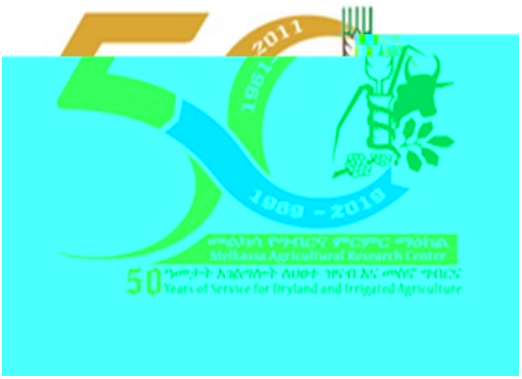
Progress Report 2018

January–December



Melkassa Agricultural Research Center
Ethiopian Institute of Agricultural Research

Progress Report 2018
January–December

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Agricultural Economics Research

Mekonnen Sime

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Table 1. Results of partial budget analysis of haricot bean (NASIR variety) production TWO recommendations Farmers' field result (on-farm)

	Innovation package plots					Extension package plots				
Benefit-cost components	Boset-1	Boset-2	Shalla-1	Shalla-2	Combined	Boset-1	Boset-2	Shalla-1	Shalla-2	Combined
Grain yield (kg)	2994.3	2706.5	2019.1	2739.7	2614.90	2743	2499.6	1583	2691	2379.15
Straw yield (kg)	6081	5275.8	3571.4	6547.6	5368.95	5946	5155.8	3571	4762	4858.70
Income from grain (Birr)	35932.2	32478.2	16152.8	21917.6	26620.20	32914	29995	12664	21530	24275.75
Income from straw (Birr)	10641.8	9232.65	4999.96	9166.64	8510.26	10405	9022.6	4999	6667	7773.40
Gross field benefit (Birr/ha)	46574	41710.9	21152.8	31084.24	35130.46	43319	39017.6	17663	28197	32049.15
Cost of fertilizer (Birr/ha)	3685	3685	3760	3760	3722.50	1510	1510	1560	1560	1535.00
Cost of labor for fertilizer application (Birr/ha)	380.6	364.9	384	468	399.38	359	366.2	422.4	468	403.90
Cost of seed (Birr/ha)	3360	3360	2660	2660	3010.00	2400	2400	1900	1900	2150.00
Cost of labor for planting (Birr/ha)	1180.5	833	882.6	746	910.53	1080.9	813.5	812.9	738.1	861.35
Cost of oxen labor for row making (Birr/ha)	546.8	600	400	400	486.70	546.8	600	400	400	486.70
Cost of capital (6% on seed + fertilizer)	422.7	422.7	385.2	385.2	403.95	234.6	234.6	207.6	207.6	221.10
Total costs that vary (Birr/ha)	9575.6	9265.6	8471.8	8419.2	8933.05	6131.3	5924.3	5302.9	5273.7	5658.05
Net benefits (Birr/ha)	36998.4	32445.25	12680.96	22665.04	26197.41	37187.7	33093.3	12360.1	22923.3	26391.10
RRI (Innovation VS Package)	*-5.50*	*-19.40*	*10.13*	*-8.21*	*-5.91*					

Note: BCR=Benefit Cost Ratio=Net benefit/Costs that vary; RRI=Rate of Return to Investment= change in net benefit over the change in costs that vary expressed in percentage; negative indicates a loss for a choice to shift from extension to innovation package

Project title:Value Chain Analysis of Strategic Agricultural Commodities
Project period: July
Activity: Value chain analysis of agro-chemicals: pesticides
Activity period:
Objectives:

Persons responsible

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Table 1. Pairwise ranking of important sorghum attributes by farmers in different districts

Sorghum traits	Districts/Woredas				
	Tahtayadiabo	**Babile**	**Miesso**	**Kewot**	**Raya kobo**
Early maturity	2	1	3	6	1
Yield potential	3	5	5	2	4
Drought tolerance	1	2	1	4	2
Enjera making quality	4	7	5	1	1
High market preference	5	3	4	3	3
Stalk palatability	6	6	7	-	-
Disease and insect resistance	-	3	2	-	7
Stalk (biomass)	-	9	8	7	6
Striga resistance	-	8	-	-	-
Seed Color	-	10	9	-	-
Blending ability	-	-	-	-	5

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Project title: The Harnessing Opportunities for Productivity Enhancement of Sorghum and Millets in Sub-Saharan Africa and South Asia (HOPE-II)
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Table 1: Major production constraints of mango

Constraints	Rank (160)				
	1st	2nd	3rd	4th	5th
Land shortage	35	23	16	20	16
Insect pest	22	21	23	17	6
Disease	11	7	7	9	6
Climate variability	19	30	20	23	16
Lack of irrigation facility	26	31	32	16	14
High input price	5	6	9	8	14
Limited knowledge and skill	8	14	18	13	9
Lack of true type seedlings	26	20	20	20	10

Results in Table 2 below showed that the major mango market constraints are low price, poor market linkage andlack of market information respectively. Out of 160 respondents ranked low price the first market constraint in fruit marketing.

Table 2: Major marketing constraints of mango

Constraints	Rank (160)				
	1st	2nd	3rd	4th	5th
Traditional weight measures		3	4	11	3
Perishability & seasonal maturity	4	7	18	10	11
Poor market linkage	27	44	34	19	4
Lack of market information	6	20	29	24	12
Low price	97	23	12	5	1
Poor infrastructure	4	21	18	7	9
Distant market	15	31	26	25	3
Lack of proper storage facilities	1	2	8	20	34

Plan for the next year: Completed, publication

Project title:Value Chain Analysis of Strategic Agricultural Commodities
Project period: July
Activity:Value Chain Analysis of Tomato in the Central Rift Valley of Ethiopia
Activity period: July
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Person/s responsible:
Reported by:
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Constraints	Rank (159)				
	1st	2nd	3rd	4th	5th
High cost of inputs	77	30	14	8	2
Insect pest	12	33	40	16	17
Disease	13	29	27	31	21
Climate variability	11	8	10	13	14
Seed access	4	9	10	14	7
Seed costs	10	13	12	11	15
Land shortage	10	3	7	15	8
Lack of capital	11	1	2	1	7
Input not timely available	6	20	17	12	9

Table 2: Major marketing constraints of tomato

Constraints	Rank (159)				
	1st	2nd	3rd	4th	5th
Brokers	53	29	41	7	9
Price fluctuation	30	53	20	13	7
Poor market linkage	20	15	22	33	33
Lack of market information	1	9	19	12	15
Low price	48	32	11	9	6
Poor infrastructure	3	1	6	23	1
Traditional weight measure	4	1	2	5	1

Plan for the next year: Completed, publication

Project title: Production Economics Research for Agricultural Investment and smallholder farmers
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Agricultural Extension and Communication

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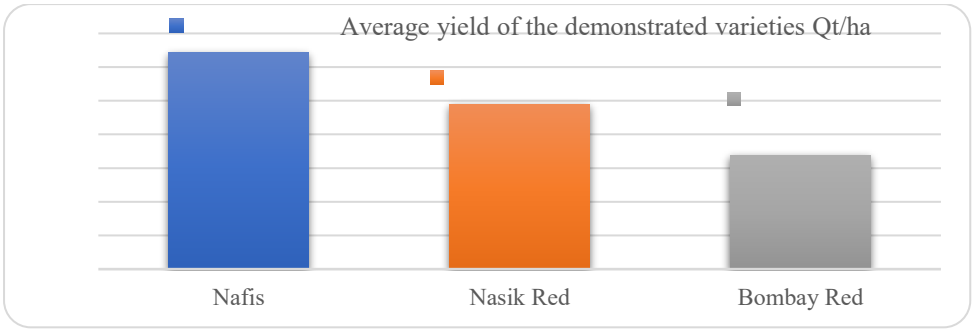

Table 1: Summary of seed/ bulb produced

District	Farmers name	Area (ha) transplanted	Total yield	
			Nasik red	Nafis
Dugda	Abu Geda	0.093		15.18
	Tesfaye Degaga	0.125	18.07	
Lume	Dereje Korme	0.171		17.97
	Shifera Badasa	0.144	15	

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Table 2: Summary of pepper and chili varities

Crop	Variety	District	kebele	No. of demonstrations
Pepper and Chili	Mereko Fana, MelkaShote, Malka Awaze, Melka Dera, Melka Oli	Lume	Shara-Dibandiba	12
		Dugda	Bekele Girissa&Shubigamo	12

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Table 3: Average yield results of common bean varieties accross location

Location	SER 125	Nasir	Awasa 1	Awash 2	KAT-B 9	KAT-B 1
Shalla	27.6	23.4	23.3		27.8	
ATJK	30.5	25	21.5	29.3	29.4	
Meisso			8.2		14	13
Adama			18	22		

Table 4: Summary of yield results of common bean from farmers field

Parameter	SER 125	Nasir	Awash 1	Awash 2	KAT B9	KAT B1
N	8	8	8	5	7	2
Minimum	26.00	20.83	7.00	20.00	13.33	10.00
Max	33.33	26.67	23.33	29.33	30.00	15.00
Mean	28.90	24.17	16.67	23.43	24.64	12.50

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Tables 5:Average yield result of the demonstrated varieties

Habro districts demo yield (qt/ha)				Miesso district demo yield(qt/ha)		
parameters	ESH-4	ESH-1	Dekeba	ESH-4	ESH-1	Dekeba
N	2	3	3	4	10	10
sum	63.39	77.06	66.5	45.81	87.06	62.38
min	24.00	16.00	16.20	0	0	0
max	39.39	36.96	30.30	29.31	29.30	23.10
Mean	31.70	25.69	22.17	11.45	8.71	6.24

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Table 6:Average demonstration yield (qt/ha) result of highland sorghum varieties

Jiru	Adele	Dibaba
43.22	39.40	40.06

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Table 7: yield performance double cropping

Yield of Beans (qt/ha)				Yield of Sorghum (qt /ha)		
Parameter	N-26	KAT B1	KAT B9	Dekeba	Melkam	Argiti
N	7.00	7.00	7.00	7.00	7.00	7.00
Max	9.41	12.50	10.34	16.0	15.00	13.80
Mean	7.07	8.59	7.03	9.77	10.96	8.75

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Table 8: Summary of yield (qt/ha) result of maize varities demonstrated

Parameter	MHQ-138	Melkassa-2	BHQ548	BHQY545	Melkassa-6
Minimum	31.00	26.80	48.00	51.20	25.00
Max	57.00	46.40	57.40	68.00	42.00
Mean	43.40	38.24	52.47	59.73	35.42

Table 9: Summary of yield result of maize varities demonstrated

Parameter	MHQ138		Melkassa-6		Melkassa-2	
	60 ×30	75×25	60×30	75×25	60×30	75×25
N	8	8	4	4	5	5
Minimum	41.67	41.67	29.67	27.33	33.33	26.33
Max	60.00	57.67	42.00	38.33	48.33	45.00
Mean	48.42	47.29	35.00	33.08	41.67	38.13

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Table10: Fruit technology popularization participants and number of seedlings distributed

Number of Farmers	Fruit seedlings and number				
	Avocado	Mango	Banana	Papaya	Total seedlings
226	1,185	1,644	4,285	9,897	17,234

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Farm Power and Field Machinery Program

Laike Kebede

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Table 1. Demonstrated and participatory evaluated technologies

No	Technology type	Multiplied	Distributed
1	Mould board	475	475
2	Tie Reidger	275	275
3	Multi Crop Planter	15	15
4	Tef Row Planter	15	15
5	2 WT attached multi crop planter	2	2

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Table 2. Number of trained farmers, development agents, manufacturers and technology users on pre and post-harvest technologies operation, use and manufacturing.

Training Title	Farmers			DAs			Experts			Technician		
	M	F	T	M	F	T	M	F	T	T	M	F
Use and handling of pre and post harvest agricultural engineering technologies	1464	350	1814	552	136	688	464	83	548	9	8	1

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Table 4. Paired t-test tef yield statistical results

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Tef yield using front pack seeder	19.7750	24	3.025	0.618
	Tef yield using manual drilling	18.50000	24	1.893	0.386

Table 5. Paired t-test wheat yield statistical results Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Wheat yield using 2WT	59.2438	16	10.74	2.68
	Wheat yield using manual drilling	51.20625	16	8.78	2.19

Table 6. Comparison of the drilling techniques

Parameters	Front pack tef seed drill	2WT attached wheat planter	Traditional tef and wheat planting
Planting width, m	1.20	1.20	0.2
Planting depth, cm	0	4-6	0 for tef7.5 for wheat
Field capacity, hr/ha	4.6	6.47	28
Seed rate, kg/ha	10(adjustable)	120(adjustable)	10 for tef 120 for wheat
Uniformity of metering	Uniform	Uniform	Non-uniform
Fuel consumption, l/ha	No	13.81	No
Labour requirement	1	1	3

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Table 1. Temperature and humidity difference between the ambient and inside the cooling structure during the storage of tomato

Structure	Temp ^{0}C	Humidity (%)
Hollow Block	4.00b	2.5b
Filla	4.5b	2.625b
Charcoal	5.5ab	7 a
Scoria	7.125 a	8.5 a

Table 2. Degree of weight loss and spoilage on tomato fruit under evaporative cooling structures after 15 days of storage

Structure	Weight loss (kgs.)	Spoilage (kgs.)
Hollow Block	0.7273	0.6850
Filla	0.5950	0.5797
Charcoal	0.5457	0.3520
Scoria	0.4247	0.2100

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Design:
Treatment:

Location:
Summary of Result

Table1 rice harvesters test result

Parameters	Treatments		
	2WT front Attached reaper	Reaper binder	Sickle (manual)
Average speed(km/hr)	3.8	3.6	-
Fuel consumption(l/hr)	0.66	0.9	0
Height of cut(cm)	6-11	5-9.5	5.3-7.8
AFC (ha/hr)	0.35	0.12	0.0036
Efficiency (%)	79.7	55.55	87.87
header loss (%)	0.56	0.495	1.67

Table 2. Main operating performances of three rice threshers

Parameters	Variety EDIGET			Variety NERICA -4		
	Indonesia	China	Selam	Indonesia	China	Selam
Moisture content of crop	9.5	9.5	9.5	13.87	13.87	13.87
Threshing capacity (kg/hr)	606.06	500	416.67	632.9	606.06	588.23
Threshing efficiency (%)	98.2	99.5	97.3	98.5	99.75	96.5
Cleaning efficiency (%)	85.34	99.21	70	86.48	97.33	74.32
Total loss (%)	1.05	0.71	3.15			3.5

Period of report:
Summary of the progress
Design:
Treatment:

Location:
Summary of Result

Plan for next year

Activity 4.4

Objective:

Reported by:
Period of report:
Summary of the progress
Design:
Treatment:
Location:
Summary of Result

Plan for next year

Activity 4.5

Activity period:
Objective:

Responsible person(s):
Reported by:

Period of report:
Summary of the progress
Design:
Treatment:

Summary of Result

Plan for next year.

Project 5:
Project period:
Activity 5.1:
Activity period:
Objective:

Responsible person(s):
Reported by:
Period of report:
Summary of the progress
Design:
Treatment:
Location:
Summary of Result

Plan for next year:

Activity 5.2:
Activity period:
Objective:
Responsible person(s):

Reported by:
Period of report:
Summary of the progress
Design:
Treatment:
Location:
Summary of Result

Plan for next year

Activity 5.2
Activity period:
Objective:
Responsible person(s):
Reported by:
Period of report:
Summary of the progress
Design:
Treatment:

Location:
Summary of Result

Plan for next year

Activity 5.3

Activity period:
Objective:

Responsible person(s):
Reported by:
Period of report:
Summary of the progress
Design:
Treatment:

Location:
Summary of Result

Project 6:

: July 2017 – June 2020
Activity 6.1
Activity period:
Objective:

Responsible person(s):
Reported by:
Period of report:
Summary of the progress
Design:
Treatment:
Location:

Summary of Result

-
-
-
-
-
-

Plan for next year

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Activity 6.2
Activity period:
Objective:
Responsible person(s):
Reported by:
Period of report:
Summary of the progress
Design:

Treatment:
Location:
Summary of Result

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Plan for next year

Activity 6.3

Activity period:

Objective:

Responsible person(s):

Reported by:
Period of report:
Summary of the progress
Design:
Treatment:

Location:
Summary of Result

Plan for next year

Activity 6.4

Activity period:
:
Responsible person(s):

Reported by:
Period of report:
Summary of the progress
Design:

Treatment:

Location:
Summary of Result

.

Plan for next year

[redacted]

Animal Science Research

Abiy Tilahun

Apiculture and sericulture
Research Process:
Program/case team:
Project title1:

Project period:
Activity Title 1:

Activity period:
Objectives

Responsible Person (s):

Reported by:
Period of report:
Summary of the progress

Design:
Treatments:
Location:
Summary of Results

Plan for the next year:

Activity title 2:
Activity period:
Objectives

Responsible Person (s):

Reported by:
Period of report:

Summary of progress

Design:
Treatment:
Location:
Summary of Results:

Plan for the next year:

Activity Title 3:
Activity period:
Objectives:

Responsible Person (s):

Reported by:
Period of report:
Summary of progress

Design:
Treatment:
Location:
Summary of Results

Plan for the next year:

Activity Title 4:
Activity period:
Objectives:

Responsible Person (s):

Reported by:
Period of report:

Summary of progress

Design:
Treatment:
Location:

Summary of Results

Plan for the next year:

Activity title 5:
Activity period:
Objective(s):-

Responsible Person (s):

Reported by:
Period of report:
Summary of progress

Design:
Treatment:
Location:
Summary of Results:-

Table 1. Performance evaluations of Eri-silkworms maintenance at MARC (sample size 100 larvae/ tray) (Eri-silkworm)

Silkworm races	10 larval weight after 4th instars (gm)	Larval period (days)	Dead larvae (no)	Cocooning percentage (%)	Average weight of 10 cocoons (gm)	Average weight of 10 cocoon shell (gm)	Shell ratio (%)
Eri-3.4	78.58	23.21	16.45	96.85	3.65	0.543	14.87
Eri-India marked	80.41	22.15	23.25	97.45	3.45	0.461	13.6
Eri India pale green							

Activity title 6:
Activity period:
Objective(s):

Responsible Person (s):

Reported by:
Period of report:
Summary of progress

Design:
Treatment:
Location:

Summary of Results

Table1. Performance evaluations of maintenance of Mulberry-silkworms at MARC (sample size 100 larvae/ tray) (Mulberry silkworm)

No	Silkworm races	10 larval weight 4 days after 4th instars (gm)	Larval period (days)	Dead larvae (no)	Cocooning percentage (%)	Average weight of 10 cocoons (gm)	Average weight of 10 cocoon shell (gm)	Shell ratio (%)
1	Kenya2 (Bivoltine)	29.54	24.25	29.54	92.25	1.18	0.24	20.34
2	Kenya3 (Bivoltine)	27.25	24.10	29.54	89.24	1.21	0.24	19.83
3	Kenya4(Bivoltine)	32.21	24.03	26.25	86.54	1.34	0.26	19.40
4	Kenya5(Bivoltine)	33.25	25.65	28.24	94.15	1.09	0.27	24.77
5	China2(Bivoltine)	26.19	25.24	32.24	87.45	1.24	0.24	19.35
6	Korea1(Bivoltine)	38.45	26.24	33.65	89.65	1.20	0.26	21.66
7	Korea3(Bivoltine)	29.14	24.00	29.75	87.15	1.23	0.25	17.88
8	Yellow cocoon (Multivoltine)	25.24	21.02	12.45	90.21	1.02	0.21	20.58
9	White cocoon (Multivoltine)	24.65	23.24	15.17	91.07	1.08	0.23	21.29

Plan for the next year:

Activity title 7:

Activity period:

Objectives

Responsible Person (s):

Reported by:
Period of report:
Summary of progress

Design:
Treatment:

Location:
Summary of Results:-

Plan for the next year:

Activity title 8:

Activity period:
Objectives

Responsible Person (s):

Reported by:
Period of report:
Summary of progress

Design:
Treatment:
Location:
Summary of Results:-

Plan for the next year:

Activity title 9:

Activity period:

Objectives

Responsible Person (s):

Reported by:
Period of report:
Summary of progress

Design:
Treatment:
Location:
Summary of Results:-

Plan for the next year:

Activity title10:

Activity period:
Objectives

Responsible Person (s):

Reported by:
Period of report:
Summary of progress

Design:
Treatment:
Location:
Summary of Results:

Plan for the next year:

Activity title 11:

Activity period:

Objectives

Responsible Person (s):

Reported by:
Period of report:
Summary of progress

Design:
Treatment:

Location:
Summary of Results:

Plan for the next year:

Activity title 12:

Activity period:
Objectives:

Responsible Person (s):
Reported by:
Period covered:
Summary of progress

Design:
Treatment:

Location:

Summary of Results:

Plan for the next year:

Activity title 13:
Activity period:
Objectives:
Responsible Person (s):

Reported by
Period of report:
Summary of Progress

Design:
Treatments

Location:

Summary of Results:

Plan for the next year:

Activity title14:
Activity period:
Objectives:
Responsible Person (s):

Reported by:
Period of report:
Summary of Progress

Design:
Treatments
Location:
Summary of Results:

Plan for the next year:

Activity title15:
Activity period:
Objectives:

Period of report:
Responsible Person (s):

Reported by
Summary of Progress

Design:
Treatments
Location:

Summary of Results:

Plan for the next year:

Activity title16:
Activity period:
Objectives:

Project period:
Responsible Person (s):

Reported by
Period of report: Jan
Summary of Progress

Design:
Treatments
Location:

Summary of Results:

Plan for the next year:

Project Title

Project period:
Activity title17:
Activity period:
Objective/s:

Responsible Person (s):
Reported by:
Period of report:
Summary of progress

Design:
Treatment:
Location:
Summary of Results:

Plan for the next year:

Project title3: Enhancing productivity of beekeeping and marketing
roject period:
Activity title18:

Activity period:
Objective/s:

Responsible Person (s):
Reported by:
Period of report:
Summary of progress

Design:
Treatments
Location:
Summary of Results:

Plan for the next year:

Activity title 19:

Activity period:
Objective/s:

Responsible Person (s):

Reported by:

Year of report:
Summary of progress

Design:
Location:
Summary of Results:

Plan for the next year:

Feeds and Nutrition Progress Report

Aklilu Mekashs

Research process:
Program:
Project title1: - Improving feed quantity and quality in different production systems of Ethiopia
Project period:
Activity title 1:

Activity period:
Objectives:

Responsible person(s):
Reported by: Aklilu Mekasha
Period of report:
Summary of progress- completed
Design:
Treatment:

Location:
Summary of Results:

Future plan:

Activity title 2
Activity period:
Objectives:

Responsible Person(s):
Reported by:
Period of report:
Summary of progress

Design:
Treatment:

Location:
Summary of Results:

Future plan:

Activity title 3:

Activity period:
Objectives:

Responsible person(s):
Reported by:
Period of report:
Summary of progress

Design:
Treatment:

Location:
Summary of Results

Future plan

Activity title 4:

Activity period:
Objectives:

Responsible person(s):
Reported by:
Period of report:
Summary of progress
Design:
Treatment:
Location:
Summary of Results

Future plan

Activity title 5

Activity period:
Objectives:

Responsible person(s):
Reported by:
Period of report:
Summary of progress

Design:
Treatment:
Location:
Summary of Results:

Future plan

Activity title 6:

Activity period:
Objectives:

Responsible Person(s):

Reported by:
Period of report:
Summary of progress:

Design:
Treatments

Location:
Summary of Results:

Future plan:

Activity title 7

Activity period:
Objectives:

Responsible person(s):
Reported by:
Period of report:
Summary of progress:
Design:
Treatment:
Location:
Summary of Results:

Future plan

Activity title 8:

Activity period:
Objectives:

Responsible person(s):
Reported by:
Period of report:
Summary of progress-:
Design:
Treatment:
Location:
Summary of Results:

Future plan:

Project title2:

Project period:
Activity title 9 :
Objectives

Activity period:
Responsible person(s):
Reported by:

Period of report:
Summary of progress-
Design:

Treatments:

Location:
Summary of Results:

Future plan:

Activity title 10:

Activity period:
Objectives:

Responsible person(s):
Reported by:
Period of report:
Summary of progress:
Design:
Treatments
Location:
Summary of Results:

Future plan:

Project title3:

Project period
Activity Title 11:

Activity period:
Objectives:

Responsible person(s):
Reported by:
Period of report:
Summary of progress:
Design:
Treatment:

Location:
Summary of Results:

Future plan:

Activity title 12:

Activity period:
Objectives:

Responsible person(s):
Reported by:
Period of report:
Summary of progress-
Design:
Treatment:

Location:
Summary of Results:

Future plan:
Activity title 13:

Activity period:
Objectives

Responsible person(s):
Reported by:
Period of report:
Summary of progress-
Design:
Treatment

Location:
Summary of Results:

Future plan:

[redacted]

Climate, Geospatial and Biometrics Research

Olika Desalegn
E-mail: oldkb2012@gmail.com; Phone number: +251-924574050

Project title:

Project period:
Activity:

Activity period:
Objective:

Responsible person
Reported by:
Year of report
Summary of the progress

Design:
Location:
Result (data, data interpretation and conclusion)

Table 1: Instruments provided for selected EIAR weather observatory stations during report period

Instruments	Quantity	List of weather stations
Thermometer for air temperature	6	D/Zeit, Alem Tena, Asosa, Haru and Ambo
Soil thermometer	4	Ambo
Sunshine card	3000	Ambo,Tepi,Jimma,D/zeit,and Kulmsa,
Computer	1	Kulmusa
New Station	2	Negele Arsi ,Holeta


Figure 1. New agro-met station at Holeta and Negele Arsi


Figure 2: Repaired and maintained Old and nonfunctional meteorological instruments

Plan for the next year

Aactivity 2:

Activity period:
Objective:

Responsible person
Reported by:

Year of report:

Summary of the progress

Design:

Treatment:

Location:

Result (data, data interpretation and conclusion)

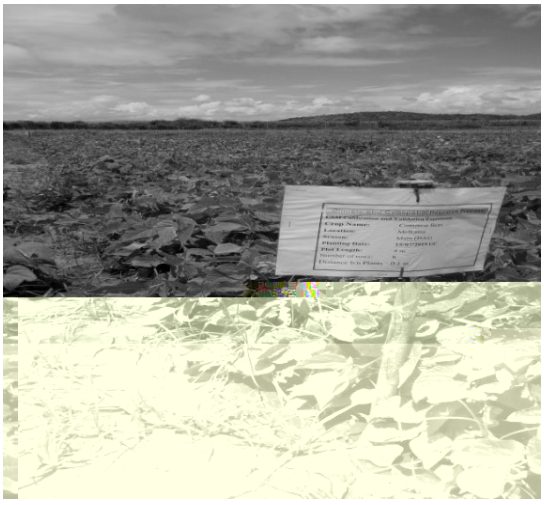


Figure 3: Phonological garden at Melkassa, Dhera and Meisso

Model Calibration

Table 2:Estimated Genetic Coefficients for sorghum cultivars

	Genotype specific coefficient parameters										
Genotype	P1	P2	P2O	P2R	PANTH	P3	P4	P5	PHINT	G1	G2
ESH-1	265.3	102	13.12	169.3	617.5	356.4	80.28	541.1	49	8.233	6.275
ESH-2	250.5	102	13.68	253.1	617.5	141.2	82.14	553.4	49	11.98	5.43
Teshale	333.6	102	13.71	277.9	617.5	362.7	90.88	545.8	49	2.266	5.558
Melkam	348.2	102	13.33	112	617.5	388.2	81.64	530.8	49	0.106	6.324

Table 3: Estimated Genetic Coefficients for Maize cultivars

Cultivar Name	ECO#	P1	P2	P5	G2	G3	PHINT
		1	2	3	4	5	6
BH140	IB0001	222.5	0.189	961.6	880.9	11.11	75
BHQP542	IB0001	238.1	0.810	941.6	857.9	16.46	75
Melkassa-2	IB0001	151.1	1.751	871.2	444.5	16.30	75
Melkassa-4	IB0001	149.7	0.719	865.7	875.2	15.04	75
Melkassa6Q	IB0001	155.2	1.633	873.6	968.7	15.91	75

Table 4: Estimated Genetic Coefficients for common bean varieties

	CSDL	PPSEN	EM-FL	FL-SH	FL-SD	SD-PM	FL-LF	LFMAX	SLAVR	SIZLF
Cultivar Name	1	2	3	4	5	6	7	8	9	10
Awash-1	12.17	0	28.61	4.5	11.47	26.86	20	0.97	322.1	138.4
Awash-2	12.17	0	29.48	4.5	7.891	26.64	20	0.97	252.6	135.3
Awash Melka	12.17	0	34.48	4.5	10.54	24.21	20	0.97	275.1	144.5
Deme	12.17	0	34.48	4.5	10.54	24.21	20	0.97	275.1	144.5

Plan for the next year

Activity 3: Agro-climatic resource characterization of research centers and their mandate areas (production systems)
Activity period:
Objective:

Responsible person:
Reported by:
Year of report:
Summary of the progress

Location:
Study site

Table 5: Selected agro-climatic characteristics of the meteorological stations

Station	Lat. (Deg)	Long. (Deg)	Elevation (m)	Period of Record	Major AEZ
MARC	8.24	39.40	1550	1977-2017	Sub moist lowland
Ziway	7.05	38.29	1640	1971-2017	Semi arid mid highland
Worer	9.40	40.07	750	1965-2017	Arid lowland
Meisso	9.20	41.11	1470	1965-2017	Arid lowland/Moist
Dhera	8.33	39.32	1680	1982-2017	lowland/sub moist lowland

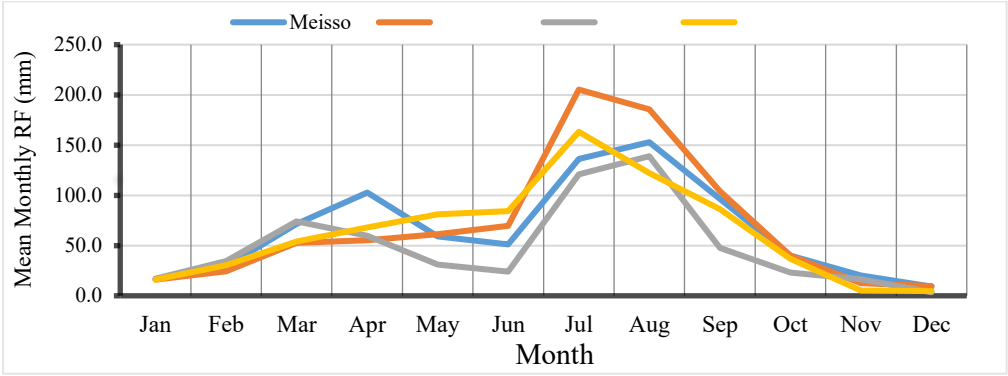


Figure 1: Seasonal Climate data Pattern at MARC, Meisso, Worer and Ziway

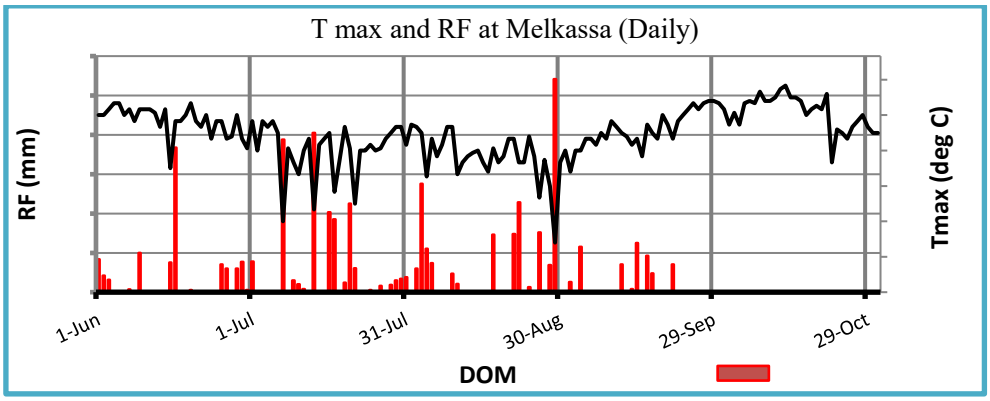
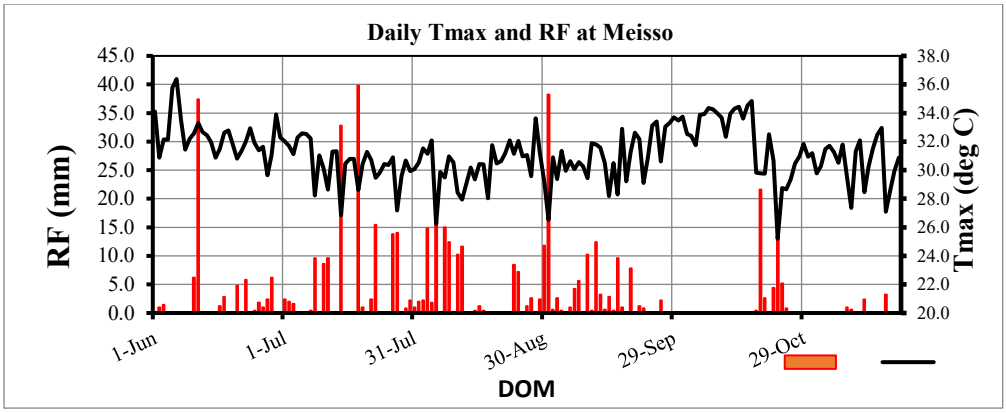


