	0	35.0	85.8
" -30	3100	70	61	3/6	0	36.5	85.0
" -21	3100	60	73	2/7	0	35.0	85.2
" -26	3050	45	58	0	0	41.5	81.0
" - 4	3050	65	63	1/5	0	41.0	85.0
" -34	3050	75	61	4/9	5	35.5	85.2
" 31	2900	85	61	0.5/6	5	39.0	85.0
" -38	2900	70	71	2/5	20	36.0	83.0
" -17	2850	55	76	2/5	0	41.5	83.0
" -23	2750	50	74	1/6	0	35.0	83.4
" - 3	2650	80	79	2/7	0	33.0	81.2
" -32	2450	70	78	0	0	38.5	80.2
" -36	2250	70	59	3/6	0	44.5	84.2
" -44	2150	75	60	2/6	0	42.0	84.2
" -28	1550	20	69	0	0	36.0	80.0

Plot size, M^2 : 2.0

Fertilizer, kg/ha: 100 DAP

Planting date : 7 July, 1980

Seeding rate, kg/ha: 125

115 - 14 Observation Trial of Wheats (Asassa)

Variety / Treatment	Yield		Days to heading	Days to Maturity	Disease	Height kg.
	kg/ha	Rel.			Septoria 0-9/0-5	
Ku 79-11-12	5230	129	78	131	7/3	98
" -19	5230	129	77	136	7/3	100
" -31	5100	126	78	131	7/3	90
" -45	4900	123	79	131	7/4	90
" -42	4750	117	82	137	7/3	98
" -29	4630	114	82	128	7/4	70
" -40	4470	110	78	134	8/5	110
" -32	4450	110	89	136	5/3	90
" -26	4400	109	72	136	7/4	90
" -15	4370	108	89	136	6/3	95
" -24	4290	106	85	137	5/3	95
" -10	4240	105	78	132	7/4	95
" -43	4160	103	81	131	7/4	105
" -18	4100	101	77	137	6/3	105
Local variety(check)	4050	100	80	129	8/5	130

Contd..

115 - 14 Contd...

Variety / Treatment	Yield		Days to		Disease	Height
	kg/ha	Rel.	Heading	Maturity	Septoria 0-9/0-5	cm.
Ku 79-11-25	3730	92	85	137	6/2	95
" -27	3720	92	86	134	6/3	90
" -38	3710	92	83	132	7/3	120
" -74	3600	89	91	140	7/3	135
" -23	3500	86	83	135	7/3	85
" -22	3480	86	72	134	7/4	90
" -28	3430	85	84	133	7/3	85
" -44	3430	85	74	128	8/5	75
" -37	3300	81	68	132	7/5	105
" -41	3270	81	87	137	5/2	105
" -30	3220	80	78	132	7/4	95
" -34	3180	79	79	137	7/3	95
" -35	3170	78	69	133	7/4	90
" -14	3150	78	76	134	7/4	75
" -21	3120	77	87	137	5/3	100
" -36	3100	77	71	131	7/5	85
" -20	2730	67	77	135	7/3	110
" - 3	2520	62	95	143	6/2	120
" -11	2420	60	86	136	6/2	105

Plot size, M^2 : 2,0

Fertilizer, kg/ha: 150

Planting date : 13 June, 1980

115 - 17 - 21 Variety Trial of Wheats with high yielding capacity (Dhera, Asassa, Kulumsa, Diksis, Bekoji)

Varieties and lines of wheat included in this trial were selected on the basis of their performances in previous years at different sites. Enkoy and a local variety were entered as checks throughout the testing sites.

Growing conditions were quite normal except that there was a shortage of rainfall at Asassa, Bekoji and Dhera towards grain filling stage. Disease incidence was not serious in general. Alike Enkoy, Ku 75-11-64 seems to have a wide range of adaptability as can be seen from the results in all the testing sites eventhough it was out-yielded by some entries at Asassa & Kulumsa due to low plant population.

115 - 17 Variety Trial of Wheat with [illegible] capacity (Dhera)

Variety / Treatment	Yield 87.5% DM kg/ha	Yield 87.5% DM Rel.	Stand %	[illegible]	Days to Heading	Days to Maturity	Disease Leaf rust	Height cm	1000 seed wt. gm	HL-Wt. kg
K 75-11-64	1460	106	[illegible]	[illegible]	[illegible]	84	-	60	28.0	80.0
Enkoy (Check)	1380	100	[illegible]	[illegible]	[illegible]	84	-	50	27.5	80.4
Carthage a 74-NP-Tob 'S'	1280	93	[illegible]	[illegible]	[illegible]	80	-	60	29.8	77.8
Dong 74 (Kal Pet)	1130	82	[illegible]	[illegible]	[illegible]	82	-	55	30.0	82.6
5711x Nortena-Ji143-22	1110	80	[illegible]	[illegible]	[illegible]	82	-	60	28.5	78.0
Inia x 70 b 'S'	990	72	[illegible]	[illegible]	[illegible]	83	-	50	27.5	80.0
ET 12 D4L7L	880	64	[illegible]	[illegible]	[illegible]	84	-	40	27.0	80.2
LR 64^2 - Son 64	850	62	[illegible]	[illegible]	[illegible]	81	-	40	27.5	78.8
21931/Ch An	800	58	84	[illegible]	[illegible]	82	-	60	27.0	79.8
Local variety (check)	690	50	[illegible]	[illegible]	[illegible]	84	90S	60	32.8	74.8
K 75-11-42	480	35	70	[illegible]	[illegible]	85	-	50	25.8	78.6

Plot size, M^2 : 2.0

Fertilizer, kg/ha : 150 DAP

Planting date : 10 July, 1980

Seeding rate, kg/ha: 125

L.S.D. 5% = NS

C.V. = 57.0 %

115 - 18 Variety Trial of Wheat with high yielding capacity (Asassa)

Variety / Treatment	Yield 87.5% DM		Days to		Diseases		Height cm.	1000-seed Wt. gm.	H-Weight kg.
	kg/ha	Rel	Heading	Maturity	Septoria 0-9	Stem rust %			
21931/Cb Am	4530	105	74	135	7	0	89	29.5	83.0
K6290-Bulk(Check)	4300	100	79	137	5	0	130	33.8	82.6
ET12 D7L9L	4230	98	91	144	7	0	90	25.8	80.0
Local variety	4090	95	78	142	7	10MS	135	40.0	83.3
Inia x Tob 'S'	3990	93	71	129	7	0	90	36.3	83.4
Enkoy	3960	92	76	136	7	0	100	30.8	83.4
Ku 75-11-64	3900	91	79	137	7	0	90	41.8	80.1
Dong 74 (Kal Pet)	3540	82	78	136	7	0	90	24.5	80.1
Kt-54-N-10B-21-10)Kt-548	3480	81	76	137	7	0	90	30.8	82.3
LR64^2-Scn64-(8)	3480	81	72	134	-	0	88	29.5	82.6
5311 xNorteno-Jil43-2L	3260	76	80	135	6	0	95	29.5	81.0

Plot size, M^2 : 2.0
Fertilizer, kg/ha : 150 DAP
Planting date : 13/6/80
Seeding rate, kg/ha: 125

L.S.D. 5% = 629 kg/ha
L.S.D. 1% = 847 "
C.V. = 9.9 %

115 - 19 Variety Trial of Wheat With High Yielding Capacity (Kulumsa)

Variety / Treatment	Yield 87.5% DM		Stand % at seedling	Days to heading	Diseases		Shattering %	Height Cm.	1000-seed weight gm	Hl-Weight kg.
	kg/ha	Rel.			Leaf rust%	Septoria C-5/0-9				
Dong 74 (Kal Pet) 6	3740	137	90	73	0	1/6	5	76	35.0	85.2
Local variety (check)	3640	133	98	74	95S	6e	0	106	40.0	80.0
ET 12.DZ L 9L	3550	130	81	86	10MS	0	10	88	29.5	83.3
K 6399-3	3360	123	90	74	0	3/7	10	72	35.5	85.4
Ku 75-11-54	3260	119	81	75	tS	2/6	10	83	36.0	83.2
Ku75-11-64	2830	104	73	73	tMR	1/6	13	73	47.5	83.0
Kt -54N-10-B-21-10) Kt 5413	2780	102	83	72	tMS	2/6	5	78	35.0	81.9
Enkoy (check)	2730	100	90	71	tMS 10S	1/6	25	80	32.0	85.2
Inia x Tob'S'	2630	96	74	69	C	1/6	5	75	39.5	85.0
Nacozari 'S'	2410	88	85	68	0	4/8	10	64	34.0	83.4
K6290 - Bulk	1900	70	69	69	tS	1/6	5	74	37.5	84.5

Plot size, M^2 : 2.0
Fertilizer, kg/ha: 100 DAP
Planting date : 27 June, 1980
Seeding rate, kg/ha: 125

L.S.D. 5% = 500 kg/ha
L.S.D. 1% = 674 "
C.V. = 11.5

115 - 20 Variety Trial of Wheat with high yielding capacity (Diksis)

Variety / Treatment	Yield 87.5% DM		Stand %	Days to heading	Days to maturity	Diseases			Lodging	Height cm.	1000-seed Weight gm.	Hl-Weight kg.
	kg/ha	Rel.				Septoria (1-9)	Leaf rust %	Stripe rust %	Late			
ET 12 DZL 9L	5110	108	85	-	162	2	-	0	0	88	31.8	83.1
Enkoy(check)	4740	100	90	78	146	3	0	0	0	110	34.0	83.3
K75-11-64	4240	89	90	83	157	6	0	0	0	98	45.5	80.4
Kt-54-N-10)Kt54B-Nal(Duc (Duchamp)8156xPJ62	3700	78	83	77	161	5	0	0	0	88	26.3	77.5
K6399 - 3	3690	78	85	73	142	3	0	0	0	100	31.0	78.6
Local variety	3440	73	85	76	140	5	80S	50MS	33	125	37.3	79.3
K6290 - Bulk	3340	70	85	75	149	6	0	0	95	123	30.0	77.2
K75-11-54	3260	69	80	75	142	8	0	0	0	105	29.8	80.0
Nacnzari "S"	3160	67	83	77	146	8	0	0	0	83	25.8	76.6
Inia x Tob'S'	3150	66	83	75	138	8	0	0	0	90	34.5	82.1
Dong 74 Kal Pet	3050	64	85	79	139	6	0	0	0	85	24.0	75.9

Plot size, M^2 : 2.0
Fertilizer, kg/ha : 30 DAP
Planting date : 27 June, 1980
Seeding rate, kg/ha: 125

L.S.D. 5% = 852 kg/ha
L.S.D. 1% = 1147 "
C.V. = 16.0 %

115 - 21 Variety Trial of Wheat with high [illegible] tolerance (Beko 1)

Variety / Treatment	Yield 87.5% DM		Early vigour	Days to 50% flowering	Days to maturity	Diseases			Lodging		Height	1000-seed Weight	Hl-Weight
	kg/ha	Rel.				Leaf rust %	Septoria 0-5/0-9		Late %	Shattering %	cm	gm	kg
Ku75-11-64	4330	109				0	3/5		0	0	95	43.0	80.9
ET 12 DZL 9L	4180	106				0	2/4		0	10	95	29.5	82.0
(Kt-54-N-10-B-21-10) Kt54B	4050	102				0	3/5		0	10	94	33.0	80.0
Enkoy (Check)	3960	100				0	3/7		4	5	96	32.0	82.8
Dong 74 (Kal Pet) (6)	3490	88				0	3/7		0	10	89	30.5	83.7
Inia x Tob 'S' (5)	3490	88				0	4/7		0	0	84	44.0	86.0
K6290 - Bulk	3200	81				30S	2/6		0	0	108	30.5	80.3
5311 x Nortena-J1143-21 (3)	2950	74				0	4/8		0	0	98	28.5	79.2
21931/oh An (4)	2060	72				0	4/7		0	10	86	30.5	83.0
Local check	2730	69				25S	5/9		14	0	109	36.5	75.5
LR 6 4^2-Son 64	2560	65				0	4/8		0	0	81	29.5	80.7

Plot size, M^2 : 2.0
Fertilizer, kg/ha : 100 DAP
Planting date : 26 June, 19[illegible]
Seeding rate, kg/ha: 125

S.D. 5% = 555 kg/ha
S.D. 1% = 748 "
C.V. = 11.1 %

115 - 22-26, 53 & 54 Yield Assessment Trial on Wheat varieties -"B" Set. (Asassa, Diksis, Kulumsa, Meraro, Bekoji, Dhera & Robe).

Lines and varieties of wheat tested in this trial are those selected on grounds of their best performances in previous years. Enkoy, the variety with a wider range of adaptability and a local wheat were included for comparison purposes. Environmental conditions during the cycle of the test were not conducive for the development of stem rust.

Regarding yield Ku 75-11-64 followed by ET12 D4 L7L out performed all the other entries across the testing sites. Ku 75-11-64 has repeatedly shown good performance and hence put under a large-scale production. At Robe, the new trial site, quite impressive yields were obtained from most entries.

115 - 22 Yield Assessment Trial on wheat varieties - "B" Set(Asassa)

Variety / Treatment	Yield 87.5% DM		Stand %	Days to heading	Days to Maturity	Diseases				Height cm.	1000-seed Weight gm.	Hl-Weight kg.
	kg/ha	Rel.				Stem rust	Leaf rust 0-5/0-9	Stripe rust %	Septoria 0-5/0-9			
Ku 75-11-64	4220	108	65	79	139	0	0	0	4/7	100	44.3	82.2
K6399 - 3	3990	102	81	76	137	0	0	0	2/6	110	32.5	84.6
Enkoy (check)	3920	100	90	76	136	0	0	0	3/7	118	32.3	87.4
K6410 - 2 (NYOKA)	3900	99	70	76	138	0	0	0	3/7	130	33.5	82.5
K6797 - 6	3840	98	71	82	139	0	0	0	3/7	115	-	-
ET 12 D4 L7L	3800	97	70	77	-	0	1/3	0	2/6	83	28.0	83.3
Ku 75 - 11 - 59	3520	90	76	78	137	0	0	0	3/7	93	27.8	81.0
Local variety (check)	3500	89	90	79	135	0	4/8	0	3/7	120	40.0	80.7
K6295 - 4A	3500	89	79	81	142	0	0	0	2/7	118	32.0	84.2
Brochis 'S' Cno Bb	2510	64	70	77	137	0	0	0	4/7	92	28.5	81.0

Plot size, M^2 : 6.0
Fertilizer, kg/ha : 150 DAP
Planting date : 13 June, 1980
Seeding rate, kg/ha: 125

L.S.D. 5% = 657 kg/ha
L.S.D. 1% = 887 "
C.V. = 12.4 %

115 - 23 Yield Assessment Trial on wheat varieties - "B" Set (Diksis)

Variety / Treatment	Yield 87.5% DM		Stand % at harvest	Days to heading	Days to maturity	Septoria 0-5/0-9	Late	Height cmr.	1000-seed weight gm.	Hl-Weight kg.
	kg/ha	Rel.								
ET 12 D4 L7L	3800	104	90	81	161	4/7	-	88	33.5	82.4
Enkoy (check)	3650	100	95	74	151	1/6	0	103	39.0	83.6
Ku 75-11-64	3420	94	90	82	155	4/6	10	95	46.5	81.6
K6295 - 44	3280	90	95	77	157	1/6	5	110	38.5	83.8
Nyoka (K6410 - 2)	2800	77	95	74	171	1/6	23	115	33.0	80.4
Ku 75-11-59	2650	73	88	85	-	3/7	0	90	32.5	81.8
K6399 - 3	2580	71	93	73	143	2/6	13	98	31.5	80.9
K6797 - 6	2500	68	98	75	144	4/7	38	105	33.0	77.6
Brochis "S" Cno Bb	2420	66	90	75	142	5/6	0	90	27.0	78.1
Local variety (check)	2290	63	98	75	134	0	95	115	34.0	78.1

Plot size, M^2 : 6.0 L.S.D. 5% = 525 kg/ha
Fertilizer, kg/ha : 80 DAP (18/46) L.S.D. 1% = 709 "
Planting date : 27 June, 1980 C.V. = 12.3 %
Seeding rate, kg/ha: 125

115 - 24 Yield Assessment Trial on Wheat Varieties - "B" Set (Kulumsa)

	Yield 87.5% DM		Stand % at Seedling	Days to heading	Days to maturity	Diseases		Shattering %	Height cms.	1000-seed Weight gms.	Hl-Weight Kg.
	kg/ha	Rel				Leaf rust %	Septoria 0-5/0-9				
Ku75-11-64	3050	141	95	64	119	tr	3/7	8	95	39.0	82.7
K6797 - 6	2840	131	89	64	118	0	0	13	75	45.5	83.1
ET 12 D4L7L	2710	125	93	70	125	12MS	1/2	5	78	31.5	84.5
Brochis 'S' Cno B	2660	123	90	65	110	0	1/7	0	73	33.0	84.0
K 6399 - 3	2470	114	98	63	126	0	3/7	5	80	36.5	84.0
Ku75-11-59	2300	106	95	72	120	0	3/7	3	80	30.0	84.5
K6295 - 4A	2250	104	98	64	113	0	1/2	20	95	35.5	84.6
Enkoy (Check)	2170	100	99	62	114	20S	0	33	88	32.5	85.5
Local variety (check)	1830	84	96	69	114	100S	4/3	10	105	37.5	79.4
K6410 - 2 (Nyoka)	1730	80	95	62	113	0e	2/7	24	98	35.5	83.5

Plot size, M^2 : 6.0
Fertilizer, kg/ha : 100 DAP
Planting date : 8 July, 1980
Seeding rate, kg/ha: 125

L.S.D. 5% = 322 kg/ha
L.S.D. 1% = 435 "
C.V. = 9.3 %

115 - 25 Yield Assessment Trial on Wheat V[illegible] (B' Set (Meraro)

Variety / Treatment	Yield 87.5% DM		Diseases			Lodging		1000-seed Weight gm	HL-Weight kg
	kg/ha	Rel	Leaf rust %	Leaf b.&s. Tech 0-50		Late %	Height cm		
Brochis 'S' Cno Bb	5750	149	tMR	3/7		0	108	34.5	81.2
Ku 75-11-64	5530	144	15MR	2/6		0	115	41.5	78.2
ET 12 D4 L 7L	4440	115	tMR	3/4		0	95	31.0	80.8
K6399 - 3	4430	115	20MR	2/5		0	119	33.5	81.0
K6797 - 6	4100	106	tMR	1/3		25	120	36.0	79.0
K6410 - 2 (Nycka)	3930	102	tMR	1/3		0	135	30.0	80.2
Enkoy (check)	3850	100	tMR	3/7		0	120	28.5	80.3
K6295 - 4A	3770	98	15MR	1/3		0	130	34.0	80.2
Ku 75-11-59	3630	94	tMR	0		0	110	34.5	81.4
Local variety (check)	2230	58	30MR	3/6		0	119	30.5	71.7

Plot size, M^2 : 2.0
Fertilizer, kg/ha: 150 [illegible]
Planting date : 21 [illegible]
Seeding rate, kg/ha: 12[illegible]

L.S.D. 5% = 529 kg/ha
L.S.D. 1% = 715 "
C.V. = 8.8 %

115 - 26 Yield Assessment Trial on Wheat Varieties - "B" Set (Bekoji)

Variety / Treatment	Yield 87.5% DM		Stand %	Days to heading	Days to maturity	Disease	Lodging %	Height cmr.	1000-seed weight gm	Hl-Weight kg.
	kg/ha	Rel.				Septoria 0-5/0-9	Late			
Ku75-11-64	4670	110	80	85	148	4/8	0	101	39.3	79.5
ET 12 D4 L7L	4470	107	79	82	149	3/8	0	94	29.3	79.5
Brochis "S" Cno Eb	4420	104	80	76	140	4/8	0	96	33.5	81.5
K6295 - 4A	4420	104	95	83	144	2/6	0	114	34.3	79.5
Enkoy (Check)	4230	100	98	76	141	2/4	15	104	32.0	80.0
K6399 - 3	4210	99	83	74	143	4/8	0	96	36.3	81.3
K6410 - 2	3950	93	83	76	141	3/8	2	119	32.8	79.4
Ku 75-11-59	3930	93	89	87	143	3/8	0	103	29.0	80.0
K6797 - 6	3310	78	81	74	141	4/8	0	101	32.8	76.7
Local variety (check)	2780	66	89	80	142	4/8	0	88	29.0	74.5

Plot size, M^2 : 6.0
Fertilizer, kg/ha: 100 DAP
Planting date : 20 June, 1980
Seeding rate, kg/ha: 125

L.S.D. 5% = 464 kg/ha
L.S.D. 1% = 626 "
C.V. = 7.9 %

115 - 53 Yield Assessment Trial on Wheat varieties -"B" Set (Dhera)

Variety / Treatment	Yield 87.5% DM		Stand % at early stage	Days to heading	Days to maturity	Diseases		Termite infestation %	Height cm.	1000-seed weight gm.	Hl-weight kg.
	kg/ha	Rel.				Septoria (0-9)	Leaf rust %				
ET 12 D4L7L	1100	116	78	66	83	0	tMS	3	58	34.0	78.5
K6399 - 3	1080	114	89	49	82	0	0	4	50	31.0	82.3
Brochis 'S' Cno Bb	1070	113	85	49	81	1	0	4	50	26.5	79.9
K6410 - 2 (Nyoka)	1030	108	71	46	80	1	0	2	70	28.0	79.4
Local variety	1000	105	94	59	-	0	0	5	75	31.0	76.0
Ku 75-11-59	960	101	91	59	-	2	0	-	58	26.0	80.6
Ku 75-11-64	950	100	80	48	-	0	0	25	53	33.5	76.8
Enkoy (check)	950	100	85	47	81	0	0	5	58	25.5	79.8
K6797 - 6	900	95	81	52	-	0	0	2	45	27.5	77.2
K6295 - 4A	820	86	84	50	80	0	40MS	3	63	23.5	79.6

Plot size, M^2 : 6.0
Fertilizer, kg/ha: 100 DAP (18/46)
Planting date : 10 July, 1980
Seeding rate, kg/ha: 125

115 - 54 Yield Assessment Trial on Wheat varieties - "B" Set (Robe)

Variety / Treatment	Yield 87.5% DM		Stand %	Days to heading	Days to maturity	Diseases				Height cm.	1000-seed Weight gm.	Hl-Weight kg.
	kg/ha	Rel.				Stripe rust %	Septoria 0-5/0-9	Stem rust %	Leaf rust %			
ET 12 D4 L7L	5520	122	80	68	135	5MR	3/8	3/8	0-1%	88	36.5	84.5
Brochis 'S' Cno Bb	4830	107	84	64	128	0	3/8	0	0	95	37.8	82.6
K6399 - 3	4600	102	89	61	127	15MR	0	0	0	90	37.3	82.5
Ku75-11-64	4600	102	79	68	135	20S 1MS	0	0	0	90	44.3	78.5
Enkoy (check)	4510	100	95	64	130	trs	0	0	0	103	37.8	83.5
Ku75-11-59	4490	99	83	68	137	5MS 60MR	0	0	0	90	35.8	83.5
K6797 - 6	4400	98	81	66	128	10MS 60MR	0	1%	0	90	43.3	83.6
Local Variety (check)	3860	86	83	64	131	10MR 15MS	0	0	0	118	46.8	82.4
K6295 - 4A	3730	83	85	67	132	10MR 15MS	0	0	0	103	37.3	81.9
K6410 - 2 (Nyoka)	3640	81	81	63	131	65S 5MR	0	0	0	100	35.5	87.3

Plot size, M^2 : 6.0
Fertilizer, kg/ha: 150 DAP
Planting date : 31 July, 1980
Seeding rate, kg/ha: 125

L.S.D. 5% = 884 kg/ha
L.S.D. 1% = 1194 "
C.V = 13.8 %

115 - 27 - 31 Yield Assessment Trial on Wheat Varieties-
"A" Set (Asassa, Dhera, Diksis, Kulumsa, Bekoji)

Wheat lines and varieties in this trial were advanced from previous year's trials conducted at different sites on grounds of agronomic and yield superiorities. As checks a local wheat and Enkoy were included in all testing locations.

Stand was low at Asassa, Dhera and Bekoji for some entries. Over all locations, diseases were not serious except incidence of Septoria leaf blotch on some varieties at Bekoji. In general, yields recorded were very low. Nevertheless, the performance of line Cgn Kal - Bb CM15133-1M-3Y-6M-0Y except at Kulumsa was remarkable. At Kulumsa very low yield was recorded for Enkoy due to shattering which was observed as high as 55%.

115 - 27 Yield Assessment Trial on Wheat varieties - "A" Set (Asassa)

Variety / Treatment	Yield 87.5% DM		Stand %	Days to heading	Days to maturity	Disease	Height cms.	1000-seed weight gms.	Hl-weight kg.
	kg/ha	Rel.				Septoria 0-5/0-9			
Cgn Kal-Bb, CM15133-1M-3Y-6M-OY	3940	123	80	74	134	4/7	97	38.5	82.4
Ku75-11-64	3820	119	58	80	133	5/8	97	41.5	79.3
K6661 - 12	3750	117	74	67	-	5/8	95	35.5	80.0
Pichichuila 'S'	3580	112	80	65	134	5/8	95	33.0	82.0
Bobito 'S' Cno.(K75-11-62)	3540	111	68	76	135	4/7	94	34.3	80.0
K6295 - 4A	3380	106	84	80	135	3/6	116	33.5	82.5
Furry Cno 'S'-No 66-CM2410	3360	105	71	79	137	4/7	111	35.0	80.5
(We/Lib Inia x Inia)-7CxTob-Cno'S', CM8625	3260	102	65	77	135	5/7	93	40.0	80.0
Enkoy	3200	100	93	77	134	3/6	107	31.0	82.3
Local variety (Check)	3090	97	96	78	-	4/8	115	42.5	78.0
Ku75-11-44	2900	91	68	84	137	4/7	87	41.5	82.5

Plot size, M^2 : 6.0
Fertilizer, kg/ha : 150 DAP
Planting date : 13 June, 1980
Seeding rate, kg/ha: 125

L.S.D. 5% = 560 kg/ha
L.S.D. 1% = NS "
C.V. = 11.3 %

115 - 28 Yield Assessment Trial on Wh[illegible] Varieties - "A" Set (Dhera)

Variety / Treatment	Yield 87.5% kg/ha	R[illegible]	[illegible]	Days to maturity	Height cms.	1000-seed Weight gms.	Hl-Weight kg.
Cgn Kal - Bb CM15133-1M-3Y-6M-0Y	1000	19[illegible]	[illegible]	45	84	58	34.0	81.3
Local Variety (check)	840	16[illegible]	[illegible]	60	84	56	31.5	76.0
K6797 - 6	750	14[illegible]	[illegible]	52	85	45	29.5	77.7
We/Lib Inia x Inia -7C-Tob-Cno'S', CM 8625	740	14[illegible]	[illegible]	50	79	46	32.5	80.1
Pichichuala 'S'	650	12[illegible]	[illegible]	47	78	46	32.0	81.3
Ku75-11-64	630	12[illegible]	[illegible]	52	84	49	32.0	75.3
Bobito 'S' Cno (Ku75-11-62)	580	11[illegible]	[illegible]	49	80	46	34.0	77.2
Furry Cno 'S' -No.66-CM 2410	580	11[illegible]	[illegible]	49	84	44	28.5	78.7
K6661 - 12	560	10[illegible]	[illegible]	47	78	45	28.5	77.2
Enkoy (Check)	520	10[illegible]	[illegible]	46	78	48	22.5	77.8
K6295 - 4A	500	9[illegible]	[illegible]	50	84	43	24.0	77.7

Plot size, M^2 6.0
Fertilizer, kg/ha 150
Planting date 9 J[illegible] 1980
Seeding rate, kg/ha 125

L.S.D. 5% = 261 kg/ha
L.S.D. 1% = NS
C.V. = 27.1 %

115 - 29 Yield Assessment Trial on Wheat Varieties - "D" Set (Diksis)

Variety / Treatment	Yield 87.5% DM		Stand % at harvest	Days to heading	Days to maturity	Diseases	Lodging %		Height cm.	1000-seed weight gm.	Hl-weight kg.
	kg/ha	Rel.				Septoria 0-5/0-9	Late				
Enkoy (Check)	3620	100	95	74	153	3/3	0		108	33.0	83.8
Bobito 'S' Cno(Ku75-11-62)	3570	99	90	82	-	4/7	0		95	45.0	81.1
Ku75-11-64	3220	89	85	83	-	4/6	0		93	48.0	80.5
Cgn Kal-Bb,CM15133-1M-3Y-6M-0Y	2730	75	90	76	150	4/8	0		95	35.5	82.4
K6661 - 12	2730	75	88	69	149	4/7	2		95	37.0	80.4
Furry Cno 'S'-No-66-CM2410	2670	74	93	79	165	4/6	0		93	37.5	80.5
Pichichula 'S'	2660	73	83	70	150	5/7	0		93	41.0	82.9
Ku75-11-44	2570	71	88	84	-	3/7	0		84	33.0	80.5
Local Variety (Check)	2340	65	95	76	138	-	95		115	35.0	78.3
(We)Lib.Inia x Inia)	2090	58	85	77	152	5/8	0		86	37.0	80.4
K6295 - 4A	1900	52	85	83	165	2/6	0		108	38.0	84.1

Plot size, M^2 : 6.0

Fertilizer, kg/ha: 80 DAP

Planting date : 27 June, 1980

Seeding rate, kg/ha: 125

L.S.D. 5% = 762 kg/ha

L.S.D. 1% = 1026 "

C.V. = 19.3 %

115 - 30 Yield Assessment Trial on W[illegible] "A" Set (Kulumsa)

Variety / Treatment	Yield 87.5% D					Diseases					
	kg/ha	Re				Leaf %	Rust %	Septoria 0-5/0-9	Shattering %	Height cm.	1000-seed Weight gm.	Hl-Weight kg.
We/Lib Inia x Inia) 7CxTob-Cno 'S', CM8625	3210	164	20	6	12	0		3/7	5	78	44.3	85.5
Ku75-11-64	3200	163	39	6	37	0		0	13	80	48.0	82.6
Bobito 'S' Cno (Ku75-11-62)	2840	145	25	6	34	0		1/2	10	78	49.0	83.2
Furry Cno 'S'-No.66-CM2410	2840	145	5	6	36	25MR		3/6	0	85	41.0	84.0
K6661 - 12	2680	137	8	5	10	0		0	5	80	41.0	83.7
Local Variety (Tikursinde)	2470	126	0	6	09	100S		4/2	0	108	35.5	80.0
Cgn Kal - Bb, CM15133-1M-3Y-6M-0Y	2430	124	9	6	14	0		2/2	3	80	40.5	84.8
K6295 - 4A	2390	122	9		15	0		0	25	98	37.5	25.6
K6290 - Bulk	2290	117	6	5	14	30MR		2/5	2	100	39.5	84.2
Pichichula	2010	103	89	1	15	0		1/2	25	80	43.0	85.0
Enkoy (Check)	1960	100	00	6	12	0		1/2	55	100	33.5	85.4

Plot size, M^2 : 6.0

Fertilizer, kg/ha : 100 DAP

Planting date : 8 July, 1980

Seeding rate, kg/ha : 125

[illegible] 0.5% = 431 kg/ha

[illegible] 0.1% = 580 "

[illegible] = 11.5 %

115-31 Yield Assessment Trial on Wheat varieties - "A" Set (Bekoji)

Variety / Treatment	Yield 87.5% DM		Stand %	Days to heading	Days to maturity	Diseases		Late	Shattering %	Height Cm.	1000-seed weight gm.	HL-Weight kg.
	kg/ha	Rel.				Stem rust %	Septoria 0-5/0-9					
Cgn-Kal-Bb, CM15133-1M-3Y-6M-CY	4500	127	80	76	146	0	4/8	1	15	101	43.0	80.2
Furry Cno "S" -No.66-CM CM2410	4240	120	81	76	145	0	4/8	2	5	123	45.5	82.0
Bobito 'S' Cno (Ku75-11-62	3900	110	86	81	145	0	4/8	3	5	109	34.3	80.0
Wa/Lib Inia x Inia) 7CxTob-Cno'S',CM0625	3540	100	81	78	143	0	1/8	8	0	100	37.0	80.6
Enkoy (Check)	3540	100	76	74	146	0	4/8	6	0	100	31.0	79.2
K6295 - 4A	3530	99	80	80	145	0	4/8	0	0	103	32.0	78.6
Pichichula 'S'	3490	98	85	85	143	0	1/8	5	0	100	43.3	81.8
Ku75-11-44	3450	97	79	77	146	0	3/8	0	10	98	35.8	82.2
K6661 - 12	3380	95	88	77	144	0	3/8	8	5	106	42.0	80.0
Ku75-11-64	3250	92	75	78	144	0	4/8	0	10	100	36.3	80.8
Local Variety (Check)	2610	74	89	78	143	70S	4/8	15	0	110	34.8	75.2

Plot size, M^2 : 6.0
Fertilizer, kg/ha : 100 DAP
Planting date : 20 June, 1980
Seeding rate, kg/ha: 125

L.S.D. 5% = 782 kg/ha
L.S.D. 1% = 1053 "
C.V. = 15.1 %

115 - 33 - 35 Yield Trial of Promising [illegible] (Asassa, Dhera, Diksis).

Included in this trial were nine promising [illegible] and Tinkoy, a medium-early variety as a check. Plant population for some entries was low in all the locations. Disease was not a problem in [illegible]. The very low yields recorded at Dhera was due to a certain extent to [illegible] and termite infestation during the vegetative growth.

The check variety was the least yielder [illegible] and Dhera. Despite very low plant population Nacozari "S" was the top [illegible] at Dhera. This indicates that the variety is tolerant to moisture [illegible]. At Asassa and Diksis Ku75-11-36 appears to be on top of all entries with [illegible] yields.

115 - 33 Yield Trial of Promising Bread Wheat (Asassa)

Variety / Treatment	Yield 87.5% DM		Stand % at seedling	Days to heading	Days to maturity	Disease Septoria (1-9)	Height cm.	1000-seed weight gm	Hl-Weight kg.
	kg/ha	Rel.							
Ku75-11-36	4430	113	93	77	134	3/7	110	31.5	82.6
Ku75-11-6	4390	112	84	72	131	4/7	95	39.0	80.3
Ku75-11-11	4290	110	75	75	132	4/7	98	34.5	85.0
Ku75-11-44	4280	109	74	80	141	3/7	98	33.5	84.9
Ku75-11-42	4080	104	66	80	133	3/7	93	29.8	83.1
K6295 - 4A	4080	104	85	77	141	2/5	128	35.3	84.1
Ku75-11-59	3940	101	93	84	137	5/5	103	29.8	84.0
Ku75-11-28	3940	101	71	79	136	3/6	95	34.3	84.1
Enkoy (Check)	3910	100	93	76	133	2/5	108	31.3	84.9
Nacozari 'S'	3330	85	62	76	131	4/7	90	30.8	81.5

Plot size, m^2 : 2.0 L.S.D. 5% = NS

Fertilizer, kg/ha : 150 DAP

Planting date : 15 June, 1980 C.V. = 21.1 %

Seeding rate, kg/ha: 125

115 - 34 Yield Trial of Promising [illegible] varieties (Dhera)

Variety / Treatment	Yield 87 % DM Kg/ha	[illegible]	[illegible]	Days to maturity	Height cm	1000-seed Weight gm	HL-Weight Kg.
Naoozari 'S'	650	6[illegible]	[illegible]	81	45	27.3	79.2
Ku 75-11-[illegible]	780	8[illegible]	[illegible]	81	40	35.5	76.8
Ku 75-11-11	650	7[illegible]	[illegible]	83	30	27.0	78.6
Ku 75-11-[illegible]9	590	[illegible]	[illegible]	84	40	26.0	80.0
Ku 75-11-42	530	7[illegible]	[illegible]	75	30	23.3	77.8
Ku 75-11-[illegible]6	510	8[illegible]	[illegible]	82	45	24.3	78.0
K6295-4A	480	7[illegible]	[illegible]	83	35	22.0	78.8
Ku 75-11-[illegible]8	400	7[illegible]	[illegible]	84	40	24.8	80.6
Ku 75-11-44	450	7[illegible]	[illegible]	84	35	26.3	81.0
Enkoy (Check)	290	8[illegible]	[illegible]	81	35	21.5	74.0

Plot size, M^2 : 2.0

Fertilzier, Kg/ha : 150

Planting date : 10 J[illegible]

Seeding rate, kg/ha : 125

L.S.D. 5% = NS

C.V. = 57.5 %

115 - 35 Yield Trial of Promising Bread Wheat varieties (Diksis)

Variety / Treatment	Yield 87.5% DM		Stand %	Days to heading	Days to maturity	Lodging%	Height cms.	1000-seed Weight gms	Hl-Weight kg.
	kg/ha	Rel				Late			
Ku75-11-36	4250	108	95	80	151	5	100	32.0	82.5
Enkoy (Check)	3940	100	93	76	-	0	110	33.3	84.2
K 6295 - 4A	3640	92	75	79	151	10	110	38.5	83.5
Ku 74-11-42	3410	87	85	80	158	0	98	32.0	82.4
Ku 75-11-59	3400	86	85	85	156	20	95	33.3	82.0
Ku 75-11-44	3250	82	88	83	156	0	88	36.0	83.1
Ku 75-11-11	3050	77	85	74	144	10	98	34.5	82.0
Ku 75-11-28	2950	75	80	83	157	0	83	29.5	82.3
Nacozari 'S'	2760	70	80	76	153	0	90	29.5	82.3
Ku 75-11-6	2700	69	83	72	138	0	88	35.5	78.3

Plot size, M^2 : 2.0
Fertilizer, kg/ha : 80 DAP
Planting date : 27/6/80
Seeding rate, kg/ha: 125

L.S.D. 5% = 632 kg/ha
L.S.D. 1% = 853 "
C.V. = 13.0 %

115 - 38 10th International Wheat Screening Nursery (Kulumsa)

This screening nursery consisted of 50 wheat varieties including a local variety as a check. Growing conditions during the test were satisfactory.

Neither lodging nor shattering was a problem in this trial. With regard to yield, a triticale variety appeared to be on top of all entries. However, there was no significant difference between the triticale and the two top wheat varieties.

