

1.16 Mixaaxisii Ykn Camcamee



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(Potato)



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INSTITUTE OF
AGRICULTURAL RESEARCH

1.18 Mosee



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2.2 Dismoodiyeemii facaasuudhaan Miidhaa " Aqanciraa" Ittisaa



**Dismoodiyeemii boqqoolloon wal-keessa facaasuudhaan aramaa aqanciraa
maasii keessaa balleessuun ni danda'ama.**

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Hagayya 1992 Addis Ababa.

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2.4 Marga Arbaa Naannoo oqqoolloo Dhaabuudhaan Galii keessan uddisaa



**Naanno Boqqoolloo marga arbaa dhaabuudhaan
urtuu agadaa to'achuun ni danda'ama**

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Hagayya 1992 Addis Ababaa



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The Federal Democratic Republic of Ethiopia
Ministry of Agriculture



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2.6 Tekinooloojii Omishummaa Biyyee Kootichaa Guddisu

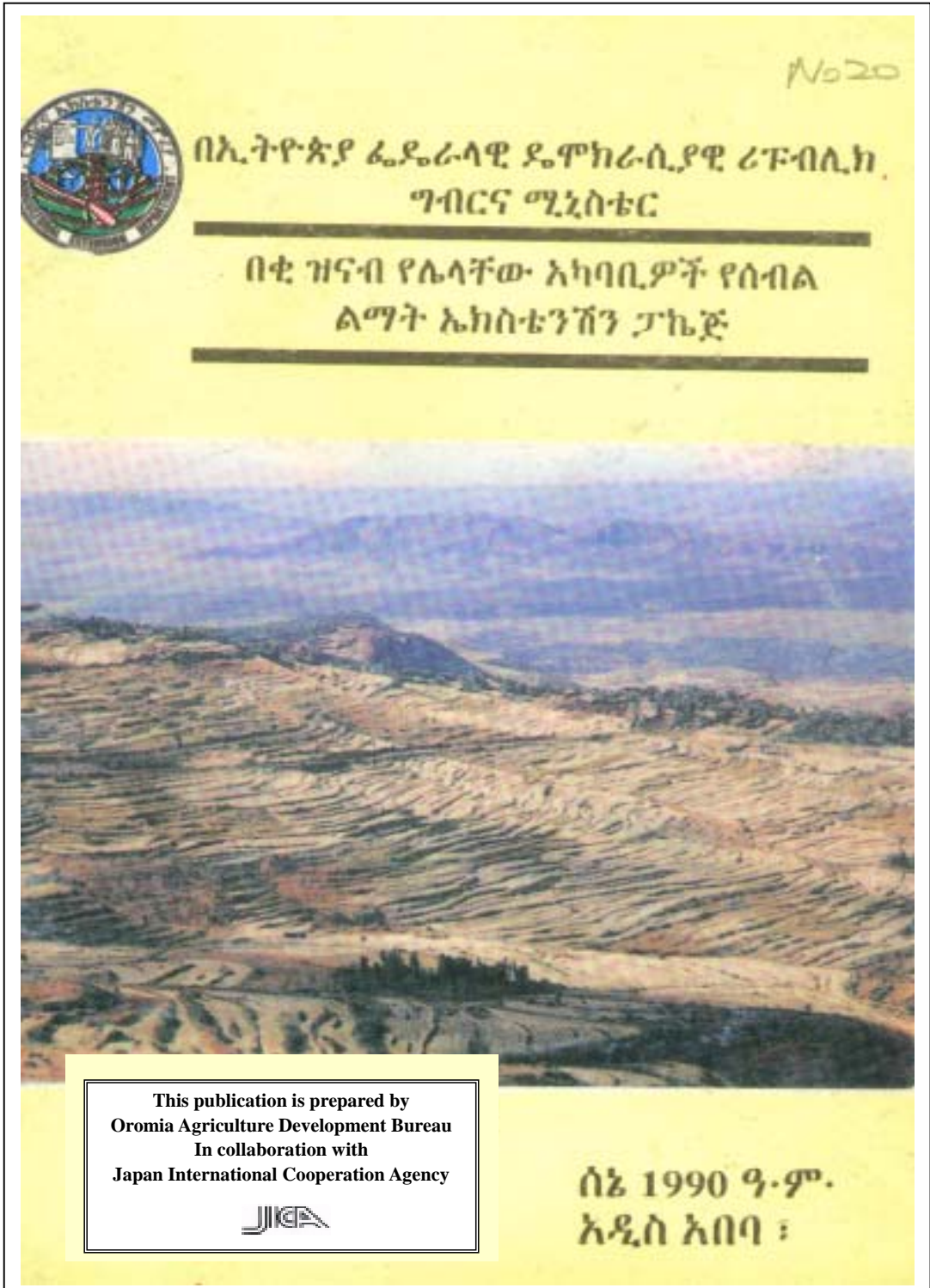


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Caamsaa 1993, Addis Ababa



3.2 Misooma Paakeejii Ekisteenshinii Naannoolee Rooba Hanquu Ta'anii

Lafa Qullaaha



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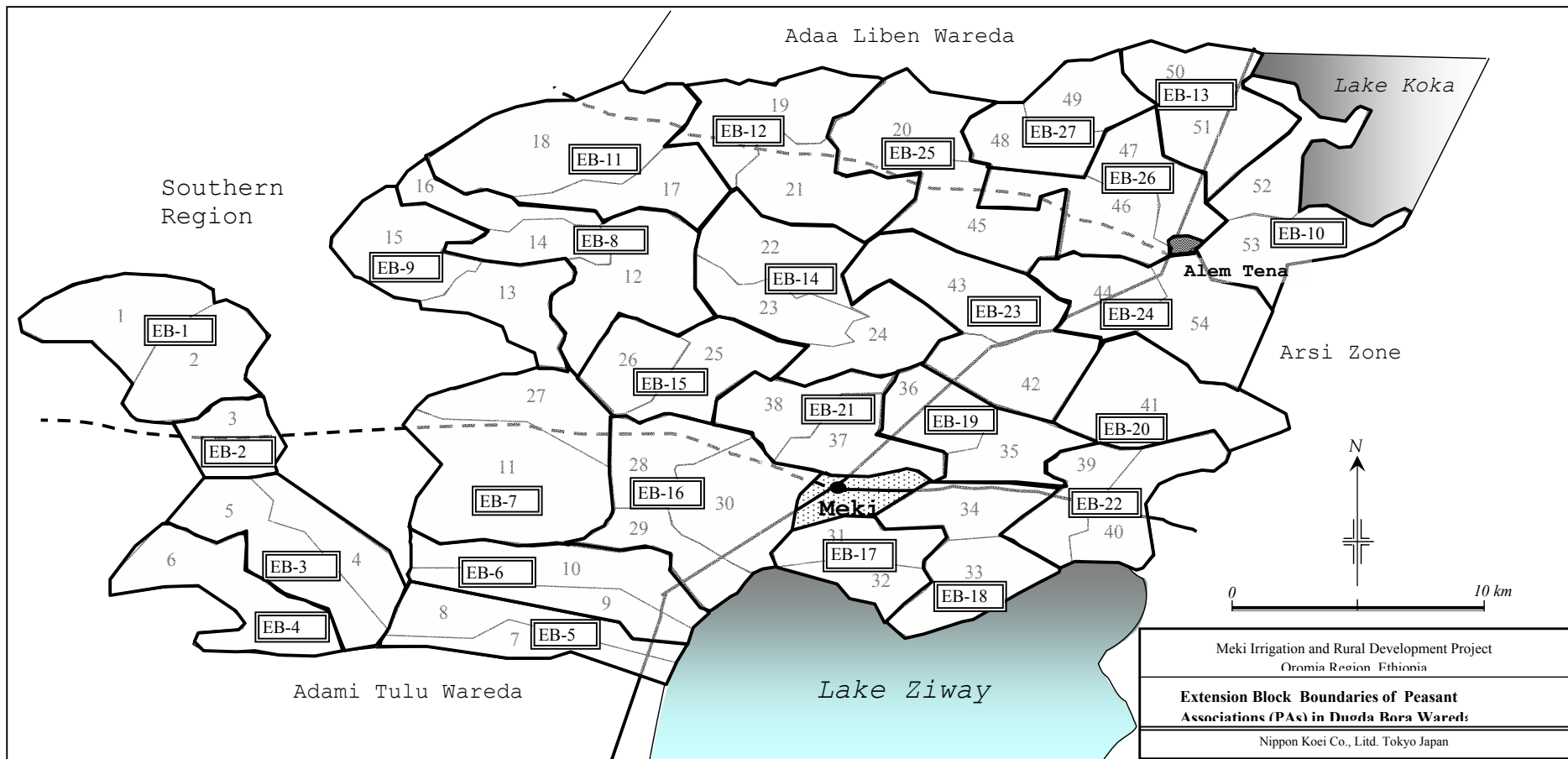
3.4 Paakeejii Ekisteenshin Misoomaa fi Eegumsa Biyyee fi Bishaanii



