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# FRG II Research Inventory

October 2012





## Foreword

Since 2010, FRG (Farmer Research Group) II Project has been implemented in Ethiopia under the consortium of Ethiopian Institute of Agricultural Research (EIAR) and Japan International Cooperation Agency (JICA).

The FRGII Project has conducted a number of research activities with researchers, farmers, extension workers, and stakeholders in various disciplines from crop, livestock, natural resource, farm implements to marketing through participatory research method.

We hope this issue be of good help for the readers to understand 36 FRG research topics at glance.

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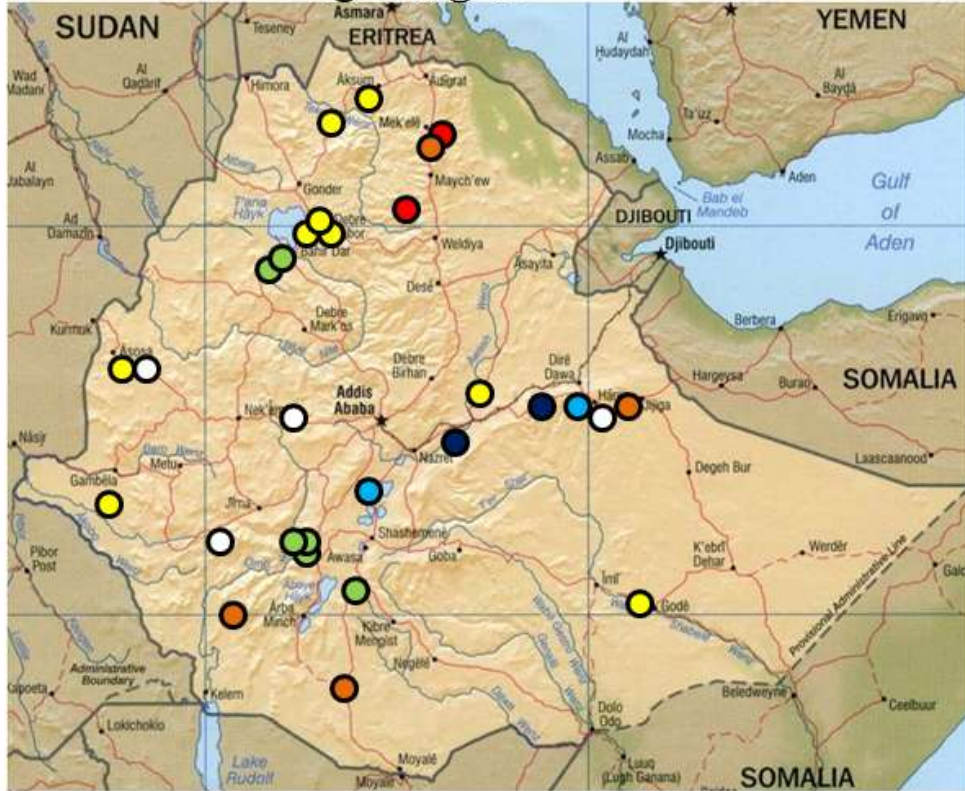
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Map of FRGII based research sites

**2012 FRG Based Research Sites**

- = Quality Seed Production
- = Seed Treatment Tech.
- = Farmer Saved Seed Qty.
- = FRG@FTC
- = Rice Tech.
- = Irrigated Vegetable
- = Forage



# 1. Rice

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# 1 [RT01]

Participatory Variety Selection with Farmers in Rainfed Rice Condition

Adet ARC (Amhara region) / Ongoing

Duration: May 2010-December 2012

Budget: 40,000 Birr

## Background:

The national rice research project tests varieties for different ecosystems following conventional breeding approach. Farmers' participation is little in the process. Many varieties cultivated in farmers' field are not registered, while many registered varieties are not cultivated by farmers.