115 - 38 10th International Wheat Screening Nursery(Kulumsa)

Variety / Treatment	Yield 87.5% DM		Days to heading	Shattering %	1000-seed Weight gms.	Hl-Weight kg.
	kg/ha	Rel.				
Mapache (TcL)	5070	165	55	0	38.0	74.2
Buck Buck "S"	4780	155	63	0	39.5	83.6
Pavon 76	4480	145	64	10	40.0	84.9
ABU GHRAIB No. 3	4220	137	54	3	32.0	84.6
Titmouse "S"	4170	135	54	10	34.0	84.1
Nacozari 76	4150	135	61	0	37.0	84.3
Bittern "S" (Durum)	3950	128	66	0	43.8	83.6
Imuris T79	3900	127	64	5	36.0	83.3
Dougga	3870	126	63	3	34.0	84.9
Tesia T79	3820	124	63	3	36.0	85.4
Veery "S"	3800	123	73	0	33.0	83.9
HD 2172	3730	121	67	0	35.5	84.9
Flicker "S"	3630	118	69	0	33.5	83.5
S 331 - Nor 67	3630	118	66	3	36.5	82.5
ANZA	3570	116	66	0	35.0	84.8
Pavon "S"	3550	115	65	18	39.0	85.3
Junco "S"	3370	109	61	5	40.8	84.9
Siete Cerros	3330	108	63	10	33.5	84.9
K6106 . 3	3300	107	63	3	34.3	83.6
Maya 74 "S" -Moncho"S"	3120	101	56	8	37.0	84.6
Mai Po"S"-Pj62xEMU"S"	3100	101	54	0	37.0	83.4
Local variety (Check)	3080	100	68	0	34.5	78.5
PIMA 77	2970	96	55	0	31.5	83.7
Marcos Jurez Inia	2950	96	68	3	36.0	84.7
HAZERA 806/1976	2950	64	64	0	36.5	84.5
Heima-COC75xBlue Jay"S"	2930	95	61	0	39.5	84.6
Antizana	2920	95	54	5	44.0	85.7
HP 1209	2920	95	59	0	42.0	84.0
Romi	2880	94	56	45	36.5	85.9
Zaraguro "S"	2850	93	71	10	29.8	83.2
Bobwhite "S"	2850	93	67	0	28.5	84.7
Alondra "S"	2800	91	72	18	39.5	83.0
Sonalika	2780	90	52	0	45.0	82.9
PK 3563 - CH70	2700	88	68	0	30.0	83.9
Malabadi	2700	88	60	0	31.8	82.1
Klein Chamaco	2680	87	61	0	32.5	84.9
Q.T. 4081	2680	87	66	5	31.0	84.8
MAHISSA 18	2680	87	55	0	33.0	82.1
Chakar "S"	2580	84	69	0	37.5	84.6
Q.T. 4083	2530	82	73	5	37.5	82.3
LAP 266	2470	80	70	0	28.0	83.5
CHAT "S"	2370	77	62	0	35.5	83.7

.../..

Variety / Treatment	Yield 87.5% DM		Days to heading	Shattering %	1000-seed Weight gms.	HL-Weight Kg.
	kg/ha	Rel.				
Chivito "S"	2330	76	70	0	36.5	80.0
Glenlea	2330	76	65	8	38.0	82.1
Estanzuela Dakaru	2320	75	60	10	31.0	83.2
Inia/Son64-P4160XSon64	2300	75	56	30	41.0	84.9
UP 262	2280	74	66	0	34.5	81.1
MN 7086	2270	74	-	0	28.0	81.8
Kavko "S"	1950	63	59	15	35.0	84.5

Plot size, M^2 : 2.0 L.S.D. 5% = 706 kg/ha
Fertilizer, kg/ha: 100 DAP (18/46) L.S.D. 1% = 935 "
Planting date : 13 July, 1980 C.V. = 13.8 %
Seeding rate : 125

115 - 3, 12, 32, 36, 37, 40, 55 - 65 Segregating populations of Wheat(Kulumsa)

These segregating materials consisting of Top crosses, Double crosses and Back Crosses with various generations ranging from F2-F6 were coordinated by Holetta Research Station. On the basis of resistance to diseases especially Stem rust and Possession of desirable agronomic properties individual plants in early generations and bulk population of a line in advance generation were selected for further testing. The selections were taken to Holetta Research Station for further screening and arrangement for the next Planting season.

115 - 39 13th International Wheat Screening Nursery (13th IBWSN)(Kulumsa)

530 introduced lines of wheat were tested to check their adaptability under Kulumsa conditions. Growing conditions were some-how satisfactory.

At Maturity only 56 best performing lines, resistant to diseases and having good agronomic characteristics were selected for further testing. Selection was jointly done by researchers from Holetta,, Debre-Zeit and Kulumsa. The selected materials were taken to Holetta Research Station for inclusion in the national trials for the next cropping season.

115- 41 National Observation Plots of Bread Wheat (Diksis)

Tested in this observation plots were lines of bread wheat advanced from the 1979 International Screening Nurserys. Stand was quite satisfactory for most of the lines. Some of the entries appeared with attractive yields.

From among 81 lines tested only twenty were selected based on their tolerance to Septoria leaf blotch and possession of desirable agronomic qualities.

115- 41 National Observation Plots of [illegible] Wheat (Diksis)

Variety / Treatment	Entry No. (1980)	Yield			Days to Heading	Disease Septoria (0-9)	Height cm.	1000-Seed Weight gm.	HL Weight kg.
Veery"S",CM33027-F-15M-500Y-OM	1	[illegible]	[illegible]	[illegible]	77	6	90	32.3	80.6
KVZ-K4500.L.A.4.SWO-176-3M-1Y-4Y-1Y-1M-OY-2PTZ-OY	65	[illegible]	[illegible]	[illegible]	90	0	95	36.5	85.6
K6919 - 1	79	[illegible]	[illegible]	[illegible]	75	1	115	34.8	83.2
K4500.4.OPTZ-OY	71	[illegible]	[illegible]	[illegible]	88	2	115	40.5	84.4
NP 876	81	[illegible]	[illegible]	[illegible]	94	3	100	35.3	83.6
PF70354-IAS54-IAS20-1PTZ-OY	61	[illegible]	[illegible]	[illegible]	95	5	100	33.8	81.6
KVZ-Buho"S"xKal-Bb-Veery"S", CM33027-F-15M-500Y-OM-OPTZ-OY	60	[illegible]	[illegible]	[illegible]	89	3	80	35.3	82.8
Shrike"S",CM33489-O-3M-3Y-2M-OY	13	[illegible]	[illegible]	[illegible]	76	4	85	35.5	81.2
KVZ-4500.L.A.4.SWO-176-3M-1Y-10Y-1Y-2M-OY-OPTZ-OY	67	[illegible]	[illegible]	[illegible]	89	2	100	36.3	86.6
Maya74"S"-1ding"S" /HK38MK(4777 (4777xRei-Y/Kt)/Yr70 CM33477-L-2M-7Y-1M-3Y-OM	12	[illegible]	[illegible]	[illegible]	81	5	90	33.5	82.8
/(PAK F46313/Tob-CfnxBb)B.Man onxCal/Maya 74"S",CM26346-B-12Y-8Y-3M-1Y-OB	31	[illegible]	[illegible]	[illegible]	77	4	90	27.0	81.6
We x Cno - Inia	75	[illegible]	[illegible]	[illegible]	75	4	85	32.0	83.6
KVZ/Cno-Chrisxon SE375-12S-3S-OS-5Ke-4Ke-4K-OY-OY	55	[illegible]	[illegible]	[illegible]	76	3	105	32.5	83.4
Gallo-Torim73xPavon"S"=Shrike "S",CM33489-O-3M-3Y-1M-OY-1PTZ-OY	66	[illegible]	[illegible]	[illegible]	89	0	90	37.4	82.0
Brochis	74	[illegible]	[illegible]	[illegible]	89	3	90	30.3	82.8
Siskin"S"-Pavon"S"=Tanager"S", CM 30697-1M-4Y-6M-OY-1PTZ-OY	69	[illegible]	[illegible]	[illegible]	86	5	90	38.8	82.8
Predgornia/3/TI-62-68/Tob 11F1/Cno	80	[illegible]	[illegible]	[illegible]	88	2	80	36.8	80.8
Cebec0148(Cno"S"-Inia"S"xLfn/Kl.Pet.Kaf)SWM1368-500Y-1B-501Y-1M-OY-OPTZ-OY	50	[illegible]	[illegible]	[illegible]	82	3	75	33.0	82.2
Nad63-TorxPichon/Bluetit"S" Mesabi"S",CM34726-F-2M-2Y-4M-2Y-OM	18	[illegible]	[illegible]	[illegible]	80	3	85	30.3	77.4
BobWhite"S",CM33203-K-9M-12Y-1M-OY	43	[illegible]	[illegible]	[illegible]	80	5	90	35.0	-

Plot size, M^2 = [illegible] Fertilizer, kg/ha = 80 DAP

115- 42, 44-46 Bread Wheat NYT -"B" (Late Set) (Bekoji, Diksis, Meraro,Kulumsa).

In this trial thirteen lines and varieties of wheat were included among which Romany Bc and a local Wheat were entered as standard and local checks respectively throughout the four locations.

Disease epidemic was not severe except Septoria leaf blotch and leaf rust, the latter being observed on most lines at Kulumsa and Meraro, and only on the local variety at Diksis as high as 85S.

The high shattering observed at Kulumsa was induced by fast and continuous wind towards harvesting period.

Yield-wise the sister lines ET12D7L9L and ET12 D4 L7L were superior with a mean yield of 4290 kg/ha and 4130 kg/ha respectively overall testing sites.

Plot size, M^2	: 2.0	L.S.D. 5%	= 680 kg/ha
Fertilizer, kg/ha	: 100 DAP	L.S.D. 1%	= 911 "
Planting date	: 20/6/80	C.V.	= 14.0 %
Seeding rate, kg/ha	: 125		

115-42 Bread Wheat NYT "B" Set (Bekoji)

Variety / Treatment	Yield 87.5% DM		Stand %	Days to heading	Days to maturity	Disease	Lodging	Shattering %	Height cm.	1000-seed weight gm.	Hl-Weight Kg.
	Kg/ha	Rel				Septoria 0-5/0-9	Late				
KavkazxKal-Bb	4660	142	79	94	165	4/7	0	0	105	36.5	80.7
ET 12 D7.L.9.L	4290	131	75	94	162	4/7	0	0	95	28.5	79.8
ET 12 D.4.L.7.L	3780	115	80	86	162	1/6	0	0	93	33.0	81.1
ET 13.A.2.L.3L	3580	109	90	87	163	1/6	10	0	120	32.5	81.6
ET 12.C.4.L.5.L(F6)	3540	108	63	88	163	2/7	0	0	120	35.5	81.9
ET 12.D.8.L.4.L	3430	105	78	89	161	4/7	10	0	118	29.5	79.8
K64 10 - 2	3410	104	86	79	160	1/6	0	0	118	34.0	79.8
Romany Bc (Standard check)	3280	100	80	79	160	3/7	0	0	110	31.0	80.0
(We Pit 62-Tob66CM8287-H-3M-1Y-3M-1Y-0M	3230	98	83	83	162	4/8	0	10	100	33.0	81.3
ET 11.7.L.7.L	3110	95	80	85	162	2/7	15	15	105	33.5	80.8
ET 30.L.2.B.L.1.1	3060	93	76	84	162	5/9	10	13	108	33.0	78.9
ET 51.A.L.R.L.(F5 BL2)	2760	84	84	85	160	5/8	0	20	113	29.5	80.6
Local variety (Check)	2160	66	70	82	161	4/7	0	0	108	37.0	75.8

115 - 44 Bread Wheat NYT - "B" Set (Diksis)

Variety / Treatment	Yield 87.5% DM		Stand % at harvest	Days to heading	Lodging %	Height Cm.	1000-seed Weight gm.	Hl-Weight kg.
	kg/ha	Rel.						
ET 13 A.2.L.3.L	3730	155	90	83	3	103	38.0	83.6
ET 12 D.7.L.9.L.	3560	148	90	93	0	88	33.5	82.9
ET 12 D.4.L.7.L.	3490	145	93	87	-	88	33.8	87.4
ET 12 D.8.L.4.L.	3490	145	88	83	5	115	36.0	81.9
ET 51.A.L.8.L.(F5 B02)	3280	136	85	82	15	118	31.0	84.2
Kavkaz x Kal - Bb	3250	135	88	92	0	95	36.0	82.7
Romany Bc (Standard Check)	2910	121	83	78	10	115	30.0	80.2
ET 30.C.2.B.L.1.1.	2880	120	85	84	5	103	30.0	82.7
ET 12.D.4.7.L.	2840	118	80	83	28	98	34.3	82.6
Ne/Pit 62xTob 66	2690	112	88	81	5	103	34.5	80.5
K6410 - 2	2640	110	85	78	48	115	32.0	81.3
ET 12 C.4.L.5.L.(F6)	2510	104	85	83	95	123	34.8	81.2
Local check (Tikur Sinde)	2410	100	85	80	40	113	33.5	82.3

Plot size, M^2 : 2.0
Fertilizer, kg/ha : 80 DAP
Planting date : 28 June, 1980
Seeding rate, kg/ha: 125

L.S.D. 5% = 596 kg/ha
L.S.D. 1% = 800 "
C.V. = 13.6 %

115 - 46 Bread Wheat NYT - "B" Set (Kulumsa)

Variety / Treatment	Yield 87.5% DM		Stand % at early stage	Days to heading	Diseases		Shattering %	Height cm.	1000-seed Weight gm.	Hl-Weight kg.
	kg/ha	Rel.			Septoria 0-5/0-9	Leaf rust				
ET 12.D.7.L.9.L.	4410	193	80	71	1/6	50MS	5	84	31.0	84.1
ET 12.D.4.L.7.L.	4380	191	84	65	0	25MS	8	80	33.0	84.0
Local Variety Check)	3880	169	93	65	2/6	100S	0	109	40.5	80.8
ET 12 D.8.L.4.L	3780	165	80	67	1/6	10MR	18	108	35.5	84.9
ET 11.7.L.7.L	3390	148	80	65	2/7	tMR	43	94	40.0	85.2
Kav kaz x Kal Bb	3290	144	71	68	1/7	20MS	5	84	37.5	82.5
ET 12 C.4.L.5.L (F6)	3240	141	83	68	1/6	0	30	115	37.5	84.4
ET 13 A.2.L.3.L	3140	137	99	68	2/6	100S	35	104	36.5	83.4
ET 30.C.2.B.L.1.1.	3050	133	79	64	0	10MS 15S	38	95	37.0	85.2
K6410 - 2	3030	132	89	62	1/7	0	10	106	41.5	85.1
We Pit 62xTob66 CM-8287-H-3M-1Y-3M-1Y-0M	2590	113	78	66	1/6	30MS	28	88	37.5	83.8
Romany Bc (Stick)	2290	100	83	63	1/7	0	45	101	38.0	84.1
ET 5 1.A.1.R.L.(F5 Bc2)	1610	70	81	64	2/6	0	75	105	33.5	86.1

Plot size, M^2 : 2.0
Fertilizer, kg/ha: 100 DAP
Planting date : 5 July, 1980
Seeding rate, Kg/ha: 125

L.S.D. 5% = 613 kg/ha
L.S.D. 1% = 821 "
C.V. = 13.1 %

115- 47 - 49 Bread Wheat NYT -"A" (Early Set) (Kulumsa, Diksis, Robe).

This National Yield Trial of bread wheat consisted of 12 early maturing lines along with Enkoy and a local variety as standard check and local check respectively. Growing conditions were satisfactory in all the locations.

Stripe rust was seen on some varieties with severity at Robe.

Location mean yield was rather low at Kulumsa as for other trials due to high shattering brought about by fast and continuous wind towards harvest time. At Robe quite attractive yields were obtained from almost all entries, and simultaneously all the improved entries significantly out-performed the local variety. Thus, top yielding lines need repeatedly be tested in the area inorder to come-up with best adaptable varieties for the vicinity.

In general lines of wheat tested in this trial showed some discrepancies in their yielding potential at the different locations. Nevertheless, the performance of Furry x Cno"S"-No.66-CM4210-10Y-4M-8Y-5M-1Y-0M at Robe is very much impressive (74 qt/ha).

115 - 147 Bread Wheat NYT "A" [illegible] (Kulumsa)

Variety / Treatment	Yield 87.5% kg/ha	Re	Stand %	Lodging	Maturity	Diseases Leaf rust	Septoria 0-5/0-9	Shattering %	Height cm.	1000-seed weight gm.	Hl-Weight kg
(We/Lib IniaxInia-Bb)7CxTob Cno 'S' CM8625-G-1M-2Y-1M-1Y-3M-OY	3830	137	80		116	15S	3/6	8	83	46.0	85.0
Local variety (Check)	3700	133	100		116	85S	2/5	0	100	39.5	79.9
FurryxCno'S'-N0.66 CM 4210-10Y 4m-8y-SM-1Y-OM	3410	122	80		117	0	2/7	3	89	47.5	84.2
ET 13-A-11-L-1,L.	3260	117	90		120	10MS	2/5	23	91	32.0	83.5
7C Anx Inia-B-Man	3190	114	83		114	5MS	2/5	45	96	32.5	84.8
Enkoy (Standard Check)	2790	100	95		117	15MS	2/3	43	91	34.5	86.0
CgnxKal-Bbom 15133-1M-3Y-2M-OY	2490	89	71		114	0	2/5	5	75	46.0	85.0
Giza 139-Gb 136a-8316 PI 243064	2350	84	91		115	tMS	3/3	65	89	35.0	85.0
Bb-ocxBon/7ccm-5478-A-1Y-1M-8Y-3M-OY	2330	82	74		117	5MS	2/5	40	81	38.5	85.2
CgnxKal-Bb-CM.15133-1M-3Y-CM-OY	2190	78	74		115	0	2/5	8	75	38.0	84.9
P T 70354 = IAS 55-IAS20	1910	68	84		117	0	1/3	78	81	35.5	82.4
ET 51.A.L.A.L.	1860	67	91		117	0	1/3	80	83	37.5	85.0
ET 11.A.4.L.4 L.	1290	46	76		114	40S	0	75	83	41.5	85.0

Plot size, M^2 : 2.

Fertilizor, kg/ha ; 10 DAP

Planting date : 5 July, 80

Seeding rate, kg/ha: 12

L.S.D. 5% = 681 kg/ha

L.S.D. 1% = 910 "

C.V. = 17.7 %

115-48 Bread Wheat NYT "A" (Early Set)(Diksis)

Variety / Treatment	Yield 87.5%DM		Stand %	Days to heading	Days to maturity	Diseases		Lodging %	Height cm.	1000-seed Weight gm.	Hl-Weight kg.
	kg/ha	Rel.				Septoria 0-5/0-9	Stripe rust %	Late			
7C An x Inia - B Man	5130	197	86	183	157	0	0	0	120	36.0	84.5
Giza 139xGb 1860-3316 PI 243064	4410	169	91	177	-	1/6	0	0	110	35.5	83.8
PF70354-I A555-I AS 20	4150	159	86	183	159	2/7	0/7	1	115	34.8	81.8
Enkoy (Standard check)	3810	146	86	78	-	2/6	0	14	105	34.0	84.2
ET 51 - A.L.A.L.	3600	138	83	80	155	1/4	0	3	105	33.5	84.8
ET 13.A.11.L.1.C	3600	138	85	155	155	4/5	0	44	113	31.5	83.0
Cgn x Kal-Bb,CM15133-3Y-2M-OY	3450	132	88	79	161	4/8	0	0	93	34.5	82.9
Cno - 7Cxcc-Tcb/7L	3380	130	85	89	160	3/7	20MS	8	103	36.0	81.4
Cgn -Kal-Bb,CM15133-1M-3Y-6M-OY	3250	125	86	81	160	3/6	0	0	85	33.0	81.9
Bb-ccxRon/7L,CM 5478-A 1Y-1M-8Y-3M-OY	3210	123	85	79	155	5/8	0	0	98	33.8	87.7
(We/Bb IniaxInia-Bb)7C-Tob-Cno'S'CM8625-G-1M 4Y-1M-1Y-3M-OY	3130	120	85	81	155	3/8	TrR	0	93	40.5	81.6
Furry x Cno'S'-No.,66CM 4210-10Y-4M-8Y-5M-1Y-0M	3040	116	84	79	155	4/8	0	11	90	37.0	81.3
ET 11.A.4.L.4.L.	2630	101	80	86	-	4/9	1	31	113	32.0	78.5
Local variety(Check)	2610	100	78	83	158	3/7	55MS	46	105	33.0	77.6

Plot size, M^2 = 2.0
Fertilizer, kg/ha=80DAP
Planting data : 28/6/80
Seeding rate, kg/ha = 125

L.S.D 5% = 630 kg/ ha
L.S.D. 1% = 845 "
C.V. = 12.4 %

115 - 49 Bread Wheat NYT - "A" (Early Set) (Robe)

Variety / Treatment	Yield 87.5% DM kg/ha	Rel.	Stand %	Days to heading	Days to maturity	Diseases: Leaf rust 0-5/0-9	Stem r. 0-5/0-9	Stripe rust %	Septoria 0-5/0-9	Height cm.	1000-seed Weight gm.	Hl-Weight kg.
FurryxCno"S"-No.66,CM4210-10Y-4M-8Y-5M-1Y-OM	7410	200	88	68	134	1/8	3/0-3	5S	0	98	45.5	84.2
CgnxKal.Bb,CM15133-1M-3Y-6M-OY	6950	188	93	60	126	0	0	15S	1/3	100	47.3	84.4
PF70354=IAS55=IAS 20	6930	187	89	70	131	0	7/0-4	30S	0	108	36.0	83.3
Bb-ccxRon/7C-CM5478A-1Y-1M-8Y-3 3M-OY	6780	183	89	63	126	1/8	1/8	100S	0	105	39.8	84.1
(We/Lib IniaxInia-Bb)7C Tob Cno'S' Cno'S' CM8625 G-1M-4Y-1M-1Y-3M-OY	6340	171	88	61	134	0	0	15S	0	98	45.0	84.2
Cno-7CxCCxTob/7C	6340	171	82	72	132	0	0	40S	0	90	39.8	82.9
CgnxKal-Bb,CM15133-1M-3Y-2M-OM	6310	171	86	62	128	0	0	31S	0	105	40.0	84.6
ET 51.A.L.A.L.	6310	171	86	65	131	0	0-2/8	20S	0	108	38.0	85.2
Giza 139xGb1360-3316-PI 243064	6200	168	90	64	134	0	0-2/8	27S	1/6	108	36.5	85.3
ET 13.A.11.L.1.L.	6100	165	85	76	138	0	0	7S	0	117	36.0	85.0
ET 11.A.4.L.4.L.	5810	157	88	67	131	0	0	88S	0	115	39.0	84.3
7C ANxInia B,Man	5640	152	90	68	130	0	0	31S	3/6	113	35.5	85.2
Enkoy (Standard Check)	5630	152	90	64	124	2-3	0-3/8	11S	0	105	35.5	85.2
Local check (Israelian)	3700	100	85	63	123	3/9	2-4/7	35S	4/8	113	47.0	83.2

Plot size, M^2 : 2.0
Fertilizer, kg/ha : 150 DAP
Planting date : 30 July, 1980
Seeding rate, kg/ha : 125

L.S.D. 5% = 1018 kg/ha
L.S.D. 1% = 1362 "
C.V. = 11.6 %

115 - 50 Bread Wheat Pre - NYT (Kulumsa)

In this trial 22 lines and varieties of bread wheat were compared. As standard check and local check Romany Bc and a local wheat variety respectively were included. Stand was low for some varieties.

Observed diseases were only leaf rust and Septoria leaf blotch on some entries. Environmental conditions were not favourable for Stem rust to break - out.

With regard to yield there was no significant difference between the four top yielders at 95% probability. Further testing of the top yielders is essential inorder to select stably best yielding ones.

115 - 50 Bread Wheat Pre - NYT (Kulumsa)

Variety / Treatment	Yield 87.5% DM kg/ha	% [illegible]	Stand %	[illegible]	Leaf rust %	Leaf blotch 0-5/0-9	Shattering %	Height cm.	1000-seed Weight gm.	Hl- Weight kg
Lt 1100-C H1-1H.4.A.3H	4570	[illegible]	[illegible]	66	0	0	0	85	36.8	85.0
Aurora x Kal Bb SWM 703.Lr.2.A.6H	4330	[illegible]	[illegible]	67	0	-	13	95	41.0	84.5
Kvz Buho'S' x Kal Bb CM33027F-4M-3Y-OM	4120	[illegible]	76	62	0	0	13	85	41.3	83.3
KVZ Buho'S'x Kal-Bb, CM33027F-4M-51-OM	3900	[illegible]	76	62	tMS	0	8	80	37.5	83.2
AU x Kal.Bb/WOP'S' CM33203N.1M-2Y-OM	3850	[illegible]	83	68	0	0	5	80	35.3	85.0
Lee-KVZ/cc x Ron-Cha, CM16780.J-1M-2Y-501M-OY	3730	[illegible]	76	66	0	0	5	75	44.0	83.3
ET30.K.3.L.3.A.(F5)5H	3650	[illegible]	92	61	[33MS]	4/8	18	93	41.0	84.5
K4500 L6 A4 (Y50 E-Kal^3 etc) ET303.L.1.A.13H	3620	[illegible]	86	67	[45MS]	0	30	98	40.3	84.1
ET30.K.3.L.3.B(F5)3H	3600	[illegible]	96	61	tS	1/7	48	93	42.0	84.3
Local check (Tikur Sinde)	3430	[illegible]	96	65	80S	4/9	0	103	37.0	79.9
K6106 - 9	3380	[illegible]	78	65	0	0	15	90	32.0	83.5
KVZ Ti 71/Maya'S'xBb, Inia, CM 33089 W3M-11Y-OM	3370	[illegible]	81	66	0	4/5	5	75	40.5	84.2
AU x Kal-Bb/WoP'S' CM 33203-G-9M-5Y-OM	3320	[illegible]	76	68	0	0	8	75	36.3	83.9
(Tob.B.ManxBb/Cal)CM8972 F-9M-1M-1M-1Y-OM (1-5313)	3320	[illegible]	78	62	0	4/7	43	88	39.0	84.9

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115 - 50 Contd.

Variety / Treatment	Yield 87.5% DM		Stand %	Days to heading	Diseases		Shattering %	Height cm.	1000-seed Weight gm	Hl-Weight kg.
	Kg/ha	Rel.			Leaf rust %	Leaf blotch 0-5/0-9				
AU x Kal.Bb/WOP'S',CM33203-G-9M-4Y-OM	3130	114	76	68	0	0	8	70	33.8	84.6
Aurora x Kal-Bb SWM1703 L.1.C.9H	2920	107	82	68	0	2/3	18	88	39.3	84.5
Man'S' NimrodxKal-Bb SWM-1629.L.1 A.1H	A.1. 2770	101	80	69	0	3/4	10	105	41.8	81.2
ET30.K.3.L.5.(F5)5H	2750	101	95	62	tMR	3/8	65	95	39.0	83.6
Romany Bc (St.check)	2730	100	85	61	0	0	13	108	39.8	83.9
K4500 L6A4(Y50E-Kal^3 etc)-ET303. L.1.A.4H	2720	100	95	78	15MS 5S	0	28	113	25.3	80.6
ET30.C.2.A.3.(F5) 9H	2270	83	86	67	15MR 30MS	1/4	48	105	41.0	83.5
K4500 L4A6 (Kt54xFr-Fn/Y)ET301.L. 2.A.5H	1820	67	96	64	20MS	0	53	110	38.8	83.7
DesConocido-Fricor-EII7753-2E-100E-0Y	1670	61	80	62	0	0	53	100	32.6	79.5
Aurora-PP Inia.SWM 1709 L.1.C.2H	1380	51	90	66	10MS	0	90	113	35.5	83.8

Plot size, M^2 : 2.0 L.S.D. 5% = 652 kg/ha
Fertilizer, kg/ha : 100 DAP L.S.D. 1% = 871 "
Planting date : 5 July, 1980 C.V. = 12.4 %
Seeding rate, kg/ha : 125

115 - 51 & 52 Durum Wheat NYT (Diksis, Asasa)

Eight durum wheat lines and as check the durum wheat variety, Cocorit71, the bread wheat variety, Enkoy and a local wheat variety were tested in this trial. At both testing sites, Diksis (115-51) and Asasa (115-52) the trial was planted with fertilizers and without fertilizers in such a way that three replications were planted without fertilizers and the other three replications with normal fertilizer levels recommended for each location.

The objective of the trial is to investigate whether or not varieties that are best yielding under high fertility conditions are also relatively best yielding without the application of fertilizers.

The investigation of varieties that perform best without the application of fertilizers as well is believed to help the problem of most farmers who lack accessibility to commercial fertilizers.

In this trial stand was low at both sites but, lower for the unfertilized plots at Diksis. Yields obtained were much higher for the fertilized trial at Diksis while the opposite is true for Asasa. This probably due to a reason that the trial at Asasa was planted to a land that had been fertilized for a long time and thus, residual effect of phosphorus was manifested. All entries out-yielded the local variety in both cases at Asasa.

Enkoy, the bread wheat check was significantly the top yielder at Diksis with the application of fertilizers; while it was slightly out-performed by two durum wheat lines in unfertilized trial at the same location. At both sites some durum wheat lines out-performed the checks, durum variety (Cocorit 71) and the local wheat when planted without fertilizers.

115 - 51 Durum Wheat NYT (Diksis)

Without Fertilizer

Variety /Treatment	Yield 87.5% DM		Stand % at harvest	Days to heading	Diseases		Lodging %	Shattering %	Height cm.	1000-seed weight gm	Hl-Weight kg.
	kg/ ha	Rel.			Septoria 0-5/C-9	Leaf rust %	Late				
Gr-GsxPg, CM13434-5Y-1M-4Y-0Y	3070	125	83	84	4/4	0	0	0	85	45.5	83.9
Ld 357/C18155 No.58-40	3070	125	75	77	3/7	5MS 30MR	0	0	110	33.5	80.8
Enkoy (B. Wheat Check)	2980	122	75	79	3/3	0	0	0	105	39.5	84.5
Cr "S" (21563/31-130xLds) Candeal II, CD3862-1BS-6BS-0GS	2920	119	67	81	3/4	TMR	0	0	108	44.5	80.1
T.Dur.T.Sph.Ram-Gll "S" xM.Sadovao/ AA"S") Fg"S", CD324-4BS-7BS-0G	2500	102	75	79	5/3	85MS 90S	5	0	80	50.5	81.4
Local Variety (Check)	2450	100	95	76	8/-	86MS	95	0	113	32.0	76.8
Cit 71/Candeal II, CD3369-2BS-2BS-0DZ	2320	95	63	81	2/4	0	5	0	123	43.0	81.1
Cocorit 71 (Durum Check)	2320	95	85	77	5/7	0	0	0	80	36.0	78.6
Masa 72Y-0M-VZ484,Capelli x Yuma, F5, ET 126	2170	89	75	81	1/5	25MS	5	0	110	42.5	80.2
GDO VZ 466-F/C, "S", CM17061-16DZ-IKDZ-3KDZ	1870	76	80	69	5/7	15S	0	0	85	40.0	80.3
Cit 71/2-B-LKxLds(JO"S"/Ld357E TC xGll "S") CM17955-1-15M-1Y	1670	68	70	82	4/5	0	0	0	70	32.0	77.8

Plot size, M^2 : 2.0
Fertilizer, kg/ha: Nil
Planting date : 26 June, 1980
Seeding rate, kg/ha: 100 - 150

L.S.D. 5% = NS
C.V = 22.3 %

115 - 51 Durum Wheat NYT (Diksis)

With Fertilizer

Variety / Treatment	Yield 87.5% DM kg/ha	Rel.	Stand % at harvest	Days to heading	Diseases Leaf blotch 0-5/0-9	Diseases Leaf rust %	Lodging Late %	Shattering %	Height cm.	1000-seed weight gm	Hl-Weight kg.
Enkoy (B.Wheat check)	5750	203	88	76	2/7	0	0	0	112	39.5	84.5
Cit 71 Candeal II,CD3369-2BS-2BS-0DZ	4080	144	80	79	2/7	0	0	0	115	43.0	81.1
Cocorit 71 (Durum check)	3950	140	85	74	3/8	0	0	0	90	36.0	78.6
(T.Dur.T.Sph.Ram.G11"S" x M.Sadovo AA"S" Fg"S",CD324-4BS-7BS-0GS	3600	127	83	78	3/7	5MS	0	0	80	50.5	81.4
Ld357/CI8155 ND58-40	3570	126	83	79	3/8	10MS	0	0	125	33.5	80.8
Gr"S"/21563/31-130xLds Candeal II, CD3862-1BS-6BS-0GS	**3470**	**123**	**83**	**79**	**3/8**	**0**	**90**	**0**	**120**	**44.5**	**80.1**
Masa 72Y-0M-VZ484,Capelli x Yuma, F5, ET 126	3420	121	80	79	4/8	0	10	0	125	42.5	80.2
Gr-GSxPg,CM13434-5Y-1M-4Y-0Y	3130	111	83	80	3/8	0	5	0	115	45.5	83.9
Local Variety (Check)	2830	100	90	77	0	80S	95	0	115	32.0	76.8
17061 16DZ-1KDZ-3KDZ	2830	100	73	70	4/9	0	5	0	95	40.0	80.3
Cit 71/2-B-1k x Lds(JO"S"/Ld 357E-Tc^2 x G11"S"),CM17955-1-15M-1Y	2800	99	85	78	5/9	0	5	0	78	32.0	77.8

Plot size, M^2 : 2.0

Fertilizer, kg/ha : 80 DAP (18/46)

Planting date : 26 June, 1980

Seeding rate, kg/ha: 100-150

L.S.D. 5% = 1408 kg/ha

L.S.D. 1% = NS

C.V. = 22.9%

115- 52 Durum Wheat NYT (Asassa)

Without fertilizer

Variety / Treatment	Yield 87.5% DM kg/ha	Yield 87.5% DM Rel.	Stand % at seedling	Days to heading	Days to maturity	Diseases Leaf rust %	Diseases Stem rust %	Diseases Leaf blotch 0-5/0-9	Lodging % Late	Height cm.	1000-seed Weight gm.	Hl-Weight kg.
Enkoy (B. wheat check)	4930	112	65	93	137	0	0	1/7	0	110	32.8	81.3
Ld 357/CI8155 ND58-40	4870	111	80	91	140	30MR 5MS	0	5/7	0	120	27.5	84.3
(J.Dur.T.Sph.Ram-G11"S" xM. Sadovo/AA"S")Fg"S",CD324-4BS-7BS-0GS	4700	107	71	93	140	0	0	3/7	5	85	44.5	82.8
Cr"S"(21563/31-130xLds) Candeal II,CD3862-1BS-6BS-0GS	4600	105	68	95	139	tMR	0	1/6	0	110	43.5	82.1
Cit 71 Candeal II, CD3369-2BS-2BS-0DZ	4530	103	53	95	139	tMR	0	0	0	125	32.5	78.1
Gdo VZ466-P/c"S",CM,17061-16DZ-1KDZ-3KDZ	4520	103	65	83	140	15S	60S	1/7	0	90	48.0	83.5
Cocorit 71(Durum check)	4400	100	70	90	135	0	0	4/8	0	80	42.5	81.0
Gr-GSxPg,CM13434-5Y-1M-4Y-0Y	4030	92	76	98	138	0	0	3/6	0	85	38.5	80.8
Cit 71/2.B-LKxLds(JO"S"/Ld 357 357E-TC^2 xG11"S")CM 17955-1-15M-1Y	3720	85	80	91	136	30MR 5MS	0	5/8	5	70	44.0	83.0
Masa 72Y-0M-VZ 484, Capelli x Yuma, F5,ET126	3500	80	70	95	140	0	0	5/9	5	105	26.0	79.4
Local Variety (Check)	3370	77	90	90	133	100S	0	5/9	95	120	33.0	79.4

Plot size, M^2 : 2.0 L.S.D. 5% = 926 kg/ha

Fertilizer, kg/ha : Nil L.S.D. 1% = NS

Planting date : 12 June, 1980 C.V. = 12.6 %

Seeding rate, kg"ha: 100 - 150

115 - 52 Durum Wheat NYT (Asassa)
With Fertilizer

Variety / Treatment	Yield 87.5% DM kg/ha	Yield 87.5% DM Rel.	Stand %	Days to heading	Days to maturity	Diseases: Stem rust %	Diseases: Leaf rust %	Diseases: Leaf blotch 0-5/0-9	Lodging %	Height cms.	1000-seed Weight gms.	Hl-Weight kg.
Ld 357/CI8155 ND58-40	4580	130	65	93	140	0	16MS	4/9	0	128	83.3	80.8
Enkoy (B.Wheat check)	4420	126	83	89	134	0	0	3/8	10	113	32.0	85.0
Cit 71 Candeal III,CD3369-2BS-2BS-0DZ	3700	105	75	93	138	0	0	2/7	5	115	46.0	83.7
Cr"S" (21563/31-130xLds)-Candeal II, CD3862-1BS-6BS-0GS	3580	102	75	93	139	0	0	3/7	65	120	44.0	82.5
Cocorit 71 (Durum check)	3520	100	73	88	135	0	0	3/9	0	90	38.0	81.2
T.Dur.T.Sph.Ram-G11"S"xM. Sadovo/AA"S")Fg "S",CD 324-4BS-7BS-0GS	3180	90	68	95	137	0	5MS	3/8	5	88	50.0	83.5
Gdo VZ466-P/C"S",CM 17061-16DZ-1KDZ-3KDZ	3180	90	73	84	135	60S	0	5/8	5	95	45.3	84.1
Gr-GsxPg,CM13434-5Y-1M-4Y-0Y	3150	89	78	95	134	0	0	2/7	5	115	46.8	82.2
CapellixYuma,F5,CT126	3120	89	80	93	140	0	0	3/8	8	125	50.0	81.0
Cit 71/2-B-1KxLds(JO"S"/ L4357 E-TC^2 x G11"S"),CM 17955-1-15M-1Y	2980	85	75	92	136	0	0	5/8	0	78	38.5	80.9
Local check	2750	78	90	91	135	0	0	3/8	71	115	27.5	80.0

Plot size, M^2 : 2.0
Fertilizer, kg/ha : 150 DAP
Planting date : 12 June, 1980
Seeding rate, kg/ha: 100 - 150

L.S.D. 5% = 914 kg/ha
L.S.D. 1% = 1246 "
V.C. = 15.5 %

Barley

125-1,2,3 National Yeild Trials on Food Barley (Bekoji,Asassa, & Dixis)

Out of the eight varieties included in this trial and laid out at Bekoji IAR/H/485 (The Standard Check) proved to be the top yielding variety with a yield of 5025 kg/ha followed by EH163/F_3-45-3H and EH163/F_3-113-6H which gave 4988 kg/ha and 4088 kg/ha respectively. At this station all of the improved varieties outyielded the local check (TABLE 1).