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List of Research Report Collected:

No	Subject	Type	Language	Page	Collected	Issued by	Remark
1	The Research Extension Farmers Linkage Strategy	Final Proposal	English	24	19-Jul	EARO/July-00	
2	The Research Extension Farmers Linkage Strategy	Draft Proposal	English	35	10/12/2000	EARO/Aug-98	
3	Farmers research Group: Experience of DZARC	Progress Report	English	8	2-Aug	DZARC/2000	
5	Achievements(Research high light)	Highlight	English	12	2-Aug	DZARC	various crop dev.
6	Agriculture Extension & Technology Transfer-1	Research summary	English	2	1-Jul	MARC:2001	On-farm trail/Meki
7	Agriculture Extension & Technology Transfer-2	Research summary	English	2	1-Jul	MARC:2001	On-farm trail/Meki
8	FRG P/Report per each FRG	Progress Report	English	17	7-Aug	DZARC	FRG result
9	Procedure of FRG IPM project	manual	English	2	8-Aug	MARC	PRA process of FRG
10	CRV: Major disease & Pest control on vegetable	manual	English	3	13-Aug	MARC	Guideline
11	Past, Present & Future of Agroforestry in Ethiopia	AF Conference	English	35	25-Aug	FRC/Oct-2000	AF Research/Ethiopia
12	Camel & cabbage tree:MPT in Dry Rift Valley	Research Paper	English	19	25-Aug	FRC/Oct-1999	
13	Salinity Problem in Dry land irrigated farming	Research Paper	English	7	25-Aug	not published	
14	Journal: EWANHS No.20 1999:Croton & coffee	Research paper	English	32	25-Aug	EWANHS/1999	Journal
15	FRC: Research Note-Growth of some forest tree in Ethiopia & suggestions for Spp selection in different climatic zone	work paper	English	52	25-Aug	FRC/1986	
16	Annual Report:1997/98	Research Highlight	English	96	10/1/2000	EARO/1999	
17	Annual Report:1998/99	Research highlight	English	57	19-Jul	EARO/Nov-2000	
18	Improved Varieties of D/Wheat in Ethiopia	Booklet(variety)	English	32	10/1/2000	DZARC/Dec-2000	
19	Improved Cultivars & Production tech of Chickpea	Booklet(variety)	English	60	10/1/2000	DZARC/1996	R/Bulletin No.2
20	Improved CV & Prod., Tech of Lentil in Ethiopia	Booklet(variety)	English	46	10/1/2000	DZARC/1996	R/Bulletin No.3
21	Improved Var., of teff Ethiopia(1970-95)	Booklet(variety)	English	32	10/1/2000	DZARC/1995	R/Bulletin No.1
22	The Status of Poultry Res & Devin Ethiopia	Booklet(var. copy)	English	62	Aug.-01	DZARC/1997	R/Bulletin No.4
23	Forty years of Research Experience '55-'94	Research Highlight	English	89	Aug.-01	DZARC/1995	
24	A Brief History of FRC & Forestry Research/Ethi	Booklet(past present)	English	45	Aug.-01	FRC/Nov.,1990	
25	25 years of Research Experience in Lowland crops	Proceedings of 25th	English	319	July.-01	MARC/Sept-1995	
26	Natural Resource under threat: an analysis of the FS of Gimbo woreda	Working Doc No.84	English	123	July.-01	ICRA/JARC/SUPAK-S 2000	
27	Participatory analysis of constraints & opport., of the FS of Tikur Inchini, west shewa/Ethiopia	Working Doc No.1	English	92	July.-01	EARO/ICRA/1999	