Figure 2: Seasonal Climate data Pattern at MARC



Plan for the next year

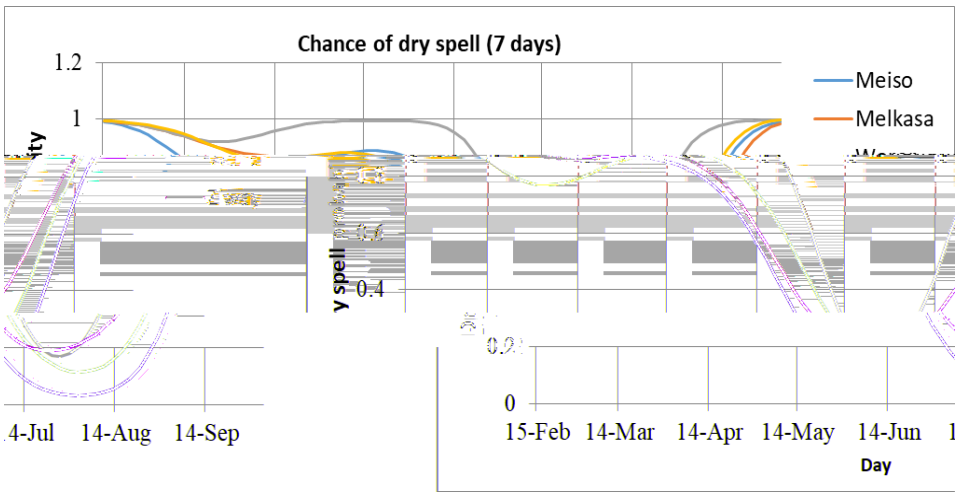
Project 2:

Project period:
Actevete1:

Objective:

Responsible person
Reported by:
Year of report
Summary of the progress

Location:
Result (data, data interpretation and conclusion)



Graph 4: Chance of dry spell at Ziway, Meisso, Werer and MARC

Plan for the next year

Activity 2

Activity period:
Objective:

Responsible person
Reported by:
Year of report

Summary of the progress

Treatments
Location:
Result (data, data interpretation and conclusion)

Plan for the next year

Activity 3:

Activity period:
Objective:

Responsible person
Reported by:
Year of report
Summary of the progress

Location:
Result (data, data interpretation and conclusion)

Plan for the next year

Project title 3:

Project period
Activity 1

Activity period:
Responsible person
Reported by:
Year of report
Summary of the progress

Location:

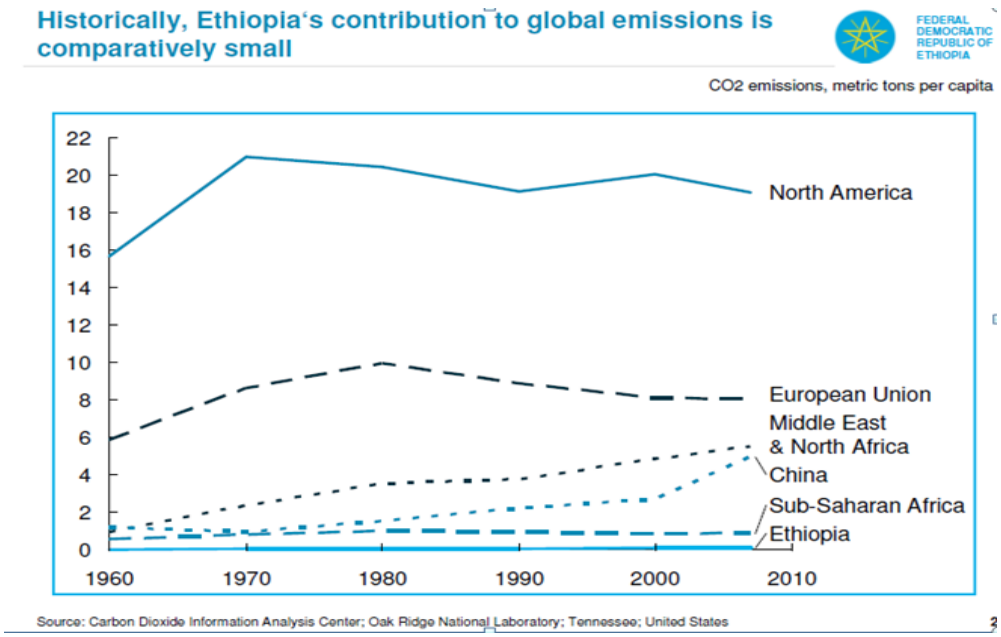


Figure 5, A focused review of the GHGs emission that compares Ethiopia with the other countries

Plan for the next year

Activity 2

Activity period:
Responsible person
Reported by:
Year of report

Summary of the progress

Location:
Result (data, data interpretation and conclusion)

Plan for the next year

Activity 3:

Activity period:
Responsible person
Reported by:
Year of report
Summary of the progress

Location:
Result (data, data interpretation and conclusion)

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Plan for the next year

[redacted]

Crop Research

Field Crop Research

Lowland Pulses Research Program

Bean Improvement Research

Project 1:

Project period:
Activity 1:
Responsible person:

Reported by:
Year of report:
Design:
Treatments
Locations
Summary of the result

Table 1. Yield advantage of released varieties compared with standard checks

Candidates	Checks	Yield advantage over checks (%)	Other merits
RAZ 42	Awash	18.6	Bruchid insect pest tolerant
RAZ 11	1	11.0	Low moisture stress tolerance for niche market demand

Future plan:

Activity 2:
Responsible person:

Reported by:

Year of report:
Design:
Treatments
Locations
Summary of the result

Table 2. Yield advantage of released varieties compared with standard checks

Candidates and checks	Yield advantage over checks (%)		Other merits
	Nasir	SER-119	Disease (CBB, HB and ALS) resistance
SCR-11	11.30	48.60	
SCR-15	15.98	54.81	

Future plan:

Activity 3:
Responsible person:

Reported by:
Year of report:
Design:
Treatments
Locations
Summary of the result

Table 3. Yield advantage of released varieties compared with standard checks

Candidates	Checks	Yield advantage over checks (%)	Other merits
SCN 5	Dinknesh	33.2	Disease (ALS,CBB and HB) resistant black bean varieties
SCN 11		45.6	

Future plan:

Activity 4.
Responsible person:

Reported by:
Year of report:
Design:
Treatments:
Locations:
Summary of Result

Plan for the next year:

Activity 5:
Responsible persons:

Reported by:
Year of report:
Design:
Treatments:
Locations:
Summary of the result

Plan for the next year

Activity 6.
Responsible person:

Reported by:
Year of report:
Design:
Treatments:

Locations:
Summary of the result

Plan for the next year:

Activity 7:
Responsible Person (s):

Reported by:
Year of report:
Design:
Treatments:
Location:
Summary of the result

Table 10. Yield performance (gm/plot) of genotypes at MARC (top 100)

Trt no.	Yield	Trt no.	Yield	Trt no.	Yield	Trt no.	Yield	Trt no.	Yield
50	395	126	289	449	244	540	223	92	203
80	377	292	287	15	241	311	220	514	202
200	375	319	287	43	240	112	219	374	201
128	372	104	285	102	237	355	219	588	200
133	350	431	283	113	237	367	219	124	199
134	350	305	273	582	237	425	218	347	199
139	346	384	264	140	236	48	217	527	198
103	344	120	262	127	233	479	217	84	197
136	335	543	262	294	233	110	214	494	197
376	335	578	260	541	230	34	213	197	196
300	332	318	259	129	229	132	213	266	196
343	327	17	258	269	229	293	210	404	196
115	324	130	257	317	229	531	210	44	195
83	310	587	255	295	227	61	208	544	195
77	301	58	254	131	226	81	208	321	194
105	298	547	254	333	226	119	208	246	193
408	296	37	252	279	225	442	208	109	192
464	294	398	250	437	224	123	206	114	192
414	292	247	248	517	224	242	205	290	192
524	191	121	245	506	223	106	204	407	191

Plan for the next year:

Activity 8.
Responsible person:

Reported by:
Year of report:
Design:
Treatments:
Locations:
Summary of the progress

Plan for the next year:

Activity 9.
Responsible person

Reported by:
Year of report: **8**
Design:
Treatments:
Locations:
Summary of the result

Plan for the next year:

Activity 10.
Responsible person:

Reported by:
Year of report:
Design:
Treatments:
Locations:

Summary of the result

Activity 11:

Responsible Person (s):

Reported by:
Year of report:
Design:
Treatments:
Location:
Summary of the progress

Plan for next year:

Activity 12:

Responsible Person (s):

Reported by:
Year of report:
Design:
Treatments:
Location (s):
Summary of the result

Plan for next year

Project 2:

Project period:
Activity 1:
Responsible Person (s):

Reported by:
Year of report:
Design:
Treatments:
Location (s):
Summary of the result

Table 1. Mean performance of flowering and maturity date of mung bean genotypes across locations tested in 2018

Genotype	DTF							DTM						
	MK	MS	KB	SK	HU	GF	Mean	MK	MS	KB	SK	HU	GF	Mean
MB 6148-05-12	48	43	30	50	54	44	45	77	71	53	86	71	73	72
Mong Hole	45	41	28	53	52	45	44	79	69	52	85	73	73	72
Black Bean	49	44	63	52	55	45	51	78	75	83	86	75	73	78
Asha	48	42	27	51	54	43	44	77	70	52	84	74	73	72
MH-85-1	47	42	29	51	55	44	44	77	71	53	84	72	74	72
MH-BR-1	47	42	34	53	55	43	45	77	70	53	85	76	73	72
MB 6173-B-33	47	42	27	52	54	43	44	71	71	53	85	75	73	72
Showa robit	47	42	28	53	54	43	44	70	71	52	83	74	73	70
Borda	48	41	27	52	55	43	44	77	70	52	91	78	71	73
Mean	47	42	33	52	54	43	45	76	71	56	86	74	73	72
CV	2	4	4.2	3.4	2.8	2.1		1.0	1.0	2.6	2.9	3.0	1.11	
LSD at 0.05	2		2.5					2	2	2.6	2.9			
Sign.	*	ns	**	ns	Ns	ns		**	**	**	**	ns	ns	

DTF= Days to flowering; DTM= Days to maturity; MK= MARC; MS= Miesso; KB=Kobo; SK= Sekota; HU=Haramaya University; GF= Goffa; CV = Coefficient of variation; LSD= List significant difference;

Plan for the next year:

Activity 2:
Responsible Perso n (s):

Reported by:
Year of report: **8**
Design:
Treatments:
Location (s):
Summary of the result

Table 2. Mean days to flowering, days to maturity and yield (kg/ha) of Cluster bean genotypes across location

Trait	Locations							Mean
	DS	WT	GN	KB	SK	MK	MS	
Days to flowering	41	45	43	47	41	45	41	43
Days to maturity	87	90	88	92	81	68	70	82
Yield	3300	2200	2000	1500	1498	1500	1489	1927

DS=Dasenech; WT=Woito; GN=Gnangatom; KB=Kobo;SK=Sekota; MK=MARC;MS=Miesso

Plan for the next year

Activity 3:
Responsible Person (s):

Reported by:
Year of report:
Design:
Treatments:
Location (s):
Summary of the result

Plan for the next year:

Activity 4:
Responsible Person (s):

Reported by:
Year of report:
Design:
Treatments:
Location (s):
Summary of the result

Table 3. Performance of Pigeon pea genotypes at Goffa 2018/19

Genotype	PHT	DTM	PPPL	SPP	HSW	Yield
ICEAP 00068	221	162	98	7	12	2019
ICEAP 00902	228	162	38	6	11	443
ICEAP 00850	217	166	140	6	12	842
ICEAP 00554	219	164	173	7	12	1993
ICEAP 01514/15	187	155	57	6	13	1261
ICEAP 00557	225	162	31	5	9	700
ICPL 87091	205	155	59	6	12	2299
Mean	214.62	161.19	85.20	6.12	11.59	1365.29
CV	2.75	0.79	15.12	8.03	5.63	6.61
LSD (0.05)	6.87	1.15	15.00	0.57	0.76	105.00
Sign.	**	**	**	**	**	**

PHT= Plant height; DTM= Days to maturity; PPPL= Pods per plant; SPP= Seed per plant; HSW = Hundred seed weight; CV = Coefficient of variation; LSD= List significant difference; Sign. = significant difference

Plan for the next year:

Activity 5:
Responsible Person (s):

Reported by:
Year of report:
Design:
Treatments:
Location (s):
Summary of the result

Activity 6:
Responsible Person (s):

Reported by:
Year of report:
Design:
Treatments:
Location (s):
Summary of the result

Plan for the next year:

Activity7:
Responsible Person (s):

Reported by:
Year of report:
Design:
Treatments:
Location (s):
Summary of the result

Plan for the next year:

Activity 8:
Responsible Person (s):

Reported by:
Year of report:
Design:
Treatments:
Location (s):
Summary of the result

Table 7. Amount of cowpea and mung bean breeder seed produced in 2018 cropping season

Variety	Amount (Qt)
Cowpea (Bole variety)	1
Mungbean (NVL variety)	1
Total	2

Plan for next year:

Activity 9:
Responsible Person (s):

Reported by:
Year of report:
Design:
Treatments:
Location (s):
Summary of the result

Plan for next year :

Moisture and Heat Stress Maize Research

Alemshet Lema

Project 1:

2.3.

2.4.

Activity period:
Responsibility

Reported by:
Year of report:
Design:
Treatment:

Locations:
Summary of Results:

Table 3. ANOVA of Conventional Early maize hybrids evaluated at MARC and Dhera in 2018 for yield and Days to anthesis

EHYB18-MELKASSA		EHYB18-DHERA		EEGG18-DHERA		EEGG-MELKASSA			MELKASSA-M18-14			DHERA-M18-14		
Ent	GY	Ent	GY	Ent	GY	Ent	GY	DA	Ent	GY	AD	Ent	GY	AD
32	6.68	11	4.78	49	3.61	39	12	66	7	4.93	64.8	4	3.44	66.5
24	6.01	6	4.62	62	3.24	52	11.9	66	18	4.89	68.9	13	3.32	69.9
10	5.97	9	4.56	58	3.22	51	11.8	64	16	4.88	69.9	19	3.31	68.3
21	5.91	32	4.32	45	3.08	20	11.2	70	4	4.86	66	15	3.31	67.7
18	5.78	7	4.02	46	3.06	37	11	65	2	4.83	66.7	14	3.3	69.9
31	5.74	43	4.00	42	3.03	59	10.9	65	8	4.62	66.4	2	3.29	68
30	5.67	44	3.99	9	3.03	56	10.8	69	10	4.48	67.3	MI4	3.23	68.7
45	5.63	5	3.91	44	2.83	32	10.7	67	1	4.42	66.7	3	3.22	67.9
44	5.46	19	3.87	39	2.78	57	10.7	64	3	4.38	66.3	1	3.21	65.9
Mean	5.34		-		1.95		9.3	66		4.27	67.4		3.2	68.2
LSD	1.51		-		1.47		1.5	1.1		0.82	0.9		0.52	2.1
MSe	0.92		-		2.02		16.7	1.7		0.85	0.3		0.72	2.9
CV	17.97		-		72.96					21.54	0.8		26.54	2.5
p	Ns		-				-	-		*	**		ns	*

Next Year Plan:

Activity3.
3.1.

3.2.

Activity period:
Responsibility
Reported by:
Year of report:
Design:
Treatment:

Locations:
Summary of Results:

Next Year plan:

Activity 4.Introduction and evaluation of early Conventional Maize OPVs
4.1.

4.2.

Activity period:
Responsibility
Reported by:
Year of report:
Design:
Treatment:
Locations:
Summary of Results:

Table 4. ANOVA for Grain Yield and Days to Anthesis for Early OPVs at MARC

MELKASSA-M18-34				**MELKASSA-M18-29**			
Entry	GY	AD	ASI	Entry	GY	AD	ASI
6	6.62	65.3	0.4	10	7.56	68.9	1.2
17	6.08	66.4	0	6	7.2	67.4	0.6
7	6.05	65.3	-0.1	25	7.09	65.8	0.7
18	5.61	65.8	0.8	13	6.94	69.5	0
Mlk4	5.38	65.7	0.5	12	6.89	69.3	0.6
12	5.33	65.6	1.1	23	6.78	70	0.3
10	5.32	64.9	0.2	11	6.69	69.6	1
16	5.3	65.4	-0.3	Mlk4	6.69	67.7	0.7
13	5.21	65.6	0.7	3	6.69	67.9	0.1
4	5.13	74.6	0	9	6.64	67.9	1
11	4.98	62.5	0.6	4	6.58	69.3	1.1
1	4.81	66.8	0.1	20	6.53	70.6	0
Mean	4.91	65.4	0.2		5.96	69.1	0.8
LSD	1.25	5.8	1.8		1.81		0.9
MSe	0.97	13.7	1.2		1.46	1.3	0.3
CV	20.04	5.7	646		20.26	1.6	71.4
p	***	*	*		***	Ns	***

Next Year Plan

Activity 5 Introduction and evaluation of Intermediate Conventional maize OPVs
Activity period:
Responsibility

Reported by:
Year of report:
Design:
Treatment:
Locations:
Results:

Next Year Plan

Activity 6.

Activity period:
Responsibility

Reported by:
Year of report:
Design:
Treatment:
Locations:
Summary of Results:

Table 6. ANOVA for Perse performance of top 14 Selected IITA fixed inbredlines at MARC and Dhera in 2018

MELKASSA-M18-08							DHERA-M18-08					
Entry	**GY**	**AD**	**ASI**	**ER**	**EA**	**PA**	**Entry**	**GY**	**AD**	**ASI**	**EA**	**PA**
9	3.08	77.9	4.1	2	2.6	2.1	4	2.76	84.5	1.6	1.9	2.7
4	2.94	75.8	-0.8	1.3	3.7	2	1	2.07	84.4	2.4	2.4	0.9
22	2.62	81.9	-1.5	-0.4	1.3	2	12	1.92	84.6	0.7	2.2	2.7
1	2.61	77.4	1	10.4	2.1	1.7	31	1.82	84.2	0.5	2.4	1.2
30	2.41	76.5	-0.3	-0.7	1.7	2	30	1.46	85.6	3	3.1	1.4
17	2.19	77.4	2.8	0.5	2.1	2.3	26	1.27	84.4	2.9	2.5	2.3
3	1.76	85.3	0.1	-0.1	2.9	2.3	13	1.26	88.3	0.9	2.5	1.6
13	1.68	77.8	3.4	0.1	2.7	2.5	17	1.25	87.8	2.3	2.8	3.3
2	1.67	81.5	-1.3	1.4	2.5	2.7	27	1.23	89.7	-	2.7	2.8
29	1.66	79.1	1.1	0.2	3.6	2	2	1.19	82.9	3.8	2.6	2.7
12	1.62	76.3	0	11.6	2.4	1.3	9	1.18	82.7	3.8	2.2	2.2
10	1.55	85.7	1.6	-0.3	1.8	2.5	23	1.06	85.1	0.9	3.3	3.8
28	1.48	80.2	3.9	0.3	3.1	2.5	24	0.89	82.3	0.9	2.9	2.7
15	1.44	83.3	2.6	1.3	2	5.2	3	0.75	88.7	-	3	2.4
25	1.34	81.1	3.6	-0.3	3.9	1.6	29	0.74	86	2.3	2.8	2
Mean	1.34	80.6	1.6	1.4	3.1	2.6		0.99	85.4	2.2	2.9	2.9
LSD		3.9			2.2	0.8		-	3.2	-	-	-
CV	71.01	2.4	103.3	288.5	36.5	18.5		62.69	2.2	87.7	23.3	35.8
P	ns	***	ns	ns	*	***		ns	***	ns	Ns	ns

Next Year Plan:

Activity period:
Responsibility
Reported by:
Year of report:
Design:
Treatment:

Locations:
Summary of Results:

Next Year Plan:

Activity 8.

Activity 9.

Activities Period
Responsibility
Reported by:
Year of report:
Design:
Treatment:

Locations:
Summary of Results

Table 7. Inbredlines used for Line development (F2-F3 advancement) Using 2k Bulk Method

Entry#	Genotype	Source
1	MMK170001-B	MK18MN03-1
2	MMK170002-B	MK18MN03-2
3	MMK170003-B	MK18MN03-3
4	MMK170004-B	MK18MN03-4
5	MMK170005-B	MK18MN03-5
6	MMK170006-B	MK18MN03-6
7	MMK170007-B	MK18MN03-7
8	MMK170008-B	MK18MN03-8
9	MMK170009-B	MK18MN03-9
10	MMK170010-B	MK18MN03-10
11	MMK170011-B	MK18MN03-11
12	MMK170012-B	MK18MN03-12

Next Year Plan:

Activity 10.Development of non-QPM inbred lines using DH technology
Activity period:
Responsibility
Reported by:
Year of report:
Design:
Treatment:

Locations:
Summary of Results:

Next Year Plan:

Activity 11. Molecular diversity analysis of non-QPM and QPM inbred lines
Activity period:
Responsibility
Reported by:
Year of report:
Design:
Treatment:

Locations:
Summary of Results

Next Year Plan:

Activity 12. National Variety yield Trial for Melkassa2 Conversion to QPM
Activity period:
Responsibility
Reported by:
Year of report:
Design:
Treatment:
Locations:
Summary of Results:

Table 8. ANOVA of Melkassa2 Conversion NVT in 2011 at three locations

MARC				Ziway			Miesso		
Genotype	**GY**	**Rank**	**AD(d)**	**GY**	**Rank**	**AD(d)**	**GW)**	**Rank**	**AD(d)**
BC2F3/CML159	6.14	4	63.3	1.19	6	53.8	1.41	3	68.6
BC2F3/CML144	7.26	1	66.2	2.07	3	56.8	1.06	5	68.6
Melkassa2 Normal	6.38	2	63.6	1.74	4	54.4	1.52	2	67.6
Melkassa3	5.26	6	62.1	2.11	2	53	1.71	1	65.5
Melkassa4	6.23	3	62.9	2.76	1	52.6	1.25	4	65.5
Melkassa6Q	5.988	5	65.545	1.494	5	54.099	0.96	6	69.3
Mean	6.21	4	63.9	1.89	4	54.1	1.32	4	67.5
LSD (0.05)	1.43	2	1	1.43	2	2.6	0.48	2	2.6
MSe	1		0	1		1	0.08		1.9
CV	14		1	54		2	21.06		2.1

Next Year Plan:

Activity13.
13.1.

13.2.

Activity period:
Responsibility
Reported by:
Year of report:
Design:
Treatment:

Locations:
Summary of Results:

Next Year Plan:

Activity14 Formation of CM single cross hybrids
Activity period:
Responsibility

Reported by:
Year of report:
Design:
Treatment:
Locations:
Summary of Results:

Next year Plan:

Activity15 Test cross formation QPM inbred lines and maintenance
15.1.
15.2.
Activity period:
Responsibility
Reported by:
Year of report:
Design:
Treatment:

Locations:
Summary of Results

Next Year Plan:

Activity16.

Activity period:
Responsibility

Reported by:
Year of report:
Design:
Treatment:

Locations:
Summary of Results:

Activity17.Evaluation of pre-released and released maize varieties for heat tolerance
Activity period:
Responsibility
Reported by:
Year of report:
Design:
Treatment:

Locations:
Results:

Activity18.
18.1.
18.2.
18.3.
Activity period:
Responsibility

Reported by:
Year of report:
Design:
Treatment:

Locations:

Summary of Results

Next Year Plan:

Activity 19.

Activity 20.
Activities Period
Responsibility

Reported by:
Year of report:
Design:
Treatment:

Summary of Results

Table10. ANOVA of Conventional Haybrid Maize NVT for yield and days to Anthesis at Four locations

CM_Melkassa			CM_Ziway		CM_Miesso		CM_Dhera		
Entry	GY	AD	GY	AD	GY	AD	Entry	GW	AD
1	9.64	68.2	2.54	67.9	1.04	67.5	13	6.07	70.5
2	6.8	74.9	1.01	75.7	0.92	72.4	7	5.23	67.6
3	9.88	72.1	1.81	74.7	0.89	71.9	3	4.9	72.7
4	11.82	71.5	1.94	73.4	0.81	70.2	6	4.84	67.6
5	7.9	73.2	1.86	76.7	0.87	72.6	4	4.83	72.5
6	8.4	66.6	1.75	69.3	1.58	65.1	14	4.51	73.8
7	9.73	66.4	2.08	67.7	1.51	75	12	4.45	72.3
8	9.97	68.5	2.56	68.5	1.05	68.7	2	4.43	73.3
9	9.82	69.4	2.2	70.5	0.94	70	8	4.25	68.5
10	8.41	71.4	1.46	70.8	1.1	68.7	10	4.17	69.3
11	7.49	69.9	2.24	74.1	1.38	71.7	5	4.14	72.4
12	9.01	75.2	1.96	76.2	0.86	71.3	1	4.07	67.9
13	8.18	70.9	2.11	72.1	1.1	70.9	11	3.95	71.6
14	6.31	73.8	1.06	75.2	0.99	71.6	9	3.65	68.8
15	7.71	68.3	0.722	70.423	1	68.4	15	3.57	68
Mean	8.74	70.7	1.82	72.2	1.07	70.4	-	4.47	70.5
LSD	2.93	2.1	1.2	2.8	0.48	6.9	-	1.34	2
MSe	3.07	1.6	1	3	0.09	15.8	-	0.85	1.7
CV	20.04	1.8	59	2	27.33	5.6	-	20.63	1.9
p	*	***	+	***	*	Ns	-	*	***

Next Year Plan:

Next Year Plan:

Activity 21.
Activity 22.
Activity 23.
Responsibility
Reported by:
Year of report:
Design:
Treatment:
Locations:
Summary of Results:

Next Year Plan:

Activities 24.
Responsibility
Reported by:
Year of report:
Design:

Treatment:

Locations:
Summary of Results:

Table 1. Sweet Corn Trail from Bako at MARC and Dhera in 2018.

BK18MHP1H-Melkassa				BK18MHP1H-Dhera		
ENTRY	GY	AD	ASI	GY	EPP	NE
1	4.513	72.4	1.9	4.066	1.07	34.3
2	4.54	73.1	1	3.865	0.96	42.9
3	4.635	73.7	1.9	4.058	1.06	32.6
4	5.396	72	2.2	1.881	1.12	27.9
5	2.784	72.3	1.7	3.66	1.3	35.2
6	5.759	71.9	1.1	4.393	1.56	27.5
Mean	4.604	72.6	1.6	3.659	1.18	33.4
LSD	2.381			1.906		19.1
MSe	13.27	0.2	0.6	13.75	0.13	100.6
CV	25.02	0.6	46.3	32.09	30.12	30
P	0.115			0.053		0.3
P	Ns	Ns	ns	*	ns	ns
Min	2.784	71.9	1	1.883	0.96	27.5
Max	5.759	73.7	2.2	4.393	1.56	42.9

Next year Plan:

Project 2:
Research Process:
Project period
Activity Title1:

Objectives

Responsible Person (s):

Reported by:
Year of report:
Summary of progress
Design:
Treatments: F
Location:
Summary of Results:

Plan for the next year:

Activity Title2-

Objectives **DT**
Responsible Person (s):

Reported by:
Year of report:
Summary of progress
Design:
Treatments:
Location:
Summary of Results

Plan for the next year:

Activity Title 3-

Objectives

Responsible Person (s):

Reported by:
Year of report:
Summary of progress
Design:
Treatments:
Location:
Summary of Results

Plan for the next year:

[redacted]

Sorghum Improvement Program

Alemu Terfessa

Project title:

Project period:
Activity1:

Activity period:
Objective:

Responsible person:
Reported by:
Period of report:
Summary of the progress
Design:

Treatment:
Location:
Summary of Result

Plan for the next year:

Plan for the next year:

Activity3:

Activity period:
Objective:

Responsible persons:

Reported by:
Period of report:
Summary of the progress
Design:
Treatment:
Location:
Summary of Result

Table1. The performances of near isogenic sorghum lines for Striga Resistance

	DTF		Biomass (kg/7.5M2)		striga count	
Pedigree	Humera	Sheraro	Humera	Sheraro	Humera	Sheraro
Debir/Birhan///Debir	80.50	76.33	4.50	3.13	769.00	293.00
Tseadachimure/Birhan///Tseadachimure	63.33	63.00	5.00	2.00	1005.67	326.00
Gambella1107/Birhan///Gambella1107	73.00	71.00	7.33	2.13	707.67	339.67
Tseadachimure/Birhan///Tseadachimure	75.00	72.33	9.50	1.87	549.67	345.00
Debir/Gobiye///Debir	68.33	63.33	4.67	2.40	601.33	388.00
Tseadachimure/Birhan///Tseadachimure	76.00	71.00	6.33	2.07	568.67	405.00
Debir/Birhan///Debir	73.00	71.67	1.33	1.87	785.33	407.33
Debir/Birhan///Debir	75.00	76.67	3.67	2.07	790.33	427.33
Teshale/Framida///Teshale	79.33	76.00	8.67	2.33	602.33	433.33
Gobiye	67.67	64.33	3.83	2.00	299.00	68.33
Birhan	69.33	63.67	4.00	1.73	395.33	118.67
Tseadachimure	75.33	71.67	4.20	1.93	557.00	439.67
Framida	84.33	80.67	9.83	2.53	469.00	440.67
Teshale	76.00	72.33	6.33	1.87	572.33	471.67
Dekeba	82.67	76.00	1.73	1.80	769.67	530.00
Debir	80.33	72.33	3.17	1.67	581.67	541.33
Gambella1107	84.00	78.67	6.17	2.07	803.00	629.33
Wediaker	77.67	75.00	3.83	2.00	940.67	665.33
Grand Total	75.55	72.69	4.98	2.05	701.71	446.22

Plan for the next year:

Activity 4:

Activity period:
Objective:

Responsible persons:
Reported by:
Period of report:
Summary of the progress
Design:
Treatment:
Location:
Summary of Result

Table1. The performances of Near Isogenic sorghum lines for drought Resistance

Pedigree	DTF	PHT	GY Kg/ha
America-1/B35///America-1	72.33	236.00	3188.00
America-1/B35///America-1	78.33	262.67	2897.33
America-1/B35///America-1	77.00	240.67	2842.67
Jigurti/B35///Jigurti	78.00	243.33	2829.33
America-1/B35///America-1	77.33	260.67	2668.00
Jamiyu/B35///Jamiyu	78.33	269.33	2649.33
Jigurti/B35///Jigurti	80.00	296.00	2594.67
Jamiyu/B35///Jamiyu	74.67	278.00	2502.67
Jamiyu/B35///Jamiyu	75.00	208.67	2405.33
America-1/B35///America-1	77.00	226.67	2393.33
Hodem-1-3/B35///Hodem-1-3	79.00	269.33	2354.67
Jigurti	74.00	305.33	3934.67
Hodem-1-3	74.00	231.33	3190.67
Jamiyu	77.67	217.33	2138.67
America-1	73.67	249.33	2017.33
B35	63.67	104.67	166.67
Gorade-2	90.67	293.33	137.33
Mean	**77.81**	**252.61**	**1660.60**