Concidering diseases scald was observed on some of the varieties IAR/H/485 and EH163/F_3-113-6H though, happened to be best yielders, were among the varieties that were severly attacked by scald as shown in talble 1 below.

At Asassa, EH163/F_3-113-6H, EH163/F_3-45-3H and EH163/F_3-17H were the threebest yielders and they gave 5238 kg/ha, 3975 kg/ha and 3900 kg/ha respectively (TABL-2) net blotch and spot blotch were the two common and sever diseases on all varieties, net blotch being more severe comparatively.

EH163/F_3-17-1H with a yield of 2813 kg/ha was the top yielding variety at Dixis. Other best yielding varieties at this station include IAR/H/485 and A-Hor 880/6 1... which gave 2525 kg/ha and 2275 kg/ha respectively.Generally yields were much lower at Dixis when compared to the other two Stations (TABLE 3).

As far as disease incidence was concerned spot blotch was observed to be sever wheras scald attacked some varieties with variable degree of severity. Some varieties showed conciderable susceptibility to lodging.

125-1 Food Barley National Field Trial.

Variety/Treatment	Yield 87.5% DM Kg/ha	% Stand	Days to Heading	Days to maturity	Diseases Scald 0 - 9	Lodging % Late	Shattering %	Height cms	1000-seed weight gms	HL weight kg.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
A Hord 880/61 ...	3688	75	111	159	2	0	0	110	34.0	60.2
EH12B/F_3-Q-L-1-L	3213	84	95	150	0	0	0	125	33.3	71.3
Phil([illegible] -L-A-L	3138	64	97	153	3	0	0	105	38.3	67.1
[illegible]	2763	76	98	152	3	0	0	120	40.5	73.0

Plot size M^2 : 2

Fertilizer kg/ha : 100 DAP

Planting date : 20/6/80

Seeding rate kg/ha : 80

L.S.D. 5% = 108 kg/ha

L.S.D. 1% = 147 "

C.V. = 18.7 %

125-2 Food Barley National Yield Trial (Asassa)

Variety/Treatment	Yield 87.5% DM kg/ha	Stand %	Days to heading	Days to maturity	Diseases: Net blotch 0-9	Diseases: Spot blotch 0-9	1000-seed weight gms	Hl-weight kg.
EH163/F_3-113-6H	5238	79	85	136	8	3	44.3	64.1
EH163/F_3-45-3H	3975	64	95	135	8	2	49.8	63.7
EH163/F_3-17-1H	3900	71	91	135	8	3	40.3	62.4
IAR/H/485 (St.ck)	3900	65	97	141	8	2	39.0	62.0
EH12B/F_3-Q-L-1L	3825	84	92	126	8	6	35.3	69.4
Local check	3450	56	85	127	8	3	36.8	63.4
E11/F_3-C-1-A-L	2913	74	98	136	8	2	34.0	66.0
A Hord 880/61....	2863	69	105	138	8	4	34.8	58.8

Plot size M^2 : 2
Fertilizer kg/ha : 100
Planting date : 13/6/80

L.S.D. 5% = 190 kg/ha
L.S.S. 1% = 260 "
C.V. = 17.9 %

125-3 Food Barley National Yield Trial (Dixsis).

Variety/Treatment	Yield 87.5% DM kg/ha	% Stand	Days to Heading	Days to Maturity	Diseases Spot blotch 0 - 9	Lodging % Late	Height cms	1000-seed weight gms	Hl weight kg.
EA/AT/485 (Stock)	2525	85	108	160	8	18	93	41.3	69.4
Local check	2263	78	91	156	8	35	90	37.5	65.5
EH11/F_3-C-1-A-L	2050	88	109	155	7	13	93	36.5	71.7
EH123/F_3-Q-L-1-L	2025	83	97	155	7	10	88	34.0	72.1
EH 163/F_3-113-6H	1713	70	106	-	7	0	85	42.0	64.4
EH163/F_3-45-3H	1538	70	104	-	7	3	105	50.0	67.5

Plot size M^2 : 2
Fertilizer kg/ha : 80 DAP
Planting date : 18/6/80
Seeding rate kg/ha : 80

L.S.D. 5% = 655 kg/ha
L.S.D. 1% = 891 "
C.V. = 20.7 %

125-4,5 Pre-National Yield Trial on Food Barley (Bekoji & Asassa).

In this trial fifteen improved varieties and one local check were included and the trials were carried out at Bekoji and Asasa.

Out of these the three top yielding varieties at Bekoji were EH37/F_3-M-1-20H, EH165/F_3-22-9H and EH163/F_3-107-4H with yields of 7300 kg/ha 7217kg/ha and 6733 kg/ha respectively (TABLE 4).

In genereal the stand was good at Bekoji, but lodging was found to be sever, particularly on variety EH37/F_3-M-1-20H (50%). Regarding disease net blotch and scald were observed but the severaly was very low.

At asassa the highest yielding varieties with yields of 5183 kg/ha, 4817kg/ha and 4717 kg/ha respectively were EH163/F_3-3-8H, EH165/F_3-22-9H and EH37/F_3-M-1-20H. Contrary to Bekoji lodging was not observed on any of the treatments, but the severity and incidence of net blotch and scald was relatively high at Asass (TABLE 5).

125-4 Food Barley Pre-National yield trial (Bekoji).

Variety/Treatment	Yield 87.5% DM kg/ha	Stand %	Days to heading	Days to maturity	Diseases Scald 0-9	Lodging % Late	Height cms	1000-seed weight gms	Hl-weight kg.
EH37/F_3-m-1-20H	7300	87	98	148	0	50	130	41.3	60.9
EH165/F_3-22-9H	7217	90	91	146	2	15	133	41.3	64.0
EH163/F_3-107-4H	6733	75	88	146	-	32	127	35.8	59.1
ARDU-12-10C	6583	75	93	146	3	12	125	39.5	62.9
ARDU-12-60B	6417	72	95	147	2	15	132	37.5	62.4
EH163/F_3-41-2H	6100	78	88	150	-	12	122	39.5	65.7
EH51A/F_3-B-1-22H	6050	80	86	150	-	10	127	41.3	64.1
IAR/H/485 (St.ck)	6017	78	93	146	1	13	120	37.3	60.8
ARDU-12-9B	5883	75	94	147	4	3	120	38.3	64.0
EH165/F_3-3-8H	5767	82	99	148	3	10	130	42.0	64.3
ARDU-12-9C	5333	85	95	147	-	32	127	34.8	60.5
ARDU-12-58a	5233	83	85	159	8	18	115	34.5	59.9
EH37/F_3-L-2-19H	4866	72	95	150	-	23	128	43.8	66.0
Local check	4300	63	98	150	-	0	122	36.8	64.9
ARDU-12-8C	3050	90	87	159	8	15	120	34.8	62.4
ARDU-12-3a	2500	88	85	159	8	18	113	35.0	63.1

Plot size 20
Fertilizer kg/ha: 100 DAP
Planting date : 20/6/80
Seeding rate kg/ha: 80

L.S.D. 5% = 1547 kg/ha
L.S.D. 1% = 2087 "
C.V. 16.6 %

125-5 Food Barley Pre-National yiels trial (Asassa).

Variety/Treatment	Yield 87.5% DM kg/ha	Stand %	Days to heading	Days to maturity	Diseases: Net blotch 0 - 9	Diseases: Scald 0 - 9	1000-seed weight gms	Hl-weight kg.
EH165/F_3-3-8H	5183	82	84	134	8	4	41.8	65.7
EH165/F_3-22-9H	4817	77	87	135	8	2	42.3	63.4
EH37/F_3-M-1-20H	4717	68	88	134	8	7	41.3	61.0
EH163/F_3-107-4H	4600	77	84	134	8	2	32.5	60.7
ARDU-12-10C	4533	77	82	129	8	5.5	41.5	63.7
ARDU-12-9C	4467	83	79	119	8	3	38.5	59.9
EH163/F_3-41-2H	4317	75	86	136	8	2	38.3	66.9
EH51A/F_3-B-1-22H	4000	77	84	133	8	1	40.0	62.1
ARDU-12-60B	3850	82	83	129	8	1	41.5	62.7
ARDU-12-9B	3817	82	82	124	8	1	42.8	64.4
IAR/H/485 (St.ck)	3800	73	86	126	8	4.5	41.0	61.5
ARDU-12-8C	3633	93	71	113	8	3.5	41.8	67.7
ARDU-12-3a	3183	92	72	111	8	5	42.8	65.4
ARDU-12-58a	3050	93	69	108	8	1.5	40.3	63.7
EH37/F_3-L-2-19H	2683	72	83	128	8	0.5	42.5	60.4
Local check	2400	62	80	126	8	1	38.8	66.2

Plot Size M^2 $2m^2$
Fertilizer kg/ha: 100
Planting date : 14/6/80
Seeding rate kg/ha: 80

L.S.D. 5% = 957 kg/ha
L.S.D. 1% = 1290 "
C.V. = 14.6 %

125-6,7,8 National Yield Trials on Malt Barley (Bekoji, Dixis & Asassa)

The National Yield Trial on Malt Barley included thirteen different varieties in which Beka and one local check were included as standard and local checks. Similar to the Food barley National Trial the trials were conducted at Bekoji Dixis and Asassa.

At Bekoji EH21B/F_3-A-1-A-2L with a yield of 4175 kg/ha outyielded the other varieties. EH21B/F_3-A-1-A1L and the local check from Bekoji market ranked second and third yielding 3950 kg/ha and 3163 kg/ha respectively. (TABLE 6)

The stand in general was not that satisfactory but in relative terms it was better than that of Asassa. Regarding disease scald was observed on some varieties but the severity was low. In addition to this few number of plants of some varieties were affected by smut.

Again EH21B/F_3-A-1-2L was the best yielding variety at Asassa with a yield of 3225 kg/ha. It was follwed by EH11/F_3-A-1-C-L and EH11/F_3-A-1-A-L which gave 2750 kg/ha and 2736 kg/ha respectively (TABLE 7). With the exception of few varieties the stand was good at this station. Lodging was observed on some varieties and the common and sever disease at this station was spot blotch.

With a yield of 5400 kg/ha, EH21B/F_3-A-1-A-2L proved to be the highest yielder at Asassa again which implies that this variety was the best yielder at all stations. Holker and EH21B/F_3-A-1-A-1L with yields of 5325 kg/ha and 4313 kg/ha respectively were also the high yielding varieties of the station (TABLE 8).

Concidering diseases, scald, net blotch, and spot blotch were observed on all varieties with variable magnitude of severity from variety to variety. Generally the stand was poor at Asassa when compared to the other two stations.

125-6 Malt Barley National Yield Trial(Bokoji).

Variety/Treatment	Yield 87.5% DM kg/ha	Stand %	Days to heading	Days to maturity	Diseases		Lodging %	Shattering %	Height cms.	1000-seed weight gms	Hl-weight kg.
					Scald 0 - 9	Smut No of plants	Late				
EH21B/F_3-A-1-A-2-L	4175	76	103	153	0	0	0	0	90	39.5	73.1
EH21B/F_3-A-1-A-1--L	3950	72	101	154	1	4	0	0	95	36.0	70.6
Local check	3163	61	100	156	1	0	0	0	110	42.0	65.3
EH12B/F_3-M-1-A-4L	2838	46	104	-	1	0	0	0	110	38.8	73.0
EH12B/F_3-M-1-A-1-L	2600	56	103	155	6	0	0	0	110	34.3	70.3
Holkr	2425	72	98	152	6	0	0	0	90	38.0	71.0
Beka (St.ck)	2375	55	101	152	8	0	0	0	90	32.5	73.5
EH11/F_3-A-1-C-L	2363	75	102	151	0	0	0	0	110	35.0	72.0
EH99/F_3-D-5-13H	2200	49	101	153	0	1	0	0	90	42.5	71.6
EH172/F_2-R-2-16H	2000	52	86	154	4	0	0	0	80	34.5	73.3
EH11/F_3-A-1-A-L	2038	50	103	153	0	0	0	0	115	36.3	69.8
EH172/F_2-P-1-14H	1725	35	107	154	3	0	0	0	90	41.3	70.9
EH172/F_2-A-1-1H	1313	31	108	154	1	1	0	0	75	35.5	68.7

Plot size : 2
Fertilizer kg/ha : 100 DAP
Planting date : 20/6/80
Seeding rate kg/ha : 75

L.S.D. 5% = 791 kg/ha
L.S.D. 1% = 1060 "
C.V. = 21.7 %

125-7 Malt Barley National Yield Trial (Dixis).

Variety/Treatment	Yield 87.5% DM kg/ha	Stand %	Days to heading	Days to maturity	Diseases Spot-blotch 0-9	Lodging % Late	Height cms	1000-seed weight gms	Hl-weight kg.
EH21B/F_3-m-1-m-2L	3225	88	91	140	7	35	80	34.3	66.8
EH11/F_3-m-1-C-L	2750	78	87	139	4.5	0	105	35.3	74.6
EH11/F_3-m-1-m-L	2738	73	90	151	4.5	3	95	35.0	73.9
EH21B/F_3-m-1-m-1-L	2675	85	90	144	4.5	8	80	33.5	70.6
Holker	2638	83	85	141	6	3	83	36.0	68.2
EH12B/F_3-m-1-m-4L	2500	83	93	144	4	5	88	36.5	73.7
Beka (St.check)	2463	75	86	134	7.5	3	83	29.5	74.9
EH172/F_2-P-1-14H	2400	70	93	-	5.5	0	83	41.8	75.2
Local check (Aruso)	2100	43	76	139	5.5	8	93	37.0	65.5
EH172/F_2-m-1-1H	2075	68	93	149	3.5	0	75	32.8	70.3
EH172/F_3-R-2-16H	1900	50	73	136	4.5	0	78	37.0	72.3
EH12B/F_3-m-1-m-1-L	1788	53	98	143	2.5	0	83	31.8	71.1
EH99/F_3-D-5-13H	1675	58	89	137	3.5	0	83	35.3	70.1

Plot size M^2 : 2
Fertilizer kg/ha : 80 DAP
Planting date : 28/6/80
Seeding rate kg/ha : 75

L.S.D. 5% = 355 kg/ha
L.S.D. 1% = 476 "
C.V. = 10.3 %

125/8 Malt Barley National Yield Trial (Asassa).

Variety/Treatment	Yield 87.5% DM kg/ha	Stand %	Days to heading	Days to maturity	Diseases: Scald 0-9	Diseases: Net blotch 0 - 9	Diseases: Spot blotch 0 - 9	Heitht cms	1000-seed weight gms	Hl-weight kg.
EH21B/F_3-A-1-A-2-L	5400	75	93	136	1.5	3	5	102	32.3	65.0
Holkr	5325	85	84	131	2	2	5	99	38.0	68.6
EH21B/F_3-A-1-A-1-L	4313	78	95	137	2.3	2	6	104	31.8	64.8
EH11/F_3-A-1-C-L	4275	88	92	133	2.5	4	8	110	31.5	69.0
Local check (Asass Market)	4225	68	80	131	5	6	7	95	34.8	63.1
EH11/F_3-A-1-A-L	3988	58	97	136	1.8	4	4	122	33.5	70.3
Beka (St.ck)	3538	65	85	136	6	3	3.5	84	32.0	74.1
EH172/F_2-P-1-14H	3525	28	99	144	3	4	3.5	94	44.5	73.5
EH12B/F_2-M-1-A-4L	3150	20	105	138	1.8	3	4	103	38.5	70.2
EH172/F_2-R-2-16H	2825	30	84	137	1.5	3	3.5	85	37.0	72.1
EH12B/F_3-M-1-A-1-L	2700	23	107	139	3.3	4	4	94	31.5	69.6
EH172/F_2-A-1-1-H	2563	48	100	143	1.3	2	6	82	35.5	71.3
EH99/F_3-D-5-13H	2425	48	96	138	1.8	2	6.5	102	37.8	68.3

Plot size M^2 : 2
Fertilizer kg/ha : 100 DAP
Planting date : 13/6/80
Seeding rate kg/ha: 75

L.S.D. 5% = 1038 kg/ha
L.S.D. 1% = 1392 "
C.V. = 22.8

125-9,10,11 Pre-National Yield Trials on Malt Barley (Asassa, Bekoji & Dixis).

Out of the nine improved and one local check malt barley varieties included in this trial the three top yielding varieties at Asassa were local check, EH172/F_2-T-2-10H and EH172/F_2-H-2-9H with yields of 3617 kg/ha, 3633 kg/ha and 3583 kg/ha respectively. (TABLE 9)

And with regard to disease net blotch was the most sever disease observed indiscriminatly on all varieties.

At Bekoji the highest yielding variety with a yield of 4933 kg/ha was EH99/F_3-D-6-14H followed by EH99/F_3-D-4-12H and EH172/F_2-H-2-9H with yields of 4800 kg/ha and 4533 kg/ha respectively. (TABLE 10)

At Dixis all of the improved varieties proved to outyield the standard check. EH172/F_2-H-2-9H with a yield of 2577 kg/ha was the highest yielding variety. EH99/F_3-D-4-12H and EH-99F_3-D-6-14H were the next two best yielding varieties of the station (TABLE 11)

Generally speaking the stand percent at this station was fair and regarding disease the trials at Dixis were severly attacked by spot bloch to a variable extent.

125-9 Malt Barley Pre-National Yield Trial (Asassa)

Variety/Treatment	Yield 87.5% DM kg/ha	Stand %	Days to heading	Days to maturity	Diseases Net blotch 0 - 9	1000-seed weight gms	Hl-weight kg.
Local check	3817	58	81	135	8	36.8	63.8
EH172/F_2-T-2-18H	3633	77	90	135	8	36.3	72.0
EH172/F_2-H-2-9H	3583	63	91	134	8	41.0	70.1
EH172/F_2-T-1-17H	3350	73	93	135	8	31.8	71.1
EH99/F_3-1-6-14H	3217	80	90	135	8	40.3	68.5
EH99/F_3-1-4-12H	3200	73	91	133	8	40.3	69.5
Beka (St.check)	2967	70	88	131	8	32.0	72.0
EH211/F_2-A-1-22H	2850	70	90	133	8	40.3	73.1
EH172/F_2-R-1-15H	2467	65	73	126	8	33.3	70.4
EH211/F_2-A-3-23H	2383	65	92	132	8	40.3	71.5

Plot size M^2 : 2
Fertilizer kg/ha : 100 kg DAP/ha
Planting date : 13/6/80
Seeding rate kg/ha : 75

L.S.D. 5% = 1145 kg/ha
L.S.D. 1% = 1570 "
C.V. = 21.2 %

125-10 Malt Barley Pre-National Yield Trial (Bokoji)

Variety/Treatment	Yield 87.5% DM kg/ha	Stand %	Days to heading	Days to maturity	Lodging % Late	Shattering %	Height cms	1000-seed weight gms	Hl-weight kg.
EH99/F_3-D-6-14H	4983	73	85	150	0	0	115	47.3	72.6
EH99/F_3-D-4-12H	4800	72	81	149	0	0	115	42.5	72.5
EH172/F_2-H-2-9H	4333	68	86	152	0	0	105	40.3	70.0
EH172/F_2-T-1-17H	4033	70	89	153	0	0	100	35.0	73.1
EH211/F_2-A-1-22H	3950	70	85	154	0	0	115	45.3	73.6
E211/F_2-A-3-23H	3733	70	91	153	0	0	115	43.0	73.6
EH172/F_3-T-2-1SH	3683	70	88	153	0	0	105	37.8	72.5
Beka (St.ck)	3650	65	87	150	0	0	90	35.0	73.0
EH172/F_2-R-1-15H	3383	68	70	151	0	0	90	38.3	73.5
Local check	3267	60	86	151	0	0	110	41.0	66.8

Plot size M^2 : 2
Fertilizer kg/ha : 100
Planting date : 20/6/80
Seeding rate kg/ha : 75

L.S.D. 5% = 78 kg/ha
L.S.D. 1% = 107 "
C.V. = 13.23 %

125-11 Malt Barley Pre-National Yield Trial (Dixis)

Variety/Treatment	Yield 87.5% DM kg/ha	Stand %	Days to heading	Days to maturity	Diseases Spot blotch 0 - 9	Lodging % Late	Shattering %	Height cms	1000-seed weight gms	Hl-weight kg.
EH172/F_2-H-2-9H	2577	77	85	142	8	0	0	85	37.8	68.6
EH99/F_3-D-4-12H	2412	77	85	139	6	5	0	88	42.8	70.3
EH99/F_3-D-6-14H	2408	85	85	139	8	10	0	95	41.5	68.5
EH172/F_2-R-4-15H	2232	78	87	132	8	-	0	78	35.5	68.9
EH172/F_2-T-1-17L	2127	82	83	140	8	8	0	70	30.5	71.3
Beka (St.check)	2015	73	84	133	6	-	0	73	30.8	70.7
EH172/F_2-T-2-18H	2002	77	84	146	6	0	0	70	35.0	72.3
EH211/F_2-A-1-22H	1992	85	82	132	8	3	0	90	40.5	72.9
EH211/F_2-A-3-23H	1923	72	85	145	8	3	0	83	40.5	73.6
Local check	1355	62	90	154	6	3	0	75	36.5	65.1

Plot size M^2 : 2
Fertilizer kg/ha : 80 DAP
Planting date : 28/6/80
Seeding rate kg/ha : 75

L.S.D. 5% = 649 kg/ha
L.S.D. 1% = 861 "
C.V. = 17.8 %

125-12,13,16/80 Food Barley Variety Trials (Dixis, Bekoji and Robe).

ARDU 1974-10c gave a yield of 4950 kg/ha and proved to be the highest yielder out of ten varieties included in this trial, at Dixis. A-Hor 880/61... with a yield of 4300 kg/ha and IAR/H/405 with a yield of 4163 kg/ha were the next two high yielding varieties. (TABLE 12)

At this station some varieties showed sever lodging percent. ARDU 1974-10c though it was the highest yielder happened to be among the varieties which showed high percent of lodging (50%). Regarding disease incidence, Scald, Leaf rust, Spot blotch and net blotch were observed with variable magnitude of severity from variety to variety. Spot blotch attacked all varieties, but the other diseases were observed only on some varieties. Generally speaking the stand of the varieties at this station was relatively good.

With a yield of 6550 kg/ha the same variety i.e. ARDU 1974-10c outyielded the other varieties at Bekoji. It was followed by IAR/H/405 and A-Hor 880/61... which gave 5600 kg/ha and 5230 kg/ha respectively. (TABLE 13). The stand percent for the varieties was fair and with respect to disease scald was observed on all varieties variably. Lodging was observed on some varieties at a latter stage of development but the severity was low.

At Robe A-Hor 880/61... IAR/H/405 and ARDU 1974-50a were the best yeilding varieties. They gave 5550 kg/ha, 4850 kg/ha and 4825 kg/ha respectively (TABLE 14). At this station shattering was observed on some varieties, the severity being higher (23%) on the local check. Concidering disease, leaf rust was observed and interestingly distinct variation in the magnitude of resistance to the disease was observed among varieties.

123-12 Food Barley Variety trial (Dixis).

Variety/Treatment	Yield 87.5% DM	Stand %	Days to heading	Days to maturity	Diseases				Lodging %	Height cms	1000-seed weight gms	Hl-weight kg.
					Spot blotch 0-9	Net blotch 0-9	Scald	Leaf rust %	Late			
ARDU 1974-12-10c	4950	90	82	131	8				50	105	41.3	62.9
A Hord 880/61 ...	4300	85	93	134	3				5	115	36.5	61.1
IAR /H/ 485	4113	84	77	133	6				55	105	39.5	59.0
ARDU 1974-12-9c	3750	73	86	133	6				45	100	40.5	63.4
ARDU 1974-12-32	3288	99	70	127	8	6	5	60 MS	-	105	39.5	60.4
Local check	3150	79	78	137	7			15 MS	55	105	36.0	63.9
ARDU 1974-12-8c	3063	100	69	127	8	7	4	80 MS	-	105	39.5	60.6
Madostrang	2850	65	96	134	4				8	75	30.5	68.1
ARDU 1974-12-582	2800	100	69	129	8	9	5	60 MR	-	110	40.3	60.2
Hord 328/73	2488	60	69	132	2		2		53	100	37.5	63.3

Plot size M^2 : 2
Fertilizer kg/ha : 150 DAP
Planting date : 28/6/80
Seeding rate kg/ha : 80

L.S.D. 5% = 882 kg/ha
L.S.D. 1% = 1192 "
C.V. = 17.6%

125-13 Food Barley Variety Trial (Bekoji).

Variety/Treatment	Yield 87.5% DM kg/ha	Stand %	Days to heading	Days to maturity	Diseases Scald 0-9	Lodging % Late	Height cms	1000-seed weight gms	Hl-weight kg.
ARDU 1974-12-10c	6550	80	100	150	4	10	115	38.8	65.4
IAR /H/ 435	5600	80	98	150	5	3	115	38.3	62.6
A Hord 880/61	5238	75	106	161	1	-	130	33.8	59.3
ARDU 1974-12-9c	4863	70	101	151	3	-	115	37.5	63.3
Local check	4100	65	102	152	3	3	120	41.0	67.1
ARDU 1974-12-3a	3875	65	101	150	3	-	120	37.8	67.1
Hadostreng	3475	55	92	161	7	-	90	30.5	68.4
ARDU 1974-12-8c	3200	95	84	160	8	3	115	35.5	65.4
Hord 328/73	2913	55	102	152	7	10	100	37.8	63.6
ARDU 1974-12-58a	2750	90	84	129	8	3	110	34.8	65.6

Plot size m^2 : 2
Fertilizer kg/ha : 150 DAP
Planting date : 20/6/80
Seeding rate kg/ha : 80

L.S.D. 5% = 605 kg/ha
L.S.D. 1% = 817 "
C.V. = 9.6%

125-16 Food Barley Variety Trial (Robe).

Variety/Treatment	Yield 87.5% DM kg/ha	Stand %	Days to heading	Days to maturity	Diseases Leaf rust %	Lodging % Late	Shattering %	Height cms	1000-seed weight gms	Hl-weight kg.
A Hord 880/61 ...	5550	70	96	148	5R	-	-	95	45.5	68.2
IAR /H/ 485	4850	65	77	138	75MS	-	-	80	40.5	66.9
ARDU 1974-12-582	4825	90	60	103	45S	70	5	115	46.8	69.9
ARDU 1974-12-10c	4725	70	100	141	35S	-	-	80	42.0	68.6
ARDU 1974-12-32	4600	85	60	106	40MS	-	5	115	47.0	69.6
ARDU 1974-12-8c	4163	90	61	107	30MS	-	5	115	46.0	67.7
Hadostron	2713	50	118	148	70MS	-	5	75	39.3	75.8
ARDU 1974-12-9c	2325	40	108	148	25MR	-	-	70	42.0	66.4
Hord 320/73	1125	35	121		5R	-	-	75	45.	63.8
Local check	663	70	84	132	85S	-	25	80	39.3	68.0

Plot size M^2 : 2

Fertilizer kg/ha : 150 DAP

Planting date : 1/8/80

L.S.D. 5% = 902 kg/ha

L.S.D. 1% = 1219 "

C.V. = 17.5%

125-14,15/80 Malt Barley Variety Trials (Dixis and Robe).

Out of tne different varieties included in this trial the three best yielding varieties at Dixis were EH12B/F_3-M-A-4L, EH12B/F_3-M-A-2L and EH12B/F_3-M-A-L. They gave 4500 kg/ha 3888 kg/ha and 3863 kg/ha. respectively (TABLE 15).

The stnd was generally good for all varieties. With respect to disease scald was the main disease observed on most varieties . Late lodging was observed on almost all varieties, with high percent of severity (55%) on EH12B/F_3-M-A-4L which was the stations highest yielding variety.

Eventhough statistical analysis showed no significant difference in yield between varieties EH21/B/F_2-B-24H at Robe gave reasonably higher yield than the other varieties (TABLE 16).

The intensity and occurance of the common diseases on barley were much higher at Robe than Dixis, leaf rust, stem rust, spot blotch and scald were observed on most varieties with a notable difference in severity.

125-14 Malt Barley Variety Trial (Dixis).

Variety/Treatment	Yield 87.5% DM kg/ha	Stand %	Days to heading	Days to maturity	Diseases Spot Blotch 0-9	Lodging % Late	Height cms	1000-seed weight gms	Hl-weight kg.
EH 12B/F_3-M-A-4c	4588	90	99	148	8	55	110	37.0	69.8
EH 21B/F_3-A-1-A-2L	3888	80	97	-	7	30	90	37.3	70.0
EH 12B/F_3-M-A-L	3863	85	100	153	8	45	95	31.3	71.6
EH 12B/F_3-A_1-A_1-L	3750	85	98	149	8	45	95	32.3	68.8
EH 11B/F_3-A-C-L	3588	90	95	142	8	20	120	35.0	75.4
EH 172/F_2-A-15H	3550	85	78	150	8	10	100	37.5	71.4
EH 8B/F_4-EL-6L	3500	85	87	149	-	10	100	37.8	71.0
EH 8B/F_4-EL-7L	3300	80	89	149	8	20	95	37.3	67.7
Proctor	3150	85	100	153	8	25	85	30.8	67.6
EH 211/F_2-B_1-24H	2600	90	74	139	-	-	110	35.0	59.7

Plot size M^2 : 2
Fertilizer kg/ha : 80 kg/DAP
Planting date : 28/6/80
Seeding rate kg/ha : 75

L.S.D. 5% = 49 kg/ha
L.S.D. 1% = 66 "
C.V. = 13.5 %

125-15 Malt Barley Variety Trial (Robe).

Variety/Treatment	Yield 87.5% DM kg/ha	Stand %	Days to heading	Days to maturity	Diseases			Shattering %	Height cms	1000-seed weight gms	Hl-weight kg.
					Leaf rust %	Stomnast	Scald 0-9				
EH 211/F_2-B_1-24H	3788	90	63	112	90 MS			-	105	40.3	74.2
EH 12B/F_3-M_1-A-4L	3700	70	104	148	90 MS	-	-	-5	80	41.3	74.1
EH 12B/F_3-M-1-A-1-L	3675	75	111	148	90 MS	80 MS	-	-	75	39.0	73.3
EH 17L/F_2-R_1-15H	3038	65	80	144	90 MS	-	-	5	70	40.0	75.1
EH 8B/F_4-E-L-7L	3500	65	96	139	10MR	70MS	-	-	75	44.0	74.3
EH 21B/F_3-A_1-A-2L	3400	70	112	147	25 MS	-	-	5	70	38.0	72.1
EH 8B/F_4-EL-6L	3275	60	100	145	15 MS	-	6	-	75	45.0	74.7
EH 12B/F_3-A_1-A_1L	3225	65	117	148	10 MR	-	-	-	70	39.5	72.9
EH 11B/F_3-A-C-L	3013	70	105	147	80 MS	-	-	-	90	40.0	75.0
Proctor	2325	60	116	148	65 S	80-MS	-	-	65	34.3	73.5

Plot size M^2 : 2
Fertilizer kg/ha : 150 DAP
Planting date : 1/8/80
Seeding rate kg/ha : 80

L.S.D. 5% = NS kg/ha
L.S.D. 1% = NS "
C.V. = 19.8%

Maize

155 1 Maize Variety Trial (Lowland Set) - (Netle).

Varieties of maize tested in this set of trial were selected for their early maturity for low rain-fed areas. Hence, the trial was conducted in the Rift valley, at Netle, one of the sites known in receiving low precipitation. Aphid attack, was a serious problem during the vegetative development.

In maturity no variety is prefered to the check entry, Katumani Composite. But, the opposite is true when it comes to yield.

155 - 1 Maize Variety Trial (Lowland Set) - (Metle)

Variety / Treatment	Yield 87.5% DM		Stand No.of plants/plot	Days to Tasseling	Days to Silking	Days to maturity	Diseases		1000-seed Weight gm.	Hl-Weight kg.
	kg/ha	Rel.				Maturity	Rust 0.0 -5.0	Blight 0.0-5.0		
Obregon 7442	6240	263	31	77	75	155	3.3	1.0	364.3	76.3
Ukiriguru 7534	6170	260	32	79	81	151	3.8	2.0	368.0	76.5
Sids 7534	6040	255	31	83	84	152	1.8	2.5	361.5	79.9
Khumaltar 7633	5590	236	32	79	88	153	2.8	1.3	345.0	76.5
Coast Composite	5410	228	32	86	90	-	2.4	1.3	357.3	76.5
Ukiriguch 7542	5320	224	31	78	87	152	2.8	0.8	392.3	77.5
Pop Corn	2920	123	25	74	82	143	1.5	1.5	148.5	81.6
Katumani Composite (check	2370	100	31	63	75	139	1.4	0.3	371.5	75.1

Plot size, M^2 : 11.25 L.S.D. 5% = 948 kg/ha
Fertilizer, kg/ha : 150 DAP +150 Urea L.S.D. 1% = 1291 "
Planting date : 18 April, 1980 C.V. = 12.9
Spacing : 75cm x 30 cm.

15? - 2 Yield Assessment Trial on Maize (Netle)

Some of the varieties entered in this trial are not lowland type. Aphid infestation and moisture stress were the major problems during the vegetative growth.

Despite low stand count, SR52 seems to perform very well than the other entries, eventhough the difference between this variety and the next five top yielding ones is not significant.

Variety / Treatment	Yield 87.5% DM kg/ha	Stand count	Days to Tasseling	Days to maturity	1000-seed weight gms.	Hl-Weight kg.
SR 52	8150	54	93	174	410.5	72.5
Bako Composite (maintained	7340	56	98	172	393.3	74.6
KCB	7330	56	98	173	404.0	73.5
UCB	7130	57	97	178	402.3	75.3
Bako Composite	7090	58	95	173	388.5	74.3
Alemaya Composite	6840	56	95	179	402.8	74.5
Jimma - Bako	6510	57	95	174	391.8	74.8
Bako Composite Pli	6250	57	95	170	371.8	75.0
KCB (Pli)	6060	56	98	176	367.8	74.5
Bako Composite III(Pei)	5730	57	98	176	361.0	75.4
H611	5710	58	98	172	357.8	74.7
Bako Composite	5540	56	99	168	394.3	75.0

Plot size, M^2 : 13.5 L.S.D. 5% = 1352 kg/ha
Fertilzier, kg/ha: 150 DAP+ 150 urea " 1% = NS
Planting date, : 17 April, 1980 C.V. = 14.2 %
Spacing : 75cm x 30cm

Pulses

223 - 1 Sowing date and plant population trial on (Kulumsa)

The objective with this trial was to investigate an optimum date of planting for horsebeans in relation with a changing plant population. The trial was designed as a split plot with four replications and four dates of planting (main treatment) and four spacings between rows (sub-treatments). From this preliminary study, planting arround mid-June with narrow spacing (30 cm) between rows gave the top yield. To obtain reliable informations further study seemed important and this is on progress.

223 - 1 The effect of sowing date and plant population on horsebean (Kulumsa)

Yield kg/ ha.

Plant population plants/m^2	Dates of sowing				Population Mean
	31 May	14 June	27 June	11 July	
66.7	1930	2214	1552	854	1638
50.0	1870	1911	1576	776	1533
40.0	1539	1919	1651	763	1468
33.3	1482	1878	1325	677	1341
Sowing dates Mean	1705	1981	1526	768	

Plot size = 9.6 m^2

Fertilizer = Nil

LSD among sowing dates 5% = 926 kg/ha

1% = 1678 "

L.S D among spacings 5% = 578 "

1% = 885 "

C .V 'for Main plots (sowing dates) = 22.7%

C.V.For sub plots (plant population) = 19.1 %

There is no interaction in the experiment

223-1 Sowing date and plant population trial on Horsebean (Kulumsa)

Treatment	Yield 90% DM kg/ ha	Days to heading	Days to Maturity	Horizontal CM Spread of the plant	Diseases 0-5 Chocolate Spot	Diseases 0-5 Rust	Flowers/ plant	Pods/ Plant	Seeds/ Pod	Lodging % Late	Height cms	1000-seed weight gms	Hl-weight kg
D2 P1	2210	51	121	14	3.8	4.0	57	19	3	0	114	281.3	78.0
D1 P1	1930	49	120	12	3.9	3.9	57	16	3	20	98	329.8	76.9
D2 P3	1920	51	121	14	3.3	4.0	53	18	3	15	116	339.0	78.3
D2 P2	1910	51	121	15	3.1	3.9	54	19	3	20	118	324.5	77.6
D2 P4	1880	51	121	15	3.5	3.8	51	20	3	15	113	354.5	78.2
D1 P2	1870	49	121	12	3.8	3.5	54	19	3	15	95	345.0	76.4
D3 P3	1650	53	115	12	3.6	3.8	53	19	3	0	123	319.3	78.2
D3 P2	1580	53	116	12	3.8	3.6	53	21	3	0	121	333.0	78.3
D3 P1	1550	53	114	12	3.7	3.6	58	22	3	0	120	308.0	78.5
D1 P3	1540	49	122	13	3.8	3.3	54	25	3	20	103	328.0	76.0
D1 P4	1480	49	123	13	3.3	3.8	52	18	3	15	104	308.8	76.1
D3 P4	1330	53	113	12	3.8	3.7	49	20	3	0	118	297.0	78.5
D4 P1	850	51	105	12	3.3	3.9	56	10	3	0	110	333.8	65.4
D4 P2	780	51	106	13	3.0	4.3	49	7	3	0	109	333.8	67.7
D4 P3	760	51	104	13	3.3	3.9	48	9	3	0	110	340.0	67.5
D4 P4	680	51	105	13	3.5	3.8	53	8	3	0	110	332.8	67.7

D1 = 31 May, 1980
D2 = 14 June 1980
D 3 = 27 "
D4 = 11 July "

P1 = 66.7 Plants/m^2
P2 = 50.0 "
P3 = 40.0 "
P4 = 33.3 "

224-1 Row planting and weeding trial season horsebeans (Kulumsa)

A trial with two methods of planting, that is broadcasting and row planting; and weeding and no weeding practices has been running for three years at Kulumsa.

Weeding seems much more important than the planting method in general.

From the results obtained in three years of test, it is observed that row planting and hand weeding are very advantageous to increase yield in horsebean production.

224-1 Row planting and weeding practices on Horsebean (Kulumsa)

Variety/Treatment	Yield 87.5% DM Kg/ha	Stand %	Days to heading	Days to Maturity	Pods/ plant	Diseases 1-5 Chocolate spot	Diseases 1-5 Rust	Weed Intensity %	Tillers/ plant	Lodging% Late	Height cms	1000-seed weight gms	Hl weight kg.
Row planting and weeding	2610	100	48	110	13	4.0	4.0	0	3	15	165	361.5	78.3
Farmer's practice and weeding	1690	100	48	110	14	2.5	3.5	10	2	5	160	339.5	79.8
Row planting no weeding	1490	95	48	110	13	3.0	3.0	85	2	10	165	367.3	79.6
Farmer's practice, no weeding	1310	100	48	110	11	3.0	4.0	35	2	10	150	326.5	78.1

Plot size M^2 : 204
Fertilizer kg/ ha: Nil
Planting date : 2/7/80
Seeding rate kg/ha: 200

225-1 NYT on horsebean (Gondie)

Such trials have been conducted since 1972 to test and select best varieties for different ecological zones of Ethiopia.