28	Participatory analysis of constraints & opport., for sustainable soil fertility Management in kacha Birra woreda of Kembaa -Alaba-Timbar Zone	Working Doc No.2	English	113	July.-01	EARO/ICRA/1999	
29	Improving soil productivity for increased & susta., crop production in the mid-altitude area of Yilmana-Densa Woreda west Gojam/Ethiopia	Working Doc No.4	English	111	July.-01	EARO/ICRA/1999	
30	Management of the Declining soil fertility in mixed farming system of Adaa Bargaa District/Oromia	Working Doc No.3	English	109	July.-01	EARO/ICRA/1999	
31	Livelihood & drought coping strategies of FFH in CRV Ethiopia	Working Doc No76	English	112	10/1/2000	EARO/ICRAF/1999	
32	Agriculture Research & Tech Transfer attempt & achievements I Western Ethiopia	Proceedings of 3rd Tech	English	157	July.-01	EARO/1998	
33	Agriculture Research & Tech Transfer attempt & achievements in Northern Ethiopia	Proceeding of 4th Tech	English	305	July.-01	EARO/1997	
34	Agriculture Research & Tech Transfer attempt & achievements in Southern Ethiopia	Proceeding of 2nd Tech	English	109	July.-01	EARO/1996	
35	Profile: MARC	Booklet	English	17	10/1/2000	MARC/Aug 1997	
36	30 years of Research Experience/Adami Tulu ARC	Booklet('68-98)	English	47	10/1/2000	OADB/Dec 1998	
37	EARO: DZARC	Profile Booklet	English	23	Aug.-01	DZARC/Nov 2000	
38	EARO: Holetta ARC	Leaflet of HARC	English	4	11/1/2000	HARC/	
39	EARO: DZARC-Research Extension Divion	Leaflet	English	2	Aug.-01	DZARC/Nov 2000	
40	Characterization of agricultural systems of Alemtena & koka areas	Research report	English	4	Aug.-01	DZARC/94	
41	AGARFA MULTI-PURPOSE AGRICULTURAL DEVELOPMENT AGENTS TRAINING CENTER, INTRODUCTORY NOTE	Brochure	English	9	Aug.-01	AMPADATC/MOA	
42	East Shewa Research Extension & Farmers Advisory Council First Regular Meeting Minutes	Proceeding	Amharic	92	Aug.-01	MARC/Jan., 2000	
43	East Shewa Research Extension & Farmers Advisory Council 2nd Regular Meeting Minutes	Proceeding	Amharic	34	Aug.-01	MARC/Sept/2000	
44	East shewa Research Extension Farmers Advisory Council/DZARC Field Visiting Report	Field note	Amharic	2	Aug.-01	MARC/Nov/2000	
45	IAR/ICRAF National Agroforestry Workshop 14-18 Nov 1988, Awasa Ethiopia JAR	Proceeding	English	149	Aug.-01	IAR/14-18 Nov '88	Mr. Dicharsa's paper: semiarid farms
46	Highlights of Annual Planned Activities & Achievements(93-00)						
47	The 2nd five year agriculture research contribution	Report	English+Amharic	47	19-Sep-01	EARO	Mr. Taklu/Research Extension strategy
48	Evaluation of Agroforestry Activey/World vision	Report	English	73	14-Sep-01	FRC	World Vision/NGO
49	Site matching management and impact of Eucalyptus	Report	English	62	14-Sep-01	FRC	Mr. Decharsa's paper
50	RAPORT REPORT: agroforestry-potentials & Research needs for the Ethiopian Highlands No.21	Report	English	107	14-Sep-01	ICRAF	
51	EARO/Kulumsa Research Center, Aug 2000	Brochure	English	14	11-Oct-01	KARC	
52	KARC: Annual Report 2000/2001	Ann. Report	English	19	11-Oct-01	KARC	
53	EARO.KARC September 2001	Research report	English	14	11-Oct-01	KARC	