## Objective:

- To identify farmers' selection criteria for rice varieties
- To introduce farmers newly improved varieties
- To enhance the capacity of farmers to multiply and diffuse seeds of varieties selected by them

## Methods:

Treatments	Replications/site	Trial farmer sites
86	3 (RCBD)	1

[Location] South Gondar Zone, Fogera Woreda, Kuhar Michael Kebele, Libokamkam Woreda, Bura Kebele, Metekel Zone, Pawe Woreda, 14 Kebele and 17 Kebele  
[Treatment]

Table 1 Rice varieties used in the research

Trial I	Trial II	Trial III	Trial IV	Trial V
IRGA370-38-1-1-F-B1-1	WAB450-24-2-2-P33-HB	FKRS	ARCCU3Fa9-L6P1-B-B-2	FKRS
WAB95-8-8-40-HB	WAB880-SG6	IRSA27(IRAT307)	ARCCU12Fa11L6P7-19-1-1-B1	IR75502-5-1-1-B
CNAX3031-15-2-1-1	WAB880-SG14	IR74371-54-1-1	ARCCU12Fa11L6P7-19-1-1-1-1	IR72023-7-6-3-2-3
WAB502-8-5-1	WAB880-SG37	IR75502-5-1-1-B	ARCCU3Fa11-L1P1-B-B-1	ROJOMENNA271/10
WAB368-8-H1-HB	WAB880-SG38	IR75502-5-1-3-B	ARCCU3Fa6-L3P9-B-B-3	IR75517-23-1-1-B
WAB368-8-1-H2-HB	WAB880-SG39	IR75506-25-1-2-B	ARCCU12Fa11L6P7-2-1-1-2-B	IR71730-51-2
WAB368-8-2-H2-HB	WAB880-SG02	IR75516-30-1-1-B	ARCCU12Fa11L6P7-2-1-1-2-1	WAB272-B-8-5-H4
WABC165(AC165)	WAB880-SG47	IR75517-23-1-1-B	ARCCU12Fa11L6P7-2-1-1-3-B	IRGA370-38-1-1F-B1-1
WAB515-B-13AL-2	WAB880-SG35	IR75517-28-1-1-B	ARCCU2Fa11-L2P1-B-B-1	WAB95-8-8-40-HB
WAB450-11-1-1-P31-HB	WAB880-SG70	IR75518-17-1-1-B	WAB880-1-38-20-17-P1-HB	IR76999-52-1-3-2
WAB-450-1-8-P-91-HB	WAB880-1-32-1-1-P2-HB	IR75518-18-1-2-B	WAB450-1-B-P-462-HB	WAB502-8-5-1
IRAT335	WAB880-1-38-13-1-P1-HB	IR75518-48-1-1-B	WAB878-6-37-5-1-P1-HB	WAB368-B-HI-HB
WAB376-B-10-H3	WAB960-B-11A1-1	IR75518-84-1-1-B	WAB8785G41	IR74052-184-3-3
WAB376-B-4-H2-HB	WAB910-B-4AB-1	WAB100-B-B-8-7-H3	WAB880-1-32-1-2-P1-HB	WABC165(AC165)
WAB33-17	WAB515-B-16A1-2	WAB272-B-B-5-H4	IRAT112	PSBRC44
AD01 (CHECK)	AD01(CHECK)	WAB-326-B-8-11-H2	AD048	PSBRC46
			AD048	PSBRC92
			AD012	WAB376-B-10-H3
				PSBRC50
				Gumara (Check)

(Control: AD01, AD048 and IAC164)

[Data collected] Evaluation of rice at the stage of 65% maturity stage

[Stakeholders] Farmers (58 farmers in 4 FRGs), DAs, Extension officers, Private rice mill owners

## Results:

- Farmers at different localities selected different varieties.
- Farmers' variety selection criteria are identified (Table2)

- Farmers' selections matched with the scientific approach in most of cases.

Table2. Farmers' variety selection criteria

Parameter considered by farmers	used for selecting top priority selection	used for selecting avert selection
Panicle size	■	■
Exerted panicle	■	
Height		■
Timing of maturing	■	■
Seeding capacity		
White/red seed color	■	■
Uniformity of maturity		■
Effective tillering capacity	■	
Harvest index		
Disease resistance	■	■
Seed size	■	
% of filled spikelets		■
Shattering		
Treshability		
High/low biomass		
Resistance to hail damage		

## Farmers' participation:

- Evaluation of different varieties at the maturing stage.
- Farmers identified their selection criteria.