Plan for the next year:

Activity 5:

Activity period:
Objective:

Responsible persons:
Reported by:
Period of report:
Summary of the progress
Design:
Treatment:
Location:
Summary of Result

Table1. The performances of Near Isogenic sorghum lines for Striga Resistance (early maturing)

Pedigree	DTF	PHT	Panicle length	Panicle width	GYLD
Dekeba/B35///Dekeba	69.67	142.00	27.00	8.33	2002.22
Tseadachimure/B35///Tseadachimure	63.67	221.33	23.67	7.33	1992.44
Gambella1107/B35///Gambella1107	75.33	158.00	19.33	6.67	1971.56
Meko/B35///Meko	65.00	177.33	23.00	7.67	1960.00
Wediaker/B35///Wediaker	69.33	159.33	22.00	7.33	1932.44
Wediaker/B35///Wediaker	66.33	134.67	21.00	7.00	1919.11
Meko/B35///Meko	66.33	188.67	21.33	5.33	1915.56
Wediaker/B35///Wediaker	70.33	191.33	24.33	6.67	1897.33
Teshale/B35///Teshale	68.67	216.00	21.33	7.67	1868.89
Tseadachimure/B35///Tseadachimure	66.33	246.67	24.67	7.00	1841.33
Gambella1107/B35///Gambella1107	74.67	160.67	19.67	6.33	1833.78
Wediaker	67.67	123.33	22.67	7.33	2488.89
Meko	64.33	156.00	20.00	6.33	2383.11
Macia	72.00	144.67	26.67	7.33	2164.89
Tseadachimure	66.67	192.67	21.67	6.33	1658.22
Gambella1107	73.67	164.00	21.33	6.00	1548.00
Melkam	72.67	150.67	32.33	7.67	1511.56
Teshale	67.67	217.33	22.67	6.33	1240.00
Dekeba	75.33	131.33	25.50	6.50	1138.67
B35	68.67	98.00	22.33	5.00	596.00
Mean	**70.17**	**176.83**	**23.11**	**6.85**	**1481.56**

Project Title1:

Reported by:
Activity 1:

Activity period:
Objectives:

Responsible Persons:

Reported by:
Period of report:
Summary of research progress
Design:
Treatment:
Location:
Summary of Result

Activities (2-7):
Activity period:
Objectives

Responsible Persons:

Reported by:
Period of report:
Summary of Research Progress
Design:
Treatment:
Locations:
Summary of Result

Table 3: List of segregating generation lines from different segregating stages to next stage

Activity Name	Number of generations planted	Number of heads selected	Advanced to	Site
Selfing F1 crosses to generate F2 populations (offseason)	203	197	F2	WR
Early maturing F2 population selection (two sets)	273	3000	F3	MS &SH
F4 generation advance for early and medium types (offseason)	1200	800	F5	MS
F3 families for drought and grain (2 Sets)	1283	800	F4	MS & KB
Evaluation and selection of early maturing F3 sorghum families for strig resistance	746	600	F4	SH&HM
Development of NAM populations for the dry lowland environment	18	3193	F3	MS and MK
Total	3,723	8,590		

Plan for the next year:

Activity 8: **)**
Activity period:
Objective:

Responsibilities:

Period of report:
Reported by:
Summary of Research Progress
Design:
Treatment:

Locations*:*
Summary of Result

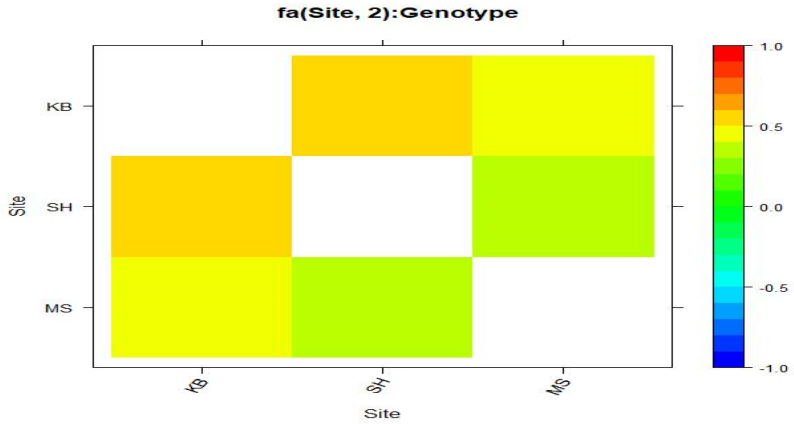


Figure 12: Genetic correlation of the trial planted at each of targeted areas

Table 1: Top performed genotypes' BLUPs and means for selected agronomic traits

Genotype	GY Predicted value	GY Standard error	DTF	PAS	PHT	DTM
ETSC15438-4-1	3.879	0.516	70	2	196.8	107.5
ETSC14773-1-3	3.536	0.505	69.3	2	192.3	106.3
ETSC14715-4-1	3.526	0.522	70	2.5	211.3	106
ETSC14596-4-3	3.429	0.522	68	3	198.8	107.5
ETSC14019-4-2	3.361	0.488	72.5	3	237.5	110.5
ETSC15396-5-1	3.348	0.489	72.5	2.5	204.5	106
ETSC14600-4-3	3.340	0.488	72.7	2.3	230.5	111.5
ETSC15410-8-3	3.336	0.513	68.5	2.5	207.3	107.5
ETSC14789-3-2	3.322	0.514	66.3	2.7	244.3	107
ETSC14722-1-2	3.321	0.514	68.5	2	213.3	104.5
ETSC14252-3-2	3.316	0.510	68.3	2.7	196.5	106.3
ETSC15437-2-2	3.312	0.513	72.3	3.3	199.5	107.7
ETSC15461-3-1	3.309	0.511	71.5	2	182.5	107.5
ETSC14590-4-5	3.299	0.521	73.3	3.7	217.3	112
ETSC14806-5-1	3.266	0.489	70.7	3.3	226.2	110
ETSC14195-1-1	3.248	0.519	64	3	232.7	103.3
ETSC14197-10-4	3.237	0.511	68.3	2	198.7	107
ETSC14744-1-1	3.234	0.514	69	2.7	209.5	109.7
ETSC14793-5-1	3.220	0.524	72	3.7	205	112.3
ETSC15534-1-1	3.206	0.494	64.3	3.7	217.2	103.7
Argiti	3.136	0.444	73.5	3	206.6	111.5
Melkam	2.781	0.446	74.3	3.3	167.2	118.5

Table 2. BLUPs for grain yield of those advanced early maturing lines advanced lines sorted by Overall average descending order

SN	Genotype	Pedigree	KB	MS	SH	Overall Average
495	ETSC15438-4-1	14MILSDT7086/Meko-1	5.763	3.001	2.446	3.740
455	ETSC15396-5-1	M36121/P9402/Gambella1107	5.285	2.615	2.490	3.460
3	ETSC14019-4-2	Teshale/SRN39	5.051	2.623	2.461	3.380
135	ETSC14596-4-3	Meko-1/13sudanint#27	5.380	2.420	2.334	3.380
230	ETSC14715-4-1	13MIF5#5024/13sudanint#13-2	5.064	2.680	2.338	3.360
150	ETSC14600-4-3	Gambella1107/13sudanint#27	4.715	2.616	2.685	3.340
333	ETSC14806-5-1	ICSV93041/13sudanint#11-3	5.238	2.667	2.091	3.330
25	ETSC14252-3-2	ETSL101866/S35	4.712	2.642	2.549	3.300
195	ETSC14686-2-1	Hodem-1-3/13sudanint#27	4.933	2.455	2.382	3.260
14	ETSC14195-1-1	IESV92045DL/Gobiye	5.271	2.316	2.156	3.250
462	ETSC15410-8-3	14MILSDT7402/E36-1	5.219	2.196	2.320	3.240
90	ETSC14581-3-2	Meko-1/13sudanint#12	4.891	2.596	2.200	3.230
310	ETSC14793-1-2	ICSR56/13sudanint#27	4.920	2.644	2.108	3.220
307	ETSC14789-3-2	NTJ2/13sudanint#14	4.862	2.433	2.353	3.220
241	ETSC14722-1-2	IESV92084DL/13sudanint#27	4.898	2.589	2.153	3.210
128	ETSC14590-4-5	Gambella1107/13sudanint#13-2	4.976	2.218	2.430	3.210
294	ETSC14773-1-3	ICSV96143/13sudanint#11-3	4.747	1.810	3.042	3.200
466	ETSC15412-6-2	14MILSDT7402/Gambella1107	4.875	2.454	2.256	3.190
311	ETSC14793-5-1	ICSR56/13sudanint#27	4.971	2.688	1.921	3.190
418	ETSC15363-1-2	S35/Gambella1107	4.742	2.596	2.236	3.190
492	ETSC15437-2-2	14MILSDT7086/Gambella1107	4.732	2.484	2.351	3.190
266	ETSC14737-5-1	AG_8/13sudanint#11-3	5.101	2.226	2.228	3.180
441	ETSC15385-2-2	WSV387/P9405/Meko-1	4.712	2.399	2.434	3.180
124	ETSC14589-6-2	Teshale/13sudanint#13-2	4.822	2.289	2.418	3.180
1	Argiti	WSV387/P9403	5.069	2.136	2.305	3.170
510	Melkam	WSV387	4.604	2.160	1.682	2.820

Activity 9. Early maturing sorghum national variety trial (21_12_17)
Activity period:
Objective:

Responsibility:

Period of report:
Reported by:
Summary of Research Progress
Locations:
Design:
Treatment:

Summary of Result

Plan for the next year:

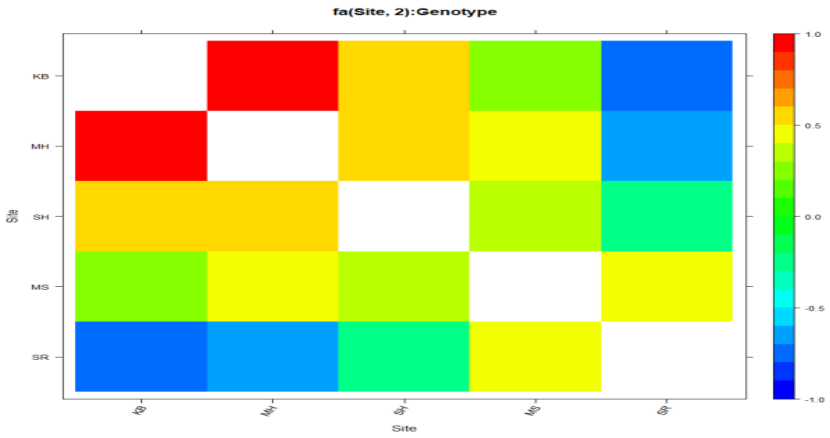


Figure1 : Genetic correlation between testing sites showed the magnitude of relation between those locations for testing such like genotypes

Activity 10:
Activity period :
Objective:

Responsible persons:
Period of report:
Reported by:
Summary of research progress
Location:
Design:
Treatment:
Summary of Result

Table 14: Performance of mutant lines based on their stand establishment evaluated at MARC

I	J	R
Genotype	Pedigree	TrialUnitComment
Degalite#2542_200 irr & 200GY	Degalite yellow	
Degalite#2542_300 irr & 300GY	Degalite yellow	Selected
Degalite#2542_400 irr & 400GY	Degalite yellow	Poor stand
Degalite#2542_500irr & 500GY	Degalite yellow	null
Melkam#3813_200 irr & 200GY	WSV387	
Melkam#3813_300 irr & 300GY	WSV387	Selected
Melkam#3813_400 irr & 400GY	WSV387	Poor stand
Melkam#3813_500irr & 500GY	WSV387	null

Activity 11:

Activity period:
Objectives:

Responsibilities:
Period of report:
Reported by:
Summary of Research Progress
Location:
Design:
Treatment:
Summary of Result

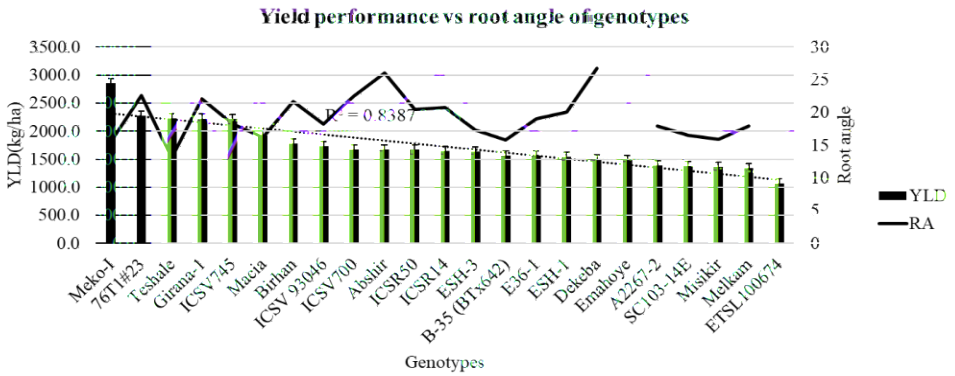


Figure 1: Root angle and grain yield correlation of the advanced genotypes

Activity 12:
Activity period:
Objective:

Responsibilities:

Period of report:
Reported by:
Summary of Research Findings
Location:
Design:
Treatment:
Summary of Result

Table 1: performance for important agronomic traits of top selected genotypes as compared to the recent released variety (Argiti) check

Genotypes	Pedigree	YLD (Qt/ha)	DTF	PHT	PAS
ETSC14673-2-1	America-1/13sudanint#14	34.1	78.3	296.1	3.5
ETSC14298-2	Baduqane/2372	30.4	75.5	248.0	3.0
ETSC14688-7	AbaAre-1/13sudanint#27	29.4	73.0	266.0	2.0
ETSC14295-1	Berjokecoll#1/2372	27.2	75.0	229.0	2.0
ETSC14425-8-1	Baduqane/Meko	27.1	76.5	267.0	3.0
ETSC14674-2	Baduqane/13sudanint#14	26.8	74.8	267.6	2.0
ETSC14418-8	Jamiyu/Meko	26.5	73.8	269.8	1.5
ETSC14425-7-1	Baduqane/Meko	26.2	75.5	229.3	2.5
ETSC14655-1-1	Berjokecoll#1/13sudanint#13-2	26.1	73.5	276.3	2.0
ETSC14290-3-2	Gorade-2/2372	26.0	76.5	306.8	3.0
ETSC14616-6-1	Jigurti/13sudanint#10-1	25.8	72.5	244.3	3.5
ETSC14671-2	Berjokecoll#1/13sudanint#14	25.7	77.5	309.5	2.5
ETSC14256-4	Jigurti/S35	25.4	75.5	283.5	3.5
ETSC14418-6-2	Jamiyu/Meko	25.2	75.5	259.8	3.0
ETSC14290-3-1	Gorade-2/2372	24.9	77.3	273.8	2.8
ETSC14616-9-2	Jigurti/13sudanint#10-1	24.5	73.5	293.8	2.5
Argiti	WSV387/P9403	22.0	72.5	223.5	2.0

Activity 13:

Activity period:
Objective:

Person responsible:

Period of report:
Reported by:
Summary of Research Progress
Location:
Design:
Treatment:

Summary of Result

Table 1: List of candidates evaluated at verification trial (left)

No	Genotype	Pedigree
1	14MW LSDT 7114	2005MI5060/E-36-1
2	14MW LSDT 7196	WSV387/76T1#23
3	14MW LSDT 7329	SDSL2690-2/76T1#23
4	2005MI5064	WSV387/P9504

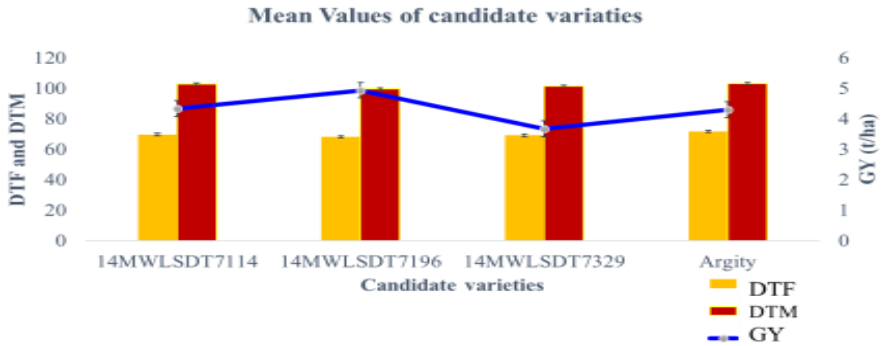


Figure 1: Grain yield performance of the candidates across testing sites

Activity 14:
Activity period: June,
Objective:

Responsible persons:

Period of report:
Reported by:
Summary of finding
Location:
Design:
Treatment:
Summary of Result

Activity 15:
Activity period:
Objective:

Responsibility

Period of report:
Reported by:
Summary of finding:
Location:
Design:
Treatment:

Summary of Result

Plan for the next year:

Project title:

Project period:
Activity1 title:

Activity period:
Objective:

Responsible person:
Reported by:
Year of report:
Summary of the progress
Design:

Treatment:

Location:
Summary of Result

Plan for the next year:

Activity 2:

Activity period:
Objective:

Responsible person:
Reported by:
Year of report:
Summary of the progress
Design:
Treatment:

Location:
Summary of Result

Plan for the next year:

Activity 3:
Activity period:
Objective:

Responsible person:
Reported by:
Year of report:
Summary of the progress
Design:
Treatment:
Location:
Result

Plan for the next year:
Activity 4
Activity period:
Objective:

Responsible person:
Reported by:
Year of report:
Summary of the progress
Design:

Treatment:
Location:
Result

Plan for the next year:

Activity5
Activity period:
Objective:

Responsible person:
Reported by:

Year of report:
Summary of the progress
Design:

Treatment:
Location:
Summary of Result

Plan for the next year:

Activity 6:
Activity period:
Objective:

Responsible person:

Reported by:
Year of report:
Summary of the progress
Design:

Treatment:
Location:
Summary of Result

Plan for the next year:

Project title:

Product concept:
Project period:
Activity1:
Activity period:
Objective:

Responsible person:

Reported by:
Year of report:
Summary of the progress
Design:
Treatment:
Location:
Summary of Result

Plan for the next year:

Activity 2

Activity period:
Objective:

Responsible person:

Reported by:
Year of report:
Summary of the progress
Design:
Treatment:
Location:
Summary of Result

Plan for the next year:

Activity 3:

Activity period:
Objective:

Responsible person:
Reported by:
Year of report:
Summary of the progress
Design: R
Treatment:
Location:
Summary of Result

Plan for the next year:

Activity4

Activity period:
Objective:

Responsible person:
Reported by:
Year of report:
Summary of the progress
Design:
Treatment:

Location:
Summary of Result

Plan for the next year:

Activity 5
Activity period:
Objective:
Responsible person:
Reported by:
Year of report:
Summary of the progress
Design:
Treatment:
Location:
Summary of Result

Plan for the next year:

Activity6 title

Activity period:
Objective:

Responsible person:

Reported by:
Year of report:
Summary of the progress

Design:
Treatment:
Location:
Summary of Result

Plan for the next year:

Activity 7

Activity period:
Objective:

Responsible person:
Reported by:
Year of report:
Summary of the progress
Design:
Treatment:
Location:
Summary of Result

Plan for the next year:

Activity8

Activity period:
Objective:

Responsible person:

Reported by:
Year of report:
Summary of the progress
Design:
Treatment:
Location:
Summary of the Result

Plan for the next year:

Table 4. Mean grain yield (Kg/ha) performance and other few traits of sorghum adaptation trial 2018 at Kurmuk (750masl) and Homosha

Entry #	Kurmuk					Homosha			
	Variety	PHT	DTF	PAS	YLD	YLD	PAS	DTF	PHT
1	Birhan	150	61	2.7	786	963	3	68.33	158.3
2	Gobiye	143.3	60	3	612	937	3	70.67	151.7
3	Abshir	163.3	62.33	2.7	526	769	2.6	71	165
4	Melkam	173.3	62.33	1	2464	1055	2.3	68	168.3
5	Deqaba	145	67.33	2.7	1075	1594	2	73.67	158.3
6	Meko	181.7	56.67	2	1515	622	3	64	168.3
7	Gembella1107	193.3	64.67	1.7	1804	1525	2	72	188.3
8	Assosa-1	200	120.67	2	1354	2702	1	132	183.3
9	Adukara	193.3	121.33	2.7	1255	2554	1.3	128.33	168.3
10	Bobeadi(local)	328.3	126.67	3	1265	2265	2	132.33	308.3
CV		8.2	1.8	27.2	7.6	20.8	13.9	1.4	6
LSD		26.17	2.48	1.09	164.6	534.74	0.53	2.11	18.72
Level of sign.		**	**	*	**	**	**	**	**

Note: "**"- significant at 1% (0.01) and "*" significant at 5%(0.05), YLD-grain yield, DTM-days to maturity, DTF- days to flowering, PHT- plant height, 1000GW-Thousand grain weight, PAS- Overall Plant aspect.

Activity 9:
Activity period:
Objective:

Responsible person:

Reported by:
Year of report:
Summary of the progress
Design:
Treatment:
Location:
Summary of Result

Plan for the next year:

Activity 10:

Activity period:
Objectives:

Responsible person:
Reported by:
Year of report:
Summary of the progress
Design:
Treatment:
Location:
Summary of Result

Table1.Mean grain yield (Kg/ha), performance and other few traits of eight time of nitrogen application to improve productivity of sorghum in Benishangul-Gumuz

No	Treatments	Ph	No hp/p	H wt kg/p	Yld kg/Ha
1	Applying all recommended N rate at planting	184.3	171.0	15.5	4764.0
2	Applying 1/2 at planting+1/2 at knee height (control),	189.0	174.0	16.7	5199.7
3	Applying 1/2 at planting+1/2 at near flowering,	180.0	159.3	15.7	4938.3
4	Applying 1/3 at planting+1/3 at knee height+1/3 at near flowering	182.0	170.7	15.5	5112.6
5	Applying 1/3 at planting+2/3 at knee height	182.7	185.3	15.5	4793.0
6	Applying 1/3 at planting+2/3 at near flowering,	183.7	161.3	16.2	4618.7
7	Applying 2/3 at planting+1/3 knee height	191.7	184.7	16.3	4851.1
8	Applying 2/3 at planting+1/3 at near flowering.	184.0	166.3	15.0	4851.1
LSD (0.05)		**15.04**	**24.08**	**2.03**	**668.65**
CV		**4.651**	**8.015**	**7.332**	**7.806**
P-value		**0.7509**	**0.2542**	**0.6942**	**0.6475**

Plan for the next year:

Project title:

Project period:
Activity 1:

Activity period:
Persons responsible

Reported by:
Year of report:
Summary of the progress

Design:
Treatment:
Location:
Summary of Result

Table 1. Group of parental lines used for crossing in 2018 season

Group	Desirable trait	Number of genotypes	Parent type
G-I	Anthracnose and grain mold resistance	2	Male
G-II	Grain yield and quality	7	Male
G-III	Advanced breeding lines	6	Female
Total number of genotypes used		15	

Table 2. List of parental lines and their merits used for crossing for 2018 crop season

#	Genotype	Parents	Traits
1	PML 981475	Male	Anthracnose and grain mold resistance
2	BTX378	Male	Anthracnose and grain mold resistance
3	Degalit yellow	Male	Farmer preferred landrace
4	Jiru	Male	Grain yield and quality
5	Debaba	Male	Grain yield and quality
6	Adelle	Male	Grain yield and quality
7	ETSC11013-1	Male	Grain yield and quality
8	ETSC11019-1	Male	Grain yield and quality
9	ETSC11019-4	Male	Grain yield and quality
10	ETSC11028-2	Female	Advanced breeding lines
11	ETSC11013-1	Female	Advanced breeding lines
12	ETSC11019-1	Female	Advanced breeding lines
13	ETSC11028-1	Female	Advanced breeding lines
14	ETSC11019-4	Female	Advanced breeding lines
15	ETSC11028-3	Female	Advanced breeding lines

Activity 2:
Activity period:
Persons responsible:
Reported by:
Year of report:
Summary of the progress
Design:
Treatment: 64
Location:
Summary of Result

Table 1: Number of populations grown and selected heads at different testing sites of sorghum segregating generations.

Testing site	Generation	Number of populations	
		tested	Selected heads
MARC	F1	38	38
Negelle-Arsi	F2	26	383

Activity 3:
Activity period:
Persons responsible:
Reported by:
Year of report:
Summary of the progress
Design:
Treatment: 52
Location:
Summary of Result

Project
Project Title 1:

Project Fund Source:
Project Coordinating Center:
General Project Manager:
Project consultant:
Sorghum Component Project PI:)
Project Implementing Centers:

Summary of Result

Component 1. Strategic planning for capacity improvement for target breeding programs in EIAR
Output 1.1.

Output 1.2. Human capacity development programs are implemented

Component 2. Enhanced varietal development pipelines
Output 2.1

Table 1: Planned and successful crosses in 2018

Product concepts	Title of PCs	Number of Crosses planned	Number of successful crosses	Number of parents
2	Early maturing varieties with acceptable yield, quality and biomass and resistant to drought and striga	200	203	53
3	High yielding hybrids with acceptable quality and biomass production and resistant to striga for dry lowlands	120	128	80
4	Long duration OPVs with acceptable grain yield and striga and anthracnose resistance for humid lowland	50	68	20
5	Long duration OPVs with acceptable grain yield and anthracnose resistance for highlands	40	52	15
6	Intermediate maturing OPVs with acceptable grain yield, grain mold and anthracnose resistance for intermediate agro-ecologies with high rainfall	40	62	16

Table 2. Advanced generations and yield trials of sorghum for different product concepts in 2018/2019

Product Type	Parents involved	#Effective crosses	F2-F4 generation	Preliminary variety trial# genotypes	National variety trial #genotypes	Variety verification trial# candidate genotypes
PC1	20	80	1100	135	0	0
PC2	60	203	5300	560	90	6
PC3	92	180	0	136	87	0
PC4	22	70	470	270	60	0
PC5	14	50	437	150	52	
PC6	14	60	160	100	60	0

Table 3. Generation advancement and yield testing for sorghum crossing program

Year	Season	Generation stage	Project
2016	Main	Crossed	MERCI
2016/17	Off	F1 selfing	MERCI
2017	Main	F2 field	MERCI
2018	Main	F3 Field	MERCI
2019	Off season	F4 Were(Field)	MERCI
2019	Main	F5 PVT Yield	MERCI

Output 2.2 Relevant mechanization and efficiency measures are developed and implemented Nomenclature and systems suitable for electronic data storage

Costing tool:

Output 2.4. Quality Support for breeding programs

Output 2.7. Outsourced marker support for breeding pipelines

Table 4 . List of set of genotypes for second round of genotyping

Genotype "group"	Number of individuals	Project	AUD	USD*
Anthracnose Phenotyping	152	iMashilla	3,800	2,546
Ethiopian Landrace collection	15	iMashilla	375	251
PC4NVT	24	MERCI	600	402
PYT 2018	482	MERCI	12,050	8,074
PYT 2019	673	IDRC	16,825	11,273
Crossing Parent	67	MERCI	1,675	1,122
Total	1413		35,325	23,668

Output 2.8. Enhanced statistical designs and analyses support

Project title:

Project period:

Activity 1.
Activity period:
Objective:
Persons responsible:

Reported by:
Year of report:
Summary of the progress
Design:
Treatment:

Location:
Summaey of Result

Plan for the next year:

Activity 2:

Activity period:
Objective:

Responsible person:
Reported by:

Year of report:
Summary of the progress
Design:
Treatment:

Location:
Summary of Result

Plan for the next year:

Activity 3:

Activity period:
Objective:

Responsible person:
Reported by:
Year of report:
Summary of the progress
Design:
Treatment:

Location:
Result:

Plan for the next year:

Activity 4:

Activity period:
Objective:
Responsible person:
Reported by:
Year of report:
Summary of the progress
Design:

Treatment:

Location:
Summary of Result

Plan for the next year:

Activity 5.
Activity period:
Objective:
Responsible person:
Reported by:
Year of report:
Summary of the progress
Design:

Treatment:

Location:
Summary of Result

Plan for the next year:

Activity 6:
Activity period:
Objective:

Responsible person:
Reported by:
Year of report:
Summary of the progress
Design: ,

Treatment:

Location:
Summary of Result

Plan for the next year:

Activity 7

Activity period:
Objective:
Responsible person:

Reported by:
Year of report:
Summary of the progress
Design:
Treatment:

Location:
Summary of Result

Plan for the next year:

Activity period:
Objective:

Responsible persons:

Reported by:
Year of the report:
Summary of the progress
Location:
Design:
Summary of Result

Table1. Demonstration plots established for sorghum and F. millet technologies (2016-2018)

Crop	2016		2017		2018		Cumulative		2019	2020	Total
	plan	Achiv	plan	Achiv	plan	Achiv	plan	Achiv	plan	plan	
Sorghum	170	13o	180	83	180	194	530	407	200	250	980
Finger millet		54		6		40		100			
Total plan	170		180		180		530				
Total achiv	184		89		234		507				
% achiv	108.24		49.44		130		95.7				

Activity title 9:

Activity period:

Objective:

Responsible Persons

Reported by:
Year of the report:
Summary of the progress
Location:
Design:
Summary of Result

Table 25. Small seed pack distribution in 2018 (sorghum)

Regional state	variety	No pack	Amount (qt)
Tigray	Melkam	878	19.1
	Dekeba	963	30
	Girana-1	24	0.36
	Birhane	50	1
	S/total	**1,915**	**50.46**
Amhara	Melkam	4400	65
	ESH-1	140	2.1
	s/total	**4,540**	**67.1**
Oromia	Melkam	4008	71
	Jiru	60	0.6
	Dibaba	60	0.6
	ESH-1	146	2.19
	s/total	**4,274**	**74.39**
Total Sum		**10,729**	**192**

Activity 10.

Activity period:
Objective:

Responsible persons:

Reported by:
Year of the report: January 2018-December 2018
Summary of the progress
Location:

Summary of Result

Activity title 11.

Activity period:
Objective:

Responsible persons:
Reported by:
Year of the report:
Summary of the progress
Location:
Design:
Summary of Result

Activity title 12. Linking sorghum grain with consumers through packaging of semi processed grain

Activity period:
Objective:

Responsible persons:
Reported by: **Year of the report:**

Summary of the progress
Location: Amhara, Oromia, Tigray regions
Design:
Summary of Result

Project title: Sorghum Genomics Toolbox: TERRA Partnership
Project Period:
Activity 1:

Activity period:
Objective:

Responsible persons:

Reported by:
Year of report:
Summary of the progress

Plan for the next year:

Activity 2:

Activity period:

Objective:

Responsible persons:

Reported by:
Year of report:
Summary of the result

Plan for the next year: **g**

Activity 3:

Activity period:
Objective:

Responsible persons:

Reported by:
Year of report:
Summary of the progress

Plan for the next year:

Activity 4:

Activity period:
Objective:

Responsible persons:

Reported by:
Year of report:
Summary of Result

Plan for the next year:

Activity 5:

Activity period:
Objective:

Responsible persons:
Reported by:
Year of report:
Summary of the result

Plan for the next year:

Activity 6:

Activity period:
Objective:

Responsible persons:

Reported by:
Year of report:
Summary of the progress

Responsible person:

Reported by:
Year of report:
Summary of the progress
Design:
Treatment:
Location:
Summary of Result

Plan for the next year:

Activity 2:
Activity period:
Objective:
Responsible person:

Reported by:
Year of report:
Summary of the progress
Design:
Treatment:
Location:
Summary of Result

Figure 1. MARC and Kobo have had a fruitful discussion with Prof Gebisa and Prof Tesfaye during sorghum trial evaluation in Kobo, November, 2018

Plan for the next year:

Activity 3:
Activity period:
Objective:
Responsible person:

Reported by:
Year of report:
Summary of the progress
Design: R
Treatment:
Location:
Summary of Result

Plan for the next year:

Activity 4:
Activity period:
Objective:
Responsible person:

Reported by:
Year of report:
Summary of the progress
Design:
Treatment:
Location:
Summary of Result

Figure 2.trial evaluation in Kobo, November, 2018

Plan for the next year:
Activity 5

Activity period: July, 2017- Jan, 2018
Objective:

Responsible person:

Reported by:
Year of report:
Summary of the progress
Design:
Treatment:
Location:
Summary of Result

Table 1. Parental seed production for ESH-4 and ESH-5

Parental lines	Area (m2)	Yield (Kg)
P9501A	255	27
P9511A	255	14
PU209A	255	27
P9501B	90	35.5
P9511B	90	22
PU209B	90	26
PU304R	484	200
PRL020817	161	80
PU209AxPU209B	2500	880
ESH4	693	68
ESH5	678	20

Plan for the next year:

Activity6: Basic seed production of parental lines of ESH-5 (A , B & R lines)
Activity period:
Objective:

Responsible person:

Reported by:
Year of report:
Summary of the progress
Design:
Treatment:
Location:
Summary of Result

Plan for the next year:

Activity 7:
Activity period:
Objective:

Responsible person:

Reported by:
Year of report:
Summary of the progress
Design:
Treatment:
Location:
Summary of Result

Figure 1.Hybrid seed multiplication of ESH4 by Oromia Seed Enterprise, Gololcha, October, 2018

Plan for the next year:

Activity 8:
Activity period:
Objective:

Responsible person:

Reported by:
Year of report:
Summary of the progress
Design:
Treatment:
Location:
Summary of Result

Plan for the next year:

Activity 9:
Activity period:
Objective:

Responsible person:

Reported by:
Year of report:
Summary of the progress
Design:
Treatment:
Location:
Summary of Result


Figure 1. Field day in Asgedetsimbila District, Tigray region, 20 Oct 2018

Plan for the next year:

Activity 10:

Activity period:
Objective:

Responsible person:

Reported by:
Year of report:
Summary of the progress
Design:
Treatment:
Location:

Summary of Result

Plan for the next year:

[redacted]

Agronomy and Crop Physiology Research

Feyera Merga

Lowland pulse agronomy

Research process:
Program/case team:
Project 1.