Source: JICA Study Team

Summary of Reviewing Research Output

A. Melkasa Agriculture Research Station

Objective:

- 1) Generation of improved agricultural technologies, such as drought tolerant crop varieties with acceptable yield and quality, crop management practices including soil and water conservation and soil fertility management.
- 2) Development of integrated pest & disease management system.
- 3) Development of agricultural implement suitable for various environments
- 4) Identifying constraints to agricultural development in the semi arid environment and assess means of alleviating them through technological changes.
- 5) Popularizing and communicating workable crop production technologies in cooperation with National and Regional level Agricultural bureaus, to the intended users.

Target crops:

Sorghum, tef, maize, haricot bean, cowpea, tomato, Irish potato, citrus, banana, papaya, mango, and other tropical & sub-tropical fruits.

(1) Developed Varieties, farming implements and seed multiplication:

Research output		Variety name, farming implement, seed	
1.	Vegetable	Onion	Adama Red
2.	Crop	Sorghum	76-T1#23, Gambella 1107, Dinkmash IS9302,
		Haricot bean	Roba-1, Awash-1
3.	Farming Tool		100 tied-ridgers, planter, 20 mould board plough, weeder, 6 donkey cart,
4.	Crop management practice		Moisture conservation techniques, crop protection practices, others
5.	Seeds	Sorghum	19888 qqs
		maize	2793 qqs
		Haricot bean	1948 qqs
		vegetables	13.2 kg
6.	Seedlings	Fruit	3700 seedlings
7.	Cuttings	Root crops	544 cuts

Distribution to various users:
Ethiopian Seed Enterprise(ESE),
MoA, NGO, Other
Governmental
Organization

(2) Breeding/Selection for Yield Improvement

Kind of Crop		Research Findings	
1	Citrus Fruit	Type of citrus	Melka Werer area: 1) Better adoption: Grape fruit, lime, lemon 2) Less adoption: orange, mandarin,
		Irrigation	1)August-May: once every 3 weeks 2)June-July: once every 2 weeks 3)10 cm appl/each and 19 irrigation/year
		Spacing	Grape fruit: 9 m x 9 m
2	Tomato	Fresh market CV	At Melkasa ARC area: Manglobe improved, manglobe(205 qq/Rainy season, 412 qq/Dry season), Money maker
		Processing CV	Roma VF(188 qq/Rainy season, 398 qq/Dry season), Napoli VF

(3) Resource Management in Lowland Agriculture-1

Agronomy and Crop Physiology Research: Achievements, Limitations and Future Prospects		
1.	Research Trend	1) Sorghum, lowland pulse, maize, teff, small farming implements 2) Crop-livestock intervention such as multi purpose tree & shrubs 3) From on-station top-down approach to prudential systems perspective bottom-up approach taking the needs of the farming community as a guide and target service.

2.	Testing site/sub-centers	1) Mekele, Kobo, Sireinka 2) Meiso, Welenchiti □ Zway
3.	Major constraints	1) Moisture stress (early, mid, late season) 2) Poor soil fertility 3) Shortage of dry season animal feed 4) High weed incidence 5) Lack of appropriate and well planned cropping system 6) Limited availability of improved and adaptive crop cultivars 7) Soil crusting problem to disturb seedling emergence 8) Pest and disease problem such as <i>Quelea</i> (bird) and stalk borer 9) Inefficient farm implements
4.	Variety	Sorghum: Gambella 1107 (2 t/ha over 3 years means)
5.	Seed technology	1) Improving emergence by using pre-soaked seeds in moisture-stressed area (traditionally farmer adopt it for maize seeds). 2) Emergence of sorghum seed is improved by using pre-soaked seed.
	Seed placement	Yield of dry sowing of maize/sorghum is recommended with improved early CV in June to mid Sept., better than after one to three effective rains.
	Depth of planting	Proper sowing depth: 1) Maize 4-8 cm, 2) Sorghum 2-4 cm
	Plant population	1) Traditionally high seed rate is used for the reason of moisture stress, method of sowing used, suppression of weeds, traditional practice of "shilshallo" and animal feed 2) Recommendation: sorghum 90,000 plants/ha (8-10 kg/ha, 75 x 15 cm), maize 66,667 plants/ha (25 kg/ha, 75 x 20 cm), Bean 50,000 plants/ha (100 kg/ha, 40 x 10 cm) 3) Variation of plant population due to seasonal rainfall, soil moisture level: sorghum up to 133,333, maize up to 88,889. 4) Under worse moisture condition: lower plant population can be used. 5) Farmer's condition: sorghum 15-20 kg seeds/ha, maize 30 kg seeds/ha, bean 130 kg seeds/ha 6) Plant population. Strongly related between CV and cultural practice. In 1984 trial, yield increased up to 23.8 % under a trial on the effect of sowing density, variety and conservation technique on maize. 7) Haricot bean: yield increased by decreasing of intra-inter space. 8) Haricot bean: 40 cm row space with 60-80 kg seeds/ha - optimum 9) Haricot bean: 100 – 140 kg seeds/ha for broadcasting is optimum
6.	Soil & moisture conserv.	Major constraints: deficiency of soil moisture, high loss of soil due to wind erosion/dry season & water erosion/wet season, high evaporative water loss.
7.	Tillage	1) Timing, frequency & method of tillage contributes to soil & moisture conservation. a. Early plowing after crop harvest helps in conserving off-season rain by increasing soil infiltration rate. b. Incorporation of some crop residue to increase soil OM and water holding capacity. c. Belg season contributes to 20 % of the yearly rainfall in Melkasa, thus conservation of this rainfall increased 30 % grain yield by plowing the field in <i>Welenchit area</i> . - First plowing : just after crop harvest (October) - 2 nd plowing: June
8.	Tie-Ridging	1) Effective in controlling run-off and soil erosion. 2) Tie-ridging resulted in the highest grain yield of maize/sorghum when ridge is tied at shorter interval. 3) Labor intensive operation (23-30 man days/ha) discouraged farmer