## Research team:

Agronomist, pathologist, entomologist, weed scientist, economist, extension researcher

## Contacts (Principle investigator):

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# 2 [RT2]

Participatory Evaluation of Time and Frequency of Different Hand Weeding Levels on Lowland and Upland Rice at Fogera



**Adet ARC (Amhara region) / Ongoing from 2010**

**Duration:** May 2010-December 2011

**Budget:** 25,000 Birr

**Background:**

Rice production and weed control are often synonymous. Well planned weed control is essential for producing rice economically. Rice farmers' weeding practice in Fogera plain is by hand and a laborious work and need to identify critical and economical timing and frequency of weeding. Hand weeding is economically feasible and environmentally sound compared to chemical weed control for small scale farmers.

**Objective:**

- To evaluate timing and frequency of hand weeding for their relative advantage.
- To create awareness among farmers and development experts on weeding at different times and frequency levels.

**Methods:**

2 independent studies are performed at lowland and highland. Numbers of treatment, replications and trial sites for each study are as indicated below.

Treatments	Replications/site	Trial farmer sites
5	3	3

[Location] South Gonder Zone, Fogera Woreda, Quar Kebele, Abau Kebele, Tihaa Kebele

[Treatment]

Weed free, hand weeding at 20 and 50 days after emerging (DAE), 35 and 50 DAE, 20, 35, and 50 DAE.

(Control: weedy)

[Plot design]

RCBD replications with farmers variety (lowland: X-jigna, upland: Nerica-4), plot size (10m x 6m), Spacing between plots (1m), seed rate (100kg<sup>-1</sup>), broadcast seeding, fertilizers (46/23 N-P kg<sup>-1</sup>).

[Data collected]

Effective tiller count /m<sup>2</sup>, plant height, grain yield

[Stakeholders]

Woreda office of Agriculture,

**Results:**

- Different time and frequency of hand weeding showed significant difference in effective tillers and grain yield, but not in plant height for both upland and lowland rice.

- Weeding at 20, 35, and 50 DAE gave the highest effective tillers and grain yield for both rice varieties followed by weed free check (complete weeding).
- Weeding at 20, 35, and 50 DAE gave the highest net benefit in both upland and lowland rice. (for lowland, see Table1)

**Remarks:**

- Most of the cases, farmers' selections matched with the scientific approach.

Table 1 . Partial budget analysis on different method of hand weeding levels on low land rice

Treatment	Marketable yield (sq/ha)	Costs of labour (birr/ha)	Gross benefit (birr/ha)	Net benefit (birr/ha)
Weedy check	4 <sup>c</sup>	0	3200	3200
Weed free check	43.89 <sup>a</sup>	10000	35112	25112
weeding at 20 and 35DAE	26.81 <sup>b</sup>	2000	21448	19444
weeding at 35 and 50DAE	36 <sup>ab</sup>	2000	28800	26880
hand weeding at 20, 35 and 50 DAE	37.45 <sup>a</sup>	3000	29996	26996

\*Means within the column followed by same letter(s) are not significantly different

\*8birr/kg of rice

**Farmers' participation:**

- Weeding and evaluation of the treatments.

**Research team:**

Weed, breeder, socio-economist, extension researcher

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# 3 [RT03]

Demonstration of Rice Transplanting and Seed Pre-germination Technologies in Fogera Plain

**Adet ARC (Amhara region) / Ongoing from 2010**

**Duration:** May 2010-December 2012

**Budget:** 25,000 Birr (2010), 30,000 Birr(2011)



## Background:

Fogera plain contributes 32% of rice production in Ethiopia. However, farmers use dry seed broadcast seeding method, whereas, in many other countries, transplanting is the most common method of planting rice as it has higher yield advantage. Similarly, rice seed pre-germination is known to be significantly increase yields.

## Objective:

-To test transplanting and seed pre-germination technologies of rice against farmers' dry seed broadcasting method in Fogera plain.

-To enhance the knowledge of farmers and extension agents on transplanting and seed pre-germination technologies of rice.