Project period:
Activity 1.

Activity period:
Objective: -

Responsible persons:
Reported by:
Year of the report:
Summary of the progress

Design:
Treatment:
Early maturing - KAT-B1

Maize varieties for Meisso

Location:
Summary of Results

Table 1 Response of maize varieties to beans compatibility in maize bean IC at MARC.

Treatment	DT	DS	DM	PH (cm)	NCP	NSPC	HSW(gm)	GY kg/ha
Melekassa-2+ KAT-B1	73.6^{a}	75.6^{a}	126^{a}	234.6^{a}	67^{ba}	485.1^{a}	24.6	3761^{cb}
Melekassa-2+ Awash-2	73.6^{a}	75.6^{a}	126^{a}	238.6^{a}	73.3^{a}	431.2^{ba}	26.7	3059^{c}
Melekassa-2+ Deme	73.6^{a}	75.6^{a}	126^{a}	229^{bac}	70^{ba}	467.4^{ba}	23.5	3993^{cb}
Melekassa-4+ KAT-B1	61.3^{b}	65.6^{b}	119^{b}	210^{d}	60^{b}	389.1^{ba}	20.8	2681^{c}
Melekassa-4+ Awash-2	61.3^{b}	65.6^{b}	119^{b}	208^{d}	61.3^{b}	374.5^{b}	25.6	3790^{cb}
Melekassa-4+ Deme	61.3^{b}	65.6^{b}	119^{b}	210.6^{dc}	61.6^{b}	393.1^{ba}	23.3	2394^{c}
Melekassa-2(sole)	73.3^{a}	75.3^{a}	126^{a}	230^{ba}	68.3^{ba}	432.1^{ba}	30	6702^{a}
Melekassa-4 (sole)	61.3^{b}	65.6^{b}	119^{b}	215^{bdc}	66.6^{ba}	426^{ba}	26	6145^{ba}
LSD5%	0.99	1.58	0	18.4	10.5	101.5	9.57	2525
CV%	0.85	1.29	0	4.78	9.18	13.8	22.2	35.8
Sig.	*	*	*	*	*	*	ns	*

Table 2. Response of beans variety to maize bean IC compatibility at MARC

Treatment	DF	DM	PH (cm)	NPPP	NSPP	HSW (gm)	GY (kg/ha)
Melekassa-2+ KAT-B1	26.1^{d}	82.3^{ef}	33.0^{d}	4^{cb}	3.6	39.6^{a}	726.3^{c}
Melekassa-2+ Awash-2	31.3^{b}	84^{dc}	41.6^{bc}	9.6^{cb}	4	17.3^{b}	749.3^{c}
Melekassa-2+ Deme	28.0^{c}	85.3^{bc}	48.3^{a}	3.6^{c}	3.6	37.6^{a}	689.0^{c}
Melekassa-4+ KAT-B1	26.0^{d}	82.3^{ef}	32.6^{d}	5.3^{cb}	3.3	38.6^{a}	702.3^{c}
Melekassa-4+ Awash-2	32.1^{a}	83.3^{def}	46.6^{ab}	8.3^{cb}	4.3	19.6^{b}	860.0^{cb}
Melekassa-4+ Deme	28.0^{c}	87^{a}	49.0^{a}	4.6^{cb}	3	41.6^{a}	701.0^{c}
KAT-B1 (sole)	26.0^{d}	82^{f}	36.6^{cd}	11.6^{b}	3.6	39^{a}	2269.7^{a}
Awash-2 (sole)	32.0^{a}	83.6^{de}	42.0^{bc}	32.0^{a}	3.3	19.6^{b}	1831.0^{a}
Deme (sole)	28.0^{c}	86.6^{ba}	48.3^{a}	9.3^{cb}	3	40.3^{a}	1263.7^{b}
LSD5%	0.66	1.61	5.91	7.8	1.4	9.8	509.7
CV%	1.34	1.12	8.2	46.1	22.9	17.5	27.3
Sig.	*	*	*	*	ns	*	*

Table 3. Response of maize variety to maize bean IC compatibility at Meisso

Treatment	DT	DS	DM	PH (cm)	NCPP	NSPC	HSW (gm)	GY kg/ha
Melekassa-1+ KAT-B1	41.3^{bac}	44.3^{cb}	96.3^{ba}	166^{c}	43	380.9	16.2^{b}	1594.2^{b}
Melekassa-1+ Awash-2	40^{c}	44.3^{cb}	96.3^{ba}	169^{cb}	44.6	330.6	20.9^{a}	1734.6^{ba}
Melekassa-1+ Deme	40^{c}	44^{c}	96.6^{a}	166^{c}	50.6	337.4	19.3^{ba}	2070.1^{ba}
Melekassa-7+ KAT-B1	41^{bc}	45^{ba}	95^{b}	177^{ba}	52.3	389.1	19.2^{ba}	1904.1^{ba}
Melekassa-7+ Awash-2	42.6^{a}	45.3^{a}	95^{b}	183.6^{a}	50.6	356.9	18.7^{ba}	1754.4^{ba}
Melekassa-7+ Deme	41.6^{ba}	45^{ba}	95^{b}	181.3^{a}	52	323.4	19.4^{ba}	1757.9^{ba}
Melekassa-1(sole)	40^{c}	44^{c}	97^{a}	167.6^{cb}	44	334.3	20.2^{ba}	2132.7^{a}

Table 4. Response of beans variety to maize bean IC compatibility at Meisso

Treatment	DF	DM	PH (cm)	NPPP	NSPP	HSW(gm)	GY(kg/ha)
Melekassa-1+ KAT-B1	41.6	81^{c}	34.6^{c}	5.7^{ba}	3.3	29.8^{a}	798.2^{b}
Melekassa-1+ Awash-2	41.6	83^{b}	43.6^{cb}	7.3^{a}	3.3	15.7^{c}	330.4^{d}
Melekassa-1+ Deme	41.6	87^{a}	53.6^{a}	4.0^{b}	3.3	24.6^{b}	141.6^{e}
Melekassa-7+ KAT-B1	42	81.3^{c}	34.6^{c}	7.0^{ba}	3.3	29.9^{a}	543.1^{c}
Melekassa-7+ Awash-2	41.3	82.6^{b}	42^{c}	6.7^{ba}	3.0	15.3^{c}	303.6^{d}
Melekassa-7+ Deme	41.3	86.3^{a}	56.6^{a}	6.7^{ba}	3.3	26.7^{ba}	175.3^{e}
KAT-B1 (sole)	41.3	81.3^{c}	35.3^{c}	8.0^{a}	3.6	27.6^{ba}	995.3^{a}
Awash-2 (sole)	42	82.3^{b}	51.6^{ba}	7.7^{a}	4	14.9^{c}	827.7^{b}
Deme (sole)	41.3	86.3^{a}	59.6^{a}	7.7^{a}	3.3	25.9^{ba}	749.4^{b}
LSD5%	1.04	0.99	9.03	3.23	1.32	4.07	120.4
CV%	1.46	0.69	11.5	27.9	22.5	10.1	12.9
Sig.	Ns	*	*	*	ns	*	*

Table 5 Response of maize and bean as sole and intercropping on LER productivity

Treatments	MARC			Meisso		
	Maize yield (kg/ha	Beans yield (kg/ha)	LER	Maize yield (kg/ha	Beans yield (kg/ha)	LER
Melekassa-1+ KAT-B1	3761	726.3	0.88	1594.2	798.2	1.55
Melekassa-1+ Awash-2	3059	749.3	0.87	1734.6	330.4	1.21
Melekassa-1+ Deme	3993	689	1.14	2070.1	141.6	1.16
Melekassa-7+ KAT-B1	2681	702.3	0.75	1904.1	543.1	1.50
Melekassa-7+ Awash-2	3790	860	1.09	1754.4	303.6	1.24
Melekassa-7+ Deme	2394	701	0.94	1757.9	175.3	1.11
Sole	6702	2269.7		2132.7	995.3	
Sole	6145	1831		2001.4	827.7	
Sole		1263.7			749.4	

Plan for the next year:

Activity 2.
Activity period:
Objective:

Responsible persons:
Reported by:
Year of the report:
Summary of the progress

Design:
Treatments:
Locations:
Summary of Result:

Plan for the next year:

Project title-2

Project period:
Activity 1.

Activity period:
Objective:

Responsible persons:
Reported by:
Year of the report:
Summary of the progress

Design:
Treatments:

Locations:
Summary of Result

Table 1. Plant height, pod length, number of seed per plant, number of pods per plant and biomass yield of mung bean as influenced by the main effect of irrigation rates and row spacing

Treatment[$]	PH	PL	NSPP	NPPP	BY
Irrigation rate					
100	49.71a	10.28a	11	19	6567.5a
75	43.31b	8.59b	10	16	3815.1b
50	36.59c	7.11c	10	15	2788.7c
LSD	1.219	0.534	NS	NS	293.1
Row spacing					
30	43.95a	8.72ab	10	16	4167.5b
40	45.30a	9.01a	11	17	4498.8a
50	40.35b	8.26b	10	16	4505.1a
LSD*	1.219	0.534	NS	NS	26
CV%	2.8	6.2	17.28	19.24	6.7

[$]PH= plant height, PL=pod length, NSPP=number of seeds per pod, NPPP=Number of pods per plan and BY= biomass yield, LSD= list significant difference. *NS = non-significant, means with the same letters in the same column are not significantly at P≤0.05; CV=coefficient of variance.

Table 2. Interaction effect of Irrigation rates and row spacing on thousand kernel weight and Grain yield of mung bean.

Treatment*		TKW (g)	GY (kg^{-1} ha)
Inter	**Intra**		
100	30	56.42a	4267ab
	40	57.38a	4559a
	50	53.66a	38.8abc
75	30	47.87b	3308cd
	40	47.94b	3392bcd
	50	44.29bc	2933dc
50	30	40.98c	2600d
	40	43.92bc	2808d
	50	43.80bc	2667d
LSD	3.108		214.34
CV%	3.7		8.7

[$]TKW= thousand kernel weight, and GY= grain yield, LSD= list significant difference; *NS = non-significant, Means with the same letters in the same column are not significantly at P≤0.05, CV=coefficient of variance.

Plan for the next year:

A. Maize Agronomy Research

Project title:
Project period:
Activity

Activity period:
Objective:

Responsible persons:
Reported by:
Year of the report:
Summary of the result

Design:
Treatments:
Locations:
Summary of the result:

Table 6: Yieldperformance of released MARC Vars under low N and optimum condition

Varieties	Grain yield (kg/ha)	
	Optimum	Low N
Melkassa 1	1847.0^{c}	125.4^{h}
Melkassa 1Q	2851.4^{b}	311.2^{h}
Melkassa 2	**3854.4^{a}**	**3082.2^{a}**
Melkassa 3	3570.8^{a}	1673.1^{cd}
Melkassa 4	3738.2^{a}	1639.3^{d}
Melkassa 5	1822.3^{c}	814.2^{g}
Melkassa 6	3645.1^{a}	1948.6^{c}
Melkassa 7	2435.4^{bc}	1150.2^{ef}
MH -130	**3637.1^{a}**	**2547.1^{b}**
MH-138Q	2172.2^{c}	1071^{fg}
MH-140	2065.5^{c}	1390de
LSD(0.05)	618.96	284.46
CV(%)	12.6	11.66

Plan for the next year:

Activity

Activity period:
Objective:

Responsible persons:
Reported by: BahiruTilahun
Year of the report:
Summary of the progress

Design:
Treatments:
Locations:
Summary of Result

Table 7: Yield Performance of Pipeline BARC Vars under low N and optimum condition

Entry #	Pedigree	Grain yield (kg/ha)	
		Optimum	Low N
1	CKDHL0089/CKDHL0295//CKLTI0344-B	4495.3ch	2292dh
2	CKDHL0089/CKDHL0295//CKLTI0348-B	3567fk	2378bg
3	CKDHL0089/CKDHL0295//CKLTI0368-B	**6062.7**^{ad}	**3015**^{ad}
4	CKDHL0089/CKDHL0323//CKLTI0045	2975gk	1971fh
5	CKDHL0089/CKDHL0323//CKLTI0200-B	7180a	1754.7gh
6	CKDHL0089/CKDHL0323//CKLTI0348-B	1743k	1877.3gh
7	CKDHL0089/CKDHL0333//CKLTI0200-B	2702.3gk	773ij
8	CKDHL0089/CML395//CKLMARSI0677-B	6789.7a	1549.3hi
9	CKDHL0089/CML3953//CKLTI0036-B	**5986**^{ae}	**3148**^{ac}
10	CKDHL0089/CML395//CKLTI0368-B	2700.7gk	3163.7ab
11	CML312/CML395//CKDHL0089-B	3966.7ej	3800.3a
12	CML312/CML442//CKDHL0089-B	2248.3jk	2754.7bf
13	CML312/CCML442//CKDHL0411-B	5898.7ae	2250.3dh
14	CML312/CCML442//CKDHL0470-B	4445.3ci	2171.7eh
15	CML395/CCML444//CKLTI0200-B	3588.3fk	2809be
16	CML395/CCML444//CKLTI0344-B	4521.3ch	2099.3eh
17	CML395/CCML444//CKLTI0348-B	6429.3ac	2145.7eh
18	CML395/CCML444//CML539-B	5442.7af	1804.7gh
19	CML442/CCML444//CKDHL0295-B	3784.7fk	1699.7gh
20	CML78/P100C6-200-1-1-B***-B-B-B//CKDHL0089-B	4676.7bg	3780a
21	CKDHL0228/CML247//CKDHL120312-B	2587.7hk	2362.3bg
22	CKDHL0500/CKLTI0137//CKDHL120312-B	6724.7ab	2343.7ch
23	CKLTI0139/CKLMARSI0029//CKDHL120312-B	3540.7fk	718.3j
24	CKLTI0138/CML550//CKDHL120312-B	7132a	1645.3gh
25	BH546	2398ik	1964.3fh
26	MH140	3701.7fk	666.3j
27	MH130	6756.7ab	779.3ij
28	Melkassa-2	4261dj	756ij
	LSD(0.05)	2084.4	807.72
	CV(%)	28.23	23.63

Plan for the next year:

B. Sorghum Agronomy Research
Project title:

Project period:
Activity 1:

Activity period:
Objectives:

Responsible persons:
Reported by:
Year of the report:
Summary of the progress

Design:

Treatment:

Location:
Summary of Result

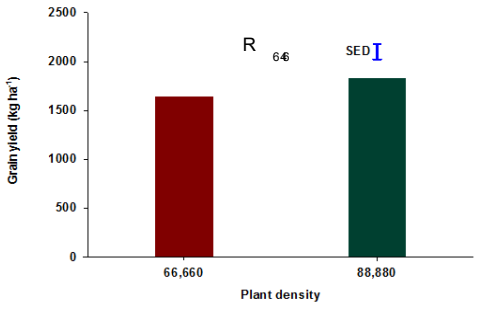
–

Table1. Effect of different cropping systems on grain and Stover yields of precedinglegumes and succeeding sorghum

Cropping systems*	Legumes		Succeeding sorghum					
	Grain	Biomass	Grain			Stover		
	kg ha^{-1}		kg ha^{-1}					
			N0	N30	N60	N0	N30	N60
LS			940	1224	1425	4021	4530	4607
FA--SCS			943	1177	1492	2420	3953	4766
CP--SCS		7944	1546	1719	1976	3101	4172	4328
CB--SCS	1058	3591	1200	1362	1430	3521	4421	5539
MB--SCS	147elW* nBT							

Table 1. P values from the analysis of variance for the significant effects of plant density (PD)and for the two-way (N X P) interactions (i.e., blue text in bold) of an experiment. Nitrogen and Phosphorus rates are partitioned into linear, quadratic, or cubic orthogonal polynomial contrasts.

		p values	
Source of variation		Main effect or interaction	
	DF	Grain	Stover
PD	1	0.029	0.673 NS
N X P	8	0.012	0.151 NS
Linear N X P	2	0.040	0.158 NS
Quadratic N X P	2	0.056 NS	0.214 NS
Cubic N X P	2	0.164 NS	0.716 NS
N X Linear P	4	0.041	0.085 NS
N X Quadratic P	4	0.032	0.412 NS



Effects of plant density on grain yield of sorghum

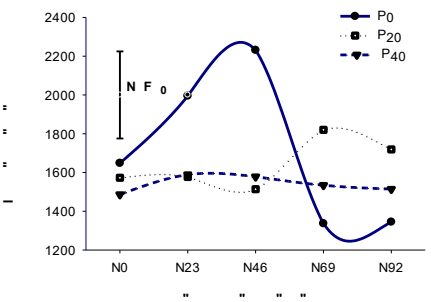


Figure 2. Effect of N X P fertilizer on grain yield of sorghum

Plan for the next year:

Activity 3:

Activity period:

Objectives:

Responsible persons:

Reported by:
Year of the report:
Summary of the progress

Design:

Treatment:
Management predictors

Environmental predictors

Genotype predictor

Location:
Summary of Results

Plan for the next year:

Horticultural Crop Research

Shimalis Aklilu

Warm Season Vegetable Research Program

Project title:

Project period:
Activity:

Activity period:
Objective:

Responsible person:

Reported by:
Year of report:
Summary of the progress

Design: RCBD
Treatment:
Location:
Results of the result

Table1: List of genotypes selected for grafting and compatibility study in hot pepper at MARC 2011 E.C

No.	Genotypes	Severity (0-5)	Vascular Discoloration (0-5)	Incidence (%)
1	Oda Haro	R (0.6)	R(1.0)	R(30.5)
2	Melka Shote	R(0.8)	R(2.0)	R(27.8)
3	PBC 602	R(1.0)	R(2.3)	R(33.3)
4	CCA 3288	R(1.0)	MR(2.7)	R(27.8)
5	Melka Dera	R(1.1)	MR(2.8)	R(33.3)
6	CCA 323	R(1.1)	MR(2.9)	MR (38.9)
7	ACC0206(1)	MS (2.4)	MS(2.1)	MR(50)
8	Dame	R(0.6)	S(3.7)	R(25)
9	CCA-984- A	MR(1.5)	R(2.6)	R(36.1)
10	Wangong no.2	MR(1.3)	MR(2.7)	MR(38.9)
11	Mareko Fana	HS(5)	HS(5)	HS(100)

Note: R=Resistant, MR=Moderately Resistant, S=Susceptible, MS= Moderately susceptible, HS=Highly Susceptible 0=Highly resistant, 5=Highly susceptible

Plan for the next year:

Program/case team:
Project:

Project period:
Activity:

Activity period:
Objective:
Responsible person:
Reported by:
Year of report:
Summary of the progress

Design:
Treatment:
Location:
Summary of Result

Plan for the next year:

Project 2:

Project period:
Activity title1:

Activity period:
Objective:

Responsible person:

Reported by:
Year of report:
Summary of the progress

Design:
Treatment:
Location:
Summary of Results

Plan for the next year:

Project title:

Project period:
Activity 1:
Activity period:
Objective:

Responsible person:

Reported by:
Year of report:
Summary of the progress

Design :
Treatment:
Location:
Summary of Results

Plan for the next year:

Program/case team:

Project title:
Project period:
Activity:
Activity period:
Objective:

Responsible person:

Reported by:
Year of report:
Summary of Progress.
Design : single plot
Treatment: 4
Location: MARC
Summary of

Plan for the next year:

Project title:

Project period:
Activity:
Activity period:
Objective:

Responsible person:

Reported by:
Year of report:
Summary of the progress

Plan for the next year:

Program/case team:
Project title:

Project period:
Activity:
Activity period:
Objective:
Responsible person:
Reported by: Jibicho Geleto
Year of report:
Summary of the progress

Design :
Treatment: 3

Location:
Summary of Results

Plan for the next year:

Program/case team:
Project title:

Project period:
Activity:

Activity period:
Objective:

Responsible person:
Reported by:
Year of report:
Summary of the progress

Design:
Treatment:
Location:
Summary of Results

Plan for the next year:

Project title:

Activity:
Project period:
Responsible person:

Reported by:
Summary of the progress
Design:
Treatment:
Location:
Summary of Result

Plan for the next year:

Project title:

Activity:
Project period:
Responsible person:

Reported by:
Year of report:
Summary of the progress
Design:
Treatment:
Location:

Summary of Result :

Plan for the next year:

Project title:

Activity:
Project period:
Responsible person:

Reported by:
Year of report:
Summary of the progress
Design:
Treatment:
Location:
Result

Table1: Vegetative and pod characteristics of okra genotypes

No.	Genotypes	Day to maturity	pod number per plant	pod length (cm)	Fruit width (mm)	plant height (cm)	Average fruit weight (gm)	Ridge number per pod
1	Bamya-Humera	71	25.7	14	17	165	14.4	5
2	ML-OK-10	84	26.8	20	23	172	37	8
3	ML-Ok-16	78	49.7	16	17	213	31.4	0
4	RCA1	71	15.6	17	17	123	24.3	5
5	Spinless	71	24.8	19	26	137	37.8	9
6	TZSMN	84	33.6	17	18	184	26.1	5
	Mean	76.5	29.4	17	20	166	28.5	5
	F-test	**	**	**	**	**	**	**
	LSD	3.86	11.07	1.1	5.6	36.7	3.41	0.9
	CV	2.8	20.7	3.5	2	12.6	6.6	9.7

Plan for the next year:

Project title:

Activity:
Project period:
Responsible person:

Reported by:
Year of report:
Summary of the progress

Design:
Treatment:
Location:
Summary of Result

Plan for the next year:

program
Project title:

Project period
Activity:

Activity period:
Objective:

Responsible person: Yosef A

Reported by:
Year of report:
Summary of Progress
Design:

Treatment:
Locations:
Summary of Result

.

Plan for the next year:

Project title:

Project period:
Activity:
Activity period:
Objective:

Responsible person: Yosef A.,

Reported by:
Year of report:
Summary of Progress
Design:

Treatment:
Locations:
Summary of Result

.

Plan for the next year:

Project title:

Project period
Activity:
Activity period:
Objective:

Responsible person:

Reported by:
Year of report:
Summary of Progress
Design:

Treatment:
Locations:
Summary of Result

Plan for the next year:

Project title:

Project period
Activity 4:

Activity period:
Objective:

Responsible person:

Reported by:
Year of report:
Summary of Progress
Design:

Treatment:
Locations:
Summary of Result

Plan for the next year:

Project title:

Project period:
Activity:
Activity period:
Objective:
Responsible person:

Reported by:
Year of report:
Summary of the progress
Design:
Treatment:
Location:
Summary of Result

Plan for the next year:

Project title:

Project period:
Activity:

Activity period:

Objective:

Responsible person:

Reported by:
Year of report:
Summary of the progress
Design:
Treatment:
Location:
Summary of Result

Project title:

Project period
Activity:
Activity period:
Objective:

Responsible person: Yosef A.,

Reported by:
Year of report:
Summary of Progress
Design:

Treatment:
Locations:
Summary of Result

Plan for the next year:

Table 1: Mean marketable and total yield at MARC 2011 & under irrigated conditions

Cultivar	Marketable yield(Kg/ha)	Marketable yield (kg/ha)
HAB-414	3700	6070
Oxinel	6130	8880
Saxa	5270	7450
HAB-420	4400	5740
Loiret black gross graine	6100	8080
Tarrot	6420	9600
HAB-419	6610	8140
HAB-406	5740	7870
Plati	5490	7060
Mean	5540	7660

Project title:

Project period
Activity title (6):

Activity period:
Objective:
Responsible person:

Reported by:
Year of report:
Summary of Progress
Design:
Treatment:
Locations:
Result (data, data interpretation and conclusion)

Table 2: Amount of seed (g) of snap bean genotypes, 2018

No.	Genotype	Amount(gm)	No.	Genotype	Amount(gm)
No.	HAB-501	1232.1	19	HAB 408	661.6
1	Plati	974	20	HAB 130	1127.8
2	KSB 8.7	2754.2	21	HAB 404	560.6
3	Loiret noire	1496.6	23	Volta	650.8
4	Lorel Black-grosse Graine	2394.4	24	HAB 173	686.8
5	Tarrot	1953	25	Oxinel	305.2
6	Lomami	1298.4	26	HAB 401	1125
7	HAB 420	1708.2	27	S61	313
8	Saxa	1674.6	28	HAB 414	436.6
9	Pyramide	3205	29	KSB-08-03	1029
10	HAB 409	1829.4	30	Variete Local	629.9
11	Montano	1101.2	31	Xera	386.6
12	HAB 438	1135	32	HAB 410	154.2
13	HAB-416-Aristocrop	234.2	33	SAB-08-11	581.2
14	SB-318	1055	34	Boston	1112.4
15	Polister	400.8	35	SBR 286	552.4
16	S62	571.4	36	HAB 406	138.4
17	HAB 419	2183.4	37	Opera	385.4
18	HAB 407	680.6	-	-	-
Total		38,718.4			

Project title:

Project period
Activity:
Activity period:
Objective:
Responsible person: Yosef A.,

Reported by:
Year of report:
Summary of Progress
Design:
Treatment:
Locations:
Result (data, data interpretation and conclusion)

Plan for the next year:

Project title:

Project period
Activity title:
Activity period:
Objective:
Responsible person: Yosef A.,

Reported by:
Year of report:
Summary of Progress
Design:
Treatment:
Locations:
Summry of Result

Table 1. Amount of seed (Kg) of released snap bean varieties

No.	Variety	Amount(Kg)
1	Plati	47
2	BC 4.4	33
Total		**80**

Plan for the next year:

Project title:

Project period

Activity:
Activity period:
Objective:
Responsible person: Yosef A.,

Reported by:
Year of report:
Summary of Progress
Design:
Treatment:
Locations:
Summary of Result

Table 1: Amount of seed (Kg) of released onion varieties

No.	Variety	Amount(Kg)
1	Bombay Red	30
2	Violed Deglimi	16.3
3	Robaf	93
4	Nasik Red	110
5	Nafis	100
Total		**349.3**

Plan for the next year:

Project title:

Project period
Objective 1

Activity title (10):
Activity period:
Responsible person: Yosef A.
Reported by:
Year of report:
Summary of Progress
Design:
Treatment:
Locations:
Summary of Results

Plan for the next year:

Project title:

Project period
Objective 1

Activity title (11):

Activity period:
Responsible person:
Reported by:
Year of report:
Summary of Progress
Design:
Treatment:
Locations:
Summary of Result

Table 1: Yield performance of improved varieties and local check at four districts

District	Variety	Yield(q/ha)
Zeway Duda	Nasik Red	388.3
	Nafis	341.7
	Bombay red	-
	Mean	**365.0**
Dugda	Nasik Red	335.5
	Nafis	375
	Bombay red	260
	Mean	**323.5**
A/T/J/K	Nasik Red	210
	Nafis	272
	Bombay	104
	Mean	**195.3**
Bora	Nasik Red	325
	Nafis	284
	Bombay red	132
	Mean	**247**

Plan for the next year:

Project title:

Project period
Objective 1

Activity 2:

Activity period:
Responsible person:
Reported by:
Year of report:
Summary of Progress
Design:
Treatment:
Locations:
Summary of Result

Table 1:Yield performance of improved hot pepper varieties at three districts

District	Variety	Yield(Kg/ha)
Ziway Dugda	Melka shote	21700
	Melka Awaze	19630
	Mean	20700
Bora	Melka shote	13500
	Melka Awaze	14500
	Mean	14000
Dugda	Melka shote	14000
	Melka Awaze	2850
	Mean	8430

Project title:

Project period
Objective 1

Activity 13:
Activity period:
Responsible person: Yosef A.,
Reported by:
Year of report:
Summary of Progress
Locations:

Summary of Result

Project title:

Project period
Activity title(14). :

Activity period:
Objective:

Responsible person:
Reported by:
Year of report:
Summary of Progress
Design:
Treatment:
Locations:
Summary of Result

Next plan

Project title:

Project period
Activity title (15):

Activity period:
Objective:

Responsible person:

Reported by:
Year of report:
Summary of Progress
Design:
Treatment:
Locations:
Summary of Result

Next plan

Project title:

Project period:
Activity: Title:

Activity period:
Objective:

Responsible person: responsible:
Reported by:
Year of report:

Materials and Methods
Treatment:
Design:
Location:

Summary of Result

.

Future plan

Table 1. Fruit characters and yield potential of hot pepper cultivars evaluated at MARC 2018

no	Acc	Canopy width (cm)	Plant height (cm)	Fruit diameter (cm)	Fruit length (cm)	Yield q/ha	
						mark	total
1	Acc-48	42.4	53	11.3	83.5	1.9	3.1
2	Acc-5	43.6	51.4	11.2	81.7	4.6	6.5
3	Acc-6	34.6	55.2	12.1	84.6	9.5	12.7
4	Acc-7	34.4	38.8	13.4	57.2	8.0	10.4
5	Acc-9	35.2	47.4	9.7	116.2	12.5	17.7
6	Acc-10	41.8	46.2	10.9	64.7	5.5	8.2
7	Acc-14	36	42.4	10.1	88.8	23.4	30.9
8	Acc-15	40.8	51	10.4	104.4	19.7	25.0
9	Acc-38	61.4	75	9.7	87.2	10.3	13.9
10	Acc-37	47.2	77	10.7	77	10.4	12.9
11	Acc-30	48.4	79	11.4	88.4	15.9	20.3
12	Acc-21	44.4	62	10.7	75.5	14.7	19.2
13	Acc-26	35.6	43.8	12.8	81.7	12.1	15.7
14	Acc-23	47.2	48.6	10.2	48.6	14.5	18.4
15	Acc-20	42.4	53.8	11.5	84.2	9.2	11.8
16	Acc-22	40.8	53	13.2	86.7	9.0	12.6
17	Acc-13	57	64	17	90	15.0	17.0
18	Marko fana	41	59	12	83	13.0	14.0
	mean	**43.0**	**55.6**	**11.6**	**82.4**	**11.6**	**15.0**

Project title:

Project period:
Activity:

Reported by:
Period covered:
Objective:

Person responsible:
Year of report:
Summary of Progress
Design:
Treatment:
Location:
Summary of Result

Plan for future

Project title:

Project period:
Activity:
Activity period:
Objective

Person responsible
Reported: by
Year of report:
Summary of Progress
Treatment:
Design
Location:
Summary of Result

Table1: Fruit characters and yield potential of hot pepper cultivars at MARC.