Fifteen promising varieties were included in this trial with one local check. General growing conditions were excellent and stand was 100% for all entries. Chocolate spot and rust attack were common on all varieties. Lodging was very high in this trial.

From the results, the top yield (50 qt/ ha) was obtained at this station (Gondie). As compared to the results from other locations, again Gondie scored the top mean yield.

The varieties included in this trial gave yields better than the local check, and more than ten varieties out yielded the improved check Kuse 2.27.33.

Further test is essential inorder to arrive at best adaptable varieties for different ecologies.

225-2 Pre-NYT on horsebean (Gondie)

Nineteen lines of horsebean were planted with an improved check (Kuse 2.27.33) to test them for yield potential, disease resistance and other agronomic characteristics.

Weather conditions were very conducive and growth of the crop was excellent.

All varieties were infested with the two common horsebean diseases (chocolate spot and rust.)

More than half of the varieties out performed the improved check (46.6 qt/ha); nevertheless, only the top yielder MKT Addis Alem (54 qt/ha) significantly out yielded the check improved variety.

As yields are fluctuating from season to season, further testing seems important inorder to document reliable information about means of horse-bean production.

225 - 1 NYT on Horsebean (Gondie)

Vareity/Treatment	Yield 90% DM Kg/ha	Stand %	Days to heading	Days to maturity	Diseases 0-5 Chocolate Spot	Diseases 0-5 Rust	Pods/Plant	Seeds/pod	Lodging % Barly	Height cms	1000-seed weight gms	Hl-weight kg.
NC 40	5000	100	52	122	2.8	3.0	14	3	18	145	654.0	80.2
DZ MKT 74B	4970	100	50	120	2.5	2.8	14	3	33	136	700.3	79.0
DZ MKT 74C	4920	100	53	119	2.5	2.8	14	3	59	145	753.5	78.5
NEB 207 X 74TA 207	4900	100	52	126	2.8	2.8	15	3	68	153	774.3	79.6
MKT 8 Bedele	4800	100	54	123	2.5	2.5	14	4	35	145	725.0	80.0
NC 58	4710	100	54	123	2.3	2.5	16	4	33	148	702.5	80.0
NC 34 (73)	4700	100	54	123	2.5	2.3	15	3	40	145	689.3	80.0
Azezo Begemidir	4650	100	55	124	2.8	2.3	13	3	38	141	701.3	79.3
IAR (V) 4 72	4640	100	55	125	2.0	2.8	16	3	33	145	748.8	78.0
NC 36	4630	100	55	126	2.5	2.5	13	4	46	151	785.5	79.2
NC 64	4580	100	55	124	2.3	2.8	16	3	25	149	654.8	82.0
NC 67	4550	100	56	124	2.5	3.0	16	3	23	140	699.8	79.3
Kuse 2.27.33 (Check)	4490	100	55	126	2.3	2.5	17	3	23	145	711.5	80.0
CS 11 A K	4440	100	58	126	2.3	2.8	15	3	59	151	720.8	79.0
NEB 207 x 74TA74 - 6A	4350	100	51	117	3.3	3.0	15	3	55	128	768.0	78.5
Local check	3920	100	58	127	2.5	2.3	13	4	46	141	628.5	79.9

Plot size M^2 = 6
Fertilizer kg/ha = Nil.
Planting date = June 24, 1980
Seeding rate kg/ha= 200

L.S.D 5%= 557 kg/ha
L.S.D. 1% = 731
C.V = 8.8%

225 - 2 Pre-NYT on Horsebean (Gondie)

Variety/Treatment	Yield 90% DM kg/ha	Stand %	Days to heading	Days to Maturity	Diseases 0-5 Chocolate Spot	Diseases 0-5 Rust	Pods/Plat	Seeds/pad	Lodging % Late	Height cms	1000-seed weight gms	Hl- weight kg.
MKT Addis Alem	5400	100	50	123	2.3	2.3	14	3	28	143	685.8	80.5
Coll 31/77	5280	100	53	120	2.3	3.0	12	3	42	158	747.3	79.3
Coll 23/77	5240	100	51	124	2.3	3.0	14	3	42	155	679.5	80.5
74TA 12050x74TA 236	5190	100	51	118	2.7	3.0	14	3	53	148	762.0	79.4
NEB 207x74TA74-42c	5110	100	45	115	3.0	3.0	15	3	52	145	674.0	80.0
MKTI Masha Illubabur	5040	100	52	124	2,7	2.7	17	3	43	158	671.3	80.0
Chocolate spot spreader	4880	100	49	119	2.7	2.3	14	3	43	150	707.8	80.0
NC 86	4860	100	53	124	2.3	3.3	14	3	38	162	671.8	79.8
MFT Greyer Kossier	4550	100	52	125	2.7	2.3	13	3	38	152	699.3	80.2
74TA 12050x74TA236-207-268	4530	100	49	121	2.3	3.0	15	3	48	150	749.0	76.6
74TA 12050x74TA 236-207-ZB	4500	100	52	119	3.0	2.7	13	3	55	148	723.0	77.4
MKJ 10 Jibat and Mecha	4410	100	58	124	2.7	2.0	16	3	38	157	688.3	79.0
Unkonwn F4	4380	100	50	122	2.3	3.0	14	3	57	147	745.3	78.9
DZ MKT 74	4280	100	51	119	2.3	3.0	15	4	63	148	707.8	78.0
74TA 1250x74TA 236-2DZ-50C	3810	100	51	125	2.7	3.0	12	3	48	152	801.5	77.0

Plot size M^2 = .6
Fertilzer kg/ha: Nil
Planting date = 24/6/80
Seeding rate kg/ ha: 200

L.S .D. 5% = 714 kg/ha
L.S .D. 1% = 926 "
C.V . = 10%

225 - 3 Preliminary screening on horsebean (Bekoji)

Seventy-six lines of horsebean collections were sown in a single plot nursery at Bekoji to test and screen promising materials. General growth of the crop was very poor which ofcourse could be due to low temprature. Out of the seventy six entries tested only forty two entries which scored yields above 15 qt/ha. are presented in this report.

Though, yields in general are low, some entries with better agronomic characteristicsand performances will be advanced to the next stage of testing.

225 - 4 Frost Resistance Screening on Horsebean (Merarc)

Twenty eight entries from both local and introduced materials of horsebeans were tested in two rows of single plot observation at the higher altitude of Merarc (2980 m. above sea level). The main objective was to test and select horsebean lines resistant to frost-hit which is a limiting factor for horsebean production at the higher altitude in areas now dominantly covered with only cereals, mainly barley.

Growing conditions instead were conducive and yields in general were high.

Great differences in yield were observed between the entries, but seemed to be not due to frost hit. The improved check, 20 DK appeared with top yield (80 qt/ha). As can be seen from the result further testing of the best yielding lines which showed signs of tolerance to frost seems very important.

225 - 3 Preliminary Screening on Horsebean (Bekoji)

Variety/Treatment	Yield 90% DM kg/ ha	Stand %	Days to Heading	Days to Maturity	Diseases 0-5		General condition	Height cms
					Chocolate Spot	Rust		
PGRC Acc No. 027123	3290	95	59	154	2.0	1.0	good	120
" 027125	3260	97	59	156	2.0	1.0	good	100
" 027127	3110	94	59	156	2.0	1.0	good	100
" 027122	3010	95	61	153	2.0	1.0	Fair	100
" 027124	3010	95	61	156	2.0	1.0	good	120
" 027146	2820	93	57	153	2.0	1.0	good	80
" 027121	2810	95	59	157	2.0	1.0	good	100
" 027156	2730	90	58	158	2.0	1.0	good	80
" 027126	2700	93	58	153	2.0	1.0	Fair	105
" 027154	2290	95	56	152	2.5	1.0	fair	70
" 027138	2270	90	59	160	2.5	1.0	fair	100
" 027155	2250	90	58	154	2.0	1.0	good	80
" 027207	2250	75	56	153	2.0	1.0	poor	60
" 027139	2230	90	59	155	1.5	1.0	poor	90
" 027140	2200	90	63	157	1.5	1.0	poor	90
" 027191	2140	55	61	155	2.0	1.0	poor	80
" 027158	2090	85	66	156	2.0	1.0	fair	65
" 027153	1980	90	56	153	2.5	1.0	poor	65
" 027216	1960	75	61	153	2.0	1.0	poor	45
" 027227	1930	75	80	160	1.5	1.0	poor	65
" 027244	1930	80	63	153	2.0	1.0	poor	70
" 027148	1900	90	58	155	2.5	1.0	poor	70
" 027224	1900	75	79	161	1.5	1.0	poor	60
" 027137	1880	88	59	153	2.0	1.0	good	90
" 027211	1820	70	59	155	2.0	1.0	poor	60
" 027232	1780	60	77	153	2.0	1.0	poor	55
" 927117	1700	85	63	158	2.0	1.0	fair	70
" 027193	1680	40	59	153	2.0	1.0	poor	60
" 027212	1680	70	59	15	2.0	1.0	poor	50
" 027179	1650	60	59	160	2.0	1.0	fair	70

Variety/Treatment	Yield 90 % DM kg/ ha	Stand %	Days to heading	Days to maturity	Diseasres 0-5		General condition	height cms
					Chocolate spot	Rust		
PGRC A cc. No. 027213	1640	80	59	153	2.0	1.0	poor	85
" 027239	1620	60	57	151	2.0	1.0	poor	65
" 027147	1610	85	61	155	2.5	1.0	poor	70
" 027145	1600	80	59	155	1.5	1.0	poor	65
" 027194	1590	50	57	153	2.0	1.0	poor	50
" 027219	1590	70	62	152	2.0	1.0	poor	50
" 027228	1570	65	78	160	1.5	1.0	poor	70
" 027225	1550	80	81	161	1.5	1.0	poor	75
" 027244	1550	70	61	151	2.0	1.0	poor	60
" 027240	1540	55	59	150	2.0	1.0	poor	65
" 027241	1540	60	59	152	2.0	1.0	poor	60
" 027149	1500	88	57	154	2.5	1.0	poor	70

225 - 4 Frost Resistance Screening on Horsebean (Meraro)

Variety	Yield 90% DM kg/ha	Stand %	Days to heading	Days to maturity	Diseases 0-5		Frost hit	Height cms
					Chocolate Spot	Rust		
CS 20DK (check)	8000	100	69	169	1.0	1.0	R	110
251331	6710	100	68	168	2.0	0.0	MR	105
254002	6170	100	66	168	2.0	1.0	R	100
NC20	6080	100	66	169	2.0	2.0	MS	115
253808	6070	100	63	167	4.0	1.0	MR	100
262913	5710	100	65	168	4.0	0.0	MS	90
369497	5500	100	65	167	4.0	0.0	MR	95
253806	5420	100	68	167	2.0	1.0	MR	100
ALAD 359	5330	100	68	168	1.0	1.0	R	90
371802	5270	100	70	169	1.0	1.0	R	115
253809a	5220	100	68	167	2.0	1.0	MR	95
NC89	5150	100	62	168	3.0	1.0	MR	100
NC 65	5130	100	63	167	3.0	0.0	MR	95
NC 23	5080	100	73	170	2.0	0.0	R	120
NC 57	5030	100	64	167	2.0	0.0	MS	115
ALAD 272	4880	100	66	168	3.0	1.0	MR	95
254001	4800	100	72	167	2.0	0.0	R	90
ALAD 259	4790	100	64	167	4.0	1.0	R	100
253807	4580	100	65	169	3.0	0.0	R	115
NC 22	4540	100	64	167	1.0	0.0	R	90
ALAD 159	4470	100	65	168	2.0	2.0	MR	80
203154	4460	100	66	167	3.0	2.0	MS	95
ALAD 160	4420	100	66	168	4.0	1.0	R	100
Gondie MKT	4170	100	65	169	0.0	1.0	R	85
NC 26	3830	100	75	169	2.0	1.0	MR	95
ALAD 373	3630	100	65	167	2.0	3.0	R	75
Meraro MKT	3460	100	64	168	2.0	2.0	MR	95
NC 42	2080	100	65	168	2.0	1.0	MR	85

Plot size M^2 = 1.2

Fertilizer kg/ha = Nil

Planting date = June 13, 1980

243 - 1 Planting dates and plant population trial on Fieldpeas (Bekoji)

This trial was designed as a split plot with four dates of sowing and four spacings (10 cm, 20 cm, 30cm &40 cm between rows & 5 cm within the row), and was conducted at Bekoji.

The objectives were to find out the optimum planting time of field-peas and again to determine the response of the crop to different seeding rates at different dates of planting.

As to planting time of fieldpeas arround Bekoji, late May to early June showed better performance and spacing of 20 cm. between rows and 5 cm. between plants gave reasonably better result.

As this trial was only tested for the first time, it has to repeatedly be carried out until reliable information about the practices is gathered.

243 - 1 The effect of planting date and spacing on Fieldpeas at Bekoji

Plant population/m^2	Dates of sowing				Population Mean
	29 May	12 June	25 June	10 July	
200 plants	4069	4105	3738	3012	3731
100 "	4630	4313	3909	2630	3871
66.7 "	3906	3703	3580	2117	3327
50 "	3718	4086	3413	1865	3271
Sowing dates Mean	4081	4052	3660	2406	

Plot size = 6 m^2

Fertilizer = Nil

L.S.D Among Sowing date means:

5% = 341 kg/ ha
1% = 416 "

L.S.D: Among spacing means

5% = 99 kg/ha
1% = 127 "

C.V. : For Main plots (sowing dates) = 22.6%
C.V : For sub-plots (Spacing) = 12.1%

There is no interaction between plant population and sowing dates.

243 - 1 Planting Dates & Plant Population Trial on Fieldpeas (Bekoji)

Variety/Treatment	Yield 90% DM kg/ha	Stand %	Days to heading	Days to maturity	Diseases 0-5 Ascochyta blight	Flowers/ Plant	Pods/ Plant	Height cms	1000-seed weight gms	Hl-weight kg.
D1 P2	4630	99	84	166	3.5	24	11	170	176,8	79.4
D2 P2	4310	98	89	168	3.0	20	-	167	170.8	81.2
D2 P1	4110	100	86	167	3.3	22	-	157	165.5	81.0
D2 P4	4090	98	87	170	2.3	24	-	160	150.5	80.9
D1 P1	4070	98	84	165	4.0	21	11	163	177.5	80.1
D1 P3	3910	99	85	167	4.3	24	11	160	175.5	80.9
D3 P2	3910	99	85	157	2.5	23	-	171	154.5	81.2
D3 P1	3740	99	84	155	2.5	21	-	160	166.5	81.2
D1 P4	3720	99	85	169	4.0	25	12	168	176.5	80.9
D2 P3	3700	99	87	168	2.8	24	-	160	172.5	81.2
D3 P3	3580	98	84	157	2.0	24	-	168	161.8	81.4
D3 P4	3410	99	84	158	2.0	24	-	164	169.3	80.9
D4 P1	3010	100	78	145	2.0	12	-	133	155.8	81.3
D4 P2	2630	99	78	146	1.5	17	-	130	156.8	81.0
D4 P3	2120	92	78	145	2.1	14	-	130	160.3	81.0
D4 P4	1870	98	79	146	-	14	-	126	166.0	81.0

- Data not taken

245 - 1 & 2 NYT and PNYT on Fieldpeas (Bekoji)

In the NYT and PNYT twenty and twenty six promising materials of fieldpeas respectively were tested. In both trials fieldpea Ex. Debre-Zeit was included as a check.

The trials were conducted at Bekoji. The main objectives were to test the materials at different stages of testing and develop Fieldpea varieties which are high yielding, disease resistant and possess desirable agronomic properties.

Weather conditions were very conducive and growth of all entries was attractive and stand ranging from 94 to 100% was scored.

Disease incidence (mainly Ascochyta blight and powdery mildew) was generally low this season (1980).

As regard to yield, encouraging results were obtained in both trials, and about four and three varieties significantly out-yielded the improved check (Fp ex. D.Z.) at 95% PP. in both the NYT and PNYT respectively. Further testing is essential inorder to come up with varieties adapting best to the area.

245 - 3 Preliminary Screening on Fieldpeas (Bekoji)

Eighty samples of fieldpeas, recieved from Ethiopian Plant Genetic Resource Centre (PGRC) were planted with an improved fieldpea (FP. ex. Debre-Zeit) as a check at Bekoji. This was mainly to test and evaluate the lines for wider range of adaptation, yield potential, reaction to the common fieldpea diseases (Ascochyta blight and Powdery Mildew), and further more for desirable agronomic characteristics and seed qualities.

Weather conditions were favourable for growth of the crop. Disease out-break was not severe this season. Not much difference in flowering and maturity dates, and other qualitative marks were noticed. As regard to yield, eighteen accessions out-yielded the improved standard check (FP. ex. D.Z).

On the bases of yield and qualitative characteristics obtained some entries have been selected and will be advanced to the next stage of evaluation.

245 - 4 Fieldpeas Introduction Observation (Bekoji)

Fourteen entries from both indegeneous and introduced materials of fieldpeas were planted with two improved checks at Bekoji. This was to test and find out materials with high yield potential and other qualitative characteristics.

As to the observations made, the introduced lines performed very impressively.

Disease observation had been done and no clear effect on the yield could be seen.

Top yield (52 qt/ha) was obtained from the introduced variety (Svalofs Timo) and second & third ranks were occupied by the improved checks (Fp ex. D.Z and CS436k) giving yield of 41 qt/ha and 38 qt/ha respectively.

Varieties with better performances will be advanced to the next testing stage.

245 - 5 Winter hardiness on Fieldpeas (Meraro)

Sixteen introduced fieldpea varieties were tested with two improved checks at the highland of Meraro. This trial was carried-out for a number of years to test and find out fieldpea varieties which fit to the highland areas where low temprature is a limiting factor for peas production.

As clearly shown in the table, stand % had great effect on the yield, and no clear symptom of temprature effect at vegetative stage was observed.

This trial has to be repeated preferably with different dates of sowing inorder to find-out reasons causing variabilities in plant population as very low stand was observed in some plots in this trial.

245 - 1 NYT on Fieldpeas (Bekoji)

Variety/ Treatment	Yield 90% DM kg/ha	Stand %	Days to heading	Days to maturiety	Diseases 0-5		Height, cm	1000 - seed weight gm	HL-weight kg.
					Ascochyta Blight	Powdery Mildew			
F/P NUr/74 F	5310	94	84	160	2.0	0.5	153	208.8	81.6
Parvus	5040	99	79	147	2.5	0.0	115	166.3	78.1
F/P Nur/74 L	4850	97	80	158	1.5	0.0	150	159.0	80.6
NC 45	4840	99	83	157	2.5	1.5	148	139.8	81.1
G- 22763-2C	4680	98	80	158	2.0	1.0	133	161.3	80.5
G- 22770-3D	4670	99	80	152	2.0	2.0	138	128.0	80.3
NC 95 Haik	4660	98	81	158	2.0	0.5	165	150.5	80.3
G -2270	4630	99	81	159	2.0	1.0	120	132.5	80.7
G - 22764/70	4440	97	80	157	2.0	0.5	130	169.3	79.7
G - 22854	4430	97	82	157	1.5	0.5	243	156.5	79.2
FP ex D.Z	4400	97	82	158	1.5	0.0	138	162.5	80.8
F /P Nur/ 74 A	4370	96	81	158	2.5	0.5	133	194.8	79.5
G - 22793	4340	98	85	159	1.5	1.0	140	161.3	82.1
G - 22854 - 3G	4330	96	80	152	2.0	0.5	243	163.8	80.2
G - 22766	4320	97	80	149	2.0	0.5	130	157.7	80.7
F/P Nur/ 74 J	4280	98	79	152	2.0	1.0	140	174.5	79.1
G - 22802	4270	96	85	156	1.5	1.5	140	167.0	78.3
F/P Nur/ 74 I	4240	96	82	157	1.5	0.5	120	176.0	81.6
F/P Nur/ 74 B	4180	96	82	154	1.5	0.0	145	198.8	79.5
Local Check	4110	99	87	160	1.5	1.0	150	166.0	78.2

Planting Date: 18/6/1980 Plot size M^2 = 5

Seeding rate: 150 kg/ha Fertilizer = Nil

L.S.D . 5% = 379 kg/ ha C.V.= 7.4 %

L.S .D. 1% = 529 "

245 - 2 Pre-NYT on Fieldpeas (Bekoji)

Variety/ Treatment	Yield 90% DM kg/ ha	Stant %	Days to heading	Days to maturity	Diseases 0-5		Height cm	1000 - seed weight gm	Hl-weight kg.
					Ascochyta Blight	Powdery Mildew			
F/P Nur/ 74 Y	4890	97	86	160	1.0	1.0	123	201.0	80.0
G-22793-2D	4680	98	84	159	1.3	1.0	130	148.0	80.0
F/P Nur/ 74 P	4660	97	78	162	1.7	1.3	122	138.0	80.1
NEF 7 Goba	4640	96	78	162	1.7	1.0	130	154.5	79.0
G 22758 - 2E	4450	100	86	162	1.3	1.7	117	151.8	81.4
F/P Nur/74 W	4370	95	80	159	1.7	0.7	113	203.3	80.6
F/P Nur/74 K	4350	94	78	149	1.7	1.0	105	166.0	78.8
F/P Nur/ 74 O	4310	97	77	152	1.7	1.0	110	128.3	80.2
FP ex DZ (check)	4310	97	80	158	1.7	0.7	123	160.5	80.5
F/P Nur/ 74 N	4300	99	78	151	1.7	1.0	97	167.3	78.7
G - 22772	4230	98	79	159	2.3	1.0	125	166.3	80.5
CS 185	4160	98	84	159	1.3	1.3	120	167.8	78.2
A R Bcki 76	4000	99	85	161	1.3	1.3	133	162.3	78.0
NC 58	3990	97	83	161	2.0	1.0	120	166.3	79.0
NC 50	3980	95	78	163	1.7	1.0	122	158.3	79.2
Schmids	3960	96	84	162	1.7	1.3	125	205.5	79.9
G - 22780	3950	97	84	163	1.7	1.7	135	152.8	78.6
NC 51	3950	100	80	163	1.7	1.7	125	143.5	79.0
F/P Nur/ 74 - 5	3910	98	83	162	1.7	1.0	125	185.0	80.1
AR Moye 76	3870	100	88	163	1.3	1.7	125	163.5	77.3
G - 22792/70	3850	96	80	158	2.0	1.0	120	160.5	78.5
G - 22785 - 3E	3740	98	80	159	2.0	1.7	115	152.0	78.5
Holleta Shiro	3710	97	86	162	1.7	1.0	115	152.3	78.3
AR. Tija Samura	3690	99	87	161	1.7	1.3	127	151.8	78.5
AR - Dande 76	3370	97	89	163	1.7	1.0	128	144.0	79.8
Weitor	3350	98	78	157	1.7	1.3	98	157.3	80.0

Plot size M^2 = 5
Fertilizer kg/ ha = Nil
Planting date = 19/5/1980
Seeding rate k /ha = 150

L.S.D 5% = 431 kg/ha
L.S .D 1% = 552 "
C.V . = 7.2%

245-3 Preliminary Screening on Fieldpeas (Bekoji)

Variety/Treatment	Yield 90. DM kg/ha	Days to heading	Days to Maturity	Diseases 0-5 Ascochyta Blight	Diseases 0-5 Powdery Mildew	Agronomic character	Height cm
PGRC. Acc. No. 032463	4700	86	160	1.5	2.0	good	170
" 032424	4500	85	154	2.0	2.0	v.good	150
" 032388	4430	85	158	2.0	2.0	v.good	185
" 032387	4340	85	158	2.0	3.0	v.good	195
" 032389	4270	86	162	2.0	2.0	v.good	175
" 032374	4240	84	159	2.0	3.0	v.good	195
" 032016	4160	83	153	2.0	3.0	v.good	145
" 032433	4120	84	159	2.0	3.0	good	185
" 032375	4120	90	164	1.0	1.0	v.good	190
" 032412	4110	82	152	2.0	1.0	v.good	205
" 032413	4110	82	155	3.0	1.0	v.good	165
" 032457	4100	79	154	2.0	3.0	v.good	145
" 032459	4080	78	154	2.0	2.0	good	145
" 032464	4040	79	158	1.5	2.0	v.good	165
" 032417	4030	79	153	2.0	2.0	v.good	155
" 032461	4030	85	162	1.5	2.0	v.good	165
" 032414	4030	81	157	2.0	1.0	v.good	135
" 032373	4030	89	164	2.0	3.0	v.good	190
FP ex.DZ (check)	3980	82	148	2.0	1.0	v.good	135
PGRC. Acc. No. 032369	3920	89	162	3.0	2.0	v.good	180
" 032416	3910	80	153	2.0	2.0	v.good	145
" 032468	3880	78	156	2.0	3.0	v.good	165
" 032408	3870	88	158	2.0	1.0	v.good	160
" 032426	3860	87	152	2.0	2.0	v.good	155
" 032469	3820	79	152	2.0	2.0	v.good	165
" 032487	3800	86	162	2.5	3.0	v.good	180
" 032444	3790	80	161	2.0	2.0	v.good	145
" 032485	3780	85	162	2.0	3.0	v.good	185
" 032411	3760	82	157	2.0	1.0	v.good	155
" 032453	3760	82	160	2.0	2.0	good	135

245 - 3 contd.

Variety/ Treatment	Yield 90% DM kg/ ha	Days to heading	Days to maturity	Diseases 0-5		Agronomic Character	Height cms
				Ascochyta Blight	Powdery mildew		
PGRC A cc. No 032442	3720	81	160	2.5	2.0	v.good	145
" 032409	3640	83	158	2.0	2.0	v.good	195
" 032467	3620	89	156	1.5	3.0	v.good	170
" 032460	3560	85	161	1.5	2.0	v.good	155
" 032368	3510	90	162	1.0	2.0	v.good	195
" 032012	3500	85	153	2.0	2.0	v.good	170
" 032013	3480	87	154	2.0	2.0	v.good	170
" 032484	3480	86	163	2.0	2.0	v.good	175
" 032407	3480	72	156	2.0	1.0	good	150
" 032371	3480	91	163	2.0	2.0	v.good	135
" 032372	3470	90	164	2.0	3.0	v.good	175
" 032441	3460	87	162	2.0	2.0	v.good	175
" 032415	3450	90	155	2.0	1.0	v.good	170
" 032376	3430	92	166	1.0	3.0	v.good	190
" 032425	3430	82	152	2.0	1.0	v.good	150

Plot size, M^2 = 5
Fertilizer, kg/ ha. = Nil
Planting date = June 19, 1980

245-4 Observation of Feldpeas Introduction (Bekoji)

Variety/ Treatment	Yield kg/ha	Stand %	Days to heading	Days to maturity	Diseases 1-5 Ascochyta Blight	Diseases 1-5 Powdery Mildew	Agronomic character ≠	General Condition	Plant Growth	Height cm
Svalots Timo	5250	90	74	148	2.0	3.0	v.g	v.g	v.g	100
F/P ex DZ	4110	100	83	150	2.0	2.0	v.g	v.g	v.g	100
CS	3810	100	83	154	2.0	2.0	v.g	v.g	v.g	115
Svalots Simo	3720	96	81	154	2.0	3.0	fair	fair	fair	65
" Verta	3280	90	79	149	2.0	3.0	good	good	good	100
" Lotta	3080	90	79	154	1.0	3.0	good	good	good	100
BG R C 016303	1700	20	67	150	1.0	2.0	Fair	Fair	v.s.leaf	110
" 022477	1030	40	81	153	1.0	1.0	Fair	Fair	fair	110
" 018637	1000	15	77	156	1.0	1.0	poor	Fair	dwarf	60
Svalots Stivo	760	95	100	161	3.0	2.0	poor	poor	v.g	30
BGRC 010118	610	35	70	151	1.0	1.0	poor	poor	v.g	50
" 010119	300	10	76	152	1.0	1.0	poor	poor	v.g	45
" 018626	280	10	68	150	1.0	1.0	poor	poor	v.g	40
" 017777	70	25	127	183	3.0	1.0	poor	poor	S.L	65
" 017780	30	35	124	181	1.0	2.0	poor	poor	S.L	60

V.G = Very good
V.S.Leaf= Very small leaf
S.L Small leaf

≠ - Height
- branching (canopy)
- seed size, shape and color

245 - 5 Winter Hardiness on Fieldpeas (Leraro)

Variety/ Treatment	Yield 90% DM kg/ha	Stand %	Days to heading	Days to maturity	Diseases 0-5 Ascochyta Blight	Diseases 0-5 Powdery mildew	Height cm	1000 - seed weight gm	Hl-weight kg.
CS 436 K	4090	95	90	162	1.5	0.0	125	170.0	78.4
AW - 76 119	3950	75	85	144	1.0	1.0	80	176.0	80.3
A W-76-302	2980	65	85	152	1.0	0.0	78	166.3	73.6
AW-76-95	2890	80	83	150	1.5	0.0	105	154.5	79.5
AW - 76-304	2730	75	87	149	2.0	0.0	93	163.3	73.3
AW - 76 - 303	2600	35	73	145	1.5	1.0	60	170.5	70.8
AW - 76 - 124	2550	95	99	163	1.0	1.0	108	130.0	79.9
AW - 76 - 48	2520	90	73	164	0.5	0.0	143	146.0	78.8
AW - 76 - 301	2510	30	83	144	1.5	1.0	105	192.0	77.4
AW - 76 - 108	2390	85	85	152	2.0	1.0	75	156.8	70.0
AW - 76 - 308	2380	45	83	148	1.5	1.0	65	192.5	76.1
AW - 76 - 78	2340	40	83	151	1.5	0.0	68	175.0	74.4
AW- 76 - 135	2330	70	97	143	1.0	0.0	98	166.0	75.3
AW - 76 - 106	1650	40	95	153	2.0	1.0	63	159.3	75.4
AW - 76 - 309	1280	30	83	148	1.5	1.0	55	198.5	79.1
Prussian Blue	970	30	85	160	1.0	0.0	48	231.0	81.5
AW - 76 - 139	800	15	83	153	1.0	1.0	100	176.0	77.5
AW - 76 - 76	570	10	83	153	2.0	1.0	35	223.5	81.6

Plot size M^2 = 5

Fertilizer kg/ha = Nil

Planting date: 13/6/80

L.S.D. 5%= 825 kg/ha

L.S .D. 1%=1060 "

C.V . = 24%

255 - 1 NYT on Haricotbean (Kulumsa)

Eleven haricotbean varieties received from I.A.R. (Nazareith Research Station) were planted at Kulumsa on July 3, 1980. The objective was to test the materials and develop a variety or varieties resistant to diseases (commonly anthracnose). Weather conditions were favourable and emergence in general was excellent, hence all plots scored 100% for stand. Disease (Anthracnose) attack was observed commonly on all entries with variable degrees of severity. Shattering as high as 20% was recorded.

As regard to yield, encouraging result was obtained. Of the new entries 15 -R-52 gave the top yield (28.7 qt/ha) followed by the improved check Mex. 142 (27.8 qt/ha).

As there is no haricotbean variety with reliable resistance to the existing common diseases, more has to be done inorder to acheive disease resistant varieties having good agronomic properties.

255 - 1 NYT on Haricotbean (Kulumsa)

Variety/Treatment	Yield 90% DM kg/ha	Stand %	Days to heading	Days to maturity	Diseases Anthracnose 0 - 5	Shattering %	Height cms	100-seed weight gms	Hl-Weight kg.
15 - R - 52	2870	100	66	115	0.9	15	44	176.0	79.0
Mexican 142	2780	100	46	107	2.5	13	58	150.0	82.0
Negro Mecentraw	2740	100	66	116	0.8	5	47	166.5	79.6
15 - R - 66	2730	100	66	116	2.1	5	50	162.8	80.2
15 - R - 195	2660	100	66	110	1.9	18	38	204.5	78.6
Mexican 142 - R	2570	100	68	111	2.6	20	51	187.3	82.8
15 - R - 42	2550	100	66	113	1.8	15	54	170.5	78.3
15 - R - 57	2440	100	63	116	2.5	8	48	154.5	80.9
Biak Desie	2370	100	68	116	1.1	3	76	178.8	79.0
Brownspeckled	1810	99	48	113	3.8	5	54	391.0	76.2
W-95-03	1790	100	64	115	1.3	8	41	169.0	79.9

Plot size M^2 = 9.6
Planting date = 3/7/1980

L.S.D. 5% = 119 kg/ha
L.S .D. 1% = 164 "
C.V. = 16.2 %

265 - 1 & 2 NYT and PNYT on Lentils (Kulumsa)

Ninteen indegeneous and twenty two introduced materials of lentils were planted and evaluated with one local check each at Kulumsa.

Weather conditions were generally good through-out the growing period. No disease symptom on both trials was observed.

Results from these trials were encouraging with reasonably good yields in general.

Top yields from the NYT (qt/ ha) and PNYT (30 qt/ha) were obtained from NEL 256 and the local check respectively.

In general the indegeneous materials were superior in yield, and the local check stood third and first top in yield in the NYT and PNYT respectively. The results from these trials encourage researchers to give more attention to the collection of indegeneous materials of lentils.

265 - 1 NYT on Lentils (Kulumsa)

Variety/ Treatment	Yield 90 % DM kg/ha.	Stand %	Days to headings	Days to maturity	Shattering %	H eight cms	1000-seed weight gms	HL-weight kg
NEL 256	2530	82	61	114	3	32	23.5	86.6
Lasta Lalibela	2410	77	59	105	16	37	19.8	86.4
Local	2330	99	57	102	18	37	21.0	87.0
EL 103	2300	91	54	103	26	44	23.3	85.6
EL 142	2270	81	60	105	19	41	19.0	85.0
NEL 358	2220	80	60	113	3	36	25.3	83.2
EL 50	2190	85	60	104	15	43	18.8	85.9
EL 59	2060	82	60	104	16	36	22.5	85.8
EL 122	2060	85	62	106	21	32	18.8	86.1
EL 74	1980	81	62	106	25	33	17.5	86.0

Variety/ Treatment	Yield 90% DM kg/ha	Stand %	Days to heading	Days to maturity	Shattering %	Height cms	1000-seed weight gms	Hl-weight kg.
R 179	1940	79	63	133	13	42	25.0	83.6
NEL 285	1770	83	72	131	11	39	27.0	83.8
R 186	1660	88	97	131	11	35	26.0	85.0
NEL 499	1610	82	73	131	13	32	26.0	85.2
L 2 600	1590	85	47	107	13	37	20.3	85.6
R 59	1530	75	70	132	15	41	25.0	83.8
R 132	1480	83	98	133	6	32	25.3	85.2
R 277	1330	78	73	132	9	36	27.8	82.4
CKN 1 - J(Flo)	1160	76	65	131	11	34	26.5	85.6
NEL 347	1080	74	98	145	8	38	25.5	85.2

Plot size M^2 = 1.6 L.S.D. 5 % = 495 kg/ha
Fertilizer kg/ ha: Nil L.S .D. 1% = 623 "
Planting date : 15/ 7/1980 C.V . = 21 %
seeding rate kg/ ha: 50

265 - 2 Pre - NYr on Lentils (Kulumsa)

Variety/ Treatment	Yield 90% DM kg/ ha	Stand %	Days to heading	Days to maturity	Shattering %	Height cms	1000-seed weight gms	Hl-weight kg
Local (check)	3000	99	55	102	11	36	22.5	84.4
NEL - 355	2800	89	58	114	4	35	22.8	83.1
NEL - 357	2360	88	64	106	4	35	23.8	81.9
NEL - 275	2170	80	76	126	16	34	26.8	83.2
NEL - 358	2060	85	65	104	5	33	24.8	82.3
NEL - 944	1810	88	62	115	5	34	18.8	85.0
NEL - 349	1810	81	96	129	9	37	24.8	83.9
R - 252	1800	90	73	128	8	40	26.0	84.1
NEL - 1068	1720	86	49	114	6	28	17.0	85.2
NEL 219	1630	85	70	115	5	29	17.3	85.3

Variety/ Treatment	Yield 90% D M kg/ha	Stand %	Shattering %	Height cms	1000-seed weight gms	Hl-weight kg.
R 184	1640	86	18	33	25.0	83.9
NEL 228	1610	83	5	23	17.0	85.3
NEL 226	1300	83	10	29	16.5	86.0
C x N 1 - G (F10)	1220	84	14	33	26.8	85.0
NEL 795	1200	87	13	37	20.0	86.0
NEL 360	1180	79	10	27	49.5	84.2
C x N 1-N (F10	1180	84	18	31	26.0	86.0
C x N 1 - P (F 10)	1060	88	16	38	27.0	84.4
Cow boy Nerica	940	87	21	39	32.0	84.4
C x N 10	830	86	10	32	28.3	85.2
NEL - 518	810	86	13	46	20.0	84.6
NEL - 712	640	84	9	35	24.5	84.0
WJR 16USSR	530	90	16	43	21.3	84.0

Plot size M^2 : 1.6
Fertilizer kg/ha: Nil
Planting date : 14/ 7/ 80
Seeding rate kg/ha: 50

S.D. 5% = 334 kg/ ha
S.D. 1% = 421 "
V% = 18%

Oil Crops

Linseed

315-1,2 Lin Seed National Yield Trial (Bekoji & Kulumsa).

This year's National Yield Trials on Linseed comprised twelve improved varieties, one standard check (victory) and one local check (from each respective location). The trials were laid out at Kulumsa and Bekoji which represent medium and high altitude zones respectively.

Regarding yield at Bekoji best results were obtained from LAR-/Li/ 157 and CI-1249 which gave 1519 kg/ha and 1300 kg/ha respectively. The standard check (victory) was the top yielder at Kulumsa followed by CI-1279 and CI-1525 whcih gave 1244 kg/ha and 1194 kg/ha repectively, yields vary significantly at both location. Relatively higher yields were recorded at Kulumsa than Bekoji.

The stand percent for all varieties at Kulumsa was very good and was more than 85%. A conciderable number of varieties showed variable lodging percent and shattering was observed on all varieties indiscriminatly. At Bekoji only very few varieties were susceptible to lodging.

315-1 Line Seed National Yield Trial (Bekoji).