		<p>from adoption.</p> <p>4) Agricultural Implements Research Center developed "<i>maresha</i>"-attached tied-ridger, which is very effective in below normal rainfall year.</p> <p>5) Tie-ridge showed significant interaction with fertilizer use on maize/sorghum; say in below normal rainfall year, fertilizer use without tie-ridge is no profitable.</p> <p>6) Modified tie-ridging for teff production gave promising results in poor rainfall year.</p>
9.	Mulching	<p>1) Mulching is very effective in conserving soil moisture, decreasing soil temperature, increase soil OM, suppressing weed infestation, maintaining favorable soil structure via enhancing biological activity.</p> <p>2) Dry season feed shortage requires most of crop residue from crop field, and which makes mulching impossible in the lowlands.</p> <p>3) Teff straw mulching at rate of 3-5 t/ha increased sorghum production by 147 %.</p> <p>4) Scoria(red ash) mulching at rate of 3-5 cm thickness resulted in 184 and 170 % increase of sorghum gain yield, respectively.</p> <p>5) Teff is the main feed source of oxen during early land preparation; scoria mining and transport are the major constraints among farmers.</p> <p>6) Multi-purpose fodder shrubs and trees were evaluated at Melkasa under alley cropping with major crops and farm-yard live fence.</p> <p>a. Shrub can serve as dry season feed bank, source of mulch, and fire wood source.</p> <p>b. Promising spp; <i>Sesbania sesban</i>, <i>Cajanus cajan</i> with sorghum & other food crops produced a substantial amt., of biomass(2-3 t/ha)</p>
10.	Shilshallo	<p>1)Traditional farmer's technology aims at thinning, improvement of water infiltration, but need to apply the proper time of doing "<i>Shilshallo</i>" at:</p> <p>a. 6 -8 leaves stage for sorghum</p> <p>b. 4-6 leaves for Maize</p> <p>2) "<i>Shilshallo</i>" can contribute to making modified tie-ridging practice.</p>
11.	Soil Fertility	<p>1) Major constraints: low soil fertility with deficient of both in N & P.</p> <p>2) Soils are also shallow with low OM.</p> <p>3) Prevailing wind & water erosion aggravate the above-mentioned 1) and 2), especially removing fertile topsoils.</p> <p>4) Most farmers in the dry land areas prefer fertility maintenance intervention options than using chemical fertilizers.</p>
12.	Crop rotation	<p>1) Crop rotation is the cheapest methods used for fertility maintenance.</p> <p>2) Effect of crop rotation contributes to suppression of weed infestation, incidence of disease & pest.</p> <p>3) Ideal crop rotation should include equal proportion of cereals & legumes but in lowland area, there are limited legumes crops to cereals crops. For example; Teff: shallow root, Sorghum: deep root Thus, teff followed by sorghum or maize reduces weed infestation on maize or sorghum field because of intense weeding done on teff.</p> <p>4) Yield increased by 60 % when maize followed bean or teff.</p> <p>5) Similar beneficial effect resulted from alley cropping cereal/sesbania or sole bean.</p>
13.	Green manuring	<p>1)Green manure is one of the options available for fertility maintenance in the lowlands area.</p> <p>2) Green manure legumes can be introduced during the fallow years where there is no land shortage or by growing short-season leguminous crop early in the season.</p> <p>3) Presently, no practice of green manuring crop is made in the CRV. The effect of "<i>Sesbania</i>" green manure is superior to "<i>Cajanus</i>".</p>
14.	Inter-	<p>1) Inter-cropping is an important system of fertility maintenance.</p>