## Methods:

Treatments	Replications/site	Trial farmer sites
3	1	5

[Location] South Gonder Zone, Fogera Woreda, Kuhar Michael Kebele, Tiweha Zalena Kebele

[Treatment]

- Transplanting of 4-leaf stage seedlings
- Seed soaked for 48h and incubated for 24h before planted in nursery (Control: Dry seeds)

[Plot design]

Variety (X-jigna), plot size (10m x 10m (gross), 8m x 8m (net)), 32 rows of 8m length, fertilizer (N/P<sub>2</sub>O<sub>5</sub> 69/23kg ha<sup>-1</sup>)

[Data collected]

Effective tiller count /m<sup>2</sup>, plant height, grain yield

[Stakeholders]

3 FRG (20-30 farmers each), extension agents

## Results:

- Significant difference among replications in days to heading, but not for plant height, days to maturity and grain yield.
- Higher heights and grain yields for transplanted compared to dry seed sowing.
- Transplanted rice headed 11 days earlier than dry seed sowing

-Labor cost was higher for transplanted rice than that of dry seeds and soaked seeds, but the cost compensates by less labor cost for weeding. (Table1)

**Table 1** Estimated variable cost and net benefit for rice transplanting, seed pre-germination and dry seed sowing in Fogera plain, 2010

Treatments	Labor requirement(ha)				Cost per man days(birr)	Grain yield	Total variable cost(birr)	Gross benefit(birr)	Net benefit(birr)
	Seedling raising	Planting	Weeding	Total					
Transplanting	30	100	84	214	20	4573	4280	29724.5	25445
Seed soaking	--	50	165	215	20	4104	4300	26676.0	22376
Dry seed planting	--	50	165	215	20	3276	4300	21294	16994

Price of rice grain = 6.5 birr/ kg

**Remarks:** In 2011, transplanting is performed in 6 host farmers' fields of 1000m<sup>2</sup> each.

## Farmers' participation:

-Site selection, nursery development, planting, trial management, 3 field-days and feed-back about technologies.

## Research team:

Agronomist (2), socio economist, extension researcher, breeder, pathologist, entomologist, and weed scientist.

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# 4 [RT04(1)]

Participatory Evaluation of Effect of Different Levels of N Fertilizer on Yield and Yield Component of Upland Rice (*Oryza sativa L*). Nerica-1 at Gode District in Somali Region



**SoRPARI ARC (Somali Region) / Completed**

**Duration:** May 2010-December 2012

**Budget:** 33,500 Birr (2010)

## **Background:**

Rice is becoming a high potential crop in the Somali Region, but as the crop is new to the region, there is a lack of fertilizer recommendations that could help maximize the productivity of the cultivation techniques in the region. In some cases, unfavorable condition of the plants or soil causes low efficiency of absorption of nitrogen, thus judicious use of fertilizers depend on the various growth stages according to the type of variety grown, is crucial.

## **Objective:**

- To evaluate the effect of Nitrogen application on yield and yield component of NERICA-1.
- To determine the optimum nitrogen level for production of upland rice NERICA-1 at Gode.
- To increase farmers participation on rice research to identify and adopt appropriate techniques of rice cultivation in the areas.

## **Methods:**

Independent studies are performed in three different locations.

Below is the information for each study.

Treatments	Replications/site	Trial farmer sites
4	1	3

[Location] Gode Zone, Hilagudud Kebele, Barsan Kebele, and Midnimo Kebele

[Treatment] Nitrogen fertilizer in the level of 23, 46, and 69 kg $ha^{-1}$  (Control: no fertilizer)

[Plot design] Variety (NERICA-1), plot size (10m x 10m), spacing (20 x 10 cm), fertilizer (constant phosphorus application of 60 kg $ha^{-1}$ , N/P<sub>2</sub>O<sub>5</sub> 60 kg  $ha^{-1}$ ), irrigation

[Data collected] days of 50 % heading, days of 75 % physiological maturity, plant height at maturity, 1000-seeds weight, number of seeds per panicle, number of panicle per hill, number of hills per m<sup>2</sup>, grain yield per plot, and biomass yield per plot at harvesting.

[Stakeholders] FRG farmers

## **Results:**

- Application of higher levels of nitrogen fertilizer significantly made better results for all of the factors of the data collected.

## **Farmers' participation:**

Provide land for trial, manage trials, weeding, discuss progress among FRG member farmers, and sharing info with non-FRG farmers.

## **Research team:**

Agronomists

## **Contacts (Principle investigator):**

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# 4 [RT04(2)]

Participatory Evaluation of Effect of Irrigation Intervals on Yield and Yield Components of Nerica-1 Rice at Gode District in Somali Region

**SoRPARI ARC (Somali region) / Ongoing**

**Duration:** May 2010-December 2012

**Budget** 25,000 Birr (2011)



**Background:**

Irrigation depends on the ability of rice plant to adapt to natural conditions combined with the ability of farmers to manage conditions within the boundaries. Water is a limiting factor for the rice production in the region, but no specific recommendations on irrigation interval and frequency effects on upland rice production.