Variety/Treatment	Yield 87.5% DM kg/ha	Rank	Stand %	Days to heading	Days to maturity	Lodging % Early	Shattering	Height cms.	1000-seed weight gm.	Hl-weight kg.
IAR (Li) 124	1188	4	85	994	149	0	0	60	4.0	69.5
" " 126	1219	3	90	994	146	0	0	60	3.5	70.3
" " 157	1519	1	90	933	146	0	0	60	3.5	70.1
CI 342	638	13	70	105	158	0	0	70	6.3	66.3
463	506	14	75	103	158	0	0	70	5.5	65.3
937	844	9	70	95	149	20	0	55	4.3	68.0
1299	1300	2	85	91	152	0	0	70	4.5	68.0
1525	906	7	80	97	154	0	0	75	5.5	66.8
1650	831	10	85	97	152	0	0	75	5.5	67.4
1652	961	6	85	98	153	0	0	80	5.8	65.6
1275	850	8	85	96	154	0	0	70	4.8	66.8
1201	813	11	75	97	155	10	0	70	5.0	66.2
Victory (St.Ck)	669	12	85	93	152	45	0	65	4.5	66.7
Local check	1138	5	85	94	152	0	0	60	3.5	70.1

Plot size, M^2 : 4.0
Fertilizer, kg/ha : 55/23 N/P_2O_5
Planting date : 20/6/80
Seeding rate, kg/ha : 25.0

L.S.D. 5% = 233 kg/ha
L.S.D. 1% = 311 "
C.V. = 17.1%

315-2 Lin Seed National Yield Trial (Kulumsa).

Variety/Treatment	Yield 87.5% DM kg/ha	Rel. Rank	Stand %	Days to heading	Days to maturity	Lodging % Early	Shattering %	1000-seed weight gms.	Hl-Weight kg.
IAR (Li) 124	913	11	95	81	126	0	15	4.0	72.2
" " 126	919	10	95	82	130	0	10	4.0	71.4
" " 157	519	13	95	82	125	0	15	3.5	72.8
CI 342	1038	7	90	75	123	20	15	6.0	67.8
463	1056	6	90	74	125	25	20	5.5	66.1
937	913	11	90	63	140	85	15	4.0	69.1
1299	831	9	85	73	135	30	15	4.5	68.8
1525	1194	3	95	74	131	15	15	5.0	68.1
1650	1188	4	95	75	130	5	20	5.5	68.9
1652	1069	5	95	75	126	0	15	5.0	68.8
1279	1244	2	95	73	133	0	15	5.0	69.0
1201	975	8	90	74	132	0	20	5.0	69.5
Victory (St.ck)	1813	1	90	72	129	5	15	5.0	69.0
Local check	488	14	100	73	130	5	10	3.5	70.6

Plot size, M^2 : 4.0
Fertilizer, kg/ha : 55/23 N/P_2O_5
Planting date : 7/7/80
Seeding rate kg/ha : 25.0

L.S.D. 5% = 182 kg/ha
L.S.D. 1% = 182 "
C.V. = 25.2%

315-3,4&5 Lin Seed Pre- National Yield Trial (Kulumsa, Bekoji,& Asassa)

Fourteen different varieties, one standard check (concurrent) and one local check were included in the Pre-National Yield Trial on linseed and they were carried out at Kulumsa, Bekoji and Asassa.

CI-2297 and concurrent were the best yielders at Kulumsa. They gave 1426 kg/ha and 1253 kg/ha respectively. However, yields between treatment means were not statistically significant.

At Bekoji IAR/Li/150 proved to be the highest yielder followed by the local check from Bekoji market and CI-1510. They gave 1225 kg/ha 1192 kg/ha and 967 kg/ha respectively which was significantly different. With yields of 1667 kg/ha IAR/Li/150 again proved to be the top yielder at Asassa, followed by CI-929 and CI-2297 which gave 1492 kg/ha and 1467 kg/ha respectively.

Regarding other agronomic data at Kulumsa lodging was recorded on all varieties with the exception of CI-2297 which happened to be the best yielder of the station. Shattering was commen on all varieties, but the magnetude of severity varied from variety to variety. The stand percent at this station was higher than the other two station.

At Bekoji lodging was observed on some varieties the severity being high (53%) on variety CI-462.

315-3 Lin Seed Pre-National Yield Trial (Kulumsa).

Variety/Treatment	Yield 87.5% DM kg/ha	Rank	Stand %	Days to heading	Days to maturity	Lodging % Early	Shattering %	1000-seed weight	HI-weight kg.
IAR/Li/ 158	1078	10	90	77	124	20	10	3.8	67.5
CI 462	1148	6	85	70	122	35	15	5.0	63.3
" 929	880	13	90	70	124	15	15	4.5	69.6
" 1412	918	12	80	69	122	45	20	5.5	68.4
" 1510	832	14	90	76	130	5	15	4.8	70.8
" 1627	1178	3	80	64	123	15	15	5.5	67.8
" 2297	1426	1	90	68	128	0	15	3.0	68.4
" 2565	1158	5	90	72	134	5	15	6.0	69.3
" 2604	1049	11	95	68	125	35	15	5.5	68.5
" 2605	1115	8	95	68	128	15	15	6.5	69.0
" 2674	1132	7	95	69	127	5	15	5.5	69.5
" 2698	1172	4	90	69	125	10	15	5.3	67.8
" 2743	1080	9	95	70	125	20	15	5.0	67.9
" 2786	953	15	90	68	128	10	15	4.3	69.4
Concorrent (St.ck)	1253	2	95	65	125	25	15	4.5	67.7
Local check	798	16	95	73	127	5	15	6.5	69.6

Plot size, M^2 : 4.0
Fertilizer, kg/ha : 55/23 N/P_2O_5
Planting date : 7/7/80
Seeding rate, kg/ha : 25/0

L.S.D. 5% = NS
L.S.D. 1% =
C.V. = %

315-4 Lin Seed Pre-National Yield Trial (Bekoji).

Variety/Treatment	Yield 87.5% DM		Stand %	Days to heading	Days to maturity	Lodging %	Shattering %	Height cms.	1000-seed weight gms.	Hl-weight kg.
	kg/ha	Rank				Early				
IAR/Li/ 158	1225	1	85	91	148	0	0	50	4.0	70.8
CI 462	450	16	80	99	151	53	0	65	5.5	66.8
" 929	793	7	80	102	148	0	0	65	4.0	68.4
" 1412	525	15	80	105	153	10	0	70	5.8	66.8
" 1510	967	3	90	97	150	5	0	55	4.3	68.7
" 1617	550	14	80	102	153	5	0	70	5.5	68.2
" 2297	900	4	80	99	154	0	0	70	6.5	67.8
" 2565	700	12	80	101	146	5	0	75	6.5	67.0
" 2604	783	8	85	100	151	0	0	70	5.5	67.0
" 2605	808	5	80	98	151	0	0	80	6.0	68.4
" 2674	700	12	80	99	150	5	0	70	5.5	69.2
" 2698	842	6	80	92	149	5	0	70	5.3	67.0
" 2743	725	11	80	99	150	5	0	70	5.5	66.6
" 2786	767	10	90	106	149	30	0	80	4.5	67.9
Concurrent (St,check)	783	8	85	94	149	35	0	60	4.8	66.3
Local check	1192	2	90	93	147	0	0	65	3.5	70.6

Plot size, M^2 : 4.0
Fertilizer, kg/ha : 55/23 N/P_2O_5
Planting date : 21/6/80
Seeding rate, kg/ha : 25.0

L.S.D. 5% = 229 kg/ha
L.S.D. 1% = 308 "
C.V. = 17.2%

315-5 Lin Seed Pre-National Yield Trial (Asassa).

Variety/Treatment	Yield 87.5% DM		Stand %	Days to heading	Days to maturity	Height cms.	1000-seed weight gms	Hl-weight kg.
	kg/ha	Rel.						
IAR /Li/ 158	1667	1	75	89	149	70	3.8	69.7
CI 462	1442	4	70	89	152	85	5.8	68.0
929	1492	2	75	89	154	90	4.5	68.7
1412	1292	9	70	89	151	85	5.5	66.2
1510	1383	7	85	89	154	80	4.5	69.1
1617	975	13	65	87	154	95	5.5	65.8
2297	1467	3	65	88	154	105	6.3	69.0
2565	942	14	65	93	158	110	3.5	68.2
2605	1417	5	65	91	153	100	3.5	66.5
2604	917	15	65	89	153	100	5.3	68.5
2674	1283	10	65	90	155	90	5.3	68.5
2690	1350	8	70	88	153	90	5.5	68.6
2743	1267	12	70	89	150	85	5.5	68.1
2756	792	16	70	90	146	95	4.8	70.2
Concurrent (St.ck)	1275	11	65	85	144	70	4.5	66.7
Local check	1400	6	90	81	146	75	3.5	69.6

Plot size : 4.0
Fertilizer, kg/ha : 53/23 N/P_2O_5
Planting date : 4/6/80
Seeding rate, kg/ha : 25.0

L.S.D. 5% = 266 kg/ha
L.S.D. 1% = 360 "
C.V. = 12.6%

Rape Seed

335-1 Rape seed Observation Nursery (Kulumsa).

Twelve different varieties and one standard check (Target) were included in this trial. The seeds were obtained from Germany and Sweeden, and the cardinal objective of this trial was to find out those varieties that can aclamatize themselves to Ethiopian highland conditions for future multiplication. Out of these three varieties namly Aunta, Eluvia and Repora (all of which are winter Rapes) totally failed to set seeds due to photoperiod effect. On the other hand, Texi, Olong, Nikolas and 2178GI proved to be well adapted and promising varieties for possible advancment and inclusion in the Pre-National Yield Trials in the future.

335-1 Rape Observation Nursery (Kulumsa).

Variety/Treatment	Yield 87.5% DM		Stand %	1000-seed weight gms	Hl-weight kg.
	kg/ha	Rel.			
Auinta (Wi Rape)	-		60	-	-
Eluiva (")	-		65	-	-
Repora (")	-		65	-	-
Gulliva (Sur Rape)	1111	6	75	3.3	68.2
Nicolas (")	1644	4	70	2.5	66.9
Texi	1778	2	75	2.0	66.4
Sedo (Su. Rape)	867	8	75	2.0	66.6
Lovas(")	778	9	70	2.5	67.0
Trota(")	1067	7	90	2.0	67.6
2178-GI	1409	5	85	2.0	68.0
ORo	778	9	85	2.5	67.0
Olong	1756	3	80	2.5	66.6
Target (Stck)	2911	1	80	30	67.9

Plot size M^2 : 4.5
Fertilizer, kg/ha : $46N/69P_2O_5$
Planting date : 5/7/80
Seeding rate, kg/ha: 10.0

335-2,3,4 Rape seed National Yield Trial (Bekoji, Asassa and Kulumsa)

The three top yielding varieties at Bekoji with yields of 334 kg/ha, 3163 kg/ha and 3004 kg/ha were Dodola, Dorze and Kilte Awlalo respectively with statistically significant difference in yield between treatment means. At Asassa though there was no significant yield difference between treatment means Dorze outyielded all other varieties. It gave 2013 kg/ha. Zafa Asassa was the best yielding variety at Kulumsa with a yield of [illegible] kg/ha. It was followed by Kilte Awlalo and S-67 (Standard check) with yields of 3121 kg/ha and 3021 kg/ha respectively.

Generally yields were relatively low at Asassa when compared to the other stations. The stand percent at Kulumsa was very good and was more than 80% for all entries. The lowest stand percent was again recorded at Asassa.

335-2 Rape Seed National Yield Trial (Bekoji)

Variety/Treatment	Yield 87.5% DM		Stand %	Days to heading	Lodging %	Shattering %	Height cms.	1000-seed weight gms.	Hl-weight kg.
	kg/ha	Rank			Late				
Dodola (Bale)	3342	1	95	38	0	0	155	4.0	65.9
Dorze (Gamu gofa)	3163	2	80	35	0	0	160	4.0	64.9
Durbete (Gojam)	2583	7	80	99	0	0	190	4.5	63.9
Durbete (")	2475	10	70	95	0	0	170	4.0	64.5
Finote selam (Gojam)	2467	11	70	92	0	0	165	3.5	64.6
Zalambasa (Shoa)	2825	5	85	85	0	0	145	4.5	65.2
Gilgel Abay (Gojam)	2850	4	75	91	0	0	180	4.0	64.7
Meshenti (")	2763	6	75	89	0	0	170	4.5	64.4
Kilte awlalo (Tigri)	30004	3	80	88	0	0	150	4.0	64.7
S-67 (St.check)	2500	9	70	87	0	0	150	3.5	65.2
S-71 (")	2512	8	75	88	0	0	170	4.0	65.0
Target(")	1945	12	80	85	0	0	120	3.5	64.7

Plot size M^2 : 6.0
Fertilizer, kg/ha ; 46/69 N/P_2O_5
Planting date : 20/6/80
Seeding rate, kg/ha : 10.0

L.S.D. 5% = 394 kg/ha
L.S.D. 1% = 530 "
C.V. = 12.4%

335-3 Rape Seed National Yield Trial (Asassa)

Variety/Treatment	Yield 87.5% DM kg/ha	Rank	Stand %	Days to heading	Days to maturity	Height cms.	1000-seed weight gms.	Hl-weight kg.
Dodola (Bale)	1913	2	80	76	153	150	3.3	68.8
Dorze ([illegible])	2013	[illegible]	80	75	154	155	3.8	67.7
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible] (Gojam)	[illegible]	11	70	87	161	165	3.0	68.8
Finote Selam (Gojam)	1500	9	70	86	159	160	3.3	68.1
Zalambasa (Shoa)	1550	7	70	76	153	140	3.8	68.1
Gilgel Abay (Gojam)	1513	8	70	87	159	165	3.3	68.1
Meshenti (")	1554	6	70	85	158	165	3.0	67.7
Kilte Awlalo (Tigri)	1867	3	75	77	154	155	3.5	67.9
S-67 (St.check)	1849	4	85	76	154	150	3.5	68.0
S-71 (")	1575	5	80	84	158	160	3.5	68.4
Target(")	1179	12	80	71	145	145	3.5	66.9

Plot size, M^2 : 6.0

Fertilizer, kg/ha : 46 N/69 P_2O_5

Planting date : 14/6/80

Seeding rate, kg/ha : 10.0

L.S.D. 5% = NS

L.S.D. 1% = M

C.V. = 22.9%

375-4 Rape Seed National Yield Trial (Kulumsa).

Variety/Treatment	Yield 87.5% DM		Stand %	Days to heading	Height cms.	1000-seed weight gms.	Hl-weight kg.
	kg/ha	Rank					
Dodola (Bale)	2796	5	95	81	180	3.5	67.6
Dorze (Gamu Gofa)	3017	4	90	97	190	4.3	66.3
Durbere (Gojam)	2792	6	90	90	215	3.5	66.0
Durbere (")	2463	10	90	93	195	3.3	65.9
Finote Selam (Gojam)	2642	9	85	91	200	3.0	66.2
Zalambessa (Shoa)	3254	1	95	82	175	3.5	67.4
Gilgel Abay (Gojam)	2446	11	85	93	225	2.8	65.8
Keshenti (")	2783	7	95	91	195	3.0	66.2
Kilte Awlalo (Tigri)	3121	2	90	84	180	3.5	67.0
S-67 (St.check)	3021	3	90	82	175	3.5	67.6
S-71 (")	2746	8	80	90	195	3.5	66.9
Target(")	1983	12	95	76	150	3.5	65.9

Plot size, M^2 : 6.0
Fertilizer, kg/ha : 46/69 N/P_2O_5
Planting date : 20/6/80
Seeding rate kg/ha : 10.0

L.S.D. 5% = 455 kg/ha
L.S.D. 1% = 612 "
C.V. = 11.5%

335-5 & 6 Rape Seed Pre-National Yield Trial (Bekoje & Kulumsa).

In this trial Eleven different varieties and two Standard checks (S-67 and Target) were included. Two Station- Bekoji and Kulumsa were chosen as testing sites.

At Bekoji one of the Standard checks - S-67 excelled all other varieties yieldwise, with a yield of 2644 kg/ha followed by Canada which gave a yield of 2083 kg/ha. At Kulumsa the two standard checks S-67 and target proved to be the best yielding varieties than the rest. At both locations statistically significant difference in yield between treatment means was obtained.

335-5 Rape Seed Pre-National Yield Trial (Bekoji).

Variety/Treatment	Yield 87.5% DM		Stand %	Days to heading	Days to maturity	Lodging %	Shattering	Height cms.	1000-seed weight gms.	Hl-weight kg.
	kg/ha	Rank				Late				
Pura	2000	3	75	80	161	0	0	130	3.5	62.6
Tower	1861	5	80	78	163	0	0	135	3.8	62.6
Oro	1788	8	80	91	146	0	0	130	3.5	62.1
Esora	1605	11	70	92	167	0	0	120	3.5	60.0
Escora	1838	6	75	90	168	0	0	125	3.3	60.0
Unada	2083	2	85	80	163	0	0	125	3.5	62.4
Riko	1922	4	80	82	164	0	0	130	3.5	61.2
Gorman	1777	0	80	91	167	0	0	130	3.3	59.4
Echo	1483	12	85	90	147	0	0	135	1.2	65.1
Tonch	1133	13	70	80	142	0	0	130	1.2	65.2
Tosa	1666	10	65	89	168	0	0	130	3.5	60.0
S-67-(Cst.ck)	2644	1	70	88	183	0	0	150	4.0	64.2
Target	1827	7	75	87	160	0	0	120	3.3	63.2

Plot size, M^2 : 6.0
Fertilizer, kg/ha : 46/69 N/P_2O_5
Planting date : 20/6/80
Seeding rate, kg/ha : 10.0

L.S.D. 5% = 446 kg/ha
L.S.D. 1% = 604 "
C.V. = 14.5 %

335-b Rape Seed Pre-National Yiled Trial (Kulumsa).

Variety/Treatment	Yield 87.5% DM kg/ha	Rank	Stand %	Days to heading	Height cms.	1000-seed weight	Hl-weight kg.
Tuke	2496	12	85	81	125	3.0	65.6
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
8.0	1083	5	80	94	130	3.0	64.3
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Escora	1117	8	80	94	125	2.5	64.9
Uanada	1922	3	70	81	140	3.5	65.1
Riko	1378	6	75	87	140	3.0	64.7
Gorean	906	13	80	95	140	3.0	64.2
Echo	1239	7	85	66	115	2.8	66.1
Torch	1028	10	75	61	100	2.3	66.0
Kosa	978	11	80	93	140	3.0	65.0
S-67 (St.check)	3583	1	75	88	165	3.8	66.9
Target "	2000	2	85	80	130	3.3	66.9

Plot size, M^2 : 6.0
Fertilizer, kg/ha : 46/69 N/P_2O_5
Planting date : 20/6/80
Seeding rate kg/ha : 10.0

L.S.D. 5%= 270 kg/ha
L.S.D. 1%= 366 "
C.V. = 10.7%

Noug

375-1 Noug National Yield Trial.

This trial was undertaken for the first time. Eleven improved varieties and one local check (Assela Market) were included and the trial was conducted at Kulumsa. Generally speaking the stand was very good and was more than 80% for all treatments. With respect to yield the top yielding varieties were IAR/GU/158 and IAR/GU/160 which gave 1050 kg/ha and 1033 kg/ha respectively. IAR/GU/154 with a yield of 625 kg/ha proved to be the lowest yielding variety. Lodging was observed on all varieties with pronounced severity (90%) on the local check. Shattering was also a problem on all varieties.

375-1 Noug National Yield Trial (Kulumsa)

Variety/Treatment	Yield 87.5% DM kg/ha	Rank	Stand %	Days to heading	Lodging % Early	Sattering %	Height cms.	1000-seed weight	Hl-weight kg.
IAR/GU/ 26	658	11	90	83	15	20	160	2.5	60.2
" 36	742	9	85	84	20	20	155	2.5	59.6
" 72	854	3	90	82	10	20	155	3.0	60.1
" 152	833	4	80	84	45	25	155	3.0	59.9
" 154	625	12	85	83	35	20	165	3.0	61.4
" 156	754	8	90	85	40	20	165	3.0	60.7
" 157	825	6	90	84	40	20	165	3.0	60.5
" 158	1050	1	90	82	30	25	155	3.0	60.2
" 160	1033	2	95	78	60	20	155	2.5	59.9
" 166	763	7	90	83	35	20	165	3.0	59.3
" 267	725	10	90	82	40	20	150	3.0	69.7
Local check	833	4	95	75	90	25	150	2.5	60.9

Plot size, M^2 : 6
Fertilizer, kg/ha : 23/23 N/P_2O_5
Planting date : 51 + 180
Seeding rate, kg/ha : 100

L.S.D. 5% = 732 kg/ha
L.S.D. 1% = 987 "
C.V. = 20.9

4. PASTURE AND FORAGE CROPS

400- Observation Trials

Eight observation trials were conducted on different grasses and legumes at Kulumsa, Bekoji, Robe & Diksis.

The main objective was to get additional information about the different forage crops at the mentioned stations.

The plots were fertilized with phospate and Nitrogen. Parts of the plots were harvested to get comparable yield figures for the botanical productivity where as some part was left to obtain information on their seed producing capacities.

405-1/80 Variety Observation on Some Perennial Grasses (Robe).

Robe (2420m) being a new station to be included in the program different tropical and temperate grasses were planted with the objective to observe their performance under this ecological zone.

Most of the grasses were not established at all, where as some were well established but no substantial yields were obtained. Sudan grass, Columbus grass and Perennial rye grass showed good performace and high dry matter yields were obtained.

405-1/80 Variety Observation on Some Perennial Grasse, Robe.

Entry No.	Varieties grasses	Harvesting date	Height cm	Yield DM kg/ha	
1	Chloris gayana Rhodes	Not established			
2	Panicum coloratum	"			
3	Congo Signal	"			
4	Setaria anceps	Few plants emerged but no substantial yield			
5	Lolium perene	15-11-80	45	9688	
6	Dactylis glomerata	Well established but no Substantial yield			
7	Phalaris tubrosa	" "	"	" "	
8	Phalaris aurindinaceal	Not established			
9	Sorghum Sudanese	15-11-80	185	22500	
10	Sorghum almum	15-11-80	165	15600	
11	Panicum antidotale	Not established			
12	Panicum maximum	" "			

Design - Single plot
Plot size - Gross 6m^2 net 1.2 m^2
Date of planting - 16 July
Seeding rate - 20 kg/ha
Spacing - 20 cm between rows
Fertilizer - 200 kg/ha DAP

405-2/80 Observation of Some Forage Legumes, Kobe.

The objective of this trial was to observe the agronomic performance and productivity of some forage legumes under the ecological conditions of Kobe.

All the medicago spp., Dolichos, melilotus & Vicia performed quite well. The others did not establish.

405-2/80 Observation of Some Forage Legumes, Koba.

Legumes	Stand %	Harvesting date	Height cm	Yield DM kg/ha
Medicago sativa H.P.	45	15-11-80	60	1689
" " L.S.P	95	"	65	1688
" " H.R.	70	"	75	1938
" truncatula	80	"		3125
" littoralis	80	"		3438
Stylosanthes guanensis	Not established			
Desmodium uncinatune	Only few plants emerged			
" intortum	Not established			
Centrosema pubensis	"	"		
Glysine wightii	Only few plants emerged			
Dolichos lablab	20	15-11-80	40	2081
Melilotus altissimus	30	"	105	2961
Vicia dasycarpa	100	"	235	12875

Design - single plot
Plot size - Gross 8 m^2 net 1.6 m^2
Planting date - 16 July
Seeding rate - 12 kg/ha except 1) Dolichos - 30 kg/ha
2) Vicia - 20 "
Spacing - 40 cms between rows
Fertilizer - 200 kg/ha DAP

H.P. Hairy pruvian
L.S.P. Lehmanton siro peruvian
H.R. Hunter river

405-3/80 Observation of differnt tropical grasses, (Kulumsa).

The grass species in this trial were Chloris gayana var mabrara, Chloris gayana var massaba, Panicum coloratum, Panicum maximum, Panicum antidotate, Congo signal, Setaria sphacelata.

The objective was to establish these grasses and make comparative studies on them. They were planted on the first week of June and due to shortage of rains immediately after planting they could not germinate well and were soon overtaken by Andropogon abyssinicus.

Therefore no yield data is available.

405-4/80 Observation of different Tropical Legumes, (Kulumsa).

The legumes planted were Medicago sativa var Hairy Peruvian, Desmodium uncinatum, Desmodium intortum, Stylosanthes guanensis, Centro sema pubensis, Glysine wightii, Phaseolus atropur pureum.

The objective was to observe their seed setting ability. All established well except centrozema pubensis. Alfalfa showed vigrous growth but only few flowers were formed. Phaseolus (siratro) produced some seeds.

Generally most of them had shown slow growth and no harvestable seed yield was obtained.

405-5/80 Observation of Tropical Grass/legume.mixtures (Kulumsa).

In order to study the comeptitive ability over the ley years and the level of improvement both in yield and nutritive value a trial was established with two common tropical grasses and Seven tropical legumes. The grasses established quite well but some legumes failed to establish. The dry matter yield was generally high.

405-5/80 Observation of Some Tropical Grass/Legume Mixtures, Kulumsa.

Species grass + Legume	Yield DM kg/ha	% Legume	Seed yield kg/ha
Chloris gayana + Medicago sativa	6804	14	92
+ Desmodium uncinatum	9923	9	153
+ Desmodium intortum	10016	3	200
+ Stylosanthes guanensis	10560		250
+ Centrosema pubensis	11160		225
+ Glysine wightii	9834	20	205
+ Macroptium atropurpureum	10464		200
Panicum coloratum + Medicago sativa	8603	15	110
+ Desmodium uncinatum	14010		212
+ Desmodium intortum	13703		261
+ Stylosanthes guanensis	13905	6	367
+ Centrosema pubensis	12353		317
+ Glysine weghtii	12123	10	261
+ Macroptilum atropurpu-	12384		356

Design - Single plot
Plot size - Gross 20 m^2 net for forage $2m^2$, for seed $18m^2$
Date of planting - 6 June
Date of harvesting - 16 October
Seeding rate - 20/10 kg/ha grass/legume (mixed)
Spacing - 40 cms between rows
Fertilizer - 200 kg/ha DAP

405-8; Observation of different forage crops (Diksis).

To observe the performance of different pastures and forage crops at Diksis a trial was conducted on 20 crops (grasses, legumes & kale).

The main objective of this trial was to screan out the most adaptable crops to seasonally waterloged black clay soil of Diksis and incidence of frost which occurs in October to November. The entries were both temperate & tropical crops.

Some crops haven't been established at all; nos 3,4,8,11 where as some have but no substatial yields were obtained i.e, nos 1,2,7, 9,16,18,& 19. Entries no 2,9,&10 were severely damaged by frost.

Some established well but the vegetative vigor was poor may be due to walertagging & low temperative etc, nos 7,16,17,18,19,&20 Oat, Vicia, Oat/Vicia mixture, Lolium perenne performed quite good. The vegetative growth and yield of oat shows the tolerance of oat to low temperatures & semi waterlogging conditions of Dixsis.

405-8/80 Observation of different forage crops, Diksis

Entry No	Species	Stand %	Height cm	DM yield kg/ha
1	Chloris gayana	30	No substantial yield	
2	Panicum coloratum	20	"	"
3	Congo signal	Not established		
4	Setaria anceps	"	"	
5	Lolium perene	90	45	9030
6	Dactylis glomerata	90	35	4805
7	Phalaris tubrosa	40	No substantial yield	
8	Phalaris aurindenaceal	Not established		
9	Sorghum Sudanese	75	60	All leaves were damaged due to frost
10	Sorghum almum	50	70	3059.
11	Panicum antidotate	Not established		
12	Panicum maximum	"		
13	Avena sativa - oat-Lampton	85	180	14007
14	Vicica dasycarpa	75	170	10440
15	Oat/vicia mixture	75	180/65	14007
16	Melilotus altissimus	30	Very stunted growth, no substantial yield	
17	Medicago sativa Var.Hun.Kiv	5	35	708
18	Medicago truncatula	5	Very stunted growth, no substantial yield	
19	Medicago littoralis	5	"	"
20	Marrow stem kale	60	No substantial yield	

Design	- Single plot observation
Plot size	- $12m^2$ net $2m^2$
Date of planting	- 28 June
Date of harvesting	- 15 Nov.
Seeding rate	- 20 kg/ha
Spacing	- 40 cm & 20 cms between rows for legumes & grasses respectively
Fertilizer	- 200 kg/ha DAP (18/46)

431- Fertilizer trials on established leys.

Different fertilizer trials which were established in 1974 were continued. The results up to 1979 were reported in the previous annual reports and publications.

The trials were located at Kulumsa (Rhodes grass) and Bekoji (Cocksfoot grass).

The fertilizer used was urea (46% N) as source of Nitrogen. The main objectives of the trials were to study the effect of level of fertilizers and time of top dressing on yield and quality of the hay as well as the seed.

Top dressing was made in the last month of June and there was quite sufficient moisture at the time.

Harvesting was made by a grass mower for hay and by the use of hand sickle for seed.

As the capital available for investment is the most important factor to estimate the benefit of using inorganic fertilizers the calculation concerning production costs for the yield increases were included. The current fertilizer cost was Eth. Birr 85.- (for both TSP & Urea).

Germination tests were done in the seed laboratory and included. Samples for nutrition analyses were taken but not analysed yet.

The figures which show the best response to different rates and time of fertilizer application were shown in the following tables. Since these trials were and well be continuous no conclusions were made at present. It, however, appeared that significant response to nitrogen application was observed.

431-1/74 The effect of N-top dressing on Rhodes grass

Urea level kg/ha	DM yield kg/ha	Seed yield kg/ha	Relative figure	Germination %
0	3375	33	100	17
100	4867	44	134	12
200	4792	56	171	11
300	6381	105	317	18
400	5306	107	324	18
LSC 5%	852.4	11		
1%	1196.5	16		
C.V. (%)	11	22		

Desing - RCB (4 rep)
Plot size - 12m^2 for DM 20m^2 for seed
Species name - Chloris gayana (Rhodes' grass)
Date of planting - 19/5/
Date of top dressing - 25 Ju
Fertilizer - According to the plan

431-1/74 The effect of N-topdressing on Rhodes grass

For forage production.

Treatments urea kg/ha	DM yield kg/ha	DM increase over control	Fertilizer cost Birr/ha	Cents per kg yield increase
0	3375	-	-	
100	4867	1492	85.00	6
200	4792	1417	170.00	12
300	6381	3006	255.00	9
400	5306	1931	340.00	18
LSD				
5%	852.4			
1%	1196.5			
CV%	11			

431-1/74 The effect of N-topdressing on Rhodes grass for seed production.

To show the cost per kg yield increase.

Treatments urea kg/ha	Seed yield kg/ha	Seed increase over control	Fertilizer cost Birr/ha	Birr per kg yield increase
0	33.2	-		
100	44.4	11.2	85.00	7.59
200	56.8	23.6	170.00	7.20
300	105.1	71.9	255.00	3.55
400	107.5	74.3	340.00	4.58

431-2/77 The effect of N-topdressing on Cocksfoot grass for seed production, Bekoji

Treatments urea kg/ha		Height cm	Seed yield kg/ha	Germination %	Seed yield increase over control	Fertilizer cost Birr/ha	Birr per kg yield incr
a	0	75	97	61	-	-	-
b	100	85	140	78	43 kg	85.00	1.98
c	200	90	155	65	58 "	170.00	2.93
d	300	95	246	69	149 "	255.00	1.71
e	400	100	360	67	263 "	340.00	1.29
LSD							
	5%		87				
	1%		122				
	CV%		28				

Design - RCB (4 reps)
Plot size - 20m^2
Species name - Dactylis glomerata (Cocksfoot)
Date of planting - March 1976
Date of urea topdressing - 19 June
Date of harvesting - 18 November

431-4/74 Harvesting stage trial with Nitrogen application on Rhodes grass, Kulumsa.

Fertilizer N	Yield dry matter kg/ha			
	Harvesting stage			
kg/ha	Grazing 13-8-80	Silage 27-8-80	Hay 16-9-80	Fertilizer mean
0	323	577	1470	790
40	723	1615	3212	1817
80	1264	2008	5649	2974
120	1030	3033	4807	2957
Harvesting stage mean	835	1784	3785	

Design -Split plot; main plots - Harvesting stages
sub plots - N-levels

Plot size -Gross=$10m^2$, net= $6m^2$

Specis name -Chloris gayana (Rhodes grass)

Planting date -19/5/73

Harvesting date -See above

Fertilizer -200 kg/ha DAP at planting, N according to the plan.

431-5/74 Fertilizer trial on established ley of Rhodes grass, Kulumsa.

Fertilizer kg/ha P_2O_5	Fertilizer kg/ha N	Height (cm)	DM yield kg/ha	Dry matter increase over control kg/ha	Fertilizer cost Birr/ha	Cents per kg yield increase
0	0	36	1508	-	-	
0	69	53	2842	1334	127.50	10
0	138	65	3327	1819	255.00	14
46	0	39	1848	340	85.00	25
46	69	55	3254	1749	212.50	12
46	138	71	4838	3330	340.00	10
92	0	53	2015	507	170.00	34
92	69	58	3485	1977	297.50	15
92	138	81	4925	3417	425.00	12

LSD	P-level kg/ha	N-level kg/ha	N x P_2O_5
5%	378	378	499
1%	513	513	677
C.V(%)			14.%

Design -3^2 factorial
Plot size -gross = $20m^2$, net $12m^2$
Species name -Chloris gayana (Rhodes grass)
Date of sowing -19/5/73
Date of fertilizer application -25 June
Date of harvesting -22 September
Fertilizer -200 kg/ha NP (18/46) at planting
top dressing according to the plan.

431-6/80 The effect of time of N-application on Rhodes grass, Kulumsa.

Date of nitrogen top dressing	DM yield kg/ha	Seed yield kg/ha	Relative figure	Germination %
Control- 0-level	1444	15.3	100	12
18 June	5797	55.7	364	19
2 July	4667	88.0	575	20
16 July	6583	125.5	820	18
30 July	7211	110.3	721	14
13 August	5625	72.8	476	14
27 August	3814	31.3	205	15
LSD 5%	1257	16.8		
1%	1763	23.6		
C.V(%)	14%	13%		

Design -RCB (4 repls)
Plot size -gross = 20m^2, net 12m^2
Species name -Chloris gayana (Rhodes grass)
Date of sowing -19/5/73
Date of harvesting -21 October
Fertilizer - 200 kg/ha DAP (18/46) at planting, 200 kg/ha urea top dressed on the dates shown above.

431-8/74 The effect of delay cleaning cut and time of N-top dressing on Rhodes grass.

Kulumsa.

Date of cleaning cut and nitrogen top dressing		DM yield kg/ha	Seed yield kg/ha	Relative figure	Germinationg %
Control	Nil	2625	17.3	100	18
June	18/80	4665	48.6	281	19
June	25/80	4094	62.1	359	12
July	2/80	2800	39.9	231	21
July	9/80	3685	55.5	321	23
July	16/80	2433	38.0	320	13
July	23/80	2071	34.0	197	13
July	30/80	1433	26.3	150	10
August	6/80	1042	25.8	149	10
L S D					
	5%	653	10.8		
	1%	887.6	14.7		
C.V(%)		16	19%		

Design -RCB (4 repls)
Plot size - Gross 20m^2, net= 12m^2
Species name - Chloris gayana (Rhodes grass)
Date of sowing - 19/5/1973
Date of harvesting - 23 September
Fertilizer - 200 kg/ha NP (18/46) at planting
200 kg/ha urea top-dressed on the dates shown above.

431-9/76 Fertilizer trial on the established ley of Cocksfoot.

Bekoji.

Fertilizer kg/ha		DM yield	DM increase	Fertilizer	Cents per kg
P_2O_5	N	kg/ha	over control	cost Birr/ha	yield increase
0	0	2558	-	-	-
0	69	3008	450	127.50	28
0	138	3015	457	255.00	56
46	0	3038	480	185.00	18
46	69	3331	773	212.50	27
46	138	4550	1992	340.00	17
92	0	4125	1567	170.00	11
92	69	3373	815	297.50	37
92	138	3631	1073	425.00	40

L S D	P-level	N-level	N_2 x P
5%	343 kg/ha	343 kg/ha	584 kg/ha
1%	467 "	467 "	793 "
C.V(%)			11.7%

Design - 3^2 factorial

Plot size - Gross = $20m^2$, net = $12m^2$

Species name - Dactylis glomerata (Cocksfoot)

Date of sowing - 1976

Harvesting date - 23 September 1980

Fertilizer - 200 kg/ha NP (18/46) at sowing.

431-13/77 The effect of time of urea topdressing on seed yield of Cocksfoot grass,.

Bekoji,

Dates of topdressing	Height (cm)	Seed yield kg/ha	Germination %
Control - 0 - level	80	60	66
18 June	90	138	74
2 July	90	141	66
16 July	90	176	63
30 July	90	71	51
13 August	70	67	60
27 August	70	64	69
L S D (kg/ha)			
5%		71.3	
1%		100.1	
CV%		39	

Design RCB (3 reps)
Plot size -net 20 m^2
Species name -Dactylis glomerata
Harvesting date -18 November 1980
Fertilizer -200 kg/ha urea.

439- Management of Grass Leys.

Management trials to determine the effect of harvesting stage on (1) yield and quality of hay (trial no 439-2/74) and (2) seed yield & germination capacity (trial no 439-5/74 & 439-6/79) were continued.

As the stage of maturity influences the nutritive value of grass hay it was essential to determine the best stage when the crop has best yield and quality. No results on the nutritive value is available since the analysis hasn't been completed.

One of the difficulties in tropical grasses seed production is their high percentage of shattering. This has been observed on Rhodes & Coloured Guinea grasses quite often. To fix the best stage when the loss due to shattering is low and produce quality seed trials were laid out. The data is given on samples under trial nos. 439-5/74 for Rhodes grass and 439-6/80 for Coloured Guinea grass.

439-2/74 Management of Grass Leys.

Kulumsa.

Cutting stages	Harvesting date	Yield D.M kg/ha
Before heading	13 August	1500
Start heading	27 August	2527
Full heading	13 October	4771
LSD		
5%		250
1%		378
C.V(%)		4.9%

Design - RCB (4 reps)
Plot size - Gross 20m^2, net plot size 12m^2
Species name - Chloris gayana (Rhodes grass)
Date of sowing - 9/5/73
Date of N-top dressing - 23 June 1980
Fertilizer - 100 kg/ha NP (18/46) at sowing and 100 kg/ha urea topdressed.

439-5/74 Harvesting stage trial on Rhodes grass for seed production. Kulumsa.