	cropping	<p>2) Subsistence farmers tend to intercrop to minimize risk, diversify crop grown and spreading labor peaks.</p> <p>3) No practice is observed in Nazaret area;</p> <p>4) Study revealed a yield advantage of 74 %, 37 % and 31 % were obtained when sorghum was intercropped with a. mungbean, b. haricot bean, c. cowpea respectively compared to sole crop at Melkasa IAR.</p>
15.	Use of Commercial Fertilizer	<p>1) N & P response studies were carried out at Melkasa ARC. But result was not consistent and significant for maize & sorghum.</p> <p>2) In a treatment of 100kg Dap & 50 kg Urea/ha with <i>additional treatment of soil moisture conservation</i>, grain yield of sorghum & maize was significant.</p> <p>3) In time of N fertilizer application, significant effect resulted in half at sowing and half at booting (knee high) stage application.</p>
16.	Development of improved Production Packages	<p>1) Extension strategy: Various package components so far referred give farmers optional flexibility for stepwise adoption of technology, based on their conditions and resources.</p> <p>2) Package components;</p> <p>a. Maize 100 kg DAP+ 50 kg Urea/ha, early weeding once at 3 weeks after emergence, row sowing with recommended spacing & population, sowing in the furrow of ridge tied at 6 m interval, - Recommended weeding & tie ridging package result in 71 % increase to control. - Recommended fertilizer on a row planted maize results in 47 % increase to farmer's practice.</p> <p>b. Sorghum Sowing in the furrow of ridges tied at 6 m interval, row sowing with recommended plant population, timely weeding at 20-25 days after emergence were evaluated in the local variety. - Tied ridge & timely weeding practice resulted in 6 % & 11 % increase of grain yield, respectively - Row sowing with optimum plant population resulted in 32 % increase of grain yield. - Additional row sowing and recommended time of weeding to farmer's practice result in 48 % increase of grain yield. - Row sowing, timely weeding and tie ridging resulted in 55 % increase of grain yield to the control.</p> <p>For improved CV, tie-ridging is vital component followed by timely weeding.</p>

(4) Resource Management in Lowland Agriculture-2

System Research Status and Future Trends in the Rift Valley		
1	Weed, Insect, pests and disease	<p>1) Maize/bean cropping system experiments were conducted at MARC & Awasa in the cropping season.</p> <p>2) Treatment: 2 early bean CVs with maize were planted a. simultaneously, b. relay planting one month after maize.</p> <p>3) Effect:</p> <p>a. 42-53 % (Melkasa) and 35 to 47 % (Awasa) reduction in weed incidence was observed in comparison to sole maize.</p> <p>b. 2 rows maize-1 row bean inter-crops and sole maize were having highest weed infestation.</p> <p>c. Planting schedule of bean significantly affected weed growth.</p>

		<p>d. Intercrop was effective in controlling the incidence of insect pest: array of cob worms □ stalk borer, pod bores, and bean fly.</p> <p>e. Incidence of pest in both maize and beans was higher in relay inter-crops than simultaneous inter-crops.</p> <p>f. Maize/bean intercropping significantly reduced the incidence of bean rust.</p> <p>g. Incidence of anthracnose was higher in inter-crops compared to sole beans.</p> <p>In pulse yield, simultaneous planting with maize in 2 rows maize /1 row bean gave significantly higher yield.</p>
2	Alley cropping & Crop rotation	<p>Alley cropping:</p> <ol style="list-style-type: none"> 1) Alley cropping is one of land use system to increase crop production and to increase sustainability of crop and shrub growth. 2) Alley cropping provides fuel wood, animal fodder, cash products, and diversification of agricultural product. 3) Research result <p>Substantial amount of biomass was produced from alley cropped leguminous shrub without reduction of crop production and green manure or mulching material can be supplied through alley cropping.</p> <p>Crop rotation:</p> <ol style="list-style-type: none"> 1) Conventional crop farming in the CRV is continuous cereal grain cultivation. 2) This practice contributes to decline in soil fertility and increase weed, insect pest and disease incidence. 3) MARC carried out crop rotation experiment to mitigate above constraints. 4) Treatment: Sowing pulse crop (haricot bean) proceeding to maize 5) Effect: <ol style="list-style-type: none"> a. Give sustainable yield in test crop b. Increase grain yield with a bonus yield of bean c. Green manure application from alley cropped leguminous shrub give 70 - 100 % yield increase compared to maize-maize rotation. d. Improve soil fertility e. Alleviate weed infestation, pest/disease occurrence