Cultivars	Average fruit length	Fruit diameter	Plant height	Average fruit wt/gm	Total yield q/ha	Mark. Yield q/ha
Acc-36	83.9	8.5	73.8	0.2	16.0	12
Acc-41	94.6	14.8	55.8	0.2	28.0	18
Acc-42	81.2	12.6	56.2	0.1	20.0	17
Acc-40	86	10.6	65	0.2	22.0	15
Marko fana	91.8	7.1	57.8	0.1	15.0	14
Acc-12	79.7	8.7	66.2	0.1	18.0	14
Acc-19	84.6	9.4	72.6	0.2	11.0	10
Acc-11	97.9	7.5	63	0.2	21.7	20
Acc-4	74.3	15	72.6	0.3	14.0	12
mean	77.4	9.4	58.3	0.16	16.5	13

Project title:

Project period:
Activity:

Activity period:
Objective:
Responsible person:

Reported by:
Year of report:
Summary of the progress
Design:
Treatment:
Location:
Summary of Result

Project title:

Project period:
Activity:

Objectives:

Reported by:
Year of report:
Summary of progress
Design:
Treatment:
Location
Summary of Result

Future plan:

Table 1. Yield performances onion varieties under MARC conditionsy evaluation [redacted]

Varieties	Plant height (cm)	Marketable yield Q/ha	Total yield Q/ha	[redacted]
Dzt-78 selection	70	461	560	111.8

Table 1 . The yield potential of F2 four F2 progenies with their parents at MARC, 2011

Varieties	Plant height (cm)	Marketable yield Q/ha	Total yield q/ha	Bulb weight (g)
AXB	52	269	331	45
AXN	55	281	325	44
NXB	50	311	338	45
NXM	57	312	363	48
N	48	280	300	43
B	46	240	250	44
mean	**54**	**282**	**318**	**44**

Tropical Fruit Research Program

Project Title 1

Activity 1
Activity period:
Objective:
Responsible Person:

Reported by:
Year of report:
Summary of progress
Design:
Treatment:
Locations:
Summary of Result

Table.1 Growth, yield and yield component performance of papaya genotypes at MARC

Variety name	Total height at first flower (cm)	Internodes length (cm)	Girth meas. 30 cm above ground in (cm)	Canopy spread (cm)	Marketable yield (t/ha)	Total Yield (t/ha)	Fruit size (mm) Dia	Len.
WN-139 L#532	117.70	6.00	39.66	168.00	98.4	98.970	275.2	226.2
WN-140 L#484	165.33	6.33	34.66	188.33	122.4	125.4	368.0	225.4
KK-102 L#214	139.33	7.00	21.66	161.33	118.1	120.5	372.6	266.7
Mk-114 L#164	197.00	7.66	30.66	145.33	57.6	58.5	256.3	158.8
Mk-114 L#177	143.67	5.00	30.66	146.33	88.0	91.1	313.7	202.6
Gergedi-3 L#159	121.00	5.00	28.66	144.67	115.5	116.8	399.4	258.8
MK-121 L#516	122.33	6.00	20.00	163.00	137.0	146.7	447.4	216.5
CV	4.84	4.81	16.13	6.93	15.98	16.15	12.88	11.19
F-test	***	***	**	**	***	***	**	**
LSD	13.1	0.525	8.44	19.68	29.92	31.01	79.61	44.23

Plan for future:

Activity 2.

Activity period:
Objectives:
Responsible Persons:
Reported by:
Year of report:
Summary of the progress
Design
Treatment:
Locations:
Summary of Result

Plan for future:

Activity 3.

Activity period:
Objectives
Responsible persons:
Reported by:
Year of report:
Summary of the progress
Design
Treatment:
Locations:
Summary of Result

Table 1. Yield and yield components of passion fruit germplasm collection for fresh and processing

Geno type name	Marketable fruit		Unmarketable fruit		Fruit size		Juice volume (ml)/fruit	TSS (%)
	No.	Weight (grm/plt)	No.	Weight grm/plt)	Length (cm)	Width (cm)		
FB Purple	8	900	2	153	8	6	77	8
Uganda -1	21	3313	4	756	9	8	128	11
FB 300	12	2155	2	384	10	7	134	11
FB 200	21	5138	4	497	8	7	126	13
Uganda 2	38	4029	11	1630	9	7	123	11
Purple red	14	1764	5	921	10	8	137	11

Future plan

Activity 4.
Activity period:
Objectives:
Persons responsible:
Reported by:
Year of report:
Summary of the progress
Design
Treatment:

Locations:
Summary of Result

Future plan: The

Activity 5

Activity period:
Objectives
Persons responsible:
Reported by:
Year of report:
Summary of the progress
Design
Treatment:
Locations:
Summary of Result

Future plan:

Activity period:
Objectives:
Persons responsible:
Reported by:
Year of report:
Summary of the progress
Design:

Treatment
Locations:
Result

Activity period:
Objectives
Persons responsible:
Reported by:
Year of report:
Summary of progress:
Design
Treatment
Locations:
Result

Future Plan

Activity period:
Objectives

Responsible Persons:
Reported by:
Year of report:
Summary of the progress
Design
Treatment:
Locations:
Summary of Result

Future plan:

Activity period:
Objectives:

Responsible Persons:
Reported by:
Year of report:
Summary of the progress
Design
Treatment:
Locations:
Summary of Result

Future plan:

Activity period:
Objectives:

Reported by:
Year of report:
Summary of the progress
Design:
Treatment:
Location:
Summary of Result

Table.1 Papaya lines showing the disease severity scale under glasshouse

Scale	Line (dioecious)	No. genotypes
0 – 1.0 (HR)	NA	0
1.1 – 2.0 (MR)	MK-110 L#10	1
2.1 – 3.0 (S)	MK-108 L#695, WN-140 L#484, BS-2 L#136, ZW-128 L#315, Higgins L#49, MK-119 L#295, MK-114 L#177, MK-116 L#342, ZW-130 L#223, KK-101 L#479, MK-104 L#662, MK-112 L#761, ZW-126 L#241, MK-117 L#731, MK-109 L#153, ZW-124 L#271, MK-113 L#714, MK-108 L#691, ZW-130 L#227	20
> 3.1 (HS)	WN-139 L#532, MK-3 L#149, MK-105 L#55, MK-109 L#151, MK-111 L#185, MK-127 L#305	6

Future plan:

Activity 11.

Activity period:
Objectives:
Responsible Persons:
Reported by:
Year of report:
Summary of the progress
Design:
Treatment:
Locations:
Summary of Result

Future Plane:

Activity 12
Activity period:
Objectives

Responsible Persons

Year of report:
Summary of the progress
Design:
Treatment:

Locations:
Summary of Result

Activity 13:
Activity period:
Objectives

Persons responsible:

Reported by:
Year of report:
Summary of the progress
Design:
Treatment:
Locations:
Summary of Result

Future plan

Subtropical fruit crops research
Program/case team:

Activity 1.1:
Activity period:
Objective:

Responsible person:

Reported by:
Year of report:
Summary of the progress
Treatments and design

Locations:
Summary of Result

Table 8. Vegetative performances of commercial avocado varieties at MARC, 2018

Variety	Tree height (m)	Girth below union (m)	Girth above union (m)	Canopy spread (m)
AL-1	4.22	0.63	0.53	3.67
AL-II	3.85	0.61	0.51	3.86
Chaquate	3.07	0.64	0.56	4.18
Hass	2.97	0.57	0.55	3.43
Jose Antonio	2.93	0.72	0.47	2.99
Simmonds	2.97	0.60	0.51	3.15
Mean	3.34	0.63	0.52	3.55

Among the six avocado varieties, four of them started to give fruit (Table 2). AL-I gave the highest average marketable (45 q/ha) and total (55 q/ha) fruit yields, followed by Chaquate. On the other hand, Chaquate followed by AL-I provided bigger fruits than the other varieties. Jose Antonio and Simmonds did not give fruit (Table 2).

Table 2. Yield performances of commercial avocado varieties at MARC, 2018/19

Variety	Fruit length (cm)	Fruit width (cm)	Marketable yield (q/ha)	Unmarketable yield (q/ha)	Total yield (q/ha)
AL-I	12.80	8.06	45.0	10.0	55.0
AL-II	11.26	8.36	16.0	9.0	25.0
Chaquate	14.46	9.24	36.0	6.0	42.0
Hass	9.94	7.17	33.0	3.0	36.0
Jose Antonio	-	-	-	-	-
Simmonds	-	-	-	-	-
Mean	12.12	8.21	32.5	7.09	39.5

Plan for the next year:

Program/case team:

Project period:
Activity: 1.2:
Activity period:
Objective:

Responsible person(s):

Reported by:
Year of report:
Summary of progress:
Treatments and design

Locations:

Summary of Result

Plan for next year:

Project title:

Project period:
Activity: 1.3:
Activity period:
Objectives:

Responsible person(s):

Reported by:
Year of report:
Summary of progress:
Treatments and design

Locations:

Summary of Result

Table 1. Vegetative performances of pummelo varieties at MARC, 2018

Variety	Tree height (m)	Canopy spread (m)	Girth below union (cm)	Girth above union (cm)
Bosworth pink	2.31	1.73	23.75	21.25
Dwarf Chandler	2.83	1.69	28.75	25.00
Dwarf Tahitian	2.62	1.85	27.67	20.00
Pomlit	2.24	1.90	27.50	23.75
Mean	2.50	1.79	26.92	22.50

Plan for next year:

Project period:
Activity 1.4:
Activity period:
Objectives:

Responsible person(s):

Reported by:
Year of report:
Summary of progress:
Treatments and design

Locations:

Summary of Result

Table 1. Vegetative performances of lemon varieties at MARC, 2018

Variety	Tree height (m)	Canopy spread (m)	Girth below union (cm)	Girth above union (cm)
Allen Eureka	3.7	3.8	46.7	40.7
Frost Eureka	2.3	2.2	27.1	24.4
Lemon Eureka	3.5	3.7	47.9	44.2
Limonoria Lisbon	2.5	2.8	34.7	31.4
Mean	3.0	3.1	39.1	35.2

Plan for next year:

Project period:
Activity: 1.5:

Activity period:
Objectives:

Responsible person(s):

Reported by:
Year of report:
Summary of progress:
Treatments and design

Table 1. Vegetative performances of lime varieties at MARC, 2018

Variety	Tree height (m)	Canopy spread (m)	Girth below union (cm)	Girth above union (cm)
Bears	2.70	3.30	35.0	30.6
Big lime	3.63	3.82	44.2	35.8
Lime seedless	3.98	3.68	41.7	36.7
Tahitian lime	-	-	-	-
Mean	3.44	3.60	40.3	34.37

Plan for next year:

National Subtropical Fruit Crops Research Program

Project period
Activity 1.6:

Activity period:
Objective:

Responsible person(s):
Reported by:
Year of report:
Summary of progress:

Location:
Summary of Result

Table 1. Vegetative performances of introduced avocado varieties at MARC, 2018/19

Variety	Tree height (m)	Canopy spread (m)	Girth measurement	
			Below union (m)	Above union (m)
Ashdod-7	4.92	3.70	0.56	0.49
Ashdod-17	3.62	2.53	0.48	0.43
Dagaraga	3.98	2.80	0.50	0.54
Fair Child	2.26	1.61	0.35	0.31
Jimma-7	3.53	3.63	0.53	0.51
Ryan (Summer Fuerte)	2.58	3.08	0.57	0.49
Mean	3.48	2.89	0.50	0.46

Plan for next year:

Project period:
Activity 1.7:

Activity period:
Objective:

Responsible person(s):

Reported by:
Year of report:
Summary of progress:
Treatment and design

Locations
Summary of Result

Table 9. Vegetative performances of avocado rootstock genotypes at MARC, 2018/19

No.	Variety	Plant height (m)	Canopy spread (m)	Girth below union (cm)	Girth above union (cm)
1	Duke-7	2.8	1.7	44.9	43.4
2	Tibila	4.7	6.1	105.0	108.0
3	Zeway	3.1	3.0	60.0	61.0
	Mean	3.53	3.6	69.97	70.8

Plan for next year:

Project period:
Activity Title 1.8:

Activity period:
Objectives:

Responsible person(s):
Reported by:
Year of report:
Summary of progress:
Treatments and design

Location:
Summary of Result
A. Set-I mango collections

Table 1. Vegetative performances of local mango genotypes (Set-I) at MARC, 2018

Genotype	Tree height (m)	Canopy spread (m)	Girth size below union (cm)	Girth size above union (cm)
Apple mango	4.1	5.6	90.0	62.5
ME-1	4.8	6.9	102.0	86.1
ME-2	6.0	7.0	134.3	110.7
ME-3	4.8	5.2	85.0	76.0
ME-6	5.2	6.1	96.3	79.4
ME-7	5.8	6.8	117.0	79.0
NE-1	6.0	7.2	94.2	78.3
NE-2 (Kent)	5.4	5.7	90.8	72.8
NE-3 (Tommy)	4.5	4.8	74.2	55.0
NE-4 (Keitt)	4.2	3.6	81.0	47.0
NE-6	4.9	5.0	123.8	51.9
NE-7	4.5	6.2	89.3	61.0
Sodere-1	4.8	5.1	81.2	68.0
Sodere-2	4.9	7.2	110.7	85.1
Sodere-3	5.0	6.6	120.8	92.0
Sodere-11	4.8	5.3	88.7	63.3
W-1	4.7	6.8	124.6	91.7
W-3	5.1	6.1	82.9	69.3
Mean	4.97	5.96	99.27	73.84

B. Set-II mango collections

Plan for next year:

Project period:
Activity: 1.9:

Activity period:
Objective:

Responsible person(s):
Reported by:
Year of report:

Summary of progress:

Treatments and design

Location:
Summary of Results

Plan for next year:

Project period:

Activity 1.10: Collection, establishment and evaluation of naturalized citrus (*Citrus* spp. L.) genotypes
Activity period:
Objectives:

Responsible person(s):

Reported by:
Year of report:
Summary of progress:
Treatments and design

Locations:
Summary of Results

Table 1. Collected and established naturalized citrus genotypes at MARC, 2018

Genotype	Collection sites	No. of established trees in the field	Purpose
CAR-1220 Citrange	North Wello (Tis Abalima)	3	Rootstock
Mersa-01	North Wello (Mersa area)	1	Scion
Mersa-04 S. orange	North Wello (Mersa area)	4	Scion
Mersa S. orange	North Wello (Mersa area)	3	Scion
Shewa Robit-08	North Shewa (Amhara)	4	Scion
Shewa Robit-09 S. orange	North Shewa (Amhara)	2	Scion
Tis Abalima 05 S. orange	North Wello	1	Scion
Tis Abalima-07	North Wello	3	Rootstock
Troyer Citrange	Tony farm (Dire Dawa)	4	Rootstock
Yeferenj Lomi	Methara Sugar Estate (Abadir)	4	Scion
Yeferenj Mandarin	Methara Sugar Estate (Abadir)	1	Scion

Plan for next year:

Project period:

Activity: 1.11:

Responsible person(s):

Reported by:
Year of report:
Summary of progress:
Treatments and design

Locations:
Summary of Result

Plan for next year:

Project period:
Activity: 1.13:
Activity period:
Objectives:

Responsible person(s):

Reported by:
Year of report:
Summary of progress:
Treatments and design

Location:

Summary of Result

A. Sweet Oranges

Table 1. Vegetative performances of sweet orange varieties at MARC, 2018/2019

Variety	Plant height (m)	Canopy spread (m)	Girth above union (m)	Girth below union (m)
Campbell Valencia	2.58	2.48	0.32	0.39
Carter Naval	1.33	1.15	0.27	0.31
Cutter Valencia	2.31	2.61	0.34	0.39
Frost Naval	2.61	2.38	0.31	0.36
Frost Valencia	2.66	2.41	0.36	0.41
Hamlin	2.90	2.73	0.37	0.43
Jaffa	0.95	0.65	0.42	0.47
Olinda Valencia	2.95	2.63	0.37	0.42
Pineapple	2.53	2.33	0.33	0.39
Ruby	2.73	3.21	0.44	0.45
Ruby Blood	2.91	2.85	0.37	0.41
Shamute	1.34	0.81	0.25	0.34
Skagus Bonanza	2.34	2.24	0.31	0.36
Temple Orange	2.45	2.05	0.27	0.32
Valencia Rhugs	2.59	2.80	0.29	0.36
Valencia Rhode	2.65	2.34	0.27	0.35
Washington Naval	2.74	2.65	0.32	0.38
Mean	2.39	2.25	0.33	0.38

B. Mandarins

Table 1. Vegetative performances of mandarin varieties at MARC, 2018

Variety	Plant height (m)	Canopy spread (m)	Girth above union (m)	Girth below union (m)
Clementine	1.73	1.34	0.20	0.27
Dancy	2.74	2.63	0.28	0.34
Fairchild	1.75	1.25	0.21	0.23
Fremont	1.74	1.05	0.20	0.22
Kara	1.88	1.13	0.35	0.22
Lee Tangerine	1.56	1.50	0.16	0.19
Murcott	1.11	0.63	0.12	0.13
Nova	1.61	1.48	0.23	0.28
Osceolia	1.95	1.73	0.24	0.28
Ponkan	1.14	1.04	0.20	0.33
Satsuma	1.49	1.71	0.20	0.21
Temple Mandarin	2.49	2.01	0.31	0.33
Trovita	1.44	1.39	0.50	0.22
Mineola	1.50	1.50	0.58	0.21
Orlando	1.25	1.35	0.17	0.19
Tangor	1.00	1.06	0.18	0.19
Mean	1.65	1.43	0.26	0.24

C. Limes

Table 1. Vegetative performances of lime varieties at MARC, 2018/19

Variety	Plant height (m)	Canopy spread (m)	Girth above union (m)	Girth below union (m)
Bears	3.31	3.30	0.44	0.47
Mexican	2.18	2.18	0.29	0.31
Mean	2.75	2.74	0.37	0.39

D. Lemons

Table 1. Vegetative performances of lemon varieties at MARC, 2018

Variety	Plant height (m)	Canopy spread (m)	Girth above union (m)	Girth below union (m)
Allen Eureka	1.91	1.95	0.23	0.27
Limonoria Lisbon	1.24	0.94	0.44	0.32
UCR Improved	2.75	3.23	0.39	0.46
Mean	1.97	2.04	0.35	0.35

E. Grapefruits

Table 1. Vegetative performances of grapefruit varieties at MARC, 2018

Variety	Plant height (m)	Canopy spread (m)	Girth above union (m)	Girth below union (m)
Red Blush	1.73	1.80	0.25	0.30
Reed	1.25	1.40	0.17	0.16
Shamber	1.01	1.01	0.12	0.15
Star Ruby	1.14	1.15	0.16	0.19
Mean	1.28	1.34	0.18	0.20

F. Citrus rootstocks

Plan for next year:

Project period:
Activity: 1.14.

Activity period:
Objectives:

Responsible person(s):

Reported by:
Year of report:
Summary of progress:
Treatments and design

Locations:

Summary of Results

Plan for next year:

Project title:

Project period:
Activity: 1.15:

Activity period:
Objectives:

Responsible person(s):
Reported by:
Year of report:

Summary of progress:
Treatments and design

Location:
Summary of Results

Plan for next year:

Project title:

Project period:
Activity Title 1.16:

Activity period:
Objectives:

Responsible person(s):
Reported by:
Year of report:
Summary of progress:
Treatments and design

Location:
Summary of Results

Plan for next year:

Project title:

Activity period:
Objectives:

Responsible person(s):
Reported by:

Summary of progress:

Location:
Results

Table 19. Vegetative performances of cazamiroa collections at MARC, 2018

Variety	Plant height (m)	Canopy diameter (m)	Girth measurement (m)
Sep/8	5.83	6.02	0.73
Sep/37	5.80	5.98	0.77
Sep/66	6.30	5.17	0.87
56/8	5.82	5.50	0.82
56/37	5.07	4.89	0.61
56/66	6.92	4.85	0.75
64/8	5.80	5.50	1.23
64/37	4.77	4.33	0.79
64/66	6.10	5.20	0.75
Sodere/8	6.40	7.60	1.23
Sodere/37	5.10	5.50	0.87
Sodere/66	4.10	2.10	0.50
Mean	5.67	5.22	0.83

Plan for next year:

Project title:

Project period:
Activity: 1.18:

Activity period:
Objectives:

Responsible person(s):

Reported by:
Year of report:
Summary of progress:
Treatment and design

Objectives:

Activity 2.1:

Activity period:
Objectives:

Responsible person(s):
Reported by:
Year of report:
Summary of progress
Treatments and design

Location:
Summary of Results

Plan for next year:

Project period:
Activity title 2.2:

Activity period:
Objective:

Responsible person(s):
Reported by:
Year of report:
Summary of progress:
Treatments and design

Location:
Summary of Results

Plan for next year:

Project title:

Project period:
Activity: 2.3:

Activity period:
Objective:

Responsible person(s):
Reported by:
Year of report:
Summary of progress:
Treatments and design

Location:
Summary of Result

Plan for next year:

Project period:

Activity: 2.4:

Activity period:
Objectives:

Responsible person(s):
Reported by:
Year of report:
Summary of progress:
Treatments and design

Location:
Summary of Results

Plan for next year:

Project title 3:

Project period:
Project title:
Project period:
Objectives:

Project period:
Activity: 3.1:
Activity period:
Objectives:

Responsible person(s):

Reported by:
Year of report:
ummary of Progress:
Treatment and design

Locations:
Summary of Results

Plan for next year:

Project period:
Activity: 3.2:
Activity period:
Objectives:

Responsible person(s):

Reported by:
Year of report:
Summary of progress:
Treatments and design

Locations:
Summary of Results

Plan for next year:

Project title:

Project period:
Activity: 3.3:
Activity period:
Objectives:

Responsible person(s):
Reported by:
Year of report:
Summary of progress:
Treatment and design

Location:
Summary of Results

Plan for next year:

Project title:

Project period:
Activity: 3.4:
Activity period:

Objective:

Responsible person(s):

Reported by:
Year of report:
Summary of progress:
Treatments and design

Locations:
Summary of Results

Plan for next year:

Project title:

Project period:
Activity: 3.5:
Activity period:
Objective:

Responsible person(s):

Reported by:
Year of report:
Summary of progress:
Treatments and design

Location:
Summary of Results

Plan for next year:

Project Title 4:

Activity: 4.1:

Activity period:
Objectives:

Responsible person(s):

Reported by:
Year of report:
Summary of progress:
Treatments and design

Locations:
Summary of Results

Plan for next year:

Activity: 4.2:
Activity period:
Objectives:

Responsible person(s):
Reported by:
Year of report:
Summary of progress:
Treatments and design

Locations
Summary of Results

Plan for next year:

Activity: 4.3:
Activity period:
Objective:

Responsible person(s):
Reported by:
Year of report:
Summary of progress:
Treatments and design
Locations
Summary of Results

Activity: 4.4:
Activity period:
Objective:

Responsible person(s):
Reported by:

Year of report:
Summary of progress:
Treatments and Design:
Locations:
Summary of Results

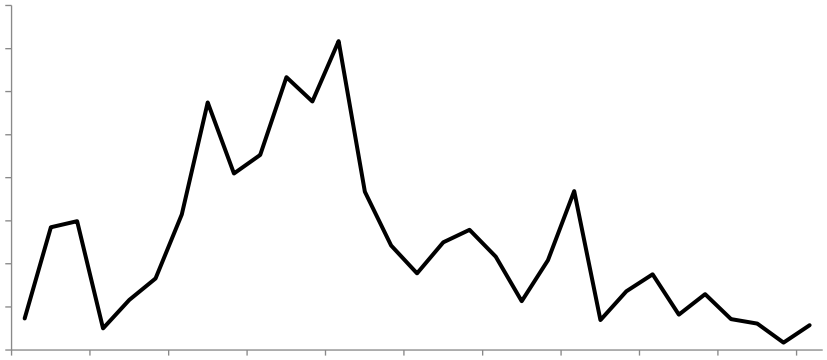


Fig 1. Fluctuation in the population of white mango scale on mango

Activity: 4.5:
Activity period:
Objective:

Responsible person(s):
Reported by:
Year of report:
Summary of progress:
Treatments and Design:
Locations:
Summary of Results

Activity: 4.6:

Activity period:
Objective:

Responsible person(s):
Reported by:

Year of report:
Summary of progress:
Treatments and Design:
Location:
Summary of Results

Activity: 4.7:

Activity period:
Objective:

Responsible person(s):
Reported by:
Year of report:
Summary of progress:
Treatments and Design:
Location:
Summary of Results

Root and Tuber Crops Research Program

Activity 1:
Activity period:
Responsible person(s):
Reported by:
Year of report:
Summary of progress:
Treatments and design

Location:
Summary of Results

Plan for next year:

Activity: 2:
Activity period:
Responsible person(s):
Reported by:
Year of report:
Summary of progress:
Treatments and design

Location:
Summary of Results

Plan for next year:

Food Science and Nutrition Research

Mulate Zerihun

Research process:
Project title 1:

Project period:
Activity title 1:

Activity period:
Objectives:

Responsible person:
Reported by:
Year of the report:
Summary of the progress

Plan for the next year

Activity title2:

Activity period:
Objectives:

Responsible persons:
Reported by:
Year of the report:
Summary of the progress

Plan for the next year

Activity 3:

Activity period:
Objectives:

-

esponsible person:
Reported by:
Year of report:
Summary of the progress

Table 1: Sensory quality of fresh fruit from desert type banana varieties

Varieties	Color	Peeling conditions	Texture	Taste	Oder	Over all acceptability
Ambo-2	4.167^{a}	4.006^{ab}	4.199^{a}	3.917^{abc}	4.2117^{a}	4.2500^{ab}
Dinka-2	4.097^{a}	4.285^{a}	4.063^{a}	3.667^{bcd}	3.8753^{a}	4.0140^{abc}
Lady finge	4.069^{a}	4.208^{a}	4.110^{a}	4.214^{a}	4.2380^{a}	4.3840^{a}
Dinke -1	3.774^{a}	3.673^{ab}	3.713^{ab}	3.552^{bcd}	3.8317^{a}	3.8033^{bc}
Paracidoaerly	3.767^{a}	3.513^{b}	3.942^{ab}	4.042^{ab}	3.8253^{a}	3.9573^{abc}
Williams h	3.746^{a}	3.696^{ab}	3.750^{ab}	3.492^{cd}	4.0877^{a}	3.9293^{abc}
Chinese dw	3.722^{a}	3.366^{b}	3.2897^{b}	3.345^{d}	3.6353^{a}	3.5657^{c}
ambowhasel	3.709^{a}	3.783^{ab}	3.750^{ab}	3.894^{abc}	3.6510^{a}	3.8387^{abc}
ambo-3	3.708^{a}	3.750^{ab}	3.750^{ab}	3.833^{abcd}	3.5833^{a}	3.7083^{bc}
LSD	0.5956	0.6547	0.7282	0.5352	0.8079	0.5565
CV	8.99	10.02	10.99	8.27	12.13	8.24
Significance	Ns	ns	ns	ns	ns	ns
F-calcu	0.90	1.92	1.26	2.42	0.82	1.86

Each observation is a mean (n=21). *, **, significant at P≤0.05 or P≤0.01, respectively. Means with the same letter within columns were not significantly different at P≤0.05

Table 2: Physic-chemical parameters of pipe-line banana verities

Varieties	PH	TSS	TA	TSS/TA	MO	Ash
Dinke-2	5.2000^{a}	23.700^{abc}	3.7103^{c}	6.3970^{a}	72.582^{e}	3.1210^{ab}
Dinke-1	5.1977^{a}	22.133^{cd}	4.9220^{b}	4.4983^{cd}	73.355^{d}	2.7710^{c}
Ambo-2	5.1633^{ab}	22.300^{bcd}	3.7300^{c}	5.9837^{a}	75.543^{b}	3.0450^{b}
Ambo-3	5.0170^{abc}	20.000^{e}	4.8913^{b}	4.0957^{d}	76.564^{a}	3.3587^{a}
chinesedw	4.8540^{bcd}	21.333^{de}	3.9803^{c}	5.3817^{b}	74.823^{c}	2.8747^{bc}
williams-h	4.8140^{cd}	24.467^{a}	5.0003^{b}	4.8947^{c}	71.529^{f}	2.8687^{bc}
Paracido-e	4.7873^{cd}	21.000^{de}	5.1383^{b}	4.0873^{d}	71.745^{f}	2.497^{d}
Lady finge	4.7177^{cd}	23.967^{ab}	5.9407^{a}	4.0360^{d}	71.651^{f}	2.6487^{cd}
Ambowha se	4.6903^{d}	20.333^{e}	5.9473^{a}	3.4233^{e}	75.707^{b}	3.3107^{a}
LSD	0.3165	1.6959	0.3375	0.4826	0.6970	0.2601
F-calcu	3.83	8.06	56.2	37.2	70.4	11.0
CV	3.74	4.47	4.09	5.92	0.55	5.15
P -Value	0.0085	0.0001	0.0000	0.0000	0.0000	0.0000
Significance	**	***	***	***	***	***

ns, *, **, ***non-significant or significant at P≤0.05, P≤0.01 or 0.001, respectively; means with the same letter with in columns were not significantly different at P≤0.05. TSS total soluble solids;TAtitrable acidity; MO moisture

Table 3: Physical quality characteristics of the four cooking banana varieties

Varties	FW(g)	PLW(g)	PPW(g)	FL(cm)	PPR	JV(mL)	TSS (%)
Cardaba	178a	54a	124a	16a	2.30a	194a	1.70a
Kitawira	73c	30c	43c	12b	1.43b	65c	1.60a
Matoka	119b	48b	71b	17a	1.48b	119b	1.60a
Nijeru	69c	24c	45c	13b	1.88b	74c	1.50a
Mean	109.75	39.00	70.75	14.50	1.77b	113.00	1.60
CV	6.11	4.77	4.56	3.28	4.42	5.93	2.90
Significance	***	**	***	**	**	***	ns

ns, *, **, ***non-significant or significant at P≤0.05, P≤0.01 or 0.001, respectively; means with the same letter with in columns were not significantly different at P≤0.05

FW fruit weight; PLW peel weight; PPW pulp weight; FL fruit length; JV juice volume; PPR pulp to peel ratio and TSS total soluble solids

Table 4. Proximate composition characteristics of cooking banana varities.