Stage of harvesting	Date of harvesting	DM yield kg/ha	Seed yield kg/ha	Germination %
Initial full heading stage	13 October	5346	88.75	20
One week after " "	20 "	4531	65.78	20
Two " " " "	27 November	5169	54.22	30
Three weeks" " "	30 "	4622	33.13	32
Four weeks " " "	10 "	4615	- *	-
L S D				
5%		453	13.55	
1%		635	19.47	
C.V(%)		6%	13.98%	

* no harvestable yield was obtained (nearly 100% shattering).

Design - RCB (4 repls)
Plot size - Gross = 16m^2, net = 9.6 m^2
Species name - Chloris gayana (Rhodes grass)
Date of sowing - 19/5/1973
Date N-fertilizer topdressed - 25 June
Fertilizer - 200 kg/ha NP (18/46) at sowing
200 kg/ha urea top dressed.

439-6/80 Harvesting stage trial on Coloured Guinea grass for Seed Production.

Kulumsa.

Stage of harvesting	Harvesting date	Seed yield kg/ha	Germination %
2 weeks after intial full heading	13 October	265.4	6.4
3 weeks after " " "	20 "	302.3	21.0
4 weeks after " " "	27 "	282.0	27.0
5 weeks after " " "	3 November	135.0	31.0
L S D			
5%		64	
1%		86	
C.V(%)		16%	

Design -RCB (4 repls)
Plot size -Gross 10.08m^2, net 9.6m^2
Species name - Panicum coloratum
Date of sowing -March 1978
Date of feritilizer top-dressing-Early July 1980
Fertilizer -200 Kg/ha DAP (18/46) at sowing and 200 kg/ha urea top-dressed.

44 CULTIVATED LEGUMES

The effect of P-application on medicago truncatula. This trial was conducted both at Kulumsa and Dherra. The trial located at Dherra was failed to produce any substantial yield due to moisture stress during the growing period.

The stand and vegetative growth were very good at Kulumsa. No significant yield difference was observed at different levels of phosphorous.

441-1/80 Effect of P-application on Medicago truncatula.

Kulumsa.

Fertilizer P_2O_5 kg/ha	DM yield kg/ha	Relative figure
0	7644	100
45	8097	106
90	8372	110
135	8281	108
L S D		
5%	NS	
1%	NS	
C.V(%)	8	

Design - RCB (4 repls)
Plot size - Gross = 20m^2, net= 8m^2
Species name - Medicago truncatula - Jemaloug
Planting date - 8 July 1980
Harvesting date - 24 October 1980
Fertilizer - As shown above.

442-1/80 Seeding rate trial on melilotus altissimus.

As shown on the previous reports this crop has been found to adapt well in the low-medium altitudes. To assess the response to different seeding rates in the lowland the trial was conducted at Dherra.

The stand and vigour were quite low due to moisture stress. The yield has also been quite low as compared to the previous results.

442-1/80 Seeding rate trial on melilotus altissmus.

Dherra.

Seeding rate kg/ha	Stand %	DM yield kg/ha
5	25	765
10	45	738.5
15	55	878.6
20	60	1089.0
25	70	1332.0
L S D		
5%		NS
1%		NS
C.V(%)		16.5

Design - RCB (3 repls)
Plot size - Gross= 24m^2, net= 6.4m^2
Species name - Melilotus altissmus
Date of planting - 11 July 1980
Date of harvesting - 7 October 1980
Fertilizer - 200 kg/ha DAP (18/46) at planting

442-1/80 Time of planting on Melilotus Altissimus.

To determine the optimum date of planting of this crop for seed production a trial was conducted at Kulumsa.

Four dates of planting i.e., from May 29- June 29 at the interval of 10 days were compared. The stand was quite good except the last date of planting. Very severe attack of Parasitic weed, Orobanche ramosa, was observed at flowering stage of the crop. There was also high moisture stress at flowering stage. Due to these factors there were no seeds produced. This trial will be conducted in the following season.

443-2/80 Time of Planting Vicia Dasycarpa.

To determine the optimum date of planting for large scale seed production a trial was conducted at Kulumsa. Four dates of planting from May 29 to June 29 at the interval of 10 days were compared.

The vegetative growth was quite satisfactory in all dates. The flower production was quite high in all dates but the seed formation was superior in the first date of planting. There was moisture stress in late September and that may be the case for lower seed yields in the latter dates of planting.

443-2/80 Time of planting on vicia dasycarpa for seed production.

Kulumsa.

Planting date	Day's to flowering	day's to maturity	Harvesting date	Seed yield kg/ha	Germination %
May 29/80	91	166	6/11/80	1291.25	64
June 9/80	107	155	11/22/80	760.0	55
June 19/80	120	152	18/11/80	726.25	65
June 29/80	117	142	18/11/80	652.50	65
LSD 5%				NS	
1%				NS	
C.V.(%)				48%	

Design -RCB (4 repls)
Plot size -Gross = $20m^2$, net = $20m^2$
Species name -Vicia dasycarpa var. lana
Seeding rate -20 kg/ha
Spacing -40 cm between rows
Fertlizer -200 kg/ha DAP at planting

445-1,2/80 Alfalfa Variety Observation Trials (Kulumsa)

Varietal observation trials were conducted on 20 Alfalfa varieties both at Robe and Kulumsa.

All varieties were established at Kulumsa where as Moapa 92 and M.arborea didn't at Robe.

The trial at Robe suffered from frost in November and the weed infestation was also high.

Different growth habits were observed; buncly and woody stem no. 9 trailing type no 16, dwarf type no. 6. Only few varieties produced flowers but failed to produce any viable seeds. It was possible to have two harvests at Robe from some varieties.

445-1/80 Alfalfa Variety Observation (Robe).

Entry no.	Species	Variety	Stand %	Height in cm.	1st Harvest DM yield kg/ha	2nd Harvest DM yield kg/ha	Total kg/ha
1	Medicago stavia	Can creep	30	45	1418	653	2071
2	"	Gaetoni cantoni	70	30	1125	-	1125
3	"	Moapa 93	80	45	1414	-	1414
4	"	Hunter River	80	50	2168	1000	3168
5	"	Hairy peruvian	85	50	2636	458	3094
6	"	Moapa 92	not established			-	-
7	"	Washoe	50	20	750	-	750
8	"	Vernal	45	15	500	-	500
9	Medicago arbarea		not established			-	-
10	Medicago sativa	Cody	50	30	438	-	438
11	"	V.C.Salton	95	45	1700	700	2400
12	"	Lahanton	85	35	1219	-	1219
13	"	Rhizoma	75	20	813	-	813
14	"	Dupuits	60	30	1350	-	1350
15	"	Sonova	70	60	2000	-	2000
16	"	Ladak	60	15	938	-	938
17	"	Gilboa	75	65	1463	500	1963
18	"	Galilie (Israel)	70	60	2250	438	2688
19	"	Gilbaa (Israel)	70	55	1444	1275	2719
20	"	Holleta polycross	80	50	1750	900	2650

Design - Single plot observation.
Plot size - Gross 3.2 m^2 net 1.6 m^2
Date of planting - 16/7/80
Date of harvesting - 15/11/80 and 29/1/81
Fertilizer rate - 200 kg/ha DAP at planting and 50 kg/ha TSP topdressed after each harvest.

445-2/80 Alfalfa Variety Observation, (Kulumsa).

Entry no.	Species name	Variety	Stand %	Height cm.	DM yeild kg/ha	Rank
1	Medicago sativa	can creep	85	55	4401	1
2	"	Gaetono cantoni	75	45	3234	10
3	"	Moapa93	90	55	2596	17
4	"	Hunter river	95	80	3506	7
5	"	Hairy peruvian	100	65	4292	2
6	"	Moapa92	30	65	2178	18
7	"	Washoe	70	30	2724	15
8	"	Vernal	75	40	3659	6
9	Medicago arborea		35	40	4093	3
10	Medicago sativa	Cody	80	50	3659	6
11	"	V.C. salton	90	55	3864	4
12	"	Lahonton	75	50	2790	14
13	"	Rhizoma	75	40	3403	9
14	"	Dupuits	70	40	3208	11
15	"	Sonova	85	60	3046	12
16	"	Ladak	70	35	2596	17
17	"	Gilboa	80	70	2852	13
18	"	Galitee (Israel)	75	70	3436	8
19	"	Gilboa (Israel)	80	60	2672	16
20	"	Holleta polycross	70	65	3752	5

Design - Single plot observation
Plot size - Gross 3.2m^2; net 1.6m^2
Date of planting - 25/6/80
Spacing - 40 cms between rows
Date of harvesting - 22/10/80
Fertilizer rate - 200 kg/ha DAP at planting.

445-3-5/80 Vetches Variety Trials.(Kulumsa, Bekoji, Dhera)

Variety trials on vetches were conducted at Kulumsa, Bekoji and Dherra to observe their performance at different ecological zones.

At Kulumsa the growing conditions were quite good and vigrous growth and higher yields were obtained.

At Bekoji the objective was to observe their response to frost and assess their capacity to produce seeds. As could be seen from the table quite high seed yields were obtained. No severe damage due to frost was observed.

At Dherra the stand and vigor were quite low due to moisture stress. Generally lower yields were obtained as compared to the other stations.

445-3/80 Vetches variety trial, (Kulumsa).

Vetches/Varieties	Stand %	D.M yield kg/ha	Relative figure
Vicia dasycarpa mamoi	75	7108	86
Vicia villosa	75	7913	96
Vicia atropurpurea	80	7433	90
Vicia sativa	70	7671	93
Vicia dasycarpa lana.	70	8250	100
L S D 5%		1497	
1%		2099	
C.V.(%)		12.7	

Design - RCB (4repls)
Plot size - Gross = $6m^2$ net; $6m^2$
Spcies name - See above
Time of planting - 26/6/80
Harvesting date - 23/10/80
Fertilizer - 200 kg/ha DAP (18/46) at planting.

445-4/80 Vetches variety trial for forage production, (Bekoji).

Vetches/Varieties	Stand	Days to flowering	Harvesting date	DM yield kg/ha	Rel. figr
Vicia dasycarpa var. mamoi	90	125	22/10/80	8708	149
Vicia villosa	65	131	22/10/80	5425	93
Vicia atropurpurea	85	141	5/11/80	7617	131
Vicia sativa	85	101	10/ 9/80	6775	116
V. dasycarpa var. lama	70	124	22/10/80	5825	100
L S D 5%				2238	
1%				3137	
C.V. (%)				21 %	

Design - RCB (4 repls)
Plot size - Gross= 6m^2, net 3m^2
Species name - See above
Time of planting - 11/6/80
Harvesting date - See above
Fertilizer - 200 kg/ha DAP (18/46)

445-4/80 Vetches Variety Trial for Seed Production, (Bekoji).

Vetches	Stand %	Day's to flowering	Day's to maturity	Harvesting date	Seed yield kg/ha
Vicia dasycarpa var. mamoi	90	125	159	17/11/80	2237
Vicia villosa	65	131	189	17/12/80	657
Vicia atropurpurea	85	141	176	4/12/80	1758
Vicia sativa	85	101	144	2/11/80	3530
Vicia dasycarpa var. lana	70	124	159	17/11/80	2323
L S D 5%					377
1%					529
C.V. (%)					12%

Design - RCB (4repls)
Plot size - Gross =6m^2 net 3m^2
Species name - See above
Time of planting - 11/6/80
Harvesting date - See above
Fertilizer - 200 kg/ha DAP (18/46)

445-5/80 Vetches Variety Trial, (Dherra).

Vetches/Varieties	DM yield kg/ha	Relative figure
Vicia dasycarpa, mamoï	2125	83
V. villosa	2838	111
V. atropurpurea	3375	132
V.sativa	1188	47
V.dasycarpa, lana	2550	100
L S D 5%	NS	
1%	NS	
C.V.%	43.6	

Design - RCB (3reps)
Plot size - $8m^2$
Species - As shown above
Planting date - 11 July 1980
Harvesting date - 7 October 1980
Fertilizer - 200 Kg/ha DAP (18/46)

Summary of vetches variety trials for 1980/81
Dry matter yield kg/ha.

Vetches/Varieties	Kulumsa	Bekoji	Dherra	Mean	Relative figure
1. Vicia dasycarpa, mamoi	7108	8708	2125	5980	108
2. V.villosa	7913	5425	3375	5571	101
3. V.atropurpurea	7433	7617	2838	5963	108
4. V.sativa	7671	6775	1188	5211	94
5. V.dasycarpa lana	8250	5825	2550	5542	100
Mean	7675	6870	2415	5653	

46- ROOT CROPS

During 1980/81 crop season different trials concerning varieties, seeding rate and planting method were conducted at Bekoji, Meraro and Koffele.

The main objective of these trials was to assess the seed yield of fodder beet under different treatments in the given trials at various stations.

At Koffele the soil moisture condition was quite good at planting and germination was fairly high. After wards there was a severe flood and the stand was much affected. The vegetative development was quite good but no seeds were produced.

At Meraro the germination and the stand at an early stage was fairly good but due to drought in May there was stunted growth. Latter on there was a damage by porcupine and no substantial yield was obtained.

At Bekoji the germination was quite normal but due to the drought period in May there was poor stand. Some plants produced viable seeds but due to very poor stand and uneven plant population the yields were not presented here.

472-1-3/80 Annual forage crops for Green feed, Silage and/or hay seeding rate trials.

To determine the optimum seeding rates of oat/vicia mixtures similar trials were conducted at Kulumsa, Bekoji and Dherra. These trials were repeatedly conducted over the last 5 years (1976-1980).

The treatments were 50,75,100 kg/ha oat and 0, 25 & 50 kg/ha vicia. The design of the trial was split plot, oat (var. lampton) being the main plot and vicia dasycarpa being the sub plot.

At Kulumsa lodging percentage was quite high particularily at higher seeding rates plants were subjected to rotting. Generally dry matter yield was higher as compared to others stations and the legume composition was also higher.

At Bekoji the stand was low and generally lower dry matter yield was obtained this year as compared to previous years.

At Dherra the moisture stress was much severe this year and the vegetative development and the dry matter yield were quite low.

472-1/80 Seeding rate trial on oat/vicia mixture, (Kulumsa).

Seeding rate kg/ha		Stand	Lodging	Height,	DM yield	Legume
Oat	Vicia	%	%	cm	kg/ha	%
50	0	85	0	140	10469	
50	25	90	25	130	8297	21
50	50	85	50	130	10906	25
75	0	95	25	135	11672	-
75	25	95	25	140	11083	8
75	50	100	75	130	8609	20
100	0	95	20	145	11167	-
100	25	100	25	140	10188	25
100	50	100	50	135	9802	16
L S D 5%					NS	
1%					NS	
C.V.(%)					a) 11.5% b) 18.8%	

Design - Split plot (4repls)
Plot size - Gross = $8m^2$, net= $4.8m^2$
Species name - *Avena sativa* var. lampton & *Vicia dasycarpa*
Date of sowing - 25/6/80
Harvesting date - [illegible]
Spacing - 20 cm between rows
Fertilizer - [illegible]

472-2/80 Seeding rate trial on oat/vicia mixture, (Bekoji).

Seeding rate kg/ha		Stand	Height	DM yield	Legume
oat	vicia	%	cm	kg/ha	%
50	0	70	125	5780	-
50	25	65	115	4088	17.0
50	50	70	140	5955	15.0
75	0	70	130	5115	-
75	25	75	140	5896	23.0
75	50	75	140	7493	17.0
100	0	75	130	5138	-
100	25	75	140	5609	5
100	50	80	130	5393	13
L S D 5%				NS	
1%				NS	

Design - Split plot (4 repls)
Plot size - Gross = $8m^2$, net= $4.8m^2$
Species name - Avena sativa var. lampton and Vicia dasycarpa.
Date of sowing - 25/6/80
Harvesting date - 15/10/80
Fertilizer - 200 kg/ha DAP (18/46)

472-3/80 Seeding rate trial on oat/vicia mixture. (Dherra).

Seeding rate kg/ha		Stand	Height	DM yield	Legume
Oat	Vicia	%	cm.	kg/ha	%
50	0	65	30	1569	
50	25	70	35	2225	20
50	50	65	36	2156	16
75	0	70	30	1994	
75	25	60	30	1365	6
75	50	60	42	2240	25
100	0	85	40	2710	
100	25	90	40	2308	15
100	50	75	30	2758	9
L S D 5%				NS	
0.01 1%				NS	

Design - Split plot (4repls)
Plot size - Gross = $8m^2$, net = $4.8m^2$
Species name - Avena sativa var lampton & Vicia dasycarpa
Date of sowing - 10/7/80
Harvesting date - 6/10/80
Spacing - 20 cms
Fertilizer - 100 kg/ha DAP (18/46)

Summary of oat/vicia and oat/pea mixtures seeding rate trials.

Trials on oat/vicia & oat/pea mixtures were conducted in 1976-1980 crop seasons at Kulumsa, Bekoji and Dherra.

The objective of these trials was to determine the optimum seeding rates of oat and vicia or pea mixtures for highest forage yield and best nutritive value at different ecological zones.

In the previous periods local pea was used to be planted mixed with cultivated oats but after the introduction of vicia dasycarpa, to minimize the competition with human food local pea has already been replaced by vicia dasycarpa which has more or less the same growth habits and feed value. It was with this intension that these trials were conducted side by side i.e. to make comparative studies on how much vicia can replace local pea.

The design used was split plot seeding rates of oat being the main plot and seeding rates of vicia or pea being sub plot. The plot size was gross $8m^2$ and net $4.8m^2$ at each station.

The seeding rates were 50,75 & 100 kg/ha for oat and 0,25 & 50 kg/ha for vicia or pea mixed together and row planted at spacing of 20 cms between rows.

The fertilizer used was DAP (18/46) at the rates of 100, 150 and 200 kg/ha for Dherra, Kulumsa and Bekoji respectively. Weeding was done by hand. Harvesting was conducted at ½ heading stage for oat which coincides with about flowering stage for the legumes.

The green matter was weighed immediately after harvest and botanical analysis (for oat and vicia or pea) was made from 1000 gm sample.

An Homogenized sample of 1000 gm was taken for dry matter and nutritive value analysis.

The sample was first air dried and then oven dried for dry matter analysis.

At Kulumsa lodging has been very high and plants were subjected to rotting.

At Bekoji no lodging problem was observed. Generally dry matter yields were lower as compared to Kulumsa.

At Dherra the fluctuation of yield was high. The yields were generally low except in 1977.

Generally there was no statistically significant differences between the treatments at any station in each season.

No nutritive value analyses were available due to lack of chemicals in the laboratory.

Recommendations

Kulumsa (medium altitudes) 75/25 kg/ha oat/vicia mixture or 100 kg/ha in pure stand of oat.

Bekoji (highlands) 75/50 kg/ha oat/vicia mixture.

Dherra (lowlands) 100/50 kg/ha oat/vicia mixture.

Table 31.

Summary of Seeding rate trials on oat/vicia mixturs

Location: Kulumsa (2200 m).

Seeding rate (kg/ha)		Yield DM kg/ha						Mean
Oat	Vicia	1976	1977	1978	1979	1980	Mean	% legume
50	0	7083	9125	11061	11153	10469	9778	
50	25	6510	9764	5477	10944	8297	8198	20.4
50	50	7448	9181	6706	10021	10906	8852	27.4
75	0	7813	7986	7459	11535	11672	9293	
75	25	11094	9097	8581	8556	11083	9682	14.8
75	50	9219	8194	8654	10708	8609	9077	28.0
100	0	9479	9583	9950	10819	11167	10200	
100	25	8542	9236	7906	11840	12188	9542	12.6
100	50	8281	8514	7397	8306	1802	8460	15.4
	Mean	8385	8964	8132	10431	10244	9231	

Summary of seeding rate trials on oat/vicia mixtures.

Location: Bekoji (2760 m)

Seeding rates		Yield DM kg/ha						Mean
Oat	Vicia	1976	1977	1978	1979	1980	Mean	% legume
50	0	6042	11781	7237	5389	5780	7246	
50	25	6510	10979	8075	5972	4088	7125	12.1
50	50	6927	11990	9779	8743	5955	8679	19.2
75	0	7188	10458	5854	6819	5115	7087	
75	25	8750	10823	8659	6319	5896	8089	24.6
75	50	7969	12437	10378	7785	7493	9212	22.2
100	0	7448	11000	10244	5701	5138	7906	
100	25	6927	11829	8559	8250	5609	8235	11.6
100	50	7969	11750	8099	8111	5393	8264	23.0
Mean		7303	11450	8543	7010	5607	7983	

Summary of Seeding rate trials on oat/vicia mixtures.

Location: Dherra (1700 m).

Seeding rate (kg/ha)		Yield DM kg/ha						Mean
Oat	Vicia	1976	1977	1978	1979	1980	Mean	% Legume
50	0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
50	25	1969	6512	4290	4411	2225	3913	16.5
50	50	1539	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
75	0	1539	5792	3187	2792	1994	3061	
75	25	1492	7167	3400	4951	1365	3675	11.5
75	50	1563	6278	3371	3063	3240	3303	17.0
100	0	1547	5667	2550	3757	2710	3246	
100	25	1516	7028	5556	4347	2308	4151	11.25
100	50	1344	7764	6516	3000	2758	4276	13.50
Mean		1537	6255	4156	3721	2147	3563	

Summary of oat/pea mixture seeding rate trials.

Location: Kulumsa.

Seeding rates kg/ha		Yield DM kg/ha					Mean
Oat	Pea	1976	1977	1978	1979	Mean	% legume
50	0	6042	9583	9173	11063	8965	
50	25	5313	10139	9580	10653	8916	26.3
50	50	6615	7958	5742	7660	6994	25.0
75	0	8906	9389	9558	12660	10128	
75	25	10677	8236	6193	10931	9009	24.3
75	50	8906	7806	9583	11021	9330	29.3
100	0	9167	8972	9982	10931	9763	
100	25	8385	8931	11907	11722	10236	17.3
100	50	8438	7931	7984	11069	8856	23.0
Mean		8050	8772	8856	10857	9133	

Summary of Seeding rate trials on oat/pea mixtures.

Location: Bekoji.

Seeding rates		Yield DM kg/ha					Mean
Oat	Pea	1976	1977	1978	1979	Mean	% legume
50	0	5833	11167	8628	5826	7863	
50	25	7917	9938	10226	7813	8974	22.4
50	50	7396	10760	9561	7333	8763	26.5
75	0	6923	11917	7103	6111	8014	
75	25	7604	10875	10133	8382	9249	22.8
75	50	7656	11208	9307	6972	8786	24.4
100	0	7656	11885	10563	6896	9251	
100	25	6667	10844	8144	7410	8266	14.6
100	50	8490	11354	8056	7181	8770	18.3
Mean		7349	11105	9080	7103	8660	

Summary of oat/pea mixture seeding rate trials.

Location: Dherra.

Seeding rates kg/ha		Yield DM kg/ha				
Oat	Pea	1976	1977	1978	1979	Mean
50	0	1313	4625	4163	3292	3348
50	25	1539	6625	4473	2639	3819
50	50	1258	5875	4473	2563	3542
75	0	1391	4431	4537	2382	3185
75	25	1352	5932	3623	4590	3874
75	50	1711	6139	4229	4007	4022
100	0	1078	5236	5363	4417	4024
100	25	1156	5944	7928	3813	4960
100	50	1242	7000	5728	4299	4567
Mean		1338	5867	4946	3556	3927

Mean % legume
34.0
30.0
21.0
35.7
18.7
27.0

475-1-3 Forage Oats Variety Trials.

Variety trials on forage oats were conducted at Robe, Dherra and Bekoji. The entries were the five elite varieties screened during the previous periods.

At Robe the stand, vegetative growth and dry matter yield were superior to all other stations. The standard variety, Lampton was out yielded by three varieties.

At Dherra, lower yields were obtained due to moisture stress. Early oat variety, Jasari, out yielded all others.

At Bekoji the late variety, CI8251 oat yielded all other varieties.

The summary of the dry matter yields at the three stations are shown on the coming pages.

475-1/80 Oat variety trial, (Robe).

Varieties	Stand %	Height in cm.	Harvesting date	DM yield kg/ha	Relative figure
CI8235	95	140	25/10/80	13413	105
CI8237	100	140	25/10/80	12638	99
CI8251	100	140	8/11/80	14356	112
Jasari	100	135	17/10/80	13525	106
Lampton	100	140	17/10/80	12800	100
L S D 5%				NS	
1%				NS	
C.V. (%)				7.7%	

Design - RCB (4repls)
Plot size - Gross = $6m^2$, net plot size = $4m^2$
Species name - Avena Sativa
Date of planting- 16/7/80
Fertilizer - 150 kg/ha DAP (18/46)

475-2/80 Oat variety trial, (Dherra).

Varieties	Stand %	Days to heading	Height cm.	DM yield kg/ha	Relative figure
CI 8235	80	92	25	1135	81
CI 8237	90	85	20	1281	91
CI 8251	90	95	30	1083	77
Jasari	95	82	40	2479	176
Lampton	80	77	30	1406	100
L S D 5%				NS	
1%				NS	
C.V.%				60	

Design - RCB (4reps)
Plot size - Gorss 4.8m^2, net = 3.2m^2
Species - Avena Sativa
Planting date - 10 July 1980
Harvesting date - 7 October 1980
Fertilizer - 100 kg/ha DAP (18/46)

475-3/80 Oat variety trial, (B[illegible]koj[illegible])

Varieties	Stand %	Days to Heading	Heig[illegible] cm	[illegible]vesting date	Yield DM kg/ha	Relative figure
CI 8235	95	129	135	[illegible]/10/81	9369	97
CI 8237	95	126	130	[illegible]/10/81	8225	85
CI 8251	95	134	130	[illegible]/10/81	10144	105
Jasari	95	116	120	[illegible]/10/81	9531	99
Lampton	80	112	140	[illegible]/10/81	9631	100
L S D 5%					NS	
1%					NS	
C.V.%					8.8	

Design - RCB (4 reps)
Plot size - Gross 6m^2 net 4m^2
Species - Avena Sativa
Planting date - 18 June 1980
Fertilizer - 150 kg/ha D[illegible]

Summary of oat variety trials (1980/81).

Dry matter yield kg/ha

Varieties	Robe	Dherra	Bekoji	Mean	Relative figure
CI8235	13413	1135	9369	7972	101
CI8237	12638	1281	8225	7381	97
CI8251	14358	1083	10144	8528	108
Jasari	13525	2479	9531	8512	107
Lampton	12800	1406	9631	7946	100
Mean	13347	1477	9380	8068	

476-1/80 Micro Seed yield Assessment on oats.

Location - Kulumsa.

Variety	Stand	Days to heading	Days to maturity	Seed yield kg/plot	Yield kg/ha
Lampton oat	90	79	114	16.600	4150
Jasari	95	82	114	19.100	4775
CI8235	90	94	131	10.500	2625
CI8237	95	91	131	10.172	2538
CI8251	95	107	140	2.780	695

Design - Single plot
Plot size - 40m^2
Date of sowing - 28/6/80
Spacing - 20 cm between rows
Fertilizer - 100 kg/ha DAP.

476-2/80 Micro Seed Yield Assessment on oats.

Location - Bekoji.

Variety	Stand	Seed yield kg/plot	Yield kg/ha
Lampton oat	75	5.696	2848
Jasari	80	9.156	4578
CI8235	85	5.584	2792
CI8237	85	6.158	3074
CI8251	85	5.834	2917
CI8257	75	6.188	3094

Design - Single plot
Plot size - $20m^2$
Date of planting- 18/6/80
Spacing - 20cm between rows
Fertilizer - 150 kg/ha DAP

HORTICULTURE

Potato

515 - 1 & 2 National Yield Trial on Irish Potato -wide adaptability (Kulumsa & Bekoji

In this trial fifteen different clones were included. With regard to yield, Al-624 was found to be the top yielding variety both at Kulumsa and Bekoji with yields of 61 ton/ha and 60.4 ton/ha respectively. Other high yielding varieties were, Al-560, Al-615 & Al-255.

In actual terms yields were very good for most varieties at both locations. However, relatively higher mean yields were obtained at Bekoji. Statistically significant differences in yields between treatment means were obtained at both locations. Considering diseases late blight (Phythophera infestans) is given utmost importance in these trials. And as far as the incidence was concerned Al-624 which is the best yielding variety showed pronounced resistance to late blight at both stations manifesting its inherent capacity to withstand the attack under different environmental conditions. Most varieties were attacked by this disease to a variable magnitude. Generally speaking the incidence or magnitude of infestation at Bekoji was by far lower than that of Kulumsa depicting the fact that Bekoji is a more suitable ecology for potato production with minimum risk of disease incidence.

515 - 1 National Yield Trial on Irish Potato-wide adaptability (. & Bekoji)

Code No.	Treatments	Disease Late Blight (0-5)	Yield ton/ha	Percentage Marketable	Rank
1	Al-148	0	56.29	79.3	2
2	Al-200	5	39.17	66.9	10
3	Al-211	5	26.11	78.3	14
4	Al-252	5	47.47	83.3	5
5	Al-253	0	46.05	77.8	6
6	Al-257	4	43.60	72.9	8
7	Al-562	2	38.73	70.1	11
8	Al-560	2	50.41	77.4	3
9	Al-563	2	39.33	73.7	9
10	Al-575	2	44.33	73.3	7
11	Al-580	2	48.77	75.5	4
12	Al-615	1	37.34	66.8	12
13	Al-624	0	61.62	74.6	1
14	Al-634	4	14.52	75.8	15
15	Al-1646	5	29.68	91.8	13

Plot size, M^2 = 4.2
Fertilizer, kg/ha= 300 DAP
Planting date = 23 June, 1980

L.S.D. 5% = 21.57 ton/ha
L.S.D. 1% = 29.10 "
C.V. = 33.1 %

515 - 2 National Yield Trial on Irish Potato - wide adaptability (Kulumsa)

Code No.	Treatments	Disease (Late Blight) 0-5	Yield ton/ha	Percentage marketable	Rank
1	Al-148	0	43.79	89.2	6
2	Al-200	2	49.21	91.3	4
3	Al-211	1^+	37.29	91.8	11
4	Al-252	1^+	53.78	94.4	3
5	Al-253	0	39.14	84.6	8
6	Al-257	0	38.27	90.4	9
7	Al-560	0	39.86	85.6	7
8	Al-563	1	31.60	82.9	13
9	Al-575	1^+	28.72	83.4	14
10	Al-580	1	33.83	66.6	12
11	Al-615	1	60.25	83.5	2
12	Al-624	0	60.35	83.9	1
13	Al-634	2^+	37.54	84.5	10
14	Al-517	0	49.09	66.7	15

Plot size, M^2 = 4.2
Fertilizer, kg/ha = 300 DAP
Planting date = 18 June, 1980

L.S.D. 5% = 13.20 ton/ha
L.S.D. 1% = 17.85 "
C.V. = 19.6 %

+ -

515 - 3 & 4 National Yield Trial on Irish Potato - High Altitude Adaptability (Kulumsa & Bekoji).

In actuality this trial included fourteen different clones for each station, but out of the fourteen clones sent to be planted at Kulumsa four varieties failed to germinate due mainly to excessive rotting of the planting materials. Hence only ten varieties were considered for yield analysis.

In this some varieties from the previous trial were included at both sta-stations. At Kulumsa Al-536 outyielded the other varieties, with a yield of 35.6 ton/ha and at Bekoji Al-624, Al-557 and Al-466-B were best yielders. They gave 48.4 ton/ha, 46.8 ton/ha and 42.4 ton/ha respectively.

Again the severity of late blight was relatively high at kulumsa when compared to Bekoji where most varieties showed considerable resistance with a single variety Al-615 showing moderate susceptability.

515 - 3 National Yield Trial on Irish Potato - High Altitude Adaptability (Kulumsa . . . .)

Code No.	Treatments	Disease Late Blight	Yield Ton/ha	Percentage Marketable	Rank
1	Al-212	5	26.64	61.5	5
2	Al-252	0	10.76	73.9	9
3	Al-264	1	31.43	65.3	2
4	Al-466-B	3^+	30.60	72.3	3
5	Al-447	0	7.23	58.4	10
6	Al-517	0	21.44	47.0	6
7	Al-536	1	35.62	60.6	1
8	Al-563	2	18.68	61.2	8
9	Al-567	1	30.60	52.8	3
10	Al-578	2	20.64	78.5	7

Plot size, M^2 : 4.2 L.S.D. 5% = NS

Fertilizer, kg/ha: 300 DAP

Planting date : 23 June, 1980 C.V. = 25.5%

515 - 4 National Yield Trial on Irish Potato - High Altitude Adaptability -((Bekoji).

Code No.	Treatments	Disease Late Blight (0-5)	Yield Ton/ha	Percentage Marketable	Rank
1	Al-212	0	41.36	92.0	4
2	Al-255	1+	8.07	63.8	14
3	Al-252	0	30.33	69.2	7
4	Al-253	0	13.93	83.9	13
5	Al-264	1	36.88	76.5	5
6	Al-466-B	0	42.37	72.4	3
7	Al-447	1+	34.50	72.2	6
8	Al-517	0	24.57	57.2	9
9	Al-536	0	22.00	69.5	11
10	Al-557	1+	46.82	89.8	2
11	Al-563	0	20.45	72.2	12
12	Al-578	0	24.14	61.6	10
13	Al-610	2	27.07	68.6	8
14	Al-624	0	48.43	67.9	1

Plot size, M^2 : 4.2 L.S.D. 5% = NS

Fertilizer, kg/ha : 300 DAP C.V. = 39.1

Planting date : 18 June, 1980

515 - 5 & 6 Variety Trial on Irish Potato (Kulumsa & Diksis)

Twenty different clones selected from previous years' trials mainly on the basis of their relative yield were subjected to test at Kulumsa and Diksis, to see their general performance under different environmental conditions. Out of these three clones failed to germinate at Kulumsa for unknown reasons.

Considering yield Al-667 out yielded all other clones follwed by Al-522 and Al-557 and they gave 58.2 ton/ha 49.9 ton/ha and 42.9 ton/ha respectively with significant difference in yield between treatment means. Al-667 and Al-522 Showed considerable susceptability to late blight infestation despite the fact that they were the top yielding clones of the station. At Diksis Al-522, Al-669 and Al-574 proved to be the three top yielding clones with yields of 35.2 ton/ha 33.1 ton/ha and 31.8 ton/ha respectively. Generally speaking yields were comparatively lower at this station. This could be attributed to water-logging problem prevalent at the station and secondly to frost attack which hit the plants in late September 1980. Regarding disease incidence, with the exception of Al-574 which showed moderate susceptability to late blight, the other tow high yielding clones of the station, Al-522 and Al-667 showed considerable resistance and the severity of the disease was much lower at Diksis when compared to Kulumsa.

515 - 5 Variety Trial on Irish Potato (Kulumsa)

Code No.	Treatments	Disease (Late-blight) 0-5	Yield Ton/ha	Rank
1	Al-574	1	33.38	8
2	Al-471	0	17.81	14
3	Al-667	5	58.17	1
4	Al-563	1	40.06	4
5	Al-470	5	17.32	15
6	Al-148	4^{+}	28.70	9
7	Al-625	0	39.94	5
8	Al-669	5	25.21	10
9	Al-568	3	25.06	11
10	Al-557	1	42.98	3
11	Al-658	5	37.78	6
12	Al-114	1	2.76	17
13	Al-522	5	49.87	2
14	Al-212	5	21.46	13
15	Al-569	5	36.25	7
16	Al-253	0	24.63	12
17	Al-404	1	9.21	16

Plot size, M^2 = 2.1
Fertilizer, kg/ha = 300 DAP

L.S.D. 5% = 19.62 ton/ha
L.S.D. 1% = 26.51 "
C.V. = 39.7 %

515 - 6 Variety Trial on Irish Potato (Diksis)

Code No. No.	Treatments	Diseases (Late-Blight	Yield ton/ha	Percentage Marketable	Rank
1	Al-574	1	31.75	73.6	3
2	Al-471	1	16.19	72.4	15
3	Al-667	1	29.05	52.4	4
4	Al-563	1	21.59	62.59	10
5	Al-569	5	22.60	55.4	9
6	Al-470	4^+	20.87	70.4	11
7	Al-625	0	17.24	63.7	14
8	Al-669	0	33.14	69.4	2
9	Al-658	5	23.51	42.7	8
10	Al-557	1	27.52	55.1	5
11	Al-568	0	18.03	59.4	13
12	Al-114	3^+	6.49	38.1	19
13	Al-522	0	35.24	65.2	1
14	Al-212	0	26.92	60.5	6
15	Al-634	5	14.02	56.8	17
16	Al-253	0	18.44	71.9	12
17	Al-404	0	14.63	60.8	16
18	Al-615	1^+	24.84	44.7	7
19	Al-260	2^+	12.92	63.7	18
20	Al-201	0	2.73	42.9	20

Plot size, M^2 = 2.1 L.S.D. 5% = 12.86 ton/ha
Fertilizer, kg/ha= 380 DAP L.S.D. 1% = 17.41 "
Planting date = 1 July, 1980 C.V. = 37.4 %

515 - 7 & 8/80 Off season Irish Potato variety Trials (Sheled)

Two sets of trials (High Altitude Adaptability and Wide Range Adaptability) were conducted at Sheled on Farmers field using irrigation water, with the objectives of maintaining the clones for the next growing season and secondly to show the farmers the superiority of improved clones over local ones. Eighteen clones were included in the high altitude set and seventeen clones in the wide range adaptability set. The clones were selected from previous trials conducted at Bekoji. The trials were planted on December 27, 1980 and harvested on May 22, 1981.

In the first set i.e, high altitude adaptability the highest yield was obtained from Al-252 which gave 27.6 ton/ha. The other two varieties ranking second and third yieldwise were Al-624 and Al-148 which gave 24.0 ton/ha and 23.7 ton/ha, respectively. However, statistically significant difference in yield was not obtained in this set.

Al-624, Al-575 and Al-580 were the three best yielding varieties in the wide range adaptability set. They gave 31.4 ton/ha, 31.0 ton/ha and 30.2 ton/ha respectively with significant difference in yield between treatment means.

Regarding late blight infestation, Al-557, Al-669, Al-563, Al-470, Al-625, Al-580, Al-644-B, Al-562 and Al-563 were found to show more susceptibility than other clones in both sets of trials. The incidence and severity of late blight is much lower during off season when trials are undertaken under irrigation as opposed to big rainy season and the severity was very low in both sets in general.

Fruits

605 - 1 Adaptation Trials on Temperate Fruit trees (Kulumsa & Bekoji)

An adaptation trial on three temperate fruit trees (Peach, Plum and Apple) is in progress at Kulumsa & Bekoji. At Kulumsa, the trees were established in 1976 and came to production in about two years. However, due to high temperature and low moisture prevalent at the station some of the trees suffered beyond recovery and were replaced with new garfled seedlings brought from Nazereth Research Station in July, 1980.

Tables 8, 9 and 10 below show the performance of the three different Temperate Fruit trees with respect to yield for the year 1980-81.