(5) Disease and Pest Management

1.	Disease management in lowland pulses	<ol style="list-style-type: none"> 1) Study has been made to identify and document all known disease of pulse 2) Research focused on identifying appropriate cultural practices, screening of effective fungicides, studying physiologic race, yield loss, development of damage loss relation ships and resistant varieties. 3) Cultural control (crop rotation, deep plowing sowing dates, population density, weeding practice) seem to have a limited effect on the spread of common bacterial blight and halo blight. 4) Varietal resistance: Awash and Rova variety show resistant to rust, intermediate to common bacterial blight (CBB), susceptible to anthracnose. 5) Seed treatment: Benomyl seed treatment alleviates seed infection of anthracnose
2.	Sorghum disease control	<ol style="list-style-type: none"> 1) Major diseases: grain mold, smut (4 types), ergot on panicle, anthracnose on leaf 2) Effective seed treatment chemicals (<i>Captan</i> and <i>Sulphur</i> fungicide) to control smut disease have been identified.

		Farmer uses previous harvests without cleaning and not application of seed-dressing chemicals to control sumut disease. Epidemiological aspects of these disease is not very well known.
3.	Insect pest control	<ol style="list-style-type: none"> 1) About 52 insects pests are recorded in Ethiopia. 2) Prioritized pests for study are <i>Stalk borers</i>, <i>Chilo partellus</i>, and <i>Busseda fusca</i>. 3) 25 CVs from ICRISAT were evaluated to screen for stalk bores resistance at Zway and Melkasa; 4 CVs were reported as good source of resistance. 4) Chemical control: <i>Cyhalothrin</i> (5 % EC) at the rate of 16 ga.i./ha is effective. 5) Cultural control; Planting date and incidence of stalk bores in Zway site was made and resulted in progressive increase in the level of infestation and a sharp decline in yield, 27.1, 17.3, 4.6 and 0.8 q/ha in June 1, 15, July1, and 15 sown sorghums, respectively. 6) Inter-cropping against stalk borer; Preliminary data indicated that broadcast inter-cropping regardless of the species inter-cropped could very much help to alleviate level of damage. 7) Horizontal placement of sorghum stalks in the sun against diapausing larvae; 80 % of the larva were found dead in stalks spread for 4 weeks compared to only 3 % in stalks stacked immediately after harvest.
4.	Pest management of lowland pulse	1) Research on the management of bean pests has been concentrated on an IPM approach and relied heavily on cultural practices, host plant resistance, natural biological control, and on the use of locally available and affordable resources.

B. Debra Zeit Agriculture Research Center

1. Research mandates:

- (1) Poultry
- (2) dairy and beef, small ruminants,
- (3) forage
- (4) animal nutrition
- (5) teff, drum wheat, chickpea/lentil, vegetables, fruits, forestry,
- (6) soil and water
- (7) crop protection,
- (8) socio-economics
- (9) research-extension

1	Teff	1) Three varieties suitable for low-mid highland area have been developed and released: DZ-Cr-37, DZ-CR-358
2	Chick pea	1) About 8 CVs suitable for 1500 -2600 m from msl have been released since 1974.
3	Lentil	1) About 2 CVs suitable for lowland have been released since 1980: Cultivar : EI -142, Chekol
4	Soils and Plant nutrition	1) Improved packages(land preparation and fertilizer rate) recommended for major crops like wheat, teff and chickpea which are applicable to certain area of the Meki where vertisol soil is expanded.
5	Forestry research	1) The method of breaking dormancy of major tree spps is developed and recommended; <i>Acacia albida</i> , <i>Acacia saligna</i> , <i>Leuceana pallida</i> and <i>Mellina azadirachta</i>

C. Adami Tulu Agricultural Research Center

1. Research mandates:
 - (1) Socio-economics
 - (2) Animal Production
 - (3) Animal feeds and nutrition
 - (4) Animal Health
 - (5) Research and Extension

1	Socio-economics	<ol style="list-style-type: none"> 1) Gender and livestock production The role of women in livestock production around Adami Tulu was studied. The study revealed that women's daily activity generally took about 14 - 16 hr/day (2 - 3 hr for livestock related activities).
2	Forage crop	<ol style="list-style-type: none"> 1) Promising forage crop adaptable and tolerant to moisture stress were studied and promising forage crop with suitable sowing date was identified as follows; <i>Lablab purpureus</i> and <i>Chloris Guyana</i>: appropriate sowing date is between mid-May to early June around Adami Tulu area.