**Objective:**

- To determine the optimum irrigation intervals for production of upland rice NERICA-1 at Gode
- To evaluate the effect of irrigation levels on yields and yield component of NERICA-1
- To increase farmers participation on rice research to adopt the appropriate techniques of rice cultivation to those areas

**Methods:**

Independent studies are performed in three different locations.

Below is the information for each study.

Treatments	Replications/site	Trial farmer sites
4	1	3

[Location] Gode Zone, Hilagudud Kebele, Barsan Kebele, and Midnimo Kebele.

[Treatment]

Irrigation intervals 4, 6, 8 and 10 days

[Plot design]

Variety (NERICA-1), Plot size (20m x 20m), Spacing (plots 0.5m), fertilizer (constant phosphorus application of 60 kgha<sup>-1</sup> N/P<sub>2</sub>O<sub>5</sub> 60 kg ha<sup>-1</sup>)

[Data collected]

50 % heading, days 75 % physiological maturity, plant height at maturity (cm), number of tillers/plant, 1000-seeds weight (g), number of seeds per panicle, number of panicle per hill, number of hills per m<sup>2</sup>, 1000 grain



weight, grain yield per plot (kg), and biomass yield per plot (kg), and harvest index.

[Stakeholders]

3 FRGs (3 trial farmers each), extension workers.



**Results:**

To be notified.

**Farmers' participation:**

Site selection, providing land, managing trials, weeding, discuss progress among FRG member farmers, sharing info with non-FRG farmers.

**Research team:**

Agronomist

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# 5 [RT05]

Enhance Rice Production through Improved Seed Production on Agro-Pastorals' Field in Afar Region

**Werer ARC (Afar region) / Ongoing from 2010**

**Duration:** May 2010-December 2011

**Budget:** 27,000 Birr (2010)

**Background:**

Most of the fertile land found at both banks of Awash River in Afar region is unused and currently covered with weeds. On the other hand, rice is a staple food for most of the Afar people, but they consume imported rice produced in Asian countries. Rice breeders have identified well-adapted rice variety (NERICA-4) to the irrigated agriculture, but the promotion of NERICA-4 has been limited due to the limited seed available.



**Objective:**

- To multiply sufficient quantities of genetically pure NERICA-4 seed on agro-pastorals' field in the Amibera District with agro-pastorals' field management practices and improved management.
- To train the agro-pastorals, development agents and agricultural experts about pure rice seed production techniques and post-harvest technologies.

**Methods:**

Treatments	Replications/site	Trial farmer sites
---	1 per farmer	4

[Location] Zone 3, Amibera Woreda, Serkamo Kebele, Ambash Kebele, Gidaro Kebele, Dirk Kebele.

[Treatment] evaluation on the adoption of NERICA-4 in each farmer field

[Plot design]

Total land area (800m<sup>2</sup>, 600m<sup>2</sup>, 400m<sup>2</sup>, 400m<sup>2</sup>), fertilizers (UREA 4kg and DAP 2kg), 10kg of seed, irrigation every 4-5 days interval, weeds removal using hand weeding whenever needed.

[Data collected]

Date of seedlings emergence, initial tillering, initial panicle emergence, flowering, maturity, number of seeds/panicle, 1000 seed weight, yield per plot, and quintal per hectare.

[Stakeholders]

DAs

**Results:**

- The performance of NERICA-4 varied among three FRGs that were not damaged. (See Table 1)
- Main reason for field difference was variation in crop management practices and irrigation of water availability.

-Crops in Dirk Kebele was damaged by water shortage and attack by wild animal.