Similar adaptation trial on these fruit trees was also advanced to Bekoji. The grafted seedlings brought from Nazereth Research Station were planted in 1979 considering growth and adaptability the fruit trees are in a very good shape, depicting the fact that the higher the altitude the more suitable it is for the production of these crops.

615 - 1 Plum Variety Observation Trial (Kulumsa)

Code No.	Treatments		Marketable		Unmarketable	
			No.	Wt (kg)	No.	Wt(kg
1	Beauty	a	58	1.08	-	-
		b	26	0.75	-	-
		c	10	0.33	-	-
		d	-	-	-	-
		e	1	0.05	-	-
		f	-	-	-	-

NB:- Nine different varieties of Plum were included in this, but out of these only one variety came to production until now.

625 - 1 Peach Variety Observation Trial (Kulumsa)

Code No.	Treatments		Marketable		Unmarketable	
			No.	Wt(kg)	No.	Wt. (kg)
1	13127	a	4	0.26	-	-
		b	-	-	-	-
		c	2	0.11	-	-
		d	1	0.30	-	-
		e	-	-	-	-
		f	-	-	-	-
2	Florida Red	a	42	3.76	-	-
		b	55	3.82	2	1.22
		c	66	3.88	6	0.08
		d	84	3.41	20	1.20
		e	84	3.22	30	1.15
		f	44	2.00	1	0.01
3	Florida Bele	a	25	1.08	20	0.51
		b	71	2.16	49	0.50
		c	100	3.95	46	0.86
		d	-	-	-	-
		e	118	4.97	19	0.25
		f	16	1.22	2	0.20
4	Makred	a	45	1.89	11	0.28
		b	95	3.55	33	0.67
		c	118	4.60	29	0.63
		d	97	3.54	14	0.42
		e	95	4.51	11	0.23
		f	55	3.15	24	0.69
5	Kakamas	a	24	0.69	-	-
		b	96	2.20	-	-
		c	-	-	-	-
		d	-	-	-	-
		e	-	-	-	-
		f	-	-	-	-
6	Sungold	a	17	0.72	-	-
		b	2	0.13	-	-
		c	-	-	-	-
		d	-	-	-	-
		e	-	-	-	-
		f	-	-	-	-

635 - 1 Apple Variety Observation Trial (Kulumsa)

Code No.	Treatments		Marketable No.	Marketable Wt (kg)	Unmarketable No.	Unmarketable Wt (kg)
1	Winter Banana	a		28	-	-
		b			-	-
		c			-	-
		d		24	-	-
		e			-	-
		f	2	68	-	-
2	Red Delicious Double	a		-	-	-
		b	1	48	-	-
		c		08	-	-
		d			-	-
		e	1	48	-	-
		f			-	-
3	Yellow Delicious Double	a			-	-
		b			-	-
		c			-	-
		d	1	78	-	-
		e			-	-
		f		17	-	-
4	Grand Malus	a		2	-	-
		b			-	-
		c		12	-	-
		d			-	-
		e		4	-	-
		f		1	-	-

Vegetables

705-1 Seed Production Observation Trials on various vegetable crops

Apart from running various National Yield Trials and Adaptation Trials on different Horticultural crops, the unit also conducts seed Production Trials in an attempt to produce . . . . Seeds of various vegetable crops to meet the ever-increasing demand of the farmers in future. Accordingly repeated trials on the production of Beet root, Carrot and Cabbage seeds were carried out at Bekoji and Meraro in the past with a satisfactory success. This trial is still in progress in a more pronounced and systematic manner.

Beet Root

This year a sort of comparison trials between seeds brought from abroad and those obtained from Bekoji and Meraro were undertaken. A satisfactory result with regard to yield and general acceptance by consumers was observed considering yield the seeds obtained from Bekoji and Meraro gave higher yields, However, they tended to be somewhat inferior to the standard check quality-wise.

Cabbage

Likewise similar trial on cabbage was undertaken. Seeds were obtained from 1978 trial at Bekoji single observation plot with an area of $36m^2$ was used. Results showed that the locally produced seeds proved to be comparable if not superior to the standard check with respect to germination ability, yield, quality and general performance.

725 - 1 Variety Trial on Tomato (Kulumsa)

Tomato is another vegetable crop of great economic importance, and one of the priority crops of Nation Wide research interest. As producer's coops grow in number at different places within the project area and demands for Horticultural Crops grow sharply every time the condition calls for the excution of various trials on these crops so as to select the best varieties and release to these areas.

In line with the above objective a variety trial comprising seven different varieties of Tomato was carried out under rainfed condition at Kulumsa, to find out those varieties which are high yielders and at the same time tolerant to late blight and virus diseases.

Regarding yield valent with an average yield of 13.5 ton/ha out yielded the other varieties succeeded by Napoli VF and Valent VF with yields of 13.4 ton/ha and 13.2 ton/ha respectively.

Taking into consideration disease incidence three varieties Roma, Beaf Steak, and Napoli VF were severely attacked by late blight right from the early stage of development. The other varieties showed reasonable resistance and good adaption under the specified condition.

725 - 1 Variety Trial on Tomato (Kulumsa)

Code No.	Treatments	Diseases		Yield Ton/ha	Percentage Marketable	Rank
		L.Blight	Virus			
1	Napoli VF	5	MS	13.4	79.3	2
2	Valent	1	Mr	13.5	86.6	1
3	Roma	5	MS	10.2	81.1	5
4	Filan - F	2	tr	11.6	63.3	4
5	Beaf Steak	5	MS	9.6	66.5	6
6	Valent F	2^{+}	tr	13.2	76.5	3
7	Marglobe	2	tr	8.9	74.7	7

Plot size, M^2 = 36
Fertilizer, kg/ha= 200 DAP
Planting date = 15-7-80

L.S.D. 5% = NS
C.V. =

755-1 Garlic Nursery

Despite the fact that garlic is not among the priority vegetable crops it is found to be worthwhile to run a nursery trial since it has significant economic importance, apart from its domestic use as flavouring stuff. However, large scale production of garlic is difficult as a result of rust disease to which garlic is very susceptible. With the objective of finding out those lines which are resonably resistant a nursery trial was undertaken at Bekoji. Different lines were collected from various places within the Administrative Region. Here some relatively tolerant lines were obtained. This trial is subject to repeated testings with more lines collected and included to choose the best possible lines for further multiplication and ultimate release to growers.

795 - 1 Pepper Observation Trial (Kulumsa)

An observation trial on pepper was carried out with the objectives of finding out whether or not pepper is adaptable to the station and secondly to find out the magnitude of resistance to virus diseases which is one of the many factors limiting large scale production.

Five locally available lines, the seeds of which were collected from various places within the administrative regions and one standard check obtained from Bako Research Station were included. Single observation plot with an area of 36 m^2 was used, and seeds were directly planted.

Generally speaking all lines showed poor and stunted growth and poor, pod-setting capacity. Variable symptoms of virus and powder mildew were observed on most of the local collections and none of them excelled the standard check (Bako Local) in all aspect.

C R O P P R O T E C T I O N

Surveys

006. Weed Survey in Ticho Area

Two comprehensive surveys were made in Chilalo adminstrative region. The first one covered the area around Asella town in 1967/68 (see CADU Publication No. 10) and the second covered most of the extension sites in the region in 1969 (see CADU Publication No. 6).

This survey now covers the second administrative region in Arsi and aim to investigate the distribution of common weeds and abundance of other weed species. The survey has been carried out in September 1980 and a total of 165 fields were sampled from Tiro, Shirka, Gobessa, Gunna, Sude, Amigna and Robie Woredas. The samples were collected from cultivated fields which represent different Altitudes of the Area. Weed samples were collected from an area of 0.25 m^2 of which majority of the samples were from wheat and barley fields.

Farmers were intrviewed regarding the problem of major weeds, method of weedings, No of ploughings and crop rotation practices. Since the concept of crop rotation is not well adapted by most farmers in the area, farming is tending more & more to large areas of monoculture which is one of the responsible factors to increase the reproduction of weed spp. and consequently the reduction of yields.

Considering the intensity of weeding 47.4% of the farmers fields were weeded only once, 36.9% of the fields were weeded twice, 0.2% were weeded 3 times while 14.4% of the sampled field were not weeded at all. Weed population decreases with time and intensity of ploughing, method of weeding and other cultural practices thus proper agronomic practices need to be followed to minimize weed infestation and to cut down unnecessary expense for weeding. Much of the cost of weed can be avoided if clean seeds are used so the use of clean seed should also be tought by rural extension agents.

Since the result of the survey indicated that majority of the weed species were brood leaved weeds and since most farmers cultivate more than what they could manage to weed with their family labour it seems use of herbicide and other agronomic practices have to be encouraged.

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Major Weeds in Relation to Crops

WEED SPECIES

Location	Crop	Number of Samples	Polygonum nepalense %	Guizota Scabra %	Galinsoga Parviflora %	Phalaris Paradoxa %	Amarantlus Angustiflius %	Galium Spurium %	Anagalis arvensis %	Chenopodium spp %	Juncus spp %	Commelina spp %
Amigna Woreda	Wheat	5	46.7	40.0	65.9	66.7	100.0	-	-	100.0	-	55.6
	Barley	1	10.0	25.0	-	-	-	-	-	-	-	-
	H.Beans	2	23.3	5.0	34.1	-	-	100.0	66.7	-	-	55.6
	Teff	2	20.0	30.0	-	33.3	-	-	33.3	-	-	44.4
Seru Woreda	Wheat	7	45.9	45.3	56.4	-	68.2	73.7	28.9	46.4	-	-
	Barley	4	30.4	39.3	5.1	-	2.3	-	63.8	21.4	-	-
	H.Beans	1	2.3	0.9	0.9	-	2.3	-	-	14.3	-	-
	Teff	2	22.9	14.5	38.5	-	27.3	26.3	4.3	17.9	-	100.0
Sude Woreda	Wheat	5	27.7	33.3	9.9	43.0	-	29.6	100.0	25.0	20	100.0
	Barley	1	-	5.1	22.5	-	26.0	-	-	12.5	2.9	-
	Horse B.	3	6.8	20.5	63.4	22.8	64.0	15.4	-	50.0	-	-
	Teff	8	65.5	41.0	4.2	34.2	10.0	33.3	-	12.5	77.1	-
Robei Woreda	Wheat	39	53.9	33.9	51.8	33.0	68.8	31.9	47.9	78.0	52.6	80.2
	Barley	5	1.4	7.5	0.8	-	-	-	-	-	-	-
	H. Bean	8	19.3	9.0	9.4	4.5	1.2	6.4	4.2	4.2	100.0	-
	Teff	15	25.1	49.0	23.5	62.5	24.7	59.6	48.0	2.0	25.0	15.8
	Rye	1	0.3	0.6	1.5	-	5.3	2.1	-	2.0	13.8	4.0
Gobessa Woreda	Wheat	5	14.7	16.4	40.1	-	81.8	40.0	100.0	-	-	-
	Barley	7	67.2	44.2	-	-	-	-	-	-	-	-
	Teff	8	11.9	29.5	59.4	100.0	18.2	56.7	-	-	-	-
	Rye	1	4.5	1.	-	-	-	-	-	-	-	-
Tena Woreda	Wheat	18	84.7	71.0	67.2	45.5	11.1	71.4	68.4	52.9	-	-
	Barley	1	0.25	6.9	-	17.1	-	4.1	-	-	-	-
	Teff	6	4.7	15.7	-	17.2	-	8.2	26.3	8.8	-	-
	Maize	1	-	0.5	11.8	-	8.3	-	-	-	-	-
	Sorghum	1	-	1.3	16.6	-	-	-	-	-	-	-
	H.Beans	3		4.6	17.5	20.1	63.9	16.3	5.3	2.9	-	100.0

Relative Frequency of Different Weed Species at Different Altitudes

Species	1800 - 2000 Meters %	2000-2200 Meters %	2200-2400 Meters %	2400-2600 Meters %	2600-2800 Meters %	2800 + Meters %
Broad Leaved Weeds						
Polygonum Nepalense	-	-	40.0	39.7	13.3	
Guizotia Scabra	2.9	0.9	63.6	24.2	8.8	
Galinsoga Parviflora	0.1	1.7	85.7	10.7	0.5	
Amaranthus Spp.	2.9	1.4	96.6	8.4	-	
Galium Spurium	-	-	77.9	29.7	5.4	0.9
Anagallis arvensis	-	-	80.7	16.1	3.1	
Chenopodium Spp	-	-	81.0	16.0	2.9	
Juncus Spp.	-	-	87.2	12.7	-	
Commelina Spp.	1.7	-	97.6	0.6	-	
Scorpiuous Spp.	-	-	100.0	-	-	
Datura Stramonium	-	-	100.0	-	-	
Corrigiola Capensis	-	-	89.9	-	-	10.1
Medicago Spp.	-	-	96.0		3.03	
Solanum Spp.	-	-	98.2		1.7	
Oxalis Spp.	-	-	100.0		-	
Erucastrum Spp.	6.1	-	71.4		22.4	
Misopates Orantium			50.0	33.3		16.6
Rumex			20.0	80.0		
Total Broad Leaved	13.70	4.00	1435.0	158.10	61.13	27.60
Grasses						
Phalaris Paradoxa	-	-	74.2	25.6	-	
Snowderica Petestachya	-	-	50.0.	26.0	-	
Bromus Pectinus	-	-	63.3	28.9	-	
Lolium Temulentum.	-	-	68.4	18.4	-	13.5
Cyperus Spp.	-	-		20.0	-	
Setaria Spp.	-	-	100.0		-	
Avena Spp.	-	-	58.6	41.3	-	
Total grass weeds			414.70	240.00	-	13.5

Distribution of Surveyed fields of all Crops Acoording to Weeding Intensity, Irrespective of Altitude

No. of Weedings	% of investigated fields weeded 0,1,2 and 3 times							%
	Wheat	Barley	Teff	Maize	Rye	B.Bean	Sorgum	Mean
0	28.00	41.2	14.6	0	0	17.6	0	14.4
1	66.7	35.3	78.0	0	100	58.8	0	48.4
2	4.0	23.5	7.4	100	0	23.5	100	36.9
3	1.3	0	0	0	0		0	0.2
Total No of Samples	75	17	41	1	1	17	1	

007 - 1 Storage Pest Survey in the Lowlands of Arbagugu

In Arssi emphasis is always placed on producing more food. Possible inputs like fertilizer, improved seed etc. are all applied. Use of cultural practices are always demonstrated at Extension demonstration fields, at Research Stations and at farmers field. Comments are either never made about protecting what has been produced or if at all insignificant, generally little is done to prevent damage after harvest.

It is estimated that up to one third of the worlds total output of grain is lost each year due to inadequate seed handling and improper storage. In the light of such an enormous waste every effort must be made to introduces technologies so that losses will be at a minimum. As the Science of grain storage is not well developed in our region a preliminary survey has made to the lowlands of Arbagugu where 97 samples were collected for laboratory analysis in May 1981.

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Due to its geographical location lowlands of Arssi have high temperature and often high humidity for many months of the year. Due to this fact insects, fungi and rodents breed rapidly and can cause much damage to stored produce. Different storing systems are used under different ecosystem of the country thus the loss also vary accordingly. Depending on the culture of the tribe, the local climate and the locally available building materials a wide diversity of store are found in Ethiopia. In Arssi the typical storage methods are the Gotteras which are built with wood and have a roof made from straw or tall grasses like Hyperina sp. Pennisetum sp etc. Others are dibijite, sacks, pits in the ground, skin bags, Ensera (brick made for transporting water) are often those that have been used for centuries, since the change from nomodic life.

In general term, losses under tropical conditions can be as high as 35.50 percent at the farmer level. In Arssi the loss is even higher than this figure during bad years.

Sampling Methods

Inorder to gather the right information farmers 5-15 km along the main road were randamly selected, interviewed & about half killo of grain is collected from different part of stores. In some cases the size of sample taken may have to be reduced in relation to the amount stored.

Number of live weevils, No. of dead weevils, weed seed, damaged seed by pests, rotten seeds, Abnormal seeds, germination and trash% etc. were all sorted out in the Laboratory and sometimes just at the spot.

Common Losses Occuring During Storage

The major food crops grown and stored by farmers in Arssi are wheat barley, maize, sorghum, Teff & beans. These products tend to detorirate after harvest unless the farmer can take adequate drying and other appropriate protective measures.

According to some farmers if grain is left untouched throughout the storage period (roughly one year) at the time of removal the estimated loss could be very high. However, in most cases grain removed at different intervals during the storage period and each quantity removed will

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suffered a different degree of loss.

Although the majority of the farmers use different types of grain some farmers still use one store for more than 2 crops by storing one over the other . In such instances the degree of grain loss by pests is found to be very serious.

From the samples we have collected it can be concluded that most of the losses are due to insect damage but a considerable proportion of grain is often lost because of moulding. Since most farmers donot measure the exact amount of grain during storage it is difficult to assess losses caused by rodents & birds but pellets of those animals were commonly found particularly in Gotteras. Moreover the loss of grain due to rats is more or less reported by every farmer in the surveyed area.

During the survey we have come across the fact that sorghum suffered from storage pests more than any other crop because most farmers store sorghum in the pits for a long time where temperature is extremely favourable for the reproduction of stored posts; Maize is the next most severely attached crop the major pest being. Sitophilus spp. for both. Though the degree of damage varies almost all crops have suffered either by weevils, termites or birds &rates apart from physical loss germination % is also reduced in relation to year of storage which is due to frequent damage of embryo from extreme heating up of grain.

007-1a. Germination in Relation to Storage Period

Crop	Number of Samples	Germination %	Range of Germination %	Period of Storage
Sorghum	15	20	2-43	6-12 Months
Maize	15	81	62-88	"
Barley	23	86	46-100	"
Wheat	17	96	78-100	"
Field Peas	2	52	43-60	"
Horse Bean	11	89	80-92	"
Rye	2	96	92-100	"

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Since there was heavy draught for 2 - 3 years prior to sampling farmers were not in a position to store any type of grain for more than one season (one year), thus the figure given for germination could be lower as the storage period increases, for instance working samples collected for Laboratory analysis was stored with live weevils for about 6 months. At the end of the 6th month period the Kernels of grain were eaten out & the number of liveand dead weevils was tripled & the loss was more or less doubled. This shows that had it been under worst condition. for example rats and birds could have brought the loss to a higher level.

007-1b: Degree of crop damage according to farmers

Crop	Serious	Moderate	Negligrble	Name	No of Farmers
Maize	43	5			48
Sorghum	46	2			48
Wheat	16	27			43
Barley	15	26	4		45
Beans			19	3	22
Teff			7	22	29

007-1c. Pest Population and Level of Foreign Material On Different Crops

Crop	Number of Samples	Total weight of samples in gm	Number of live weevils	Number of dead weevils	Weed Seed & trash %
Maize	17	1643	10	29	1.6
Sorghum	19	1999	40	52	1.63
Wheat	18	2058	13	4	3.02
Barley	19	1651	3	96	4.43
H. Beans	11	1459	2	44	2.25
Teff	10	1195	-	-	

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Neture of Loss and Suggestion for Improvement

Though the nature of loss of stored products are numerous reduction in weight and volume of infested grain, Low nutritional value of damaged grain, Low germination percentage, Low market value are amcng the commonest.

From the survey it is observed that on small farm losses are mainly bo bodly constructed stores either roof or wall, toc close construction of stores which invites migration of insects from infested store to an infested store, wrong construction of stores like Dibijite inside the living room where temp is high, poor or no checking practice of stores at intervals, poor store hygine and the mis use or non use of storage insecticide.

Bearing in mind the main causes of losses, good grain storage depends largely on the following principles.

1. As weeds and dirts Larbour most insect and rodents cleaning and burning of these objects 15 meter from the location of stores before storage is extremely necessary.

2. The most important thing for the farmer to do is to lower the moisture content of the grain to a safe level before it is put in the store. Such save levels are 14% for cereals, 15% for pulses, 10% for oil crops and 7% for groundnuts. If measuring moisture content is difficult at farmers condition simple way of ensuring that grain is dry enough is to try with teeth (to bite it). If dent cannot be made in the grain then the moisture content is at a safe level.

3. Cleaning of the store thoroughly until all debris and insects are removed from cracks, walls, and ceiling of stores, if the condition seems worest spraying of malathion, lindane etc are recommanded.

4. Keep the store completely dry - donot allow water to enter at the bottom or at the sides. If moisture enters it causes heating which attracts insects and the moisture also encourages the development of moulds and these produce water & heat from the grain.

5. Pits should be sited on a slight slope so as to give good surface run off. The bottom of the pit should be above the level of ground water.

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6. As sitophilus spp is reported [illegible] eld and store condition be sure to store weevil free gra[illegible]

7. If economy of farmers allow in[illegible] like malathion, gamma BHC lindane etc should be applied [illegible] du[illegible] or sprays.

Conclusion

It is obvious that in a coun[illegible] l[illegible]ours where population is increasing faster and where food r[illegible]sour[illegible]re limited losses need to be reduced as effectively as po[illegible]ble [illegible] a minimum cost. Losses in store means that resources such as la[illegible] labour, time, inputs like fertilizer, seeds and pesticides u[illegible] to [illegible]w the crop are wasted, thus every-body particularly agricultur[illegible] sh[illegible] give attention to eliminate stored pests and to bring the loss[illegible] a[illegible]mum.

007-2 Pest out breaks ‡

Army Worm

During 1981-82 cropping season an outbreak of Army worm (spodoptera exempta) was observed in the lowlands and medium altitudes of Arssi particularly on young cereal crops - wheat barley, maize & sorghum. Since the infestation was noticed early effective control measures was taken using the following insecticides.

007 - 2 Insecticides sprayed in diffrent areas

Insecticides	STATIONS										
	Arata	Ogelcho	Chefejilla	Gonde	Etheya	Dhera	Huruta	Degaga	Meti	Abomsa	Robe
DDT 10% dust	1000kg	1000kg	1000kg		350kg	1000kg					
DDT 25% EC	1600lt	2400lt	1000lt	200lt		2400lt					
Fenitrothion 50% EC	400lt	400lt	600lt	400lt			200lt	800lt			
Fenitrothion 95% ULV		600lt	200lt								
Endosulphan 35% EC				400lt	200lt		200lt				
Basudine 60% EC									400lt	600lt	
Malathion 50% EC										100lt	[illegible]

‡ This serveys was done in co-operation with the Extension and co-operative Promotion Department

116-1 : Direct Drilling and Conventional Seedbed Preparation in Wheat (Kulumsa)

Design: Split plot 2 seedbed preparation x 3 fertilizer rate

Variety: Enkoy

Dates of treatments - Fertilizer applied on July 7

Planting date : July 7

Gramaxone 2.5 kg/ha July 7

	Yield Kg/ha				Weight of 1000 seeds (kg)				Weight of 1 hl (kg)			
	Fertilizer rates /ha				Fertilizer Rates				Fertilizer rates			
Seed Beds	DAP	DAP	DAP	Seedbeds	DAP	DAP 100	DAP 100	Mean	DAP	DAP 100	DAP 100	
		50 Kg	100 Kg									
Cultivated, drilled	2080	2210	2640	2310	31.0	32.0	31.3	31.4	84.0	85.0	85.3	84.8
Sprayed drilled	640	870	1280	930	30.8	30.0	31.3	30.7	83.3	83.7	84.0	83.7
Fertilizer Mean	1360	1540	1960		30.9	31.2	31.3		83.7	84.4	84.7	

No interaction between fertilizer rate & seed-beds regarding the yield

LSD (for means)	Seed beds	Fertilizer rates
5%	786 kg/ha	435 kg/ha
1%	1442 kg/ha	611 kg/ha
C.V %	14.4	13.9

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Results of Trials

116-1 Direct Drilling and Conventional Seedbed Preparation in Wheat (Kulumsa)

Since no information is available about direct drilling of cereal crops in the country the conventional method of seed preparation was compared with direct drilling of wheat. The trial was designed as split-plot with seedbed preparation as main and fertilizer (Urea) levels sub-plot.

In this the conventional seedbed was prepared folwing the traditional method (ploughing, harrowing and drilling) while in the direct drilled plots the field was sprayed with Gramoxone (paraquate). The whole field has received 100 kg/ha of DAP prior to sowing.

Yield of wheat was significantly depressed when direct drilled. This was partly due to the different depth of planting from the blunt edged conventional drill and moisture stress after planting. The number of weeds were, however, significantly less in the direct drilled plots as compared with the conventional one. To come to a better conclusion one has to use the direct drilling machine itself.

116 - 1/80 Direct Drilling and Conventional Seedbed Preparation in Wheat (Kulumsa)

Relative number of remaining weeds. Check-ploughed, cultivated, drilled, (A1) =100

Date of weed counting : August 6

Entries	Polygonum nepalense	Guizotia Scabra	Galinsoga Parviflora	Corrigiola Capensis	Commelina Africana	Amaranthus angustifolius	Oxalis spp.	Misc brond leaf weeds	Setaria palidefusca	Phalaris paradoxa	Snowdenia Polystachya	Total broad leaf weeds	Total grass weeds	Total weeds
A 1	100	100	100	100	100	100	100	100	100	100	100	100	100	100
2	100+	100+	100+	100+	50	100+	0	100+	100+	100	50	100+	100+	100+
3	100+	100+	100+	100+	100	100+	50	100+	100+	100+	100+	100+	100+	100+
B 1	6	0	63	13	100+	0	100+	0	100+	100+	100+	20	100+	100+
2	10	0	50	13	100+	0	50	0	100+	100+	100+	18	100+	100+
3	6	0	25	0	100	0	0	0	100+	100+	100+	8	100+	100+
Actual (A1) No/M²	52	3	8	15	2	1	2	1	23	14	2	84	39	123

116 - 2 Time and Intensity of Soil Cultivation in Wheat (Kulumsa)

It has long been argued that the primary aim of cultivation is for weed control. If one can time and identify the frequency of cultivation with the germination and emergence of weed seeds may be able to reduce the number of weeds which would grow with the crop.

To reduce unnecessary or even harmful tillage and to identify the most suitable time and intensity of soil cultivation an experiment was conducted at Kulumsa.

Ploughing once in April/May harrowing in early June and prior to planting out yielded other treatments while spraying with Grammaxone followed with direct drilling was found to be the least. Regarding weed infestation plowing once when weeds are 10 cm tall, harrowing in early June and prior to planting have shown satisfactory control aganist most broad leaves. However, appreciable control of broad leaves was observed due to application of Grammaxone on direct drilling.

116-2 Time and Intensity of Soil Cultivation Practice in Wheat (Kulumsa)

Design: RCB with 4 replication

Sowing date: July 10

Date of Treatment = f = June 25 g= July 7

Entries	1	2	3	4	5	Number of Plants /m²	Plant height, cm		Yield kg/ha	Relative Value
							after Planting	Prior to harvest		
a			P	H	H	145	15	87	1960	100
b		P		H	H	154	15	91	1690	86
c	P	H		P	H	150	15	85	1640	86
d			P		H	142	15	86	1620	83
e				P	H	138	15	85	1170	60
f				S	H	123	13	85	1420	72
g					S	47	11	72	540	28

P = Ploughing

H = Harrowing

S = Spraying herbicide (Grama x one

L.S.D 5% 403 kg/ha

L.S.D 1% 553 kg/ha

C.V. % = 18.2

1. Right after the small rain
2. When weeds are 10 cm tall
3. April/May
4. Early June
5. Prior to planting

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116 - 2 Time and Intensity of Soil Cultivation Practice in Wheat (Kulumsa)

Entries	Polygonum nepalense	Guizotia Scabra	Galinsoga Paraviflora	Corrigiola Capensis	Commelina Africana	Amaranthus angustifolius	Oxalis spp.	Solanum spp.	Misc. Broad leaf weeds	Setaria palidefusca	Phalaris Paradoxa	Snowdenia polystachya	Total broad leaf weeds	Total grass weeds	Total weeds
a	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
b	72	100	57	41	60	60	29	33	100+	86	100+	54	50	89	40
c	100+	100+	100+	100	80	80	14	33	100+	51	100	42	100	72	81
d	100+	100+	89	90	60	100	14	33	100+	100+	100+	81	89	100+	100+
e	100+	100+	93	100+	60	80	43	67	100+	100+	100+	38	100+	100+	100+
f	61	75	100+	97	60	80	7	100+	100+	100+	100	96	96	100+	100+
g	6	25	29	3	20	0	50	0	0	100+	65	81	18	100+	80
Actual (a) No/m^2	18	4	28	29	5	5	14	3	1	125	72	26	107	223	330

116-3a-3b Conventional & Stale Seed-Bed Preparation in Wheat with Different Weeding Practices (Kulumsa, Bekoji)

To investigate the possibility of reducing some field operation and also enhance the weed reduction or control effect two seed bed preparations were compared as main plot and four weeding practices as sub-plot. The trial was performed at Kulumsa and Bekoji.

At Kulumsa a significant yield increase was obtained by the stale seed bed preparation as compared with the conventional one. This effect was further improved when terbutryne was used as a pre-emergence treatment. No advantage on yield was recorded at Bekoji though there seemed to be less weeds in the stale seed bed.

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116-3a Conventicnal and Stale Seed Bed Preparation in Wheat with Different Weeding Practices (Kulumsa)

Design Split plot: 2 seed bed preparation (Main plots) x 4 weeding practices (sub plots)

Variety: Enkoy

Dates of Treatments: Stale seed bed - Last harrowing June 21

Stale " - paraquat 2.5 kg/ha sprayed on July 7

Stale + conventicnal seed bed Terbatryne 2.5 qi kg/ha on July7

MCPA 1.0 " on Aug. 8

MCPA + hand weeding Sep. 4

hand weeding Aug. 18

Planting date : July 12

Seed beds	Yield kg/ha weedings					Weight of 1000 seed weedings					Weight of 1 hl (kg) Weedings			
	No Weeding	hand weeding	MCPA + hand weeding	Terbutryne	Seed bed mean	No weeding	hand weeding	MCPA hand weeding	Terbutryne	Mean	No Weeding	hand Weeding	MCPA+ nand Weeding	Terbutryne
Conventicnal	1370	2470	2140	2400	2095	32.5	35.5	34.0	37.5	34.9	81.3	83.2	83.2	82.
Stale	2420	2850	2800	2970	2760	31.5	39.3	33.3	31.0	33.8	83.7	82.5	84.0	83.8
Weeding mean	1895	2660	2470	2685		32.0	37.4	33.7	34.3		82.5	82.9	83.6	82.9

No interaction between seed beds and weeding regarding the yield

LSD (for means)	Seed beds	Weedings
5%	379 kg/ ha	225 kg/ ha
1%	695 "	308 kg/ha
C.V (%)	9.8	12.5

116 - 3a Visual Assessment (EWRC), September 19 (Kulumsa)

Entries	Polygonum nepalense	Amaranthus sp	Galinsoga parviflora	Corrigiola Capensis	Other broad leaf weeds	Phalaris paradoxa	Snowdenia polystachya	Setaria pallidefusca	Bromus sp	Other grass weeds
A1	9	9	9	9	9	9	9	9	9	9
2	3	3	4	3	3	4	3	4	3	3
3	2	2	2	2	2	3	2	2	2	2
4	3	2	3	2	2	4	3	4	2	3
B 1	9	9	9	9	9	9	9	9	9	9
2	3	3	3	3	3	3	3	4	2	3
3	2	2	2	2	2	3	2	3	2	2
4	3	2	3	3	2	3	3	3	3	3

116-3a Conventional and stale seed bed preparation in wheat with different weeding practices (Kulumsa)

Relative number of remaining weeds. No treatment (A1) = 100

Date of weed counting September 26

Entries	Polygonum nepalense	Galinsoga Parviflora	Solanum spp.	Amaranthus angustifolius	Anagalis arvensis	Setaria pallidefusca	Phalaris paradoxa	Snowdenia polystachya	Lolium temu/entum	Total broad leaf weeds	Total grass weeds	Total weeds
Conventional 1	100	100	100	100	100	100	100	100	100	100	100	100
" 2	13	33	50	50	100+	89	46	75	25	88	70	72
" 3	0	0	0	0	0	23	29	25	0	0	25	22
" 4	25	23	10	25	0	42	35	25	50	38	39	39
Stale 1	100 +	67	25	50	100 +	83	33	100	0	100 +	61	71
" 2	50	67	0	35	100 +	76	15	50	0	94	48	54
" 3	3	17	0	10	0	33	13	0	0	44	23	25
" 4	6	17	0	10	0	56	17	0	25	31	38	37
Actual (A 1) No/m^2	8	3	2	2	1	66	40	4	4	16	122	138

+ 1 = No weeding

2 = Hand weeding

3. MCPA - hand weeding

4. Terbutryne

116 - 3b Conventional and Stale Seed Bed Preparation in Wheat with Different Weeding Practices (Bekoji)

Design: Split plot 2 seed bed preparation (main plots) x 4 weeding practices (sub plots)

Variety: Enkoy

Dates of treatments: State seed bed - last harrowing June 18

" " + Conventional seed bed: Terbutryne 2.5 kg/ha
hand weeding on August 20
MCPA + hand weeding 1.0 kg/ha on August 2
Planting date = July 10

Seed beds	Yield kg/ha					Weight of 1000 Seeds (kg)					Weight of 1 hl (kg)				
	Weedings					Weedings					Weedings				
	No Weeding	hand weeding	MCPA + hand weeding	Terbutryne	S.b mean	No weeding	hand weeding	MCPA+ hand weeding	Terbutryne	mean	No weeding	hand weeding	MCPA+ hand weeding	Terbutryne	Mean
Conventional	2340	3190	3410	3340	3070	29.0	30.8	30.3	30.8	30.2	81.3	82.5	82.6	82.8	82.3
Stale	2090	2320	2380	2130	2230	32.8	33.3	33.5	32.8	33.1	82.8	82.9	81.0	82.1	82.2
Weeding mean	2215	2750	2895	2735		30.9	32.05	31.9	31.8		82.1	82.7	81.8	82.5	

Significant interaction between seed beds and method of weedings

LSD (for means)	Seed beds	Weedings
5%	468 kg/ ha	137 kg/ha
1%	859 kg/ha	187 kg/ha
C.V .%	11.3	7.2

116 - 3b Visual Assessment (EWRC) September 16 (Bekoji)

Entries	Polygonum nepalense	Guizotia Scabra	Rumex sp	Oxalis sp	Misc-broad leaf weeds	Bromus sp.	Other grass weeds
A1	9	9	9	9	9	9	9
2	4	3	3	4	3	3	4
3	2	3	3	4	3	3	3
4	2	2	4	4	3	4	3
B1	9	9	9	9	9	9	9
2	3	3	3	3	4	3	3
3	2	2	2	3	3	3	3
4	3	3	4	4	3	4	3

116 - 3b Conventional and stale seed bed preparation in wheat with different weeding practices (Bekoji)

Relative number of remaining weeds. No treatment (A1) = 100

Date of weed counting : September 16

Entries		Polygonum nepalense	Guizotia Scabra	Rumex sp	Misopatus Orantium	Galium Spurium	Corrigiola Caperisis	Caucelis infasta	Misc-broad leaf weeds	Bromus pectinatus	Phalaris Paradoxa	Eragrostic Sp.	Avena sp	Misc-grass weeds	Total broad leaf weeds	Total grass weeds	Total weeds
Conventional	1	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	2	21	41	100	25	0	33	100	100	86	54	50	67	0	44	57	48
	3	13	35	33	25	0	50	14	100	100	35	67	100	0	23	63	36
	4	4	12	100	25	25	0	7	100	43	70	50	100	0	17	74	36
Stale seed beds	1	23	29	100	25	0	80	79	100	71	43	67	100	100	46	61	51
	2	5	12	33	0	0	33	86	100	0	38	50	100	100	31	48	37
	3	4	6	0	0	25	33	29	100	0	22	67	100	100	18	41	26
	4	11	24	100	0	25	0	29	100	100	27	0	100	0	28	56	37
ΛActual (A1) No/m^2		56	17		4	4	3	14	5	7	37	6	3	1	109	54	163

116 - 4 Tolerance of Wheat to Illoxan (Kulumsa)

Illoxan is used for the control of grass weeds in wheat particularly Snowdenia Polystachya. In this trial the tolerance of wheat to the herbicide was studied on keeping the weed population in the trial to a minimum. Illoxan was sprayed at 3 rates at the 4 and 6 leaf stages of the Crop No significant difference in yield was obtained between the treated and untreated plots. The protein analysis also showed no significant difference though it appeared to be slightly higher when 1.5 kg/ha Illoxan was used at the 4 leaf stage of the crop.

116 - 4 The tolerance of wheat to Illoxan (Kulumsa)

Design: RCB with 4 replication

Sowing date: July 8

Date of treatment: b,d and f July 30

c, e and g August 9

Treatments	Dosage a.i kg/ha	Plant height, cm		Yield, kg/ha	Relative Value	% N	% Protein
		45 days after sowing	Prior to harvest				
a No treatment		55	91	2720	100	2.00	12.50
b 4 leaf stage	0.5	55	93	2660	98	2.02	12.62
c 6 leaf stage	0.50	52	93	2760	101	1.97	12.31
d 4 " "	1.00	53	92	2760	101	1.85	11.56
e 6 " "	1.00	54	94	2730	100	1.97	12.31
f 4 " "	1.50	54	91	2840	104	2.08	13.00
g 6 " "	1.50	57	94	2850	105	2.05	12.81

L.S .D 5% NS

L.S.D 1% NS

C.V % 7.2

.../.. 20

116-5a-5b Weed Control in Wheat (Asassa & Diksis)

Eight herbicides three from last year and five new ones were compared with handweeding and no weeding at Asassa and Diksis.

At Asassa no significant yield increase was obtained from any of the treatments. Weed counting figures, however, showed that terbutryne produced the best effect.

At Diksis terbuturyne again produced the highest and significant yield increase followed by Chlortoluron, Illoxan alone and when used with loxynil.

116-5a Weed Control in Wheat (Asassa)

Design: RCB with 3 replication
Sowing date: July 2
Date of teatments: f and i July 2
c,d,e,g,h and j August 12

Treatments		Dosage a.i, kg/ha	No. of Plants /m2	Plant Height cm		Crop Health	Yield kg/ ha	Relative Value
				3 weeks from herbicide application	Prior to harvest			
a.	No weeding		299	60	107	1	2660	88
b	hand weeding		293	60	108	1	3020	107
c	MCPA	1.0	287	59	105	1	2650	88
d	MCPA + Mecoprop	0.5+1.0	277	59	110	1	2840	94
e	Ioxynil	0.5	281	56	112	1	2650	88
f	Terbutryne (pre-emergence)	2.5	284	58	110	1	2770	92
g	Illoxan + Ioxynil	0.75+0.5	276	58	108	2	2410	80
h	Brittox	1.5	280	56	110	1	2750	91
i	Chlortoluron(Pre-emergence)	2.0	284	58	107	1	2690	89
j	Bromoxynil	0.37	289	56	107	1	2720	90

L.S.D. 5% NS
" 1% NS
C.V.,% 15

* Brittox contains mecoprop iso-octyle ester, bromoxynil octanoate, ioxynil octanoate and heptanoate.