Varties	PH	TA	DM	Ash	Mo	CP	CF	CFt	Carb
Cardaba	6.1a	1.8b	29a	2.00a	8.11b	0.99b	2.71a	1.04a	85.15a
Kitawira	5.9a	2.1b	19b	1.69b	9.61a	0.93b	2.13ab	1.11a	84.53a
Matoka	5.9a	2.9a	22b	1.32c	7.89b	1.40a	2.67a	1.24a	85.48a
Nijeru	5.9a	2.0b	20b	1.60b	9.33a	0.91b	2.93a	1.07a	84.16a
Mean	5.95	2.20	22.50	1.65	8.74	1.06	2.61	1.12	84.83a
CV	1.97	4.51	6,72	4.21	3.77	1.89	2.00	2.14	1.11
Significance	Ns	*	*	**	**	*	ns	ns	ns

ns, *, **, ***non-significant or significant at P≤0.05, P≤0.01 or 0.001, respectively; means with the same letter with in columns were not significantly different at P≤0.05.TA titrable acidity; DM dry matter; MO moisture; CP crude protein; CF crude fiber; CFt crude fate and Carb carbohydrate

Plan for the next year

Project title 2:

Project period:
Activity:

Activity period:
Objectives:

-

Responsible persons:

Reported by:
Year of report:
Summary of the progress

Plan for the next year

Project Title 3:
Project period:
Activity 1

Activity period:
Objectives:

Responsible person:
Reported by:
Year of the report:
Summary of the progress

Plan for the next year

Project Title 4:

Project period:
Activity title 1:

Activity period:
Responsible persons:

Reported by:
Year of the report:
Summary of the progress

Plan for the next year

Project Title 5

Project period:
Activity 1

Activity period:
Objective:

Responsible persons:
Reported by:
Year of report:
Summary of progress

Future plan for the next year

Activity 2
Activity period:
Objective:

Responsible persons:
Reported by:
Year of report:
Summary of the progress

Activity 3

Activity period:
Objectives:

Responsible persons
Reported by:
Year of report
Summary of the progress

Plan for the next year

Project title 6:
Project Duration
Activity 1:

Activity period:
Objectivies:

Responsible persons:
Reported by:
Year of report:
Summary of the progress

Plan for the next year

Activity 2: Evaluation of selected varieties of sorghum for malting purpose
Activity period:

Objectives:

Responsible persons:
Reported by:
Year of report:
Summary of the progress

Plan for the next year

Activity 3:

Activity period:
Objectives:

Responsible persons:
Reported by:
Year of report:
Summary of the progress

Plan for the next year

Activity 4:
Activity period:
Objective:

Responsible persons:
Reported by:
Year of report:
Summary of the progress

Table1: Oil absorption capacity and crude fiber content of finger millet

variety name	Oil Absorption Capacity(ml/g)	Fiber
48hrs malted	150	4.5
40hrs malted	140	2.53
32hrs malted	250	3.26
24hrs malted	230	4.45
Un-malted(Control)	150	1.46

At 48 hours malted finger millet has the highest oil absorption capacity and crude fiber content while un-malted and 24hours malted finger millet has the lowest crude fiber content and Oil absorption capacity respectively

Plan for the next year:

Project 7:
Project Duration:
Activity 1:

Activity period:
Objective:

Responsible person:
Reported by:
Year of report:
Summary of the progress

Plan for the next year

Project title 8

Project period
Activity 1

Activity period:
Objective:

Responsible persons
Reported by:
Year of report:
Summary of the progress

Plan for the next year

[redacted]

Natural Resource Management Research

Mesfine Hundessa

Integrated Watershed Management Program

Project Title1

Project period:
Activity 1:

Activity period:
Objective/s/:

Reported by:
Year of report:
Summary of research progress

Design:

Location:
Summary of Result

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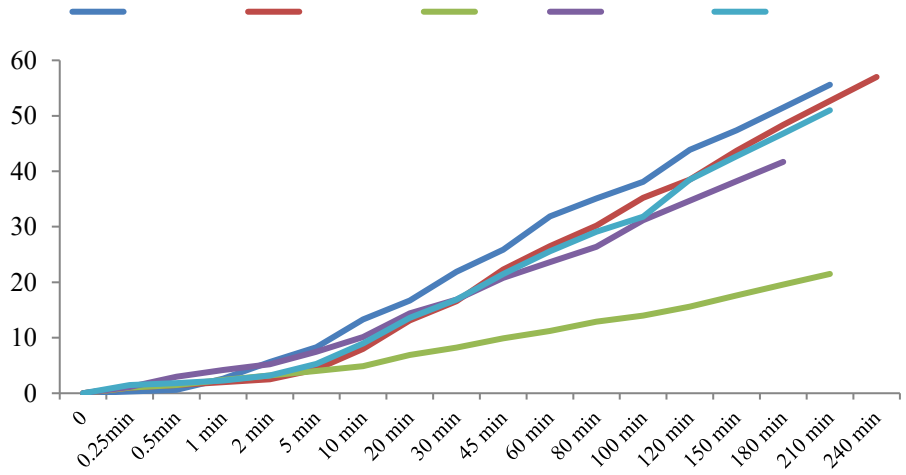

Figure 2: cumulative infiltration

Table 9:Yield and yield component

Treatments	PT H	SPK L	Seed no.	Till no.	Grain yield (qt/ha)
20m+local	80.67[a]	10.18[a]	40.53[a]	2.06[a]	33.06[b]
20m+SS+FYM	85.00[ab]	6.48[a]	39.73[a]	2.46[a]	35.04[ab]
22M+SS+FYM	84.60[ab]	6.27[a]	44.26[a]	2.40[a]	33.08[b]
25M+SS+FYM	87.46[a]	6.82[a]	42.66[a]	2.40[a]	38.76[a]
LSD % (0.05)	0.19	0.55	0.76	0.55	0.23
CV	3.95	49.06	13.69	15.12	8.79

Plan for the next year:

Activity title 2:

Activity period:
Objective/s/:

Responsible persons
Reported by:
Year of report:
Summary of the progress

Design:
Treatment:
Bare land

Location:
Summary of Result

Table 10.Treatment and the corresponding run-off and soil lost

Treatments	Annual RO M^3/ha	Annual soil loss T/ha
Bare land	133.96	0.793 T/ha
19+TM+MO	0	0
19+TR+FYM	0	0
21+TR+FYM	0	0
24+TR+FYM	0	0

Note: TM= Traditional Maresha; TR= Tie ridge; FYM= Farm Yard Manure; MO= without farm yard manure

Table 11.Crop yield from the treatments

Treatments	Yield Qt/ha	Population/h	plt height	Cob no/ha
19m +TM + M0	39.693ab	44649a	2.1667a	39035a
19m +TR+FYM	27.679b	42456a	2.1833a	24077b
21m + TR + FYM	36.614ab	42262a	2.2333a	26038 ab
24m + TR +FYM	41.667a	35799a	2.2233a	38593a
LSD (0.05)	0.1563	0.4363	0.241	0.0785
CV (%)	19.48	15.92	5.28	23.83

Plan for the next year:

Project 2:

Project period:
Activity 1:

Activity period: 2016-2020
Objective/s/:

Year of report:
Responsible person
Location:
Summary of the progress:

Design:
Treatment:

Location: Bishola
Summary of Result

Table 12.solo and intercropping maize yield and yield component

Treatments	Popn/ha	Cob no	Yield (Kg/ha)	P height (m)
Conve inter	291.00[a]	328.67[a]	4731[a]	2.43[a]
Conve maize	267.00[a]	312.50[a]	4361[a]	2.38[a]
Zero inter	279.00[a]	330.33[a]	3378[a]	2.38[a]
Zero maize	285.67[a]	388.33[a]	5094[a]	2.35[a]
LSD (0.05)	0.98	0.29	0.27	0.99
CV (%)	25.45	13.03	20.61	11.35

Conve: conventional; inter: intercropping; Infiltration rate

Plan for the next year:

Activity 2

Activity period:
Objective/s/:

Year of report:
Responsible person:
Reported by:
Summary of Result

Location:

Plan for the next year:

Activity 3:

Activity period:
Objective/s/:

Reported by:
Year of report:
Summary of the progress:

Design:
Treatment:
Location:
Summary of Result

Plan for the next year:

Project title 3:

Project period
Activity 1:

Activity period:
Objective/s/:

Responsible persons
Reported by:
Year of report:
Summary of the progress
Design:
Treatment:
Location:)
Summary of

Plan for the next year:

Activity 2

Activity period:
Objective/s/:

Responsible persons:
Reported by:
Year of report
Summary of the progress
Design:
Treatment:
Location:
Summary of Result

Plan for the next year:

Activity 3:

Activity period:
bjective:

Responsible persons
Reported by:
Year of report
Summary of the progress
Design:
Treatment:
Location:
Summary of Result

Plan for the next year:

Project 4:

Activity 1:

Activity period:
Objective/s/:

Reported by:
Year of report:
Summary of the progress

Design:

Sand bag
wooden
Location: Jogo Gudedo watershed
Summary of Result

Table 13. Dimension of gully

Points	Top width (m)	Bottom width (m)	Depth (m)
1	7.15	3.8	2.04
2	10.1	2.9	2.1
3	15.7	5	1.83
4	14.5	3.9	2.73
5	10.2	3.7	2.55
6	8.8	3.3	2.58
7	8.1	3.2	3.8
8	6.7	2	4.04
9	7.3	2.2	4.14
10	7.6	2.15	3.45
11	8.7	2.45	4.4
12	7	4.5	3.42

Plan for the next year:

Project 5

Activity:

Activity period:

Reported by:

Summary of the progress

Design:
Treatment:

Location:
Summary of Result

Table 14. Crop yield and yield component

Treatments	Yield Q/ha	Population	P height	Cob number
Convention	63.523b	49588a	2.41a	52475a
CA	73.310a	55363[a]	2.40a	58113a
LSD (0.05)	0.015*	0.17	0.4338	0.28
CV	22.33	27.10	3.88	21.61

CA: Conservation Agriculture

Plan for the next year:

Integrated Soil Fertility and Soil Health Management Research Program

Project 1:

Activity 1.

Activity period:
Objective/s/:

:

Reported by:
:
Summary of the progress:
Design:
Treatment: Six
Location:
Summary of Result

Table 1: Mean Adjusted Grain Yield of maize at Negele Arsi

Treatment	AGY
kg ha^{-1}	
0	3004.2b
10	3374.4a
20	3215.3ab
30	3287.8ab
40	3186.5ab
50	3153.6ab
CV (%)	22.4
$LSD_{\leq 0.05}$	289

Mean of the same letter statistically non- significant, AGY=Adjusted grain yield, CV= coefficient of variability, kg ha^{-1}= kilogram per hectare, LSD= least significant difference.

Table 2: Available phosphorus, change in available phosphorus, phosphorus requirement factor of maize at Negele Arsi

Treatment	AP mgkg^{-1}	ΔAP	Pf
0	4.10		
10	4.90	0.80	12.50
20	5.80	1.70	11.76
30	6.70	2.60	11.54
40	8.70	4.60	8.70
50	10.70	6.60	7.58
Average			10.4

Mean of the same letter statistically non- significant, AGY=Adjusted grain yield, CV= coefficient of variability, kg ha^{-1}= kilogram per hectare, LSD= least significant difference.

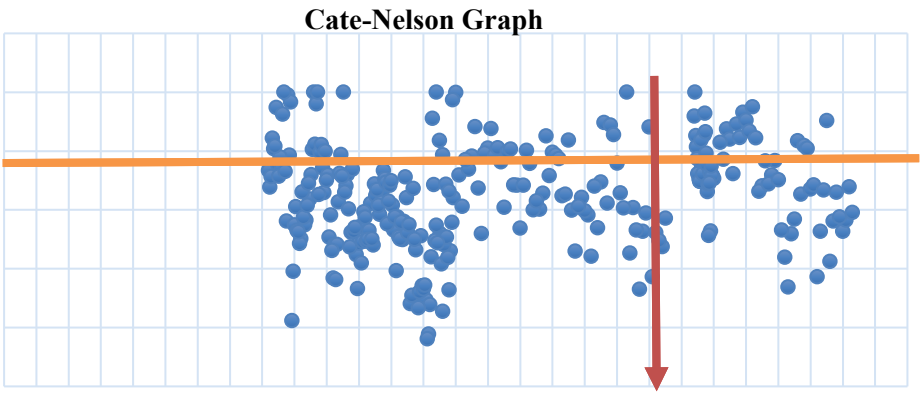

Figure 1. Effects of Phosphorus Fertilizers on maize grain yield (kg/ha) at Negelle Arsi

Plan for the next year:

Activity period:

Reported by:

Summary of the progress
Design:
Treatment:
Location:
Summary of Result

Table 3. Main and interaction effects of Blended (NPSB) Fertilizers on maize grain yield at Adamitulu-Jidokombolcha

Treatments	Grain Yield (kg/ha)	
Variety	Meki	A/Tulu
MH-140	6660	6599
Melkassa 2	5681	5783
LSD (0.01)	413	536
Fertilizers		
0+0	4705	4327
100 NPSB+ 150Urea	5792	7003
150 NPSB + 150Urea	6444	5493
200 NPSB + 150Urea	6070	5510
250 NPSB + 150Urea	6250	6586
100 NPSB + 200Urea	6294	5876
150 NPSB + 200Urea	6466	5843
200 NPSB + 200Urea	7037	6718
250 NPSB + 200Urea	5994	5700
100 NPSB + 250Urea	6625	7020
150 NPSB + 250Urea	5823	7615
200 NPSB + 250Urea	6513	6748
250 NPSB + 250Urea	6203	6049
$LSD_{(0.05)}$	1053	1367
CV(%)	20	15

Plan for the next year:

Activity 3

Activity period:
Objective/s/:

Reported by:

Summary of the progress
Design:
Treatment:
Location:

Summary of Result

Table 4. Main and interaction effects of blended (NPS) fertilizers on maize grain yield at A/Tulu

	Grain Yield		
	Interaction effect		Main effect
Treatments	MH-140	Melkassa II	
0+0	1721	4923	3322
100 NPS + 150Urea	7234	6112	6673
150 NPS + 150Urea	6491	4655	5573
200 NPS + 150Urea	5565	6338	5952
250 NPS + 150Urea	6564	5247	5905
100 NPS + 200Urea	4882	4371	4627
150 NPS + 200Urea	4807	4563	4685
200 NPS + 200Urea	5925	5101	5513
250 NPS + 200Urea	6353	5349	5851
100 NPS + 250Urea	6314	4880	5597
150 NPS + 250Urea	4845	5075	4960
200 NPS + 250Urea	5066	6485	5775
250 NPS + 250Urea	5205	5209	5207
CV (%)	20		
LSD (0.05)	2475		1294

Plan for the next year:

Activity period:

Reported by:

Summary of the progress
Design:
Treatment:
Location:
Summary of Result

Table 1. Effect of P on yield of different Haricot Bean varieties at different locations

Variety	P-Level	Adami Tulu	Shalla	Boset
AW2	0	1545.6	1464.7	1377.8
	10	2204.3	1860.6	2588.8
	20	1856.9	2139.5	2713.8
	30	1744.4	1962.5	2142.7
	40	2642.8	2694.6	3152.8
Dume	0	1507.5	1104.6	1316.6
	10	1402.5	1149.3	1353.6
	20	2058	1732.3	1926.7
	30	1757.6	1514.5	1656.9
	40	2570.3	2778.4	3632.1
SER119	0	1237.4	982.1	1294.9
	10	1932.6	2591.7	3072.3
	20	2015.9	2661.7	3293.5
	30	2262.6	2969.3	3325.1
	40	2752.3	2765.2	3171.0
CV (%)		20.8	28.7	21.8
LSD(0.05)		683.98	971.94	854.6

Plan for the next year:

Activity 5:

Activity period:
Objective:

Reported by:

Summary of the progress
Design:
Treatment:
Location:

Plan for the next year:

Project title 2
Activity 1.

Activity period:
Objective:

Responsible person:

Reported by:

Year of report:
Summary of the progress
Design: RCBD
: 4
Location:
Summary of Result

Table 1. Response of dry bean to rhizobial strains and DAP fertilizer

TMT	Yield (kg/ha)
DAPR	2818.3a
NGC	2284.3ab
HB-A15	1993.5b
HB-429	1944.8b
GM	2260.3
CV	22.75
SD(0.05)	*

Plan for next year:

Project 3
Activity 1.

Activity period:
Objective/s/

Responsible person:
Reported by:
:
Summary of the progress
Design:
Treatment:
Location:
Summary of Result

Figure 1. Sorghum growth performance at field condition

Table1. Interaction effects of moisture conservation and soil fertility improvement on sorghum grain yield at Miesso in 2018.

Fertilizers	Moisture conservation	
	Tie ridging	Farmer practice
Recommended NP	1938.9^{ab}	1344.9^{bcd}
Farmyard manure	2334.9^{a}	2165.9^{ab}
Green manuring	1983.3^{ab}	629.8^{d}
Compost	2293.9^{a}	1628.3^{abc}
50% treatment 1 + 50%treatment 2	2410.0^{a}	870.5^{cd}
50% treatment 1 + 50%treatment 3	1833.1^{ab}	1901.3^{ab}
The control treatment	2206.9^{a}	2258.1^{a}
LSD 0.05	840.85	
CV (%)	25.09	

Plan for next year: ***the activities will be conducted for one more year***

Project 4:

Activity period:
Objective:

Reported by:
Year of report:
Summary of Result
Design:
Treatment:

Location:

Table: 1 Response of maize to regional recommended NP and compost with NP

Treatment	Site 1	Site 2	Site 3
Compost	3871.98	3830.39	5439.97
NP	5855.96	2375.48	6431.96

Plan for next year:

Project 5.
Project period:
Objectives:
Responsibilities:
Reported by:
Year of report:
Summary of the progress
Design:
Treatment:
Location:
Summary of Results

Table 1. Effects of Paronamix fertilizer on maize grain yield (kg ha^{-1}) at Meki and Negelle Arsi in 2017 main cropping season

Treatment	Dugda	Negele Arsi
1. Clean seed alone (untreated control)	3729	4922
2. Pesticide dressed seed alone	4299	5129
3. Clean seed + Recommended NP/ha	4637	5589
4. Clean seed + Paronamix (2 kg/ha)	3862	4768
5. Pesticide dressed seed + Panoramix (2 kg/ha)	4197	5045
6. Pesticide dressed seed + Recom. NP/ha	4857	6492
7. Clean seed + Paronamix + Recom. NP/ha	3979	6087
8. Pesticide dressed seed + Paronamix + Recom NP/ha	4016	5151
CV (%)	12.13	16.62
LSD (0.05)	NS	NS

Table 2. Effects of paronamix fertilizer on maize grain yield (kg ha^{-1}) at Meki, Negele Arsi , Ziway and MARC

Project 6.

Project period:
Objectives:

Responsibility:
Reported by:
Year of report

Design:
Treatment:
Location:
Summary of Result

.


Figure 3. Performance of tomato at field condition

Project 7.

Project period:
Objectives:

Responsibility
Reported by:
Year of report:
Progress of the project
Design:

Location:

Summary of Result

Project period:
Objective/s/:

Responsibility:
Reported by:
Year of report:
Progress of the project
Design: RCBD
Treatment: 7
Location:
Summary of Result

Plan for the next year:

Project title 9:

Irrigation and Drainage Research Program

Project I:
Project period:
Activity 1:

Activity period:
Objective:
Persons Responsible:
.
Reported by:
Period of report:
Summary of progress:
Design:
Treatment:

Location:
Summary of Result

Table 15. Stage-wise Crop coefficient and crop water requirement values of each crop

Crop	Parameters	Initial Stage	Developmental Stage	Mid Stage	Late Stage
Wheat	Kc- Values	0.54	0.87	1.16	0.68
	CWR (mm/day)	2.45	3.85	5.73	3.86
Tef	Kc value	0.51	0.88	1.01	0.58
	CWR (mm/day)	2.24	3.79	5.32	3.30
Haricot bean	Kc value	0.45	0.84	1.13	0.66
	CWR (mm/day)	2.51	3.99	5.65	4.07
Sorghum	Kc value	0.64	0.96	1.18	0.63
	CWR (mm/day)	3.57	4.56	5.90	3.89
Maize	Kc value	0.67	0.99	1.25	0.62
	CWR (mm/day)	3.73	4.70	6.25	3.82
Onion	Kc value	0.58	0.89	1.03	0.78
	CWR (mm/day)	3.54	5.01	5.53	4.21

*Kc – Crop coefficient, CWR – Crop water requirement

Plan for the next year:

Activity-2:
Activity period:
Objective:

Reported by:
Period of report:
Summary of progress:
Design:
Treatment:
Location:

Table 16. Estimated ETo Values for Meteorological Stations

Stations	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec	Average
Adama	5.08	5.94	6.32	6.04	5.75	5.82	4.95	4.51	4.06	5.69	5.22	5.06	5.37
Chiro	5.31	6.03	6.52	6.31	6.52	6.57	5.34	4.24	5.41	6.35	5.07	4.64	5.69
MARC	5.68	6.34	6.63	6.50	6.21	6.14	4.99	4.55	4.58	5.44	5.90	5.55	5.71
Metehara	5.73	6.61	7.32	6.93	7.05	7.43	5.8	6.71	6.64	6.45	6.07	5.67	6.53
Mojo	5.08	5.51	5.92	5.89	5.94	5.72	4.87	5.17	5.28	5.52	5.18	5.07	5.43
Nura Era	5.09	5.90	6.61	6.37	6.42	7.52	5.75	6.83	6.35	6.47	5.46	5.03	6.15
Welenchiti	5.70	6.41	7.02	7.06	6.93	5.73	5.35	5.64	5.66	6.46	5.83	5.41	6.10

Plan for the next year: the trial will continue by next year

Activity-3:
Activity period:
Objective:

Reported by:
Period of report:
Summary of progress:
Design:
Treatment:
Location:
Summary of Result:

Table 17.Yield and Water Productivity of Pepper as soil moisture depletion level varied

Treatments	Melkassa	
	Yield (t/ha)	WP (Kg/m^3)
60 % ASMDL	19.48^a	4.14^a
80 % ASMDL	19.19^a	4.07^a
ASMDL	16.17^b	3.43^b
120% ASMDL	16.06^b	3.41^b
140 % ASMDL	15.66^b	3.32^b
CV (%)	7.74	7.73
$LSD_{0.05}$	2.52	0.54

*ASMD is allowable soil moisture depletion level (P=0.30)

Plan for the next year:

Project period
Activity-1:
Activity period:
Objective:
Responsible Persons:
Reported by:
Period of report:
Summary of progress:
Design:
Treatment:
Location:
Summary of Result

Table 18. Result of Maize response to soil moisture stress

Treatments*	Grain yield (Qt/ha)	Water Productivity (Kg/m^3)
IDMdMt	57.36^a	1.00^f
DMdMt	57.62^a	1.01^{ef}
IMdMt	52.26^{bcd}	1.19^{bc}
IDMt	56.27^{ab}	1.04^{def}
IDMd	57.48^a	1.16^{bcd}
MdMt	51.46^{cd}	1.17^{bcd}
DMt	57.64^a	1.07^{cdef}
DMd	56.27^{ab}	1.14^{bcde}
IMt	47.67^{de}	1.18^{bc}
IMd	21.50^{cd}	1.43^a
ID	55.55^{abc}	1.21^b
Mt	45.25^e	1.12^{bcdef}
Md	49.41^{de}	1.37^a
D	54.40^{abc}	1.18^{bc}
I	37.39^f	1.15^{bcd}
Cv	15.24	7.01
$LSD_{(0.05)}$	4.60	0.14

*Irrigation was supplied at the indicated stages; I-initial, D-development, Md-mid, Mt-maturity

Plan for the next year:

Activity-2:
Activity period:
Objective:

Reported by:
Period of report:
Summary of progress:
Design:
Treatment:

Location:
Summary of Result:

Figure 3. Field condition as affected by the frost

Plan for the next year:

Activity-3:

Activity period:
Objective:

Responsible Persons:
Reported by:
Period of report:
Summary of progress:
Design:
Treatment:

Table 19. Treatment combinations

Main Plots	Sub plots
Initial stage	Irrigated 100% ETc
Development stage	Irrigated 85% ETc
Mid stage	Irrigated 70% ETc
Late stage	Irrigated 55% ETc

Location:
Summary of Result

Table 20. Effect of deficit irrigation levels and growth stages on yield and water productivity

Irrigation levels	Yield (t/ha)	Water Productivity (Kg/m^3)
55% Etc	34.50^c	6.08^b
70% Etc	38.12^b	6.45^{ab}
85% Etc	42.15^a	6.84^a
100% Etc	44.34^a	6.93^a
LSD $_{0.05}$	3.03	0.53
Growth stages		
Initial stage	39.34	6.32
Dev't stage	41.44	6.89
Mid stage	37.88	6.56
Late stage	40.56	6.51
LSD $_{0.05}$	NS	NS
Cv	20.56	20.65

Plan for the next year: The trial will continue next year

Activity-4:

Activity period:
Objective:

Reported by:
Period of report:
Summary of progress:
Design:
Treatment:
Location:
Summary of Result

Table 21. Result of effect of supplementary irrigation on maize

Treatments	Grain Yield (Qt/ha)
NO-SI (no Supplementary irrigation)	55.79
SI of 100%Etc	65.49
SI of 80%Etc	55.25
SI of 60%Etc	55.59
SI of 40%Etc	61.86
SI of 20%Etc	64.31
Cv	10.35
LSD$_{(0.05)}$	NS

Plan for the next year:

Activity-5:

Activity period:
Objective:

Reported by:
Period of report:
Summary of progress:
Design:
Treatment:
Location:
Summary of Result:

22

Table 22. Haricot bean response to supplementary irrigation

Treatments*	Grain Yield (Qt/ha)	WP (Kg/m^3)
No-SI	23.24^{c}	1.63^{ab}
I	23.22^{c}	1.63^{ab}
D	23.55^{c}	1.65^{a}
Md	26.60^{b}	1.56^{ab}
Mt	23.74^{c}	1.37^{c}
ID	23.12^{c}	1.62^{ab}
IMd	26.01^{b}	1.53^{b}
IMt	23.81^{c}	1.37^{c}
DMt	24.15^{c}	1.39^{c}
DMd	26.48^{b}	1.56^{ab}
MdMt	28.46^{a}	1.41^{c}
Cv	14.21	14.36
$LSD_{(0.05)}$	1.77	0.11

*One supplementary irrigation at each of the indicated stages, I-initial, D-development, Md-Mid, Mt- maturity.

Plan for the next year:

Activity period:
Objective:

Reported by:
Period of report:
Summary of progress:
Design:
Treatment:

Table 23. The treatment combinations of Mulch and Furrow trial

Main plots	Sub plots
Alternate Furrow Irrigation (AF)	No mulch (NM)
Fixed Furrow Irrigation (FF)	Straw mulch (SM)
Conventional Furrow Irrigation (CF)	Plastic mulch (PM)

Location:
Summary of Result

Table 24. Interaction effect of Mulching and Furrow methods on yield and water productivity

	Bulb yield (ton/ha)			Water Productivity (kg/m^3)		
Treatments*	CFI	AFI	FFI	CFI	AFI	FFI
Plastic Mulch	39.39^a	34.24^b	27.69^c	7.17^d	12.30^a	9.94^b
Straw Mulch	38.11^a	28.65^c	25.50^d	6.84^d	10.29^b	9.16^c
No Mulch	33.73^b	21.50^e	20.58^e	6.06^e	7.72^d	7.39^d
LSD $_{(0.05)}$ = 1.89		CV (%) = 3.58		LSD $_{(0.05)}$ = 0.67, CV (%) = 4.42		

*CFI-conventional furrow irrigation, AFI-alternate furrow irrigation, FFI-fixed furrow irrigation

Plan for the next year:

Activity period:
Objective:

Reported by:
Period of report:
Summary of progress:
Design:
Treatment:

Table 25. The treatment combinations of Mulch and Furrow trial

Main plots	Sub plots
Drip system	100 % Etc
Alternate Furrow Method	85 % Etc
	70 % Etc
	55 % ETc

Location:
Summary of Result:

Table 26. Effect of irrigation methods & levels on yield and WP of maize

Irrigation Method	Grain Yield (Qt/ha)	WP (Kg/m^3)
Drip	58.42^a	1.34^b
Alternate F.	46.60^b	2.17^a
LSD $_{(0.05)}$	5.87	0.17
CV (%)	6.36	5.75
Irrigation Method*		
100 % Etc	58.65^a	1.46^d
85 % Etc	55.58^b	1.64^c
70 % Etc	50.42^c	1.82^b
55 % Etc	45.38^d	2.09^a
LSD $_{(0.05)}$	2.42	0.07
CV (%)	3.67	3.27

*ETc- Evapo transpiration

Plan for the next year:

Project III:

Activity period:
Objective:

Reported by:
Period of report:
Summary of progress:
Design:
Treatment:

Table 27. Treatment combinations of balanced fertilizer rate and irrigation regimes

Treatment		Fertilizer rates for Onion		
Irrigation Depletion Level	RNP	100 Kg Map Recommended Formula	150 Kg Map Recommended Formula	200 Kg Map Recommended Formula
80% MAD	T1	T2	T3	T4
MAD (Recommended)	T5	T6	T7	T8
120% MAD	T9	T10	T11	T12

*RNP recommended NP rate

Location:
Summary of Result:

Table 28

Table 28. Effect of balanced fertilizer rate and irrigation regime

SMDL	MARC	Fentale
	Bulb Yield (t/ha)	Bulb Yield (t/ha)
80 % ASMDL	37.76[a]	30.48[a]
ASMDL	35.65[a]	27.317[ab]
120 % ASMDL	32.88[b]	23.92[b]
LSD $_{(0.05)}$	2.27	4.31
CV (%)	5.64	13.96
Balance Fertilizer- rate (Kg) NPSZn	Bulb Yield (t/ha)	Bulb Yield (t/ha)
200	37.67[a]	30.91[a]
150	34.07[c]	24.51[c]
100	34.16[bc]	24.54[c]
RNP	35.83[b]	28.99[b]
LSD $_{(0.05)}$	1.7	1.45
CV (%)	4.86	5.39

ASMDL (FAO-allowable soil moisture depletion level for Onion = 25%)

Plan for the next year:

Activity 2:

Activity period:
Objective:

Responsible Persons:
Reported by:
Period of report:
Summary of progress:
Design:
Treatment:
Location:
Summary of Result:

Table 29. Phosphorus fertilizer rate and soil moisture level for haricot bean

Irrigation Levels	MARC	Fentale
	Grain Yield (Qt/ha)	Grain Yield (Qt/ha)
100%Etc	25.22	23.19
75 %Etc	24.64	20.92
50 %Etc	20.93	20.21
LSD $_{(0.05)}$	NS	NS
CV (%)	18.83	15.84
P- rate Kg/ha	Grain Yield (Qt/ha)	Grain Yield (Qt/ha)
40	27.35[a]	24.19[a]
30	25.37[b]	23.25[a]
20	23.44[c]	21.85[b]
10	22.2[d]	20.26[c]

0	19.61[e]	17.66[d]
LSD $_{(0.05)}$	1.02	1.20
CV (%)	15.47	15.77

*ETc- Evapo transpiration, P-phosphorus fertilizer kg/ha

Activity 3

Activity period:
Objective:

Reported by:
Period of report:
Summary of progress:
Design:
Treatment:

Table 30.Treatment combination of Nitrogen fertilizer rates and soil moisture levels

Treatment	N rate (kg/ha) for Onion				
Irrigation Intervals	0	23	46	69	92
100% Etc	T1	T2	T3	T4	T5
75% Etc	T6	T7	T8	T9	T10
50% Etc	T11	T12	T13	T14	T15

Location: MARC
Summary of Result:

Table 31. Interaction effect of N-fertilizer rate and soil moisture levels

Treatments*	Yield (t/ha)	WP (Kg/m^3)
100ETc-92N	41.83[a]	6.59[d]
100ETc-69N	37.80[b]	5.95[e]
100ETc-46N	37.37[b]	5.88[e]
100ETc-23N	31.20[c]	4.91[f]
100ETc-0N	25.20[ef]	3.97[g]
100ETc-92N	37.10[b]	7.79[c]
100ETc-69N	36.73[b]	7.71[c]
100ETc-46N	33.10[c]	6.95[d]
100ETc-23N	26.60[e]	5.59[e]
75ETc-0N	24.27[f]	5.09[f]
100ETc-92N	29.07[d]	9.15[a]
100ETc-69N	26.43[e]	8.32[b]
100ETc-46N	25.33[ef]	7.98[bc]
100ETc-23N	24.97[ef]	7.86[c]
50ETc-0N	15.93[g]	5.03[f]
CV	13.51	13.43
$LSD_{0.05}$	1.77	0.38

*ETc- Evapo transpiration, N-nitrogen fertilizer kg/ha

Plan for the next year: second year trial will be repeated

Project IV

Activity 1

Activity period:
Objective:

Reported by:
Period of report:
Summary of progress:
Design:
Location:

Plan for the next year:

Activity 2:

Activity period:
Objective:

Reported by:
Period of report:
Summary of progress:
Design:
Treatment:
Location:

Plan for the next year:

Activity 3:
Activity period:
Objective:

Reported by:
Period of report:
Summary of progress:
Design:
Treatment:
Location:

Plan for the next year:

Activity 4:

Activity period:
Objective:

Reported by:
Period of report:
Summary of progress:
Design:
Treatment:

Location:
Summary of Result:

Table 32. Application efficiency determined using Furdev model

Discharge (l/s)	Furrow Length (m)			
	50	100	150	200
	Application efficiency (%)			
1	26	52	76	91
2	16	30	45	60
3	10	20	30	40

Plan for the next year:

Project V:

Project period:
Activity 1:

Activity period:
Objective:

Reported by:
Period of report:
Summary of progress:
Design:
Treatment:
Location:

Summary of Result

Figure 4. Drip irrigation demonstration at Fentale-Gidara

Plan for the next year:

Activity 2
Activity period:
Objective:

Responsible Persons:

Reported by:
Period of report:
Summary of progress:
Design:
Treatment:

Location:
Summary of Result:

Table 33: Summary of bulb yield and water productivity under soil moisture stress

Stress conditions	Bulb yield (t/ha)	Water productivity (Kg/m^3)
DMd	31.2	5.6
DMdMt	33.6	6.0
IDMdMt	34.4	6.1

Plan for the next year:

Project VI:

Project period: 2017-2019
Activity 1

Activity period:
Objective:

Reported by:
Period of report:
Summary of progress:
Design:

Location:

Summary of Result:

Plan for the next year:

Activity period:
Objective:
Responsible Persons:

Reported by:
Period of report:
Summary of progress:
Design:
Treatment:
Location:
Summary of Result:

Plan for the next year:

Activity 3:

Activity period:
Objective:

Reported by:
Period of report:
Summary of progress:
Design:
Treatment:
Location:
Summary of Result:

Plan for the next year:

Activity 4:

Activity period:
Objective:

Reported by:
Period of report:
Summary of progress:
Design:
Treatment:
Location:

Plan for the next year:

Project VI:
Project period
Activity 1:
Activity period:
Objective:

Reported by:
Period of report:
Summary of progress:
Design:

Location:

Table 34. Summary of optimal irrigation scenario

Treatments	Yield (t/ha)
OAE+LR	5.87^{ab}
OAE	5.52^{bc}
OAE+0.1+LR	6.45^{a}
OAE+0.1	6.14^{ab}
OAE-0.1+LR	4.91^{c}
OAE-0.1	5.01^{c}
CV	7.08
$LSD_{0.05}$	0.73

Plan for the next year:

Activity 1:

Activity period:
Objective:

Reported by:
Period of report:
Summary of progress:
Design:

Location:
Summary of Result:

Plan for the next year:

Plant Biotechnology Research Process

Gemechu Olani

Plant biotechnology Program

Project title1:
Project period:
Activity title 1:

Activity period:
Objective:
Responsible persons:
Reported by:
Year of report:
Summary of Progress

Design:
Treatments:
Location:
Results:
Plan for the next year:

Activity 2:

Activity period:
Objective:
Responsible persons:
Reported by:
Year of report:

Summary of Progress

Design:
Treatments:
Location:
Results:

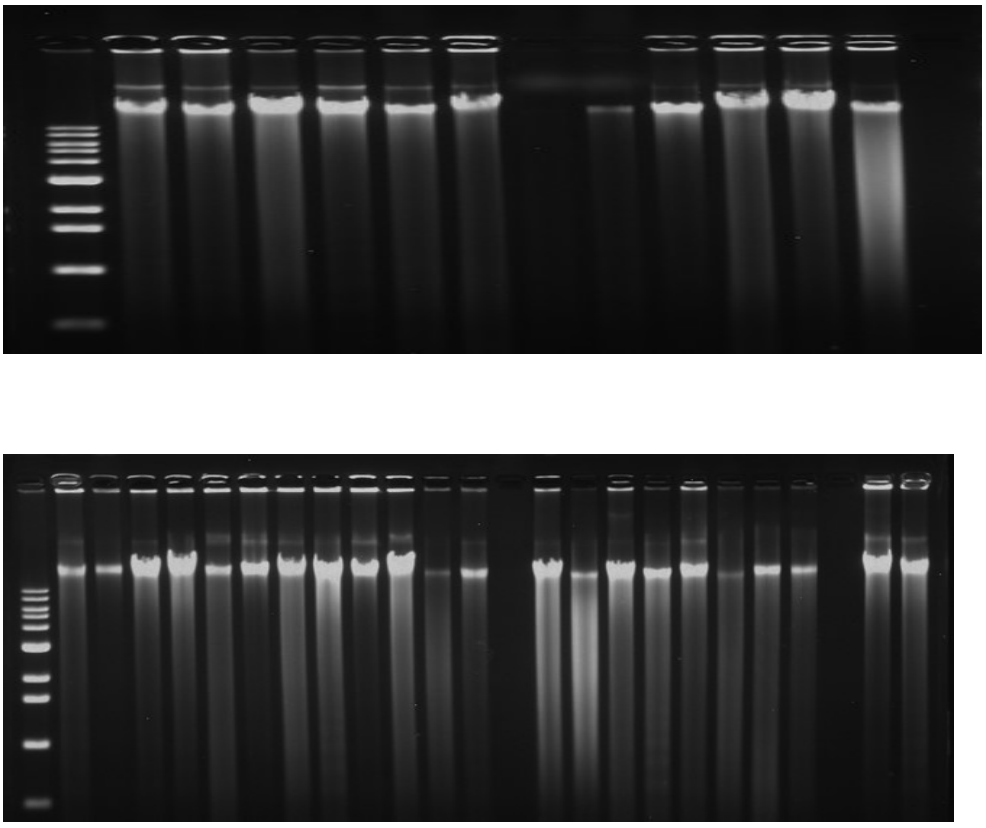

Figure 1. Pepper genotypes Genomic DNA on 0.8% agarsoe gel in TBE buffer. First lane is akb D NA ladder in both gels; the rest of the lnesare sample DNA's of A:1-22, and B: 23-34

Plan for the next year:

Activity 3:
Activity period:
Objective:
Responsible persons:
Reported by:
Year of report:
Summary of progress

Design:
Treatments:
Location:
Results:

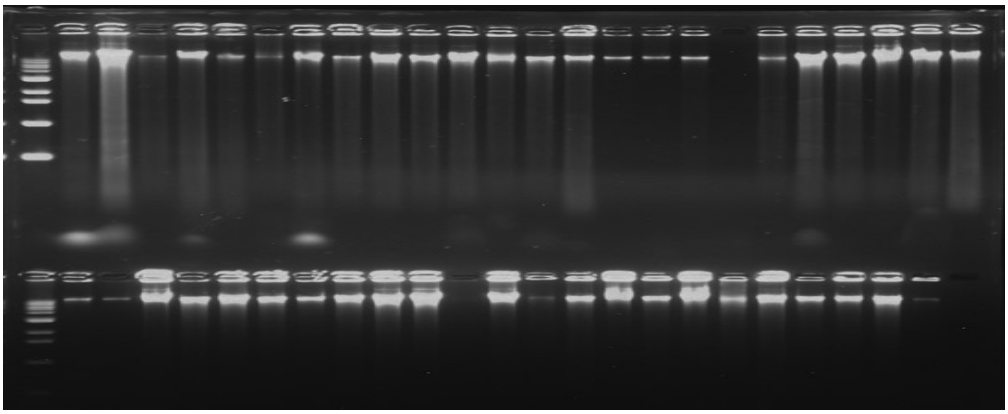

Figure 2 Banana genotypes Genomic DNA on 0.8% agarsoe gel in TBE buffer. First lane is 1kb DNA ladder in all gels; the rest of the lanesare sample DNA's of A:1-31, and B:32-54 and C: 51-96.

Plan for the next year:

Project title2:

Project Period
Activity 1:

Activity period:
Responsible persons:
Reported by:
Year of report:
Summary of progress

Design:
Treatments

Location:
Results:

Plan for the next year:

Activity title2:

Objective:-

Activity period:
Responsible person:

Reported by:
Year of report:
Summary of the Result:

Design:
Treatments
Location:
Results:

Table 1: In vitro regenerated garlic plants

Hormone (mg/l)		Explant per treatment	Regenerated shoots		Number of shoots per explants	Number of shoots per explants (weeks)		
2ip	NAA		Number	(%)		7	12	18
0	0	15	4	26	1	0	1	
0.5	0.25	16	8	50	3.5	5	2.3	1.4
0.25	0.05	15	15	100	1.5	5	2.1	1.2
1.5	0.05	15	11	73	1.7	5	2.3	1.6
1	0.05	15	13	86	1.5	6	1.9	1.2
2	0.25	15	5	33	5.4	5	7	2.3
0.22	0.19	16	8	50	8.9	8	4.9	1.6
1	0.2	16	6	37	1	0	1	1.0
5	0.2	15	5	33	1	0	1	1.0
3	0.25	16	8	50	1.5	3	1.3	1.2
0.5	0.05	15	8	53	1.4	3	1.2	1.2
3	0.1	16	10	63	3.9	8	1.8	1.6

Plan for the next year:

Activity title 3:

Activity period:
Objective:

Persons Responsible:

Reported by:
Year of report:
Summary of progress:

Design:
Treatments:
Location:
Results:

Plan f 515.re JETQq0.000007687 0 515.88 728.52 reW* nBT/F5 9 Tf1 0 0 1 105.267 28125 Tm

Design:
Treatments:

Location:
Results:

Plan forthe next year:

Project title 2:

Project Period
Activity title5:

Activity period:
Objective:
Responsible persons:

Reported by:
Year of report:
Summary of progress:

Design:
Treatments:

Location:
Results:

Table 1. Mean numbers for Njiru(Number of shoots and Multiplication Factor).

Treat.	Mean_NofShoots	Mul.Fact.
1	0.73	1.30
2	0.67	0.97
3	0.67	1.07
4	0.90	1.13
5	0.37	0.63
6	0.60	1.17
7	0.63	1.03
8	0.67	1.07

Plan forthe next year:

Project title 2:

Project Period:
Activity 6:

Objective:
Activity period:
Responsible persons:

Reported by:
Year of report:
Summary of progress

Design:
Treatments
Location:
Results:

Table 1.Total number of banana in vitro plantlet in Laboratory and Greenhouse (As of July 22, 2019)

Variety	Stage	Available numbers of plantlets
Poyo	Mult. & Rooting	23,556
Giant Cavendish	Mult. & Rooting	7,128
Williams	Mult. & Rooting	80
Grande naine	Mult. & Rooting	8,096
Butuza	Mult.	80
Aloe vera (Linn.)	Mult.	376
Total		**39,316**
Dwarf	Acclimatization	10
Grande Naine	Acclimatization	72
Njiru (Cooking Banana)	Acclimatization	160
Total		**242**

Table 2.The amount of tissue culture banana distributed to stakeholder in 2018/19

Sites of Distributions	Gaint	Grande Naine	Dwarf	Poyo	Williams	Total
Arsi Surrounding	250	250				500
Sire District (Invester)	330	650				980
Fentalle	312	600	10	928		2000
Fentalle		60		140		200
Melkassa/Bishola		24	20	96	14	154
Arbaminch	250					250
Chiro		500	500	500		1500
Adama				150		150
Sinana ARC	250	250	250	250		1000
Total	1392	2334	780	2064	14	6734

Plan forthe next year:

Plant Protection Research Process

Plant Pathology

Project title 1:

Project period:
Activity:

Activity period:
Objective:

Responsible person:
Reported by:
Year of report:
Summary of the progress:
Design:
Treatment:

Location:
Result

Table 1. List of fungicides in their application sequence

Spray sequence	Fungicide	Mode of action	Rate/ha	Rate/plot (200 sq. m)
1	Mancozeb 80 WP	Contact	3 kg in 800 L. of water	60 g in 16 L. of water
2 and 3	Curzate OR	Contact + systemic	2.5 kg in 800 L. of water	50 g in 16 L. of water
	Ridomil Gold MZ 68 WP		2.5 kg in 800 L. of water	50 g in 16L. of water
4	Kocide	Contact	2 kg in 800 L. of water	40 g in 16 L. of water

Note: The spray schedule mentioned shall be followed when the pathogen (purple blotch) persists after the previous spray. Otherwise, the following spray shall be applied only when the incidence warrants so.

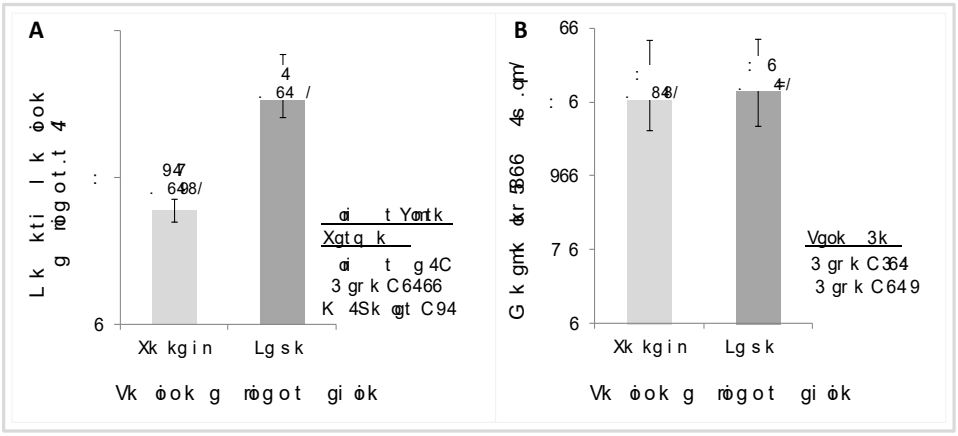

Figure 1. Frequency of pesticide application (A) and onion yield (B) under research and farmer practice.

Plan for the next year:

Project title 2:

Project Period:
Activity:

Activity period:
Objectives:

-
-
-

Responsible person:
Reported by:
Year of report:
Summary of the progress
Design:
Treatment:
Location:
Result

Plan for the next year:

Project title 3:

Project period:
Activity 1:

Activity period:
Objectives:

-
-

Responsible person:
Reported by:
Year of report:
Summary of the progress
Design:
Treatment:
Location:

Result

Plan for the next year:

Activity title 2:

Activity period:

Objective

-
-
-
-

Table 5. Response of hot pepper varieties/accessions to *Fusarium oxysporium* f.sp.*capsici* infection under greenhouse conditions

Var/Acc	FWI (%)	VDI (0-5 scale)	RC
Melka Oli[RV]	75.0[bc]	4.8[a]	HS
Mareko fana[RV;S]	100.0[a]	4.7[ab]	HS
Dinsire[RV]	100.0[a]	4.5[b]	HS
BakoLocal[RV]	100.0[a]	4.2[c]	HS
ACC 211470[Acc]	50.0d[e]	4.1[cd]	MS
ACC 223648[Acc]	83.3[ab]	4.0[de]	HS
NJP[Acc]	100.0[a]	3.9[def]	HS
Kume[RV]	100.0[a]	3.9[def]	HS
ACC 212587[Acc]	75.0[bc]	3.8[ef]	HS
Dame[RV]	75.0[bc]	3.8[ef]	HS
Melka Zala[RV]	75.0[bc]	3.7[f]	HS
ACC 230798[Acc]	75.0[bc]	3.5[g]	HS
ACC 229334[Acc]	75.0[bc]	3.2[hi]	HS
Melka Dera[RV]	75.0[bc]	3.0[j]	HS
ACC 24047[Acc]	58.3[cd]	3.4[hg]	S
Melka Awaze[RV]	58.3[cd]	3.3[gh]	S
Melka Shote[RV]	50.0[de]	3.0[ij]	MS
ACC 80[Acc]	50.0[de]	2.2[k]	MS
ACC 212679[Acc]	41.7[ef]	2.1[kl]	MS
Oda Haro[RV;T]	33.3[ef]	2.0[l]	MR
ACC 80061[Acc]	25.0[f]	1.5[m]	MR
CV (%)	**21.3**	**4.9**	**-**
LSD (5%)	**21.3**	**0.2**	**-**

RV

Acc

VAR ACC FWI

VDI RC HS S

MS MR

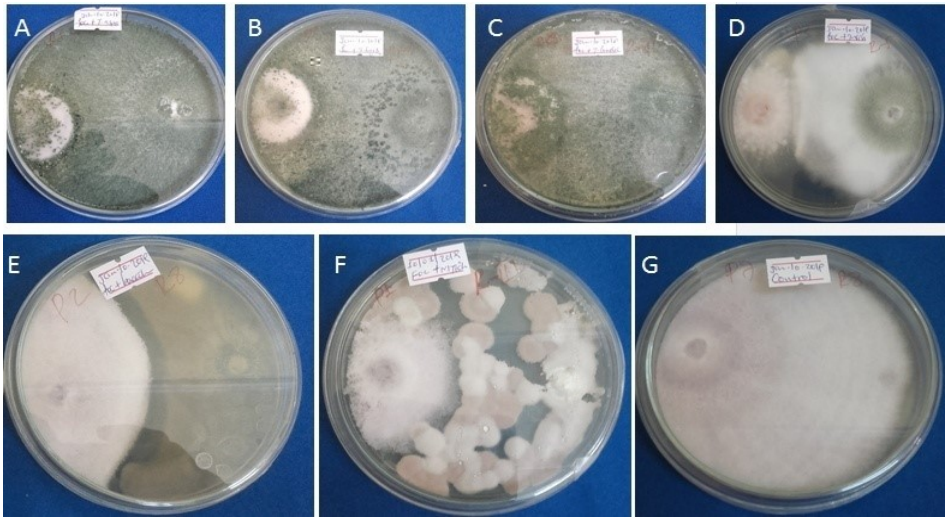

Figure 1. Dual culture assay on potato dextrose agar showing mycelial growth inhibition of *Fusarium oxysporium* f.sp. *capsici* 4DGK by *Trichoderma asperellum* (A), *T.harzianum*(B), *T.longibiracher*(C), *T.viride*(D), *Bacillus subtilis*(E), *Paciliomus lilicinus*(F) and *F. oxysporium* f.sp. *capsici* 4DGK growth without BCA (G)

Plan for the next year:

Project 1:

Project period: 2015
Activity 1.

Activity period:
Objective:
•
Responsible person:
Reported by:
Year of report:
Summary of the progress
Design:
Treatment:
Location:
Result

Plan for the next year:

Project title:

Project period:
Activity:

Activity period:
Objective:

Responsible person

Reported by:
Year of report:
Summary of the progress
Design:
Treatment:

***Varieties**
Location:
Result

Plan for the next year:

Activity 2

Duration
Objective/s/

-

-

Responsibilities

Reported by:
Year of report
Summary of the progress:
Design:
Treatment:

Location:
Result

Table 1. Reaction of common bean varieties to *P. griseola* isolates under greenhouse conditions

	Responses of common bean varieties to *P. griseola* inoculations[1]					
	Dolla1		**Dolla2**		**Dorebafano**	
Variety	**AUDPC**	**RC**	**AUDPC**	**RC**	**AUDPC**	**RC**
KATB1	48.25^{efghij}	S	54^{cdefgh}	S	70.56^{a}	S
BABILE	28.96^{lmn}	S	35.32^{klm}	S	45.65^{ghijk}	S
NASIR	26.38^{mn}	I	25.12^{mn}	I	25.12^{mn}	I
DEME	42.75^{hijk}	S	45.88^{ghijk}	S	40.88^{ijk}	S
DINKNESH	57.88^{bcde}	S	49.12^{efghij}	S	60.87^{abcd}	S
DIMTU	64.75^{abc}	S	63.62^{abc}	S	66.62^{ab}	S
KATB69	43.75^{hijk}	S	50.5^{defghi}	S	57.38^{bcdef}	S
SER125	9.0^{p}	R	10.12^{p}	R	9.0^{p}	R
SER119	13.88^{op}	I	12.75^{p}	R	10.88^{p}	R
AWASH2	35^{klm}	S	23.5^{no}	I	43.38^{hijk}	S
SAB632	50.38^{defghi}	S	44.62^{ghijk}	S	55.75^{bcdefg}	S
SAB736	38.12^{jkl}	S	43.88^{hijk}	S	46.5^{fghijk}	S
CV (%)	**17.1**					

[1]AUDPC = Area under disease progress curve; RC = Resistance reaction category; R = Resistant; S = Susceptible and I = intermediate resistance. CV = Coefficient of variation. Means in columns and rows followed by the same letter(s) are not significantly different at 5% level of significance, DMRT.

Plan for the next year:

Activity 3.

Activity period:
Objective:

-

-

Responsibilities (Person, Center):

Reported by:
Year of report
Summary of the progress
Design:
Treatment:
Location:
Result

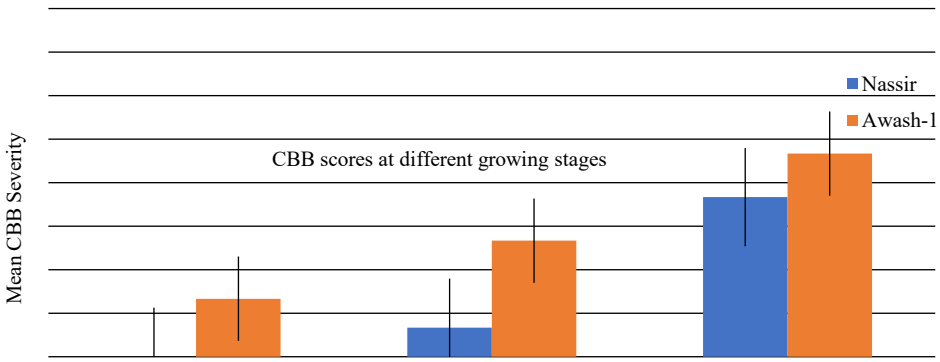

Figure 1. Progress of common bean bacterial blight at MARC in 2018 on two common bean varieties.

Plan for the next year:

Activity 4.

Activity period:
Objective/s/

-

•

Responsible person

Reported by:
Year of report:
Summary of the progress
Design:
Treatment:
Result

Table 3. Reaction of Large red bean varieties to Halo blight at MARC 2018

Genotype	Score 1	Score 2	Score 3	Genotype	Score 1	Score 2	Score 3
DAB 497	2.0	3.3	5.3	DAB 544	1.0	2.0	2.0
DAB 317	2.3	2.3	2.7	DAB 525	1.0	1.0	1.0
DAB 482	3.7	4.0	5.0	DAB 545	1.0	2.0	3.0
DAB 523	2.3	3.7	6.7	DAB 540	3.0	1.7	3.7
DAB 512	2.7	3.7	5.0	DAB 532	1.0	2.7	1.0
DAB 513	1.0	2.3	3.7	DAB 481	1.7	2.0	3.3
DAB 496	1.0	2.7	3.3	Melka dima (check)	1.7	3.0	4.0
DAB 478	1.3	1.3	1.7	Red kideny	1.0	1.3	3.7

Table 4. Mean reaction of large red mottled bean varieties to Halo blight at MARC 2018

No	Genotype	Score 1	Score 2	Score 3	No	Genotype	Score 1	Score 2	Score 3
1	DAB 220	1.0	2.67	3.00	10	DAB 298	1.0	1.67	2.0
2	DAB 241	1.0	1.67	2.33	11	DAB 237	1.0	4.0	4.3
3	DAB 245	1.0	2.33	2.33	12	DAB 283	1.0	3.0	4.0
4	DAB 259	1.0	1.0	1.3	13	DAB 396	1.67	2.0	4.3
5	DAB 251	2.3	3.33	3.33	14	DAB 265	1.0	1.67	1.67
6	DAB 320	1.0	1.0	2.3	15	DAB 247	1.0	1.0	1.0
7	DAB 288	1.67	1.67	2.00	16	GLP-2	2.0	2.0	2.0
8	DAB 292	1.0	1.67	2.0	17	NUA 99	1.67	4.0	5.0
9	DAB 278	1.33	2.33	3.0	18	NUA 94	1.33	1.67	2.0

Plan for the next year:

Agricultural Entomology Program

Project Title 1
Project Period
Activity 1 Survey on occurrence and damage of White Mango Scale
Activity period:
Objective:
-

Responsible persons
Reported by:
Year of report
Summary of research progress
Design:
Treatments:
Locatio
Result

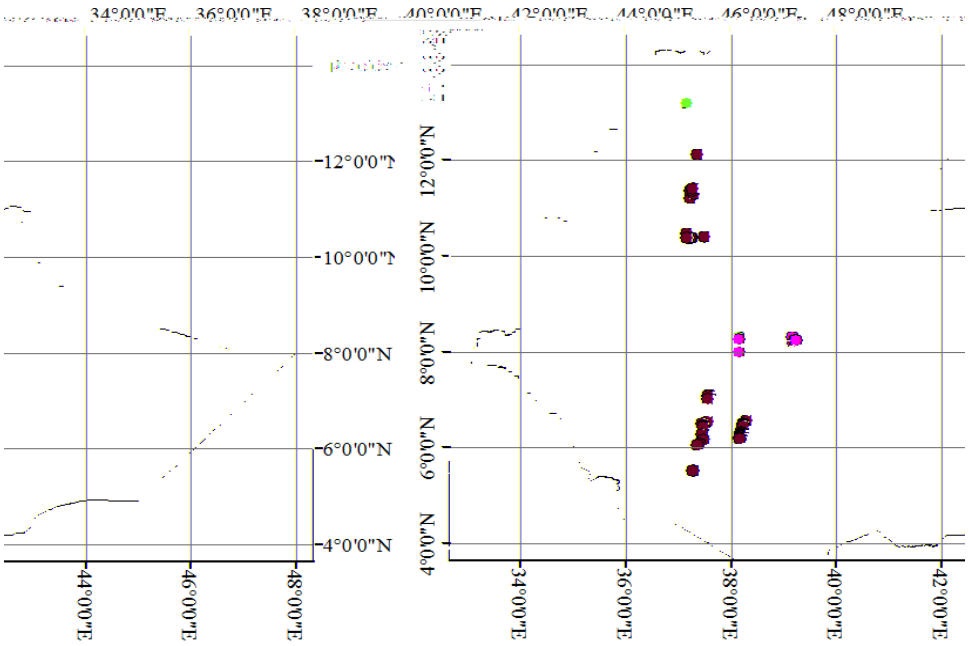

Figure 1. Distribution and severity of WMS in different parts of Ethiopia: Yellow (60- 100% Infestation; green (no infestation)

Plan for the next year:

Activity 2
Activity period:
Objective
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Responsible persons
Reported by:
Year of report
Summary of research report
Design:
Treatments:
Locatio
Result

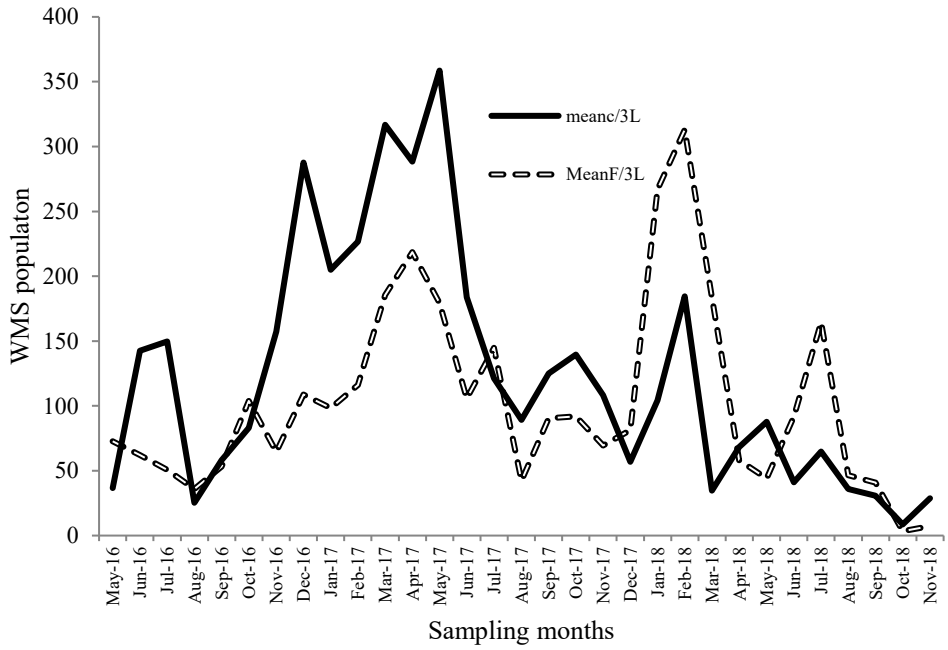

Figure 2. Fluctuation in the population of white mango scale on mango, **WMS**: white mango scale

Plan for the next year:

Activity period:
Objective
•

Responsible persons:

Reported by:

Design:
Treatments and:
Locatio
Result

Plan for the next year:

Activity 4.

Activity period:
Objective:
•

Reported by:

Summary of research progress
Design:
Treatments
Location:
Result

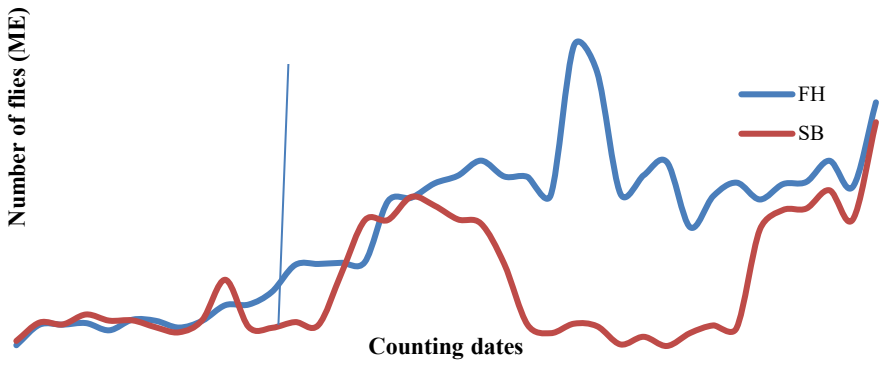

Figure 1. Efficacy of local product and synthetic bait for controlling fruit flies on mango

Plan for the next year:

Activity 5.

Activity period:

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Responsible persons
Reported by:

Design:

Locations
Result

Plan for the next year:

Project Period
Activity 1

Activity period:
Objective
•

Responsible persons:
Reported by:

Summary of research report
Design:
Treatments:
Locations
Result

Plan for the next year:

Activity 2.

Activity period:
Objective

•

Reported by:
Year of report
Summary of research report
Design:
Treatments
Locations
Result

Table 2: Efficacy of registered insecticides for *Tuta absoluta* control on tomato

No.	Treatment	Mark. Fruit No.	Mark Fruit Wt. (Kg)	% Tuta Damage fruit No.	% Tuta Damage fruit wt.
1	Ampligo 150	92.3	8.8	82.2	77.6
2	Coragen 200 SC	79.7	6.8	81.4	77.4
3	Belt 480 SC	256.3	21.8	50.5	42.8
4	Best field 360 SC	404.0	35.1	31.6	24.9
5	Radiant 120 SC	328.0	28.7	42.7	37.3
6	Tracer 480 SC	381.0	29.7	33.9	29.7
7	Avaunt 150 EC	262.5	21.6	41.1	37.4
8	Untreated check	84.0	8.3	75.8	71.5

Plan for the next year:

Activity 3

Activity period:
Objective:
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Responsible persons
Reported by:

Design:

Table 3: Effect of trap height and lure concentration on moth catches

Treatment	Moth number	Lure concentration	Moth number
Ground	2162	Low (0.5 mg)	1510
Crop surface	1982	Medium (0.8 mg)	1558
Above crop surface	841	High (3 mg)	1920

Table 4: Effect of trap position on moth catches

Direction	Moth number
North	2353
East	1866
West	1424
SOUTH	1397
CENTRAL	1213

Plan for the next year:

Activity 4

Activity period:
Objective:
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Responsible persons:
Reported by:
Year of report:
Summary of research report
Design:
Treatment:
Locations:
Result

Plan for the next year:

Project 1:

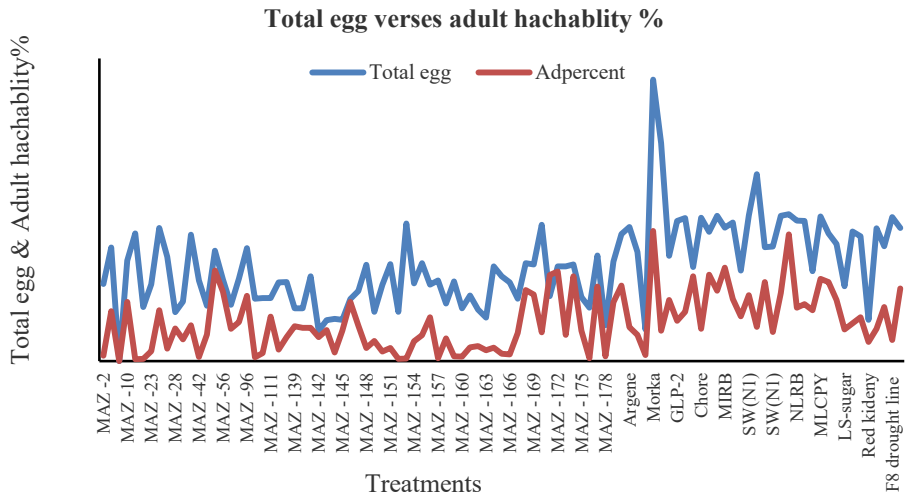
Activity 1

Activity period:
Objective

Responsible persons:
Reported by:

Design:
Treatments

Locations
Result:



Plan for the next year:

Activity 2

Activity period:
Objective

Responsible persons:
Reported by:
Year of report:
Summary of research progress
Design:

Locations
Result

Plan for the next year:

Activity period:
Objective
•

Reported by:

Design:
Treatments:

Locations
Result

Table 1. Effect of Dimethoate 400g/L spraying 3,6,9 and 12 weeks after emergence on stand count after 3 & 6 week, severity score(1-5), Infested plant and yield qt/ha, against Aphids on Cowpea

No	Time of spraying (Dimethoate 400g/L)	SC after 3 weeks Emergence	SC after 6 weeks Emergence	Severity score (1-5)	# of infested plant by Aphids	Grain Yield Qt/ha
1	3 WAE(Bole)	159.67a	98.33ab	2.33a	12.33a	8.33a
2	6 WAE(Bole)	159.33a	97ab	2.33a	10.67abc	5.63ab
3	9 WAE(Bole)	159.3a	111a	1.67a	3.67bcd	7.57ab
4	12 WAE(Bole)	159a	95.67ab	2.33a	11.67ab	5.17b
5	3+6 WAE(Bole)	159a	106.67ab	0.67bc	3.33bcd	6.17ab
6	6+9 WAE(Bole)	158.67a	108.33ab	0.33bc	2.33cd	6.1ab
7	3+9 WAE(Bole)	158a	105ab	0.67bc	4.33abcd	5.43ab
8	3+6+9+12 WAE(Bole)	159.67a	104.67ab	0.67bc	3.67bcd	5.27b
9	Control	159.33a	101ab	1.67ab	7abcd	7.93ab
1 0	3 WAE(White wonder)	158.33a	101.67ab	1.67ab	7.33abcd	6.3ab
11	6 WAE(White wonder)	159.67a	101.33ab	0c	2b	6.53ab
12	9 WAE(White wonder)	159.33a	97.33ab	1abc	5abcd	5.7ab
13	12 WAE(White wonder)	159a	98.67ab	1abc	7abcd	7.57ab
14	3+6 WAE(White wonder)	159a	97.67ab	1abc	7abcd	5.67b
15	6+9 WAE(White wonder)	159.33a	87b	1abc	4.33abcd	6.3ab
16	3+9 WAE(White wonder)	158a	100ab	1abc	5.67abcd	5.1b
17	3+6+9+12 WAE (White wonder)	156.33a	91.67ab	1.33abc	8.33abcd	6.17ab
18	Control	156a	104ab	1.67ab	9abcd	5.1b
	LSD(0.05)	NS	23.03	1.55	8.51	3.05
	CV (%)	1.44	13.85	17.55	18.72	26.64

Plan for the next year:

Activity 4.

Activity period:

-

Reported by:

Design:

Locations:
Result

Plan for the next year:

Weed Science Research

Project title:

Project period:
Activity 1:

Activity period:
Objective
•

Reported by:

Summary of the progress
Design:
Treatment:
Location:
Result

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Plan for the next year:

Activity 2:

Activity period:
Objective:

Responsible person
Reported by:
Year of report:
Summary of the progress
Design:
Treatment:

Location:
Result

Table 1. Yield and yield components affected by weed management practices

Treatment	PPP	SPP	Yield	100sw
Weedy check	3.80d	4.00b	140.00d	5.27c
Twice hand-weeding at 7 & 21 days after emergence	11.60a	11.33a	1100.00b	6.40ab
S-metolachlor at the rate of 0.96kg/ha + hand-weeding	5.53c	5.00b	716.67c	6.13b
S-metolachlor at the rate of 0.96kg/ha + hand-weeding				
at 28 days after emergence	10.73ab	10.33a	1200.00ab	6.60ab
S-metolachlor at the rate of 0.96kg/ha + hand-weeding				
at 14 and 28 days after emergence	9.93b	10.67a	1266.67a	6.73a
Weedy check	12.07a	11.33a	1300.00a	6.73a
Mean	8.94	8.78	953.89	6.31
CV	10.12	9.68	8.52	4.62

*=PPP=pod per plant, SPP=seed per pod, 100sw=hundred seed weight

Plan for the next year:

Program/Case team:
Project 1:

Project period:
Activity 1.
Activity period:
Responsible person(s):

Reported by:
Year of report:
Summary of the progress
Design:

Location:

Result

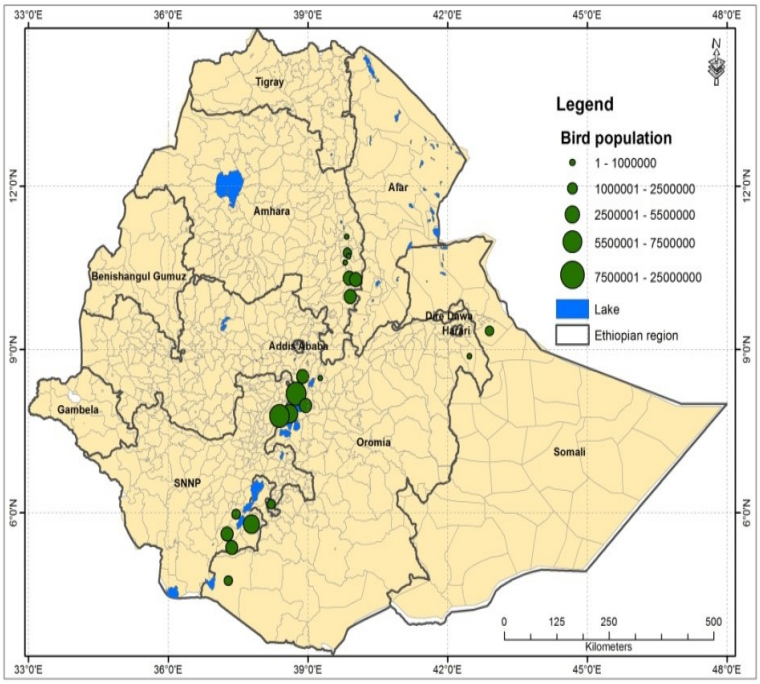

Figure 1 Map of quelea roosting and breeding site in central and south rift valley and other quelea prone lowland areas.

Plan for the next year:
Activity 2.

Activity period:
Responsible person(s):
Reported by:
Year of report
Summary of the progress
Design:
Treatments

Plot size
Location:
Result

Table 1. The two years grain yield data (kg/ha)

Treatments	Year/kg/ha	
	2017/18	**2018/19 E.C**
Treated plot	1674.14	3046.2
Untreated plot –V check	971.43	2665.83
Manual guarded +V check	1530.12	4338.72

Plan for the next year:

Activity 3.
Activity period:
Responsible person(s):
Reported by:
Year of report
Summary of the progress
Design:
Treatments

Result

Table 2: Response of three management option's in yield loss of Sorghum at MARC in, 2017

No	Management options	Stand count	Yield of 40 rows/kg	Total yield kg/ha	Yield advantage (%)
1	Bird scaring	410	41	84.6	479.45
2	Chemical (Mesurol)	390	8.2	46.6	219.18
3	Bag covered	372	15.4	19.8	35.62
4	Control	421	8.8	14.6	0

Plan for the next year:

Project 2

Project period:
Activity 1._

Activity period:
Responsible person(s):
Reported by:
Year of report
Summary of the progress
Design:

Location:
Result

Table 3

Plan for the next year:

Activity 2:

Activity period:
Responsible person(s):
Reported by:
Year of report
Design:
Treatments

Location:
Result

Table 4. Mean of Mole-rat hill count in citrus, Mango and Avocado fields at MARC, in 2018

B Block	Hill (pre treatment)	New hills after treatment	
	Old	****Potato bait**	**Almunium phosphid**
Citrus	9.02	3.45	2.21
Mango	3.02	2.36	1.23
Avocado	23.10	14.23	2.67

***Potato bait=**
Plan for the next year:

Activity 3:

Activity period:
Responsible person(s):
Reported by:
Year of report
Summary of the progress
Design:
Treatments
Location:

Result:
Plan for the next year:

Technology Multiplication and Seed Research

Kedir Oshone

Project title1:

Project period: 2017 - 2019
Activity 1:

Activity period:
Objective:
Responsible person:
Reported by:
Year of report:
Summary of the progress

Design: CRD
Treatments combination:

Table1: treatments combination S1= storage environment (Ambient)

V1p1mo	V1p1m1s1	V1p1m2s1	V1p1m3s1	V1p1m4s1	V1p1m5s1	V1p1m6s1
V1p2mo	V1p2m1s1	V1p2m2s1	V1p2m3s1	V1p2m4s1	V1p2m5s1	V1p2m6s1
V1p3mo	V1p3m1s1	V1p3m2s1	V1p3m3s1	V1p3m4s1	V1p3m5s1	V1p3m6s1
V2p1mo	V2p1m1s1	V2p1m2s1	V2p1m3s1	V2p1m4s1	V2p1m5s1	V2p1m6s1
V2p2mo	V2p2m1s1	V2p2m2s1	V2p2m3s1	V2p2m4s1	V2p2m5s1	V2p2m6s1
V2p3mo	V2p3m1s1	V2p3m2s1	V2p3m3s1	V2p3m4s1	V2p3m5s1	V2p3m6s1
V3p1mo	V3p1m1s1	V3p1m2s1	V3p1m3s1	V3p1m4s1	V3p1m5s1	V3p1m6s1
V3p2mo	V3p2m1s1	V3p2m2s1	V3p2m3s1	V3p2m4s1	V3p2m5s1	V3p2m6s1
V3p3mo	V3p3m1s1	V3p3m2s1	V3p3m3s1	V3p3m4s1	V3p3m5s1	V3p3m6s1

V= Varieties, P= packing materials, m= months

Table1: treatments combination S2= storage environment (cold room)

V1p1mo	V1p1m1s2	V1p1m2s2	V1p1m3s2	V1p1m4s2	V1p1m5s2	V1p1m6s2
V1p2mo	V1p2m1s2	V1p2m2s2	V1p2m3s2	V1p2m4s2	V1p2m5s2	V1p2m6s2
V1p3mo	V1p3m1s2	V1p3m2s2	V1p3m3s2	V1p3m4s2	V1p3m5s2	V1p3m6s2
V2p1mo	V2p1m1s2	V2p1m2s2	V2p1m3s2	V2p1m4s2	V2p1m5s2	V2p1m6s2
V2p2mo	V2p2m1s2	V2p2m2s2	V2p2m3s2	V2p2m4s2	V2p2m5s2	V2p2m6s2
V2p3mo	V2p3m1s2	V2p3m2s2	V2p3m3s2	V2p3m4s2	V2p3m5s2	V2p3m6s2
V3p1mo	V3p1m1s2	V3p1m2s2	V3p1m3s2	V3p1m4s2	V3p1m5s2	V3p1m6s2
V3p2mo	V3p2m1s2	V3p2m2s2	V3p2m3s2	V3p2m4s2	V3p2m5s2	V3p2m6s2
V3p3mo	V3p3m1s2	V3p3m2s2	V3p3m3s2	V3p3m4s2	V3p3m5s2	V3p3m6s2

Locations: MARC
Results:

Table1: Data of pure seeds, 1000 seed weight, moisture content, germination &vigorisity

Varieties	SC	PS(%)	TSW (g)	MC (%)	SG%	SL (cm)	RL (cm)	SDW	VI-I	VI-II
Melkassa-2	Pbs	98	273.9	13	93	26.75	21.55	2.13	4491.9	198.09
Melkassa-4	Pbs	98.5	275	13.5	92.5	26.49	19.94	2.55	4294.78	235.88
Melkassa-6Q	Pbs	99	227.9	13	91.5	24.72	18.85	1.75	3986.66	160.13

Plan for the next year:

Activity title 2:

Objective:

Activity period:
Responsible person:
Reported by:
Year of report:
Summary of the progress

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Design:
Treatments:

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Location:
Results:

Table1:Data of pure, 1000 seed weight, moisture content, germination &vigorisity

Varieties	PS	IM	OCS	WS	TSW	MC	SG	SL	RL	SDW	VI-I	VI-II
A1	98	1.2	0.8	0	159.35	11.5	97	26.6	7.28	0.55	3286.36	53.35
A2	99	0.8	0.2	0	207.4	12	99	26.27	6.65	0.45	3259.08	44.55
Nasser	99.5	0.5	0	0	218.65	12.5	98	28.55	6.02	0.8	3387.86	78.4

Plan for the next year:

Activity 3:

Objective:

Activity period:
Responsible person:
Reported by:
Year of report:
Summary of the progress

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-
-

Design:
Treatments combination:

Table1: treatments combination

V1p1mo	V1p1m1	V1p1m2	V1p1m3	V1p1m4	V1p1m5	V1p1m6
V1p2mo	V1p2m1	V1p2m2	V1p2m3	V1p2m4	V1p2m5	V1p2m6
V1p3mo	V1p3m1	V1p3m2	V1p3m3	V1p3m4	V1p3m5	V1p3m6
V1p4mo	V1p4m1	V1p4m2	V1p4m3	V1p4m4	V1p4m5	V1p4m6
V1p5mo	V1p5m1	V1p5m2	V1p5m3	V1p5m4	V1p5m5	V1p5m6
V2p1mo	V2p1m1	V2p1m2	V2p1m3	V2p1m4	V2p1m5	V2p1m6
V2p2mo	V2p2m1	V2p2m2	V2p2m3	V2p2m4	V2p2m5	V2p2m6
V2p3mo	V2p3m1	V2p3m2	V2p3m3	V2p3m4	V2p3m5	V2p3m6
V2p4mo	V2p4m1	V2p4m2	V2p4m3	V2p4m4	V2p4m5	V2p4m6
V2p5mo	V2p5m1	V2p5m2	V2p5m3	V2p5m4	V2p5m5	V2p5m6
V3p1mo	V3p1m1	V3p1m2	V3p1m3	V3p1m4	V3p1m5	V3p1m6
V3p2mo	V3p2m1	V3p2m2	V3p2m3	V3p2m4	V3p2m5	V3p2m6
V3p3mo	V3p3m1	V3p3m2	V3p3m3	V3p3m4	V3p3m5	V3p3m6
V3p4mo	V3p4m1	V3p4m2	V3p4m3	V3p4m4	V3p4m5	V3p4m6
V3p5mo	V3p5m1	V3p5m2	V3p5m3	V3p5m4	V3p5m5	V3p5m6

V= Varieties, P= packing materials, m= months

Location:
Results:

Table2. Data of pure, 1000 seed weight, moisture content, germination &vigorisity

Varieties	PS	IM	OCS	WS	TSW	MC	SG	SL	RL	SDW	VI-I	VI-II
A1	98	1.2	0.8	0	159.35	11.5	97	26.6	7.28	0.55	3286.36	53.35
A2	99	0.8	0.2	0	207.4	12	99	26.27	6.65	0.45	3259.08	44.55
Nasser	99.5	0.5	0	0	218.65	12.5	98	28.55	6.02	0.8	3387.86	78.4

Plan for the next year:

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Activity 4:

Objective:

Activity period:
Responsible person:
Reported by:
Year of report:
Summary of the progress

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Design:
Treatments combination:

Table3: treatments combination

V1p1mo	V1p1m1	V1p1m2	V1p1m3	V1p1m4	V1p1m5	V1p1m6
V1p2mo	V1p2m1	V1p2m2	V1p2m3	V1p2m4	V1p2m5	V1p2m6
V1p3mo	V1p3m1	V1p3m2	V1p3m3	V1p3m4	V1p3m5	V1p3m6
V1p4mo	V1p4m1	V1p4m2	V1p4m3	V1p4m4	V1p4m5	V1p4m6
V1p5mo	V1p5m1	V1p5m2	V1p5m3	V1p5m4	V1p5m5	V1p5m6
V2p1mo	V2p1m1	V2p1m2	V2p1m3	V2p1m4	V2p1m5	V2p1m6
V2p2mo	V2p2m1	V2p2m2	V2p2m3	V2p2m4	V2p2m5	V2p2m6
V2p3mo	V2p3m1	V2p3m2	V2p3m3	V2p3m4	V2p3m5	V2p3m6
V2p4mo	V2p4m1	V2p4m2	V2p4m3	V2p4m4	V2p4m5	V2p4m6
V2p5mo	V2p5m1	V2p5m2	V2p5m3	V2p5m4	V2p5m5	V2p5m6
V3p1mo	V3p1m1	V3p1m2	V3p1m3	V3p1m4	V3p1m5	V3p1m6
V3p2mo	V3p2m1	V3p2m2	V3p2m3	V3p2m4	V3p2m5	V3p2m6
V3p3mo	V3p3m1	V3p3m2	V3p3m3	V3p3m4	V3p3m5	V3p3m6
V3p4mo	V3p4m1	V3p4m2	V3p4m3	V3p4m4	V3p4m5	V3p4m6
V3p5mo	V3p5m1	V3p5m2	V3p5m3	V3p5m4	V3p5m5	V3p5m6

V= Varieties, P= packing materials, m= months

Location:
Result:

Plan for the next year:

Activity title 5:

Objective:

Activity period:
Responsible person:
Reported by:
Year of report:
Summary of the progress

-

-

Design:

Treatments:

Location:
Result

Plan for the next year:

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Activity title 6:

Objective:

Activity period:
Responsible person:
Reported by:
Year of report:
Summary of the progress

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Design:
Treatments combination:

Table1: treatments combination

V1p1mo	V1p1m1	V1p1m2	V1p1m3	V1p1m4	V1p1m5	V1p1m6
V1p2mo	V1p2m1	V1p2m2	V1p2m3	V1p2m4	V1p2m5	V1p2m6
V1p3mo	V1p3m1	V1p3m2	V1p3m3	V1p3m4	V1p3m5	V1p3m6
V1p4mo	V1p4m1	V1p4m2	V1p4m3	V1p4m4	V1p4m5	V1p4m6
V1p5mo	V1p5m1	V1p5m2	V1p5m3	V1p5m4	V1p5m5	V1p5m6
V2p1mo	V2p1m1	V2p1m2	V2p1m3	V2p1m4	V2p1m5	V2p1m6
V2p2mo	V2p2m1	V2p2m2	V2p2m3	V2p2m4	V2p2m5	V2p2m6
V2p3mo	V2p3m1	V2p3m2	V2p3m3	V2p3m4	V2p3m5	V2p3m6
V2p4mo	V2p4m1	V2p4m2	V2p4m3	V2p4m4	V2p4m5	V2p4m6
V2p5mo	V2p5m1	V2p5m2	V2p5m3	V2p5m4	V2p5m5	V2p5m6
V3p1mo	V3p1m1	V3p1m2	V3p1m3	V3p1m4	V3p1m5	V3p1m6
V3p2mo	V3p2m1	V3p2m2	V3p2m3	V3p2m4	V3p2m5	V3p2m6
V3p3mo	V3p3m1	V3p3m2	V3p3m3	V3p3m4	V3p3m5	V3p3m6
V3p4mo	V3p4m1	V3p4m2	V3p4m3	V3p4m4	V3p4m5	V3p4m6
V3p5mo	V3p5m1	V3p5m2	V3p5m3	V3p5m4	V3p5m5	V3p5m6

V= Varieties, P= packing materials, m= months

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Location:

Results:

Table 2. Data of pure, 1000 seed weight, moisture content, germination &vigor

Varieties	SC	PS(%)	TSW (g)	MC (%)	SG%	SL (cm)	RL (cm)	SDW	VI-I	VI-II
Melkassa-2	Pbs	98	273.9	13	93	26.75	21.55	2.13	4491.9	198.09
Melkassa-4	Pbs	98.5	275	13.5	92.5	26.49	19.94	2.55	4294.78	235.88
Melkassa-6Q	Pbs	99	227.9	13	91.5	24.72	18.85	1.75	3986.66	160.13

Plan for the next year:

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Project title2:

Project period:

Activity title 1:

Objective:

Activity period:

Responsible person:

Reported by:

Year of report:

Summary of the progress

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Design:

Treatments:

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Location:

Result: (data, data interpretation and conclusion)

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Plan for the next year:

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Activity title 2:

Objective:-

Activity period:
Responsible person:
Reported by:
Year of report:
Summary of the progress

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Design:
Treatments:

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Location:
Result:

Plan for the next year:

Project title3:

Project period: 2017 - 2019
Activity title 1-4:

Activity period: 2017-2019
Objective:

Responsible person: Kedir Oshone
Reported by: Kedir Oshone
Year of report:
Summary of the progress

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Design:
Treatments:

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Location:
Result:

Plan for the next season/ year:

Activity title 5-8:

Activity period:
Objective:

Responsible person:
Reported by:
Year of report:
Summary of the progress
Maize seeds:-

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Common bean seeds

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Mung bean seed

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Warm season vegetable seed

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Design:

Treatments:

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Location:

Result: (data, data interpretation and conclusion)

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Plan for the next year:

Annex 1: List of researchers working at MARC by sex and area of training, 2018

Ser No	Name	Sex	Training (BSc/ MSc/PhD)	Area of their Specialization/Training
1	Abebe Bezu Bedada	Male	MSc	Land Resources Mngmt
2	Abebe Gezegehn Bekele	Male	MSc	Plant Science
3	Abebe Teshome Gurmu	Male	MSc	Agr. Resource Eco. & Mngmt
4	Abel Debebe Mitiku	Male	MSc	Plant Breeding
5	Abel Moges Firew	Male	MSc	Crop Science
6	Abera Asefa Biratu	Male	MSc	Animal Nutrition
7	Abera Tesfaye Tefera	Male	MSc	Water Resource & Irr. Mngmt
8	Abiy Fekadu Dibaba	Male	MSc	Plant Science
9	Abiy Solomon Haile	Male	MSc	Agri. Eng. & Mech.
10	Abiy Tilhun Adugna	Male	MSc	Entomology
11	Adem Nemo Iresso	Male	BSc	Economics
12	Adene Gebreyohannes Woldetensay	Male	MSc	Biology (Applied Genetics)
13	Adugna Mosia Kajela	Male	MSc	Plant Science
14	Agere Lupi Edao	Male	MSc	Environmental Science
15	Ahemd Umer Ahmed	Male	BSc	Mechanical Eng.
16	Ahmed Ibrahim Yuya	Male	MSc	Agri. Entomology
17	Aklilu Mekasha Gebremariam	Male	PhD	Agronomy
18	Alemeyehu Gudisa Hude	Male	BSc	Biology
19	Alemu Tirfesa Woldetensay	Male	PhD	Plant Breeding
20	Amanuel Erchafo Ertebo	Male	BSc	Agri. Eng.
21	Amare Fufa Beyene	Male	MSc	Crop Protection
22	Amare Nega Mamo	Male	MSc	Plant Science
23	Amare Syoum Hailesillae	Male	MSc	Plant Breeding
24	Ashebir Tegegn Abitew	Male	MSc	Range Ecology and Mngmt
25	Asmare Degnew Moges	Male	PhD	Horticulture
26	Asres Yenesew Mose	Male	BSc	Biology
27	Bedru Beshir Abdi	Male	PhD	International Dvpt
28	Behailu Tesfaye Ergete	Male	BSc	Plant Science
29	Behiru Tilahun Woyessa	Male	MSc	Plant Science
30	Belay Tadesse Roba	Male	BSc	Rural Dev. & Agr. Ext.
31	Berhanu Amsalu Fenta	Male	PhD	Plant Science
32	Beyene Seboke Wakene	Male	MSc	Mgt.of Agr. Knowledge
33	Birhanu Sisay Amare	Male	MSc	Horticulture
34	Bisrat Getinet Aweke	Male	MSc	Agri. Machinery Eng.
35	Bulo Debesa Gobu	Male	BSc	Plant Science
36	Chalachew Endalemehu Engida	Male	MSc	Crop Science
37	Dagmawit Tsegaye Arega	Female	MSc	Plant Science & Protection
38	Daniel Bekele Mersha	Male	PhD	Soil & water conservation Eng.
39	Daniel Nadew Teklu	Male	BSc	Plant Science
40	Dejene Abera Hora	Male	PhD	Plant Science
41	Demirew Abera Ketema	Male	MSc	Chemistry
42	Dereje Alemu Anawtie	Male	MSc	Agri. Eng. & Mech.
43	Dereje Ayalneh Tamirat	Male	BSc	Plant Science
44	Dereje Mersha Woldekirkos	Male	MSc	Agri. Economics
45	Dereje Yihun Amare	Male	MSc	Biosystems Eng.
46	Desie Belay Tiruneh	Male	BSc	Agri. Mech. Eng.
47	Edossa Etissa Chala	Male	PhD	Agronomy/Crop Physiology
48	Endiras Gebrekiristos Kebeto	Male	MSc	Plant Science
49	Eshetu Zewdu Tegegn	Male	MSc	Meteorology Science
50	Estifanos Hailemariam Demise	Male	BSc	Mngmt
51	Etaferehu Kassa Ejigu	Female	MSc	Env. Eco. & Natural Res.
52	Fekadu Getachew Woldehana	Male	MSc	Meteorology Science
53	Fitsum Abebe Telila	Male	MSc	Agri. Machinery Eng.
54	Fitsum Ademe Mamo	Male	MSc	Soil Science
55	Fitsum Merkebe Endale	Female	MSc	Agronomy
56	Fitsum Mitsum Gebrewahid	Male	MSc	Rural Dvpt & Agri. Extension
57	Gadisa Ejersa Ware	Male	BSc	Rural Dvp & Agri. Ext.
58	Gashawbeza Ayalew Chekol	Male	PhD	Agri. Entomology
59	Gebeyehu Ashemi Bikila	Male	MSc	Water Resource & Irr. Mngmt
60	Gebeyehu Wondimu Gebreyes	Male	MSc	Horticulture

Ser No	Name	Sex	Training (BSc/ MSc/PhD)	Area of their Specialization/Training
61	Gemmechu Olani Negera	Male	MSc	Biotechnology
62	Getachew Ayana Hordofa	Male	PhD	Plant Pathology
63	Getinet Adugna Iskeziya	Male	MSc	Agronomy
64	Girma Kebede Ketsela	Male	MSc	Agri. & Bioresource Eng.
65	Girma Kebede Shelemo	Male	MSc	Horticulture
66	Girma Mamo Diga	Male	PhD	Agrometrology
67	Girum Kifle Ejigu	Male	MSc	Plant Sc.& Protection
68	Gobena Dirirsa Bayisa	Male	MSc	Soil & Water Eng. & Mngmt
69	Habte Nida Chiksa	Male	MSc	Plant Science/Agronomy
70	Hailemariam Solomon Demise	Male	MSc	Plant Science
71	Israel Bekele Tirune	Male	MSc	Soil Science
72	Iyob Hailu Taye	Male	BSc	Mechanical Eng.
73	Jemel Bekere Adem	Male	BSc	Plant Science
74	Jibicho Geleto Bude	Male	MSc	Plant Science
75	Jibril Mohammd Bedaso	Male	BSc	Plant Science
76	Kalkidan Fikre Befekadu	Female	MSc	Watershed Mngmt
77	Kasaye Negash Dinagde	Male	MSc	Plant Science
78	Kebede Dida Ariti	Male	BSc	Biology
79	kedir Kebero Jebo	Male	BSc	Food Sc. & Post Harvest Tech.
80	Kedir Oshone Husen	Male	MSc	Seed Science & Technology
81	Kedir Shifa Usman	Male	MSc	Applied Entomology
82	Ketema Tezera Bizune	Male	MSC	Water Resource & Irr. Mngmt
83	Kidane Tumsa Hurisa	Male	MSc	Plant Pathology
84	Kiya Aboye Telila	Female	MSc	Plant Science
85	Laike Kebede Woldetensay	Male	MSc	Food Sc. & Post Harvest Tech.
86	Lealem Tilahun Amenu	Male	MSc	Plant Science
87	Lemma Ayele Bekete	Male	MSc	Horticulture
88	Ligaba Ayele Demise	Male	BSc	Plant Science
89	Manaye Ayalew Desta	Male	BSc	Manufacturing
90	Masresha Minuye Tase	Male	BSc	Chemistry
91	Mekonnen Sime Kidane	Male	PhD	Agr. Eco.
92	Melat Eshetu Bayu	Female	MSc	Soil Res.& Watershed Mngmt
93	Melkam Anteneh Alemu	Male	MSc	Seed Science & Tech.
94	Melkamu Ensermu Dufera	Male	MSc	Horticulture
95	Merkebu Ayalew Kebede	Male	MSc	Horticulture
96	Meseret Abebe Wakjira	Male	MSc	Agri. Eng. & Mech.
97	Mesfin Hundesa Mosisa	Male	MSc	Plant Science
98	Meskerem Mekonnen Hailemeriam	Female	BSc	Agriculture & Bioprocess Eng.
99	Metasebia Tefera Zewde	Male	MSc	Plant Pathology
100	Midekesa Bekele Tulu	Male	BSc	Plant Science
101	Mikiyas Demtew Guche	Male	MSc	Horticulture
102	Mohammed Yesuf Mohammed	Male	PhD	Plant Pathology
103	Mubarek Mohammed Isa	Male	MSc	Agri. Eng. & Mech.
104	Muhammed Rabo Usha	Male	BSc	Natural Resource Mngmt
105	Muhammed Selah Hamid	Male	BSc	Agri. Economics & Mngmt
106	Mulate Zerihun	Male	MSc	Food Science
107	Mulatwa Wondimu Getaneh	Female	MSc	Plant Entomology
108	Mulugeta Teamir Sisay	Male	PhD	Tech. of Meat & Food
109	Rebuma Merera Gerbaba	Male	MSc	Plant Science
110	Sefiya Nur Mohammed	Female	BSc	Plant Science
111	Selamawit Keteme Ashine	Female	MSc	Horticulture
112	Semir Hashim Geletu	Male	BSc	Horticulture
113	Sewmehon Siraw Belay	Male	BSc	Plant Science
114	Shemelis Aklilu Alemu	Male	PhD	Horticulture
115	Surafel ShibruTekelmariam	Male	MSc	Tropical Agri.
116	Syoum Woldesenbet Adise	Male	MSc	Farm Mech.
117	Tahir Tune Geleto	Male	BSc	Biosystems Eng.
118	Tamirat Bejiga Mosisa	Male	MSc	Plant Science
119	Tamirat Fikadu Mosisa	Male	MSc	Agri. Economics
120	Tamirat Lema Nurge	Male	MSc	Agri. Eng. & Mech.
121	Tatak Wondimu Negash	Male	BSc	Water Resource & Irr. Eng.
122	Tefera Mitiku Biru	Male	BSc	Plant Science

Ser No	Name	Sex	Training (BSc/ MSc/PhD)	Area of their Specialization/Training
123	Telef Wondwosen Woldeamanuel	Female	MSc	Plant Science
124	Tesfa Binalfew Fetene	Male	MSc	Horticulture
125	Tesfaye Asefa Aboy	Male	BSc	Agr. & Bioprocess Eng.
126	Teshome Bulo Gutema	Male	MSc	Civil Eng.
127	Teshome Feyera Tujo	Male	MSc	Post-Harvest Mngmt
128	Tewodros Mesfin Abebe	Male	PhD	Agronomy
129	Tewodros Sisay Hailu	Male	MSc	Natural Res. & Env. Mngmt
130	Tigist Shiferew Girsil	Female	PhD	Entomology
131	Tilahun Hordofa Nebi	Male	PhD	Irrigation. Eng.
132	Tola Demiyo Gelato	Male	BSc	Plant Science
133	Wakjira Chifra Mengesha	Male	BSc	Plant Science
134	Wobi Bejo Nagasa	Male	BSc	Post-Harvest Mngmt
135	Wogayehu Assefa Yebalework	Male	MSc	Horticulture
136	Yaya Tesfa Tola	Male	BSc	Horticulture
137	Yitayal Abebe Kebede	Male	MSc	Agri. Economics
138	Yitayih Gedefaw Kase	Male	MSc	Plant Science
139	Yonas Lemma Demeke	Male	MSc	Agri. Machinery Eng.
140	Yonas Mulatu Geletu	Male	MSc	Agri. Eng. & Mech.
141	Yosef Alemu Bekele	Male	MSc	Plant Breeding
142	Zeraye Mehari Haile	Male	PhD	Plant Pathology

NB. Agr. Agricultural/Agriculture, Agr. Eco.: Agricultural Economics; Dvpt.: development; Env. =Environment, Eng. Engineering; Irr.: Irrigation; Mngmt= management, Mecha. Mechanization; Res.=Resource, Tech.; technology;