Table 1 The results of each trial location

S. No	Name of the FRGs	Sowing dates	Date of seedling Emergence (Mean)	Days to Initial Tillering after sowing (Mean)	Days to Initial Panicle Emergence after sowing(Mean)	Days to 50% Flowering after sowing (Mean)	Days to Maturity after sowing (Mean)	No. of Seed/ Panicle (average of five panicles)	1000 seed wt (g)
1	Serkamo	July 20	July 25	25	65	75	95	210	31.67
2	Ambash	July 15	July 21	26	65	76	95	223	32.41
3	Gidaro	July 18	July 23	25	67	78	98	194	29.76
4	DirkKebele	July 29	August 03	25	Totally lost by water shortage and wild animals attack				

**Farmers' participation:**

Managing seed multiplication process, harvesting rice crops, threshed the rice with stick, and separated the seed from the straw.

**Remarks:**

Lack of rice milling machine to remove the rice grain cover is a challenge.



**Research team:**

Rice breeder, Crops production technology expert, Research extension researcher, Agricultural expert

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# 6 [RT06]

Popularization and Seed Multiplication of Upland NERICA Rice for Livelihood Improvement of Small Scale Farmers in Jimma Zone

**Jimma University (Oromia Region) / Discontinued in 2011**

**Duration:** May 2010-December 2011

**Budget:** 27,000 Birr (2010)



**Background:** Two year on station trial of upland NERICA varieties shows a good performance (six tons per hectare) . However, the research process have not involve clients yet. Through participatory research, farmers conduct on-farm verification trials to prove candidate varieties for their yield and agronomic merits. Farmers also implement on-farm seed multiplication on promising varieties to solve seed shortage, minimize cost of production, develop farmer-to-farmer seed exchange.

## Objective:

- To evaluate and select the best performing NERICA varieties with participatory research approach.
- To verify candidate NERICA varieties on farmers' field for release.
- To multiply released NERICA variety seeds on farmers' field.

## Methods:

Treatments	Replications/site	Trial farmer sites
5	3	6

[Location]

Shebe and Gomma (and Limmu Sekka waredas for seed multiplication).

[Treatment](Step 2)

Three NERICA varieties, X-Jiguna and N-3

[Plot design]

Simple comparison

[Data collected]

Agronomic data

[Stakeholders]

DAs, woreda experts, kebele leaders

## Results:

-

## Farmers' participation:

Six farmers groups, each containing 20 members, are established.

## Remarks:

The researchers cancelled the research at the end of the first year (2010/11) due to difficulty of managing the trial site in far distance.

## Research team:

Agronomist, breeder, pathologist, agri. Economist

## Contacts (Principle investigator):

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# 7 [RT07]

Improving Rice Productivity through Farmer Research Group Approach in Gambella Region

**Abobo ARC (Gambella region) / Ongoing**

**Duration:** May 2011-December 2013

**Budget:** 120,000 Birr



## Background:

Gambella farmers have tried to cultivate rice traditionally using their own seed, or seed obtained from neighboring farmers for decades. However, rice production consists of only 0.33 % and 0.23 % of the total area covered and production recorded from all cereals in the region, due to lack of improved varieties and other management practices.

## Objective:

- Evaluate and recommend better yielding, good quality, pest tolerant / resistant rice varieties for Gambella Region.
- Determine the effect of different fertilizer rates on growth, grain yield and yield components of recommended rice varieties.
- Determine the effect of different weeding method on growth, grain yield and yield components of recommended rice varieties.

## Methods:

**Experiment 1:** Participatory evaluation and selection of improved rice varieties

Treatments	Replications/site	Trial farmer sites
10	3(RCBD)	3

[Location] Aguna Zone, Abobo Woreda, Okuna Kebele, Gambella Zuria Woreda, Kareme Kebele, Nuere Zone, Lare Woreda, Lare Kebele

[Treatment]

8 varieties (control: 1 local variety)

[Plot design]

Plot size (1.2m x 5m x 6 rows), all agronomic parameters applied as national recommendation.

**Experiment 2:** Effect of weeding time and population density on the yield and yield components of rice

Treatments	Replications/site	Trial farmer sites
7	3(RCBD)	3

[Location] Same as in experiment 1.

[Treatment]

15 DAE (day after emergence), 15 and 45 DAE, 15, 30, and 60 DAE, 30 DAE, 45 DAE, Weed free.(control: Weedy)

[Plot design] Rice variety (from experiment 1), plot size (2m x 4m), spacing (rows 20cm) seed rate (80 kgha<sup>-1</sup>), all agronomic parameters applied as national recommendation.

[Others]Cost benefit analysis will be conducted.

[Stakeholders] 3 FRGs ( farmers), DAs.

**Experiment 3:** Nitrogen and phosphorus rate determination for rice

Treatments	Replications/site	Trial farmer sites
15	3(RCBD)	3

[Location] Same as in experiment 1.

[Treatment]

Nitrogen rate (0, 25, 50, 75, 100 kg N ha) and phosphorus rate (0, 20, 40 kg P ha) combinations

[Plot design]

Same as in experiment 2.

**Results:** To be notified.

## Farmers' participation:

Site selection, provide land, preparation, planting, field management, evaluation, recording.

## Research team:

Pathologist, Research extension researchers (2), Breeder, Entomologist, Agronomist

## Contacts (Principle investigator):

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# 8 [RT08]

Participatory Varietal Selection of Improved Rice Varieties at Central and North Western Zones of Tigray

**Aksum ARC (Tigray Region) / Ongoing**

**Duration:** May 2011-December 2013

**Budget:** 40,000Birr



## Background:

The amount of rice production has increased from 150 tons to 286 tons from 2006 to 2008 in Tigray region. There are still a lot of arable vertisols in the region which remains water logged for most of the year, preferable for water loving rice. However, little knowhow on the rice technologies are available which restricts farmers to produce rice and stay producing low productive teff and local sorghum cultivars.

## Objective:

- To introduce and evaluate the adaptability of improved upland rice varieties at M/Lekhe.
- To introduce alternate crop technology (i.e. rice) which has high market demand.
- To determine the selection criteria of farmers.

## Methods:

Treatments	Replications/site	Trial farmer sites
6	4 (RCBD)	1

[Location]

Central Zone, M/ Lakhe Woreda, Medhin Kebele, Mayweiny Kebele (Mother trial has been done in at M/Lekhe res. station)

[Treatment]

6 different varieties of rice (control: local variety)

[Plot design]

Research station: plot size (3m x 3m), 2m and 1m spacing (rows 2m, plots 1m), seed drilled at 3cm depth, and fertilizer is applied as recommended,.

Farmer site : Plot size (5m x 5m), spacing (rows 20cm, plots 1.5m), seeding rate (60 kg ha<sup>-1</sup>), germination percentage >=85%, sowing by drilling at 3 cm depth, Urea and DAP 100/100 kg ha<sup>-1</sup> was used.

12 farmers, each will be given 2 rice varieties.

[Data collected]

Agronomic data, farmers' selection criteria collected by questionnaire.

[Stakeholders]

12 households farmers, Extension experts and DAs

**Results:** To be notified.

## Farmers' participation:

Provide land, management practices of the trials, evaluation, data recording, encourage visits by non-FRG members.

## Research team:

Agronomists (2), Breeder, Entomologist, Weed scientist, Pathologist, Irrigation expert, (Socio-economist)

## Contacts (Principle investigator):

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# 9 [RT09]

Enhancing Production and Productivity of Upland Rice through Quality Seed Production in North Western and Western Tigray

**MayTsebri ARC (Tigray region) / Ongoing**

**Duration:** May 2011-January 2013

**Budget:** 40,000 Birr

## Background:

The MayTsebri ARC identified NERICA-3 and NERICA-4 improved upland rice varieties to North Western Zone, but since rice is still new to the region, both basic and certified seed productions are not yet addressed either by public or private sectors. Farmers acquire seeds themselves or neighboring farmers, thus lack of desired variety with appropriate quality discouraging farmers to produce rice.

## Objective:

- To produce adequate amount of quality rice seed locally.(under farmer's condition)
- To improve quality seed access to non-FRG members.
- To aware farmers and other stakeholders (DAs, Extension workers and others) about quality seed production techniques and post harvest handling

## Methods:

Treatments	Replications/site	Trial farmer sites
2	1 per farmer	12

[Location] North Western Zone, Tselemti Woreda, Medhanialelem Kebele, Mezekir Kebele,

[Treatment]

NERICA-3 and NERICA-4 (no local var.)

[Plot design]

N-3 and N-4 seed varieties will be provided from the center. Fertilizer (100 kg Urea and 100 kg DAP), all other cultural practices will be applied uniformly to all plots.

[Data collected]

Days to 50% emergence, flowering, heading and physiological maturity, grain yield, farmers' perception, disease and insect pest reaction, collection and comparison of different characteristics of seed quality of the different seeds from different sources (FRG trial member, non-FRG members, and seeds produced from center)

[Stakeholders]



2FRGs (6 farmers each), and 12 other farmers, Extension workers

**Results:** To be notified.

## Farmers' participation:

Provide land, management practices of the trials, evaluation, data recording, encourage visits by non-FRG members.

## Research team:

Agronomist, Entomologist, and Agricultural economics and research extension researcher

## Contacts (Principle investigator):

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# 10 [RT10]

## Participatory Evaluation and Selection of Rice (upland) Varieties at Bambasi District in Benishangul-Gumuz Regional State

Assosa ARC (Ben.Gumuz region) / Ongoing

**Duration:** May 2011-December 2012

**Budget:** 40,000 Birr



### Background:

Benishangul-Gumuz is one of the most important potential regions among other rice producing areas in Ethiopia, but the scientific approach of rice production is not well developed. Especially, there is a gap of introducing and evaluating the promising varieties (namely NERICA-3, NERICA-4, FKRS, Cukit1) on farmer field condition.

### Objective:

- To evaluate and identify the best performing rice varieties using farmers selection criteria
- To participate farmers in rice research activities and to apply their indigenous knowledge
- To create awareness about different types of rice varieties to farmers, DAs and others relevant stakeholders.

### Methods:

Treatments	Replications/site	Trial farmer sites
5	1 per farmer	4

[Location]

Assosa Zone, Bambasi Woreda, Keshemando Kebele

[Treatment]

NERICA-3, NERICA-4, FKRS, Cukit1 (control: local variety)

[Plot design]

Plot size (10m x 10m), spacing (rows 20cm), seeding rate (60 kg/ha-1), drilled at depth of 3-4cm, fertilizer (DAP and Urea 100kg/ha-1 each), weeding is practiced 3-4 times.

[Data collected]

Days to 50 % heading, to maturity, plant height at maturity, disease, number of tillers per plant, plants and capsules aspect, number of panicle per bill, number of seeds per panicle, number of hill per m<sup>2</sup>,

thousand seed weight, grain yield (kg/plot), and farmers observation/ comments.

[Stakeholders]

4 FRG farmers, DAs, MoA experts

**Results:** To be notified.

### Farmers' participation:

Whole agronomic practices such as preparation of lands, planting, weed management, and harvesting.

**Research team:** Plant scientist, pathologist, and Agricultural economist

### Contacts (Principle investigator):

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# 2 Quality Seed

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# 11 [QS01]

Farmers' Participatory Evaluation of Lower Seeding Rates on Teff Using Seed Spreaders in Wolaita Zone, South Ethiopia

Wolaita Sodo University (SNNR region) / ongoing from 2010

**Duration:** May 2010-December 2011

**Budget:** 39,670 Birr



## Background:

Teff is major grain crop next to maize in Wolaita Zone, which occupies 23 % of the land covered by grain crops. The recommended seed rate for teff is 25 to 30 kg ha<sup>-1</sup> in Ethiopia, but farmers often use 40-50 kg ha<sup>-1</sup> due to the difficulty of distributing the seed evenly and to suppress weeds at early stages. Seed spreaders (seed mixers) are materials which are used to improve the performance of tiny seeds during planting, by establishing an even plant stand with better impacts on growth, nutrient use efficiency and crop yield.

## Objective:

- To evaluate growth and productivity of teff in response to lower seed rates mixed with seed spreader.
- To identify the most suitable seed rate for the study area.
- To facilitate knowledge transfer and enhance the skill of the farmers.

## Methods:

Treatments	Replications/site	Trial farmer sites
6	4(RCBD)	1

[Location] Edo kebele in Duguna Fango Woreda,

[Treatment]

5kg ha<sup>-1</sup>, 10kg ha<sup>-1</sup>, 15kg ha<sup>-1</sup>, 20kg ha<sup>-1</sup> mixed with dry sand at seed: sand ratio of 1:4 (in volume), 35kg ha<sup>-1</sup> without sand, 30kg ha<sup>-1</sup> without sand.

[Plot design]

Teff variety (DZ-Cr-37), size of plot (3m x 3m), spacing (plots 0.75m), fertilizer (Urea 50kg ha<sup>-1</sup>, DAP 125