116-5a Visual Assessment (EWRC) August 28 (Asassa)

Entries	Amaranthus sp.	Galium Spurium	Galinsoga Parviflora	Oxalis sp.	Other broad leaf weeds	Phalaris paradoxa	Bromus sp.	Other grass weeds
a	9	9	9	9	9	9	9	9
b	9	9	9	9	9	9	9	9
c	4	6	4	7	4	6	7	6
d	4	5	2	5	3	5	7	4
e	3	4	3	5	4	5	6	4
f	2	4	2	4	2	5	4	3
g	4	4	3	5	4	4	7	6
h	4	4	3	5	4	5	7	4
i	3	4	2	6	3	5	6	4
j	3	6	3	6	4	6	7	5

116-5a Weed Control in Wheat (Asaassa)

Relative number of remaining weeds. No treatment (a) = 100

Date of weed counting: September 9

Entries	Galinsoga Parviflora	Misopatus Orantium	Chenopadium spp	Galium Spurium	Amaranthus spp	Oxalis spp	Elusine spp	Bromus Pectinatus	Cyperus esculantus	Misc. grass weeds	Rotal broad leaf weeds	Total grass weeds	Total weeds
a	100	100	100	100	100	100	100	100	100	100	100	100	100
b	0	100	100	100	19	65	100	100	67	25	44	100	73
c	20	0	0	50	44	59	100	100	0	0	44	100	75
d	0	50	0	0	31	35	100	100	67	0	28	100	73
e	0	0	0	0	13	71	100	100	100	0	33	100	86
f	0	0	0	0	0	100	11	40	0	0	40	14	31
g	0	0	0	50	31	29	100	100	100	50	26	100	52
h	0	0	0	0	25	35	89	100	67	25	23	100	53
i	0	0	0	50	50	100	0	100	100	0	49	62	53
j	0	0	100	50	38	65	78	100	67	25	49	100	67
Actual (a) No/ m^2	5	2	1	2	16	17	9	5	3	4	43	21	64

116 - 5b Weed Control in Wheat (Diksis)

Design: RCB with 4 replication

Sowing date: June 27

Date of treatments: F and i June 29

c,d,e,g,h and j August 15

Treatments		Dosage a.i kg/ha	Plant Height cm		Crop health	Yield kg/ha	Relative value
			3 weeks from herbicide application	Prior to harvest			
a	No weeding		62	109	1	3030	100
b	Hand weeding		64	105	1	3330	110
c	MCPA	1.0	62	105	1	3280	108
d	MCPA + Mecoprop	0.5+1.0	61	104	1	3260	108
e	Ioxynil	0.5	61	108	1	3530	117
f	Terbutryne(Preemergence)	2.5	61	111	1	3730	123
g	Illoxant Ioxynil	0.75+0.5	61	106	1	3530	117
h	Brittox	1.5	56	107	1	3270	108
i	Chlortoluron(pre-emergence)	2.0	63	112	1	3680	121
j	Bromoxynil	0.37	61	104	1	3130	103

116-5b Visual Assessment (EWRC) August 30

Entries	Polygonum nepalense	Other broad leaf weeds	Misc grass weeds	Total weeds
a	9	9	9	9
b	9	9	9	9
c	7	6	7	6
d	5	5	6	5
e	6	6	6	6
f	4	3	3	3
g	5	4	5	5
h	5	5	5	4
i	5	4	6	4
j	8	8	7	8

116 - 5b Weed Control In Wheat (Diksis)

Relative number of remaining weeds. No treatment (a) =100

Date of weed counting: August 30

Entries	Polygonum nepalense	Commelina spp.	Misc-broad leaf weeds	Cyperus esculantus	Total broad leaf weeds	Total grass weeds	Total weeds
a	100	100	100	100	100	100	100
b	17	67	100+	100+	34	100+	53
c	63	33	100+	100+	76	100+	94
d	37	100+	100+	63	61	100+	71
e	66	67	100	100+	68	100+	80
f	14	0	33	75	15	100	29
g	71	67	100+	75	80	88	82
h	46	0	100+	88	51	100+	65
i	40	33	67	38	41	75	47
j	100+	0	67	13	100+	13	100+
Actual (a) No/m^2	35	3	3	8	41	8	49

126 - 1 Weed Control in Barley (Kulumsa)

The main objective of this trial was to test herbicides for control of annual grasses in barley. Among 6 herbicides compared with handweeding terbutryne (2 kg/ha a.i) gave significantly higher yield increase. Manual weeding at 30 & 60 days after planting being the simplest method also gave the best and significant results. The weed control with all herbicides was not satisfactory except that of terbutryne and penoxalin.

126 - 1 Weed Control in Barley (Kulumsa)

Design: RCB with 4 replication
Sowing date: July 9
Date of treatments: g - e July 11
c - f August 9

	Treatments	Dosage a.i kg/ha	Plant height (cm) prior to harvest	Crop health (ERC)	Yield, kg/ ha	Relative value
a	No weeding		81	2	1460	100
b	Hand weeding 30& 60 days		77	2	2750	188
c	Diclofop-methyl+Linuron(posten)	0.5+0.5	80	2	1790	123
d	" + " (posten)	1.0+0.75	78	4	1920	132
e	Metoxuron (post-em)	3.0	77	2	1680	115
f	" "	3.5	78	3	1790	123
g	Terbutryne (pre-em)	1.0	85	3	2260	155
h	" "	2.0	84	2	2760	189
i	Penoxalin (pre-em)	1.5	81	3	2530	173
j	Linuron (pre-em)	1.0	81	2	1840	126
k	" "	1.5	80	2	2090	143
l	Nitrofen "	2.0	87	3	2060	141

L.S .D. 5% 517 kg/ha
L.S.D. 1% 695 kg/ha
C.V. % 17.5

126 - 1 Visual assessment (EWRC) September 1

Entries	Polygonum nepalense	Galinsoga Parviflora	Guizotia scabra	Amaranthus angustifolius	Other broad leaf weeds	Setaria Palidefusca	other grass weeds	Total weeds
a	9	9	9	9	9	9	9	9
b	9	9	9	9	9	9	9	9
c	4	6	4	4	4	5	5	6
d	4	7	4	3	4	4	5	5
e	5	5	4	4	5	5	5	5
f	4	4	3	3	5	6	6	5
g	4	3	4	3	4	5	5	4
h	3	3	3	3	4	5	5	4
i	4	4	5	5	4	4	5	5
j	7	5	4	4	5	6	6	6
k	6	5	6	4	4	5	6	5
l	6	6	7	5	6	5	6	7

126 - 1 Weed Control in Barley (Kulumsa)

Relative number of remaining weeds. No treatment (a) = 100

Date of weed counting: September 2

Entries	Polygonum nepalense	Guizotia seabra	Galinsoga Parviflora	Corrigiola capensis	Amaranthus angustifolius	Oxalis spp	Setaria palidefusca	Phalaris paradoxa	Snowderia polystachya	Total broad leaf weeds	Total grass weeds	Total weeds
a	100	100	100	100	100	100	100	100	100	100	100	100
b	22	8	38	33	40	100+	96	45	33	25	72	53
c	6	17	77	8	20	100	76	74	100	18	76	53
d	2	8	62	25	20	100+	40	94	100	16	66	46
e	16	0	38	100+	20	100+	100+	100+	100+	39	100+	100+
f	14	8	23	42	40	100+	100+	61	100+	24	100+	80
g	6	17	0	8	0	100	30	47	50	14	38	29
h	14	0	0	0	0	100+	50	27	33	25	39	34
i	8	8	23	42	20	100	54	38	33	15	46	34
j	76	100+	15	100+	20	100+	84	100+	67	77	100	94
k	22	8	8	58	20	100+	40	76	67	32	57	53
l	33	25	85	92	100+	0	60	26	67	57	47	54
Actual in (a) No/m^2	49	12	13	12	5	1	85	66	6	99	158	257

146 - 1 Direct Sowing and Conventional Seed bed Preparation in Teff (Kulumsa)

Following the same plan as in trial No 116-1 in wheat this trial in Teff was conducted at Kulumsa.

The weed population was reduced 30 - 40 % when teff was directly sown as compared to the seed bed conventionally prepared. Regarding yield it was clearly seen that direct sowing has significantly depressed the yield and no significant difference was there between the fertilizer levels.

146 - 1 Direct Drilling and Conventional Seed bed Preparation in Teff (Kulumsa)

Design: Split plot 2 seed bed preparation (Main plots) x 3 fertilizer rates (sub plots)

Variety : DZ 54

Dates of treatments - Ploughing date on May 5
Gramaxone 2 kg/ ha July 12
Planting date July 16

Seed Beds	Y I E L D KG/HA. Fertilizer Rates /ha			
	DAP 50 kg	DAP 50kg+25 kg Urea	DAP 50 kg + Urea 50 kg	Seed Bed Mean
Ploughed, Cultivated, drilled	1570	1880	1740	1730.0
Sprayed drilled	940	1030	840	936.7

No interaction between seed beds and fertilizer rates

LSD (for means)	Seed beds	Fertilizer rates
5%	643	NS
1%	1180	NS
C.V. (%)	21.5	22.7

146 - 1 Direct Drilling and Conventional Seed bed Preparation in Teff (Kulumsa)

Date of weed counting: August 18

Entries	Polygonum nepalense	Guizotia Scabra	Galinsoga Parviflora	Corrigiola Cagensis	Amaranthus sp	Oxalis Sp	Anagalis arvensis	Solanum sp	Misc. broad leaf weeds	Setaria palidefusca	phalaris paradoxa	Snowdenia polystachya	Misc grass weeds	Total broad leaf weeds	Total grass weeds	Total weeds
A1	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
2	84	100	55	100+	63	100+	100+	100	50	58	71	100+	100+	100+	77	92
3	78	100	76	100+	75	100+	100	100	100	71	86	100	100+	94	83	90
B1	6	0	18	2	13	100+	0	0	50	100+	33	100+	0	17	100+	70
2	13	0	21	2	13	100+	0	0	100	100+	57	100+	100	15	100+	88
3	13	0	15	0	0	100+	0	0	50	100+	96	100+	100	13	100+	61
Actual $(A1)_2$ No/m^2	32	2	33	41	8	2	3	4	2	24	49	3	1	127	77	204

\+ 1. DAP 50 kg/ha

2. " " + Urea 25 kg/ha

3. " " + " 50 kg/ha

336 - 1 Direct Drilling and Conventional Seed bed Preparation in Rape (Kulumsa)

Similar trials following the same plan have been conducted in wheat and teff where direct drilling was compared with the conventional method of seed bed preparation. Plant population was uneven due to moisture stress after planting and un even depth of planting from the blunt edged seed driller. Plants height was depressed in the direct drilled plots. The conventional mathod of seed bed preparetion has produced significant yield increase over the direct drilled one.

336 - 1 Direct drilling and conventional seed bed preparation in Rape (Kulumsa)

Relative number of remaining weeds. Check-ploughed, cultivated drilled. (A1) = 100

Date of weed counting. August 5

Entries	Polygonum nepalense	Galinsoga Parviflora	Corrigiola capensis	Amaranthus angustifolius	Misc-broad leaf weeds	Setaria palidefusca	Phalaris paradoxa	Snowdenia polystachya	Total broad leaf weeds	Total grass weeds	Total weeds
A1	100	100	100	100	100	100	100	100	100	100	100
2	90	100	100+	60	50	61	75	100	100+	66	100+
3	100+	100+	100+	80	100+	100+	100+	100+	100+	100+	100+
B1	19	11	0	40	50	100+	58	100+	12	100+	89
2	29	22	65	0	100	100	92	100+	47	100+	100+
3	24	44	3	0	25	100+	100+	100+	15	100+	91
Actual in (A1) No/m^2	21	9	34	5	4	61	36	1	73	98	171

+ 1. DAP 100 kg/ ha
2. " " + 50 kg/ ha Urea
3. " " + 100 kg/ha Urea

336 - 1 Direct Dilling and Conventional seed bed preparation in Rape (Kulumsa)

Design - Split plot 2 seed beds preparation x 3 fertilizer rates

Variety - Target

Dates of treatments: Ploughing date on May 5

Gramaxone 2.5 kg/ha on July 7

Planting date July 12

Seed beds	Yield kg/ha				Weight of 1000 seeds(kg)				Weight of 1 hl.(kg)			
	Fertilizer Rates				Fertilizer rates/ha				Fertilizer rates/ha			
	DAP 100 kg	DAP 100 kg + Urea 50 kg	DAP 100 kg + Urea 100 kg	Seed Beds mean	DAP 100 kg/ ha	DAP 100 + 50 kg Urea	DAP 100 Urea 100kg	Mean	DAP 100 kg/ ha	DAP 100 Urea 50	DAP 100 Urea 100kg	Mean
Ploughed, cultivated, drilled	1420	1420	1670	1503.3	3.5	3.5	3.3	3.4	65.8	66.1	65.8	65.9
Sprayed drilled	760	630	750	713.3	3.0	3.5	3.0	3.2	65.8	66.1	66.1	66.0
Fertilizer mean	1090	1025	1210		3.3	3.5	3.2		65.8	66.1	66.0	

No interaction between seed beds and fertilizer rates

LSD (for means)	Seed beds	Fertilizer rates
5%	458 kg/ ha	NS
1%	841 kg/ha	NS
CV %	26.1	18.1

336-2 Time and Intensity of soil cultivation in Rape (Kulumsa)

It is said that small seeded crops should be sown on very fine seed beds, but the extent of fineness and its advantage is not well known. Because of escalating fuel costs unnecessary ploughing should also be cut down, for this reason different ploughing & harrowing time and internsity has been compared on Rape seed . The trial follows the same plan as wheat number 116-2.

The highest yield increase was obtained from ploughing in April & May harrowing in early June & prior to planting. Ploughing once in early June and harrowing-before planting has also resulted satisfactory yield while plots treated with gramoxone prior to planting (i.e Zero tillage) appeared to be more effective from the weed control point of view but ranked least as far as yield is concerned.

336 - 2 Time and Intensity of Soil Cultivation Practice in Rape (Kulumsa)

Design: RCB with 4 replication
Sowing date: July 10
Date of treatments: f= June 25 g= July 7

Entries	1	2	3	4	5	Number of plants /m²	Plant height,cm 25 days after Planting	Plant height,cm Prior to harvest	Yield kg/ha	Relative value
a			P	H	H	48	7	110	1340	100
b		P		H	H	49	7	100	910	68
c	P	H		P	H	51	7	102	1020	76
d			P		H	49	8	101	1200	90
e				P	H	43	7	108	1250	93
f				S	H	48	6	87	820	61
g					S	23	5	87	750	56

P = Ploughing
H = Harrowing
S = Spraying herbicide (Gramoxone)

L.S .D 5% 380 kg/ha
L.S .D 1% N.S
C.V. % 24.5

1. Right after the small rain
2. When weeds are 10 cm tall
3. April/May
4. Early June
5. Prior to planting.

336 - 2 Time and Intensity of Soil Cultivation Practice in Rape. (Kulumsa)

Relative number of remaining weeds. Check-ploughed, cultivated, drilled. (a) = 100

Date of weed counting. August 5

Entries	Polygonum nepalense	Guizotia Scabra	Galinsoga parviflora	Corrigiola capensis	Commelina africana	Oxalis spp.	Solanum spp.	Setaria Palidefusca	Phalaris paradoxa	Snowdenia polystachya	Misc-grass weeds	Total broad leaf weeds	Total grass weeds	Total Weeds
a	100	100	100	100	100	100	100	100	100	100	100	100	100	100
b	84	100+	100+	100+	50	100	67	100+	100+	100+	0	100+	100+	100+
c	100+	100+	90	100+	100	43	100	100+	100+	100+	100+	100+	100+	100+
d	95	100+	100+	100+	100+	29	100+	100+	64	75	100	100+	100+	100+
e	100+	100+	100+	100+	100	71	67	100+	100+	100+	100+	100+	100+	100+
f	68	100	100+	95	50	100	33	86	100+	100+	100+	97	100+	100+
g	5	0	20	5	100	86	0	100+	16	75	100	19	100+	84
Actual (c)	19	3	10	19	2	7	3	124	58	4	1	63	187	250

127 - 1 Seed Dressing of Barley (Kulumsa)

Aldrin and Carbofuran are effective aganist pests with sucking and chewing mouth parts, to assess their performance and to know their persistency dressed barley aeed was planted with 4 replication in the laboratory and field condition immedately after seed dressing with 1,2,4,8 and 12 months interval.

Germination %, abnormal seed, rotten seed etc were all recorded. Both Aldrin and carbofuran have not had any negative influence on germination % under laboratory and field test for a period of 8 and 12 months, respectively. It was also observed in this study that under the laboratory test on felter papers germination decreased with an increasing rate of furadon through-out the experiment period.

Treatments		LABORATORY			POT		
		Germination %	Abnormal Seed %	Rotten Seed %	Germination %	Abnormal Seed %	Rotten Seed %
Planting immediatly after seed dressing							
	a. Check	93	5	2	92	2	4
	b. Aldrin 250gm/100kg Seed	8	3	10	95	1	4
	c. " 500 "	92	4	4	95	2	3
	d. " 750 "	81	5	14	94	4	2
	e. Carbofuran 150 "	78	8	14	95	3	2
	f. 300 "	61	19	20	96	2	2
	g " 600 "	53	18	29	97	1	2
One month after seed dressing	a.	84	4	12	91	5	4
	b	81	8	11	89	6	5
	c	83	10	7	98	1	1
	d	82	5	13	96	2	2
	e	80	4	16	98	1	1
	f	76	8	16	96	2	2
	g	64	13	23	94	3	3
Two months after seed dressing	a	88	5	7	98	2	0
	b	85	6	9	98	0	2
	c	89	6	5	97	2	1
	d	85	8	7	98	0	2
	e	83	8	9	98	0	2
	f	74	15	11	97	2	1
	g	78	6	16	97	2	1
Four months after seed dressing	a	91	9	0	95	4	1
	b	86	10	4	96	3	1
	c	85	10	5	97	2	1
	d	89	9	2	96	3	1
	e	89	10	1	95	4	1
	f	87	10	3	90	6	4
	g	77	19	4	96	3	1

.../..

Treatments	LABORATORY			POT		
	Germination %	Abnormal Seed %	Ratten seed %	Germination %	Abnormal seed %	Rotten seed %
Eight months after seed dressing						
a	94	5	1	95	1	4
b	90	5	5	95	2	3
c	87	9	4	97	1	2
d	87	8	5	84	5	11
e	86	12	2	92	2	6
f	85	8	7	89	1	10
g	77	10	13	98	0	2
Twelve months after seed dressing						
a	81	6	13	93	3	2
b	66	15	19	89	2	9
c	51	12	37	95	1	4
d	67	7	26	96	2	2
e	52	12	36	97	1	2
f	60	15	25	97	1	2
g	58	3	39	97	2	1

815 - Yield Assessment on Pyrethrum (Bekoji)

To draw valid conclusion from pyrethrum trial, five best entries with 3 replication was planted at Bekoji during 1978-1980. Picking of flowers was made nine times at two to three weeks intervals number of flowers, fresh weight and dry weight of each treatment was recorded. As to the number of flowers, fresh flower yield and total dry weight entery No 59 is found to be the top yielder 13 qt/ha followed by No 73 12 Q t/ha There is no significant yield difference between selections.

Since resistance to lodging is required for easy picking and weeding it is also considered as one of the criterias but all had good lodging resistance. Entery No 16 was observed to be draught resistant. Apart from these the dried flowers were crushed into a fine powder and distributed to interested house holders around the Research Station for use against bed bugs, fleas, house fly and common domestic pests. According to the questionnaries made to the users pyrethrum dust is very effective aganist bed bugs but much success was not achieved in the control of fleas and others.

To determine the pyrethrin content of the dry flowers samples were sent to central laboratory in Addis Ababa but results are not yet available. Splits obtained from the best material is distributed to farmers association around Lemu.

Summary for Yield Trial on Pyrethrum (Bekoji)

Entries	Total number of flowers	Total Fresh weight (gm)	Total dry wt (gm)	DM yield kg/ha	Number of harvests
16	33285	18257	5733	932.19	9
59	47385	26273	7981	1297.24	9
73	26810	23509	7320	1190.24	9
168	20034	12902	4122	670.24	9
185	26478	18527	5636	816.42	9

LIST OF CADU/ARDU PUBLICATIONS

PROJECT PREPARATION PERIOD

1. Report No. I - On the Establishment of Regional Development Project in Ethiopia, October, 1966.

Part	I	General Background
"	II	Project Outline
"	III	Appendices

(A reprint of the Summary is also available.)

2. Report No. II - On the Establishment of Regional Development Programme in Ethiopia, May, 1967. (The building programme appears under separate cover.)

3. Trials and Demonstration Plots at Kulumsa in 1966, July, 1966.

4. Reconnoitering Survey of the Water Resources in Chilalo Awraja by Carl-Gosta Wenner, March, 1967.

5. Creation of a Forestry Administration in Arssi Province by Gunnar Poulsen, March, 1967.

6. Crop Sampling in the Chilalo Awraja 1966, Plant Production Department, May, 1967.

7. Results of Trials and Observation Plots at the Kulumsa Farm in Arssi Province, Crop Production Department, May, 1967.

8. Sagure, a Market Village in Ethiopia by B. Wickstrom, June, 1967.

9. Forestry Nursery and Planting Techniques by Gunnar Poulsen, June, 1967.

10. Trials and Demonstration Plots at the Seed Improvement Station, Kulumsa and Swedish Mission, Asella in Arssi Province, Regional Development Project, July, 1967.

11. Grain Marketing Experiment in Arssi by Lars Leander, August, 1967.

IMPLEMENTATION PERIOD (CADU Phase I & II)

1. Plan of Operation for Regional Agricultural Development in the Chilalo Awraja, Arssi Province, Ethiopia, 1967-1970.

2. Some Reflections on Water Erosion in Chilalo Awraja by Gunnar Poulsen, October, 1969.

3. The Taungya Afforestation Method by Gunnar Poulsen, Novemeber, 1967.

4. Grow Better Bahir-Zaaf in Ethiopia by Gunnar Poulsen, January, 1968.

5. CADU Semi-Annual Report 1967/68, January, 1968.

6. Census in Sagure-Yeloma 1967 by R. Eksmyr, February, 1968.

7. The Changing Rural Society in Arssi Land: Some Findigs from a Field Study 1966-67 by A. Lexander, March, 1968.

8. CADU (Pamphlet in English and Amharic).

9. CADU Plan of Work and Budget 1968/69 (with preliminary estimates for 1969/70).

10. Cultivation Practices and the Weed, Pest and Disease Situation in Some Parts of the Chilalo Awraja by Bo Bengtsson, March, 1968.

11. Introductory Agro-Botanical Investigations in Grazed Areas in the Chilalo Awraja by Sigurd Hakansson, June, 1968.

12. Results of Trials and Observations on Fields, Forage Crops at the Kulumsa Farm and in Asella 1967/68, June, 1968.

13. Crop Sampling in the Chilalo Awraja, Arssi Province 1967, June, 1968.

14. General Agricultural Survey of the Project Area, Extension & Education Department, July, 1968.

15. CADU Statistical Digest, Planning & Evaluation Section, May, 1968.

16. Descriptions of Agricultural Demonstrations, Extnesion & Education Department, 1968.

17. Field Trials and Observations 1968/69, Crop Production Department,

18. Feasibility Study on a Farm for Breeding of Grade Cattle at Gobe, Arssi Province, Planning & Evaluation Section, September, 1968.

19. Feasibility Study on the Electrification of Sagure Town, Planning & Evaluation Section, September, 1968.

20. CADU Annual Report 1967/68, Septemeber 1968.

21. Census in Dighelu Village, May, 1968.

22. A Case Study of Peasant Farming in Dighelu and Yeloma Areas, Chilalo Awraja, Ethiopia, January, 1969.

23. CADU Semi-Annual Report 1968/69, February, 1969.

24. Results of Demonstration 1968, February, 1969.

25. CADU Plan of Work and Budget 1969/70, April, 1969.

26. Tentative CADU Programme 1970/75, Addis Ababa, March 1969.

27. Feasibility Study on Sunflower Protein Concentrate and Fafa Mixing Plant by Goran Nyberg, Addia Ababa, May, 1969.

28. Results of Trials and Observations 1968/69, Crop Production Department Addis Ababa, April, 1969.

29. CADU Evaluation Studies: Health Education (Base-line Study) by Goran Nyberg, May, 1969.

30. CADU Evaluation Studies: Crop Sampling 1968 by Goran Nyberg, Asella, May, 1969.

31. CADU Evaluation Studies: Training of Model Farmers (Base-line Study) by Goran Nyberg, Asella, May, 1969.

32. Progress Report No. 1, Implement Research Section, June, 1969.

33. Feasibility Study on Local Roads and Market Places in Chilalo Awraja, by Lars Leander, Addis Ababa, August, 1969.

34. CADU Annual Report 1968/69.

35. Census in Sagure - Yeloma by Gunnar Arhammar, Asella, February, 1968.

36. Census in Golja (Ketar Genet), by Gunnar Arhammar, Asella, March, 1969.

37. Sanitary Survey in Golja (Ketar Genet), by Gunnar Arhammar, Asella, April, 1969.

38. Kap Study of Mothers in Golja (Ketar Genet), by Gunnar Arhammar, Asella, April, 1969.

39. Food Survey of Pre-school Children in Golja (Ketar Genet), by Gunnar Arhammar, Asella, April, 1969.

40. Health Survey of Pre-school Children in Golja (Ketar Genet), By Gunnar Arhammar, Asella, April, 1969.

41. Report on a Combined Food and Health Survey in Yeloma Farming District, by Gunnar Arhammar, Asella, May 1969.

42. Census in Bekoji Village, by Gunnar Arhammar, Asella, September, 1969.

43. CADU Preliminary Final Report for the Period 1967-70.

44. CADU Semi-Annual report 1969/70. February, 1960.

45. CADU Work Programme and Budget 1970/71 (with preliminary estimates for the period 1971/72 - 1975/76) Asella, April, 1970.

46. Report on Surveys and experiments, Crop Production Department, Asella, 1969.

47. CADU Work Programme and Budget for the Period 8.7.70 - 31,12.70, Asella, June, 1970.

48. Results of Demonstration, 1969/70.

49. CADU Evaluation Studies, Crop Sampling 1969 by Goran Bergman, Asella, June, 1970.

50. Land Ownership, Tenancy and Social Organization in Waji Area, by Arne Lexander, March, 1970.

51 CADU Annual Report 1969/70.

52. Progress Report No. II, Implement Research Section, July, 1970.

53. A Master Plan for Water Resources and Supplies within CADU's First Project Area, by Carl-Gosta Norman, Asella. November, 1970.

54. Report for the Period 8.7.70 - 15.11.70, Asella, December, 1970.

55. CADU Work Programme and Budget for the Period 1.1.71 - 7.7.71, Asella, December, 1970.

56. Animal Husbandry Activities 1968/69, Research and Livestock Section, Asella, June, 1970.

57. Survey of Health Facilities of Arssi 1969/70, by Stig Lundin M.D.

58. CADU Evaluation Studies: Women's Extension, Asella, September, 1970.

59. CADU Work Programme and Budget for the Period 8.7.71 - 7.7.72, Asella, March, 1971.

60. CADU Evaluation Studies: Training of Model Farmers (after measurement of effect) by Goran Bergman, Asella, October, 1970.

61. Sanitation Survey of Bekoji, by Stig Lundin M.D., Asella, September, 1970.

62. Family Guidance in the CADU Programme 1970 by Stig Lundin M.D., Asella,

63. Report on Surveys and experiments Carried out in 1970, Crop Production Department, Asella, June, 1971.

64. CADU Evaluation Studies: Crop Sampling 1970, Planning & Evaluation Section, Asella, July, 1971.

65. CADU Annual Report 1970/71.

66. An Analysis of the CADU Credit Programme 1968/69 - 1971 and its impact on Income Distribution, by Henock Kifle, August, 1971.

67. CADU Work Programme and Budget 1972/73, Asella, October, 1971.

68. Health Survey in Sagure Village and Yelona Farming District, by Gunnar Arhammar and Roland Eksmyr, April, 1968.

69. Assessement of Status of Health in an Ethiopian Rural Community (Experience of Two Years' Public Health Work in Chilalo Awraja, Arssi), by Gunnar Arhammar, May, 1970.

70. Survey of the Consumption of Coffee, Tea, Tobacco and Alcohol in a Market Town (Sagure), Especially with Regard to Cost, by Stig Lundin M.D., September, 1971.

71. CADU Evaluation Studies: General Agricultural Survey, 1970 (Base-line Study for Evaluation of Impact of the Project), Planning & Evaluation Section, Asella, July, 1971.

72. Feasibility Study on the Establishment of a Rural General Store in Kentere, by Mehari Tesfaye, Planning & Evaluation Section, September, 1971.

73. Feasibility Study on the Establishment of Saw-Mill in Asella and Connected Workshop for Wood Processing, Planning & Evaluation Section, November, 1971.

74. Investigations on Mechanized Farming and its Effects on Peasant Agriculture, by Henock Kifle, Asella. March, 1972.

75. CADU Work Programme & Budget 1973/74, Asella, October, 1972.

76. CADU Evaluation Studies: Co-operative Activities Before Measurement by Arne Flodh, Planning & Evaluation Section, December, 1972.

77. CADU Annual Reports 1971/72 & 1972/73 - Vol. I & II.

78. Case Study on Farm Households in the Asella Area, April, 1972.

79. Progress Report No. III, Implements Research Section, July, 1971.

80. Report on Surveys and Experiements Carried out in 1971, Crop & Pasture Section, Asella, April, 1972.

81. Master Plan for the Evaluation of CADU, by Johan Holmberg, Planning & Evaluation Section, October, 1972.

82. General Agricultural Survey 1972, Planning & Evaluation Section, February, 1973.

83. Continued Research on Water Resources & Supplies within CADU's Project Area, by Carl-Costa Wenner, Asella, April, 1973.

84. CADU Forestry Activities by Gunnar Poulsen, Asella, May, 1973.

85. Trials with Experimental Household Wells by Olle Schonbeck, Asella July, 197

86. Feasibility Study on the Utilization of the Munessa Forest, by Johan Holmberg, Asella, July, 1973.

87. Report on Surveys & Experiments Carried out in 1972, Crop & Pasture Section, Asella, July, 1973.

88. CADU Work Programme and Budget 1974/75, Asella, October, 1973.

89. A Master Plan for Water Resources and Supplies in the Chilalo Awraja by Carl-Gosta Wenner, Asella, September, 1973.

90. Surveys of Consumption Patterns in Etheya Extension Area by Johan Holmberg, October, 1973.

91. Construction of Earth Dam at Egu by Carl-Gosta Wenner, Asella, April, 1973.

92. An Analysis of CADU Credit Programme 1971/72 - 1972/73, by Michael Beyene, Asella, January, 1974.

93. CADU Health Programme, Report of the Period 71-73 (1964 & 1965 E.C.) by Stig Lundin M.D., Asella, March 1974.

94. Three Research Papers on Plant Husbandry by Messrs. Betru Haile, Olof Hammar and Per Ryden, Asella, March, 1974.

95. The Rural Drug Vendor: A survey of Situation in the Province of Arsi 1966 E.C., by Stig Lundin M.D., Asella, March 1974.

96. Progress Report No. IV. 1971/72 - 1972/73, Agricultural Engineering Section, Asella, March, 1974.

97. Crop Protection Trials 1976 - 1972, by Eric Engstrom, Crop & Pasture Section, Asella, April, 1974.

98. The Consuption of Household Water in Sagure: An Appraisal of five years Work on Water Sanitation by Stig Lundin M.D., Asella, April. 1974.

99. A One-Round Multi-Purpose Study: A Combined Census - Health Assessment Sanitation Survey by Stig Lundin M.D., Asella, June, 1974.

100. A Plan for Industrial Development for CADU, by M. Mathai, Asella, July, 1974.

101. CADU Veterinary Service, A Summary of Experiences by C. Tillaeus and P.O. Nilsson, Asella, July, 1974.

102. Animal Husbandry Activities 1970-1973, by Seven Persson, Animal Husbandry & Breeding Section, Asella, June, 1974.

103. Report on Surveys and Experiments Carried out in 1973, Crop & Pasture Section, Asella, June, 1974.

104. Fertilization with Phosphorous on Different Soils by Ol of Hammar, Crop & Pasture Section, Asella, July, 1974.

105. A Study on Asella Water Work by Stefen Gronberg, Asella, August, 1974.

106. CADU Work Programme & Budget 1975/76 (Revised), Asella, April, 1975.

107. Home Economics Extension Study, by Hanna Kebede, Asella, April, 1975.

108. Crop Sampling Survey 1973/74, Planning & Evaluation Section, Asella, April, 1975.

109. Health Services in Arssi, 1966 (E.C.) A Follow-up Survey and Supplement to CADU Publication No. 57, by Stig Lundin, M.D. and Rune Torniquist, Asella, June, 1975.

110. Prospects for Development of Livestock andRelated Industries in Chilalo, by Habte Gebre Selassie, Planning & Evaluation Section, Asella, December 1974.

111. Report on Surveys and Experiments Carried out in 1974, Crop & Pasture Section, Asella, October 1975.

112. Grassland Condition in the Chilalo Awraja, Arssi Province, Ethiopia - An Ecological Study, by Alemayehu Mengistu, Crop & Pasture Section, Asella, December, 1975.

C. PERIOD OF ARSSI REGIONAL DEVELOPMENT

1. Plan for 1976-80: Arssi Rural Development Unit- (ARDU), Asella, February, 1976. ARDU Publication No. 1.

2. Attitudinal Case Study of Farm Families in Robe, Gobessa & Lemu By Hanna Kebede Asella, May 1976 ARDU Publication No. 2.

3. Economic Characteristics of Peasant Families in the Asassa Area, Chilalo Awraja, By Teruneh Zena (Asella, June 1976 ARDU Publication No. 3)

4. ARDU Work Programme & Budget 1976/77, Asella, November 1976, Publication No. 4

5. CADU Annual Report 1973/74 Asella, December, 1976 ARDU Publication No. 5

6. CADU Annual Report 1974/75 Asella, February, 1977 ARDU Publication No. 6

7. CADU Annual Report 1975/76, Asella, July, 1977 ARDU Publication No. 7

8. Crop Sampling Survey in Arbagugu andTicho Asella, April 1977 ARDU Publication No. 8

9. Consumption Study in Bekoji, Koffele & Gonde. October, 1974 Planning & Evaluation Section, Asella 1978. ARDU Publication No. 9

10. ARDU Annual Report 1976/77, Asella, October, 1978, ARDU Publication No. 10.

11. ARDU Work Programme and Budget 1977/78 Asella, July 31, 1979, Publication No. 11

12. ARDU Annual Report 1977/78 Asella, August, 1979 Publication No. 12

13. Rural Population, Land Utilization Practices and Livestock Survey, 1978. Asella, August 31, 1979 Publication No. 13.

14. PROGRESS REPORT V Ag. Engineering Section March, 1980 ARDU Pub. No. 14

15. ARDU Annual Report 1978/79, Asella, December, 1980 Pub. No. 15

16. *Report on Trials and observations carried out in 1976-78 on FORAGE and PASTURE CROPS AGRONOMY, CROP AND PASTURE SECTION Asella, February, 1980.*

17. *ARDU Annual Report 1979/80 Asella, May, 1981.*

18. *Investigations on the Impact of the Agrarian Reform on Peasants' Income and Expenditure Patterns, 1980. Planning, Evaluation and Budget Section. Asella, October 1981.*

19. *ARDU Annual Report 1980/81. Asella, February, 1982*

20. *Cost of production of major crops and grain selling prices. Planning, Evaluation & Budget Section. Asella, February, 1982.*

21. *Report on sruveys and experiments carried out in 1980. Plant Husbandry Department, Asella, June 1982*

MINOR RESEARCH TASKS

1. Farm Management Studies of Model Farmers in the CADU Project Area, by Susanne Bergholtz, July, 1969.

2. The Munessa Forest: A Plant Ecological Study, by Lill and Bjorn Lundgren June 1969.

3. Credit Situation in Chilalo Awraja (Base-line Study) by Goran Bergman and Hakan Lindquist, July, 1969.

4. Local Varieties of Wheat in the Chilalo Awraja, by G. G. Winderstrom, November-Ddecember, 1968.

5. An Inventory of Feeding System and Feed Stuff, Chilalo Awraja, Ethiopia, by Oscar Evaldsson.

6. Crop Production and Animal Production: Comparative Study on the Possibilities for Different Farm Produce in the Chilalo Area in Ethiopia, by Bo Anselmsson, February, 1972.

7. An Agrobotanical Investigation of Leguminous Species in Chilalo Awraja, Especially at Higher Attitudes, by Mats Thulin, May, 1972.

8. Mobilizing Savings in Chilalo by Martin Lundquist, Asella, April, 1973.

9. On the Occurrences of Septoria Spp. and Helminthosporium spp. as Parasites of Wheat and Barley at Three Altitudes in Central Ethiopia, by Ake Wellving, Asella, August, 1973.

10. Inventory of Indigenous Ecotypes of Some Species in the Chilalo Awraja Ethiopia, by Joel Carlsson.

11. Invetory of Soils in the Rift Valley Region of Chilalo Awraja, by Carolin Trapp. Asella, April, 1974.

12. The Grain Marketing System of Chilalo - A Descriptive and Normative Analysis - By lars Haglund, Asella, July, 1974.

13. Study of Traditional Medicine in Chilalo Awraja, by Kerstin Gustafsson Asella, June, 1975.

SPECIAL STUDIES

S.S.1. A Preliminary Survey of Soil Erosion in the Chilalo Awraja, by Kebede Tato, Asella, September, 1970.

S.S.2. Decision Making in the Family, (A Preliminary Intervies Study with the Aim of Throwing Light on the Relationship between Husband and Wife when it comes to Decision Making in the Family) by Pia Bergman, Asella, July, 1971.

S.S.3. The Innovation - Diffusion Process, by Hohan Toborn, Asella, March, 1971.

S.S.4. Sociological Profile of Provincial Elites in Chilalo Awraja, by John M. Cohen, Addis Ababa, 1972.

S.S.5. Rural Housing in Chilalo on the Eastern Plateau, Ethiopia, by Elizabeth Hanson, July, 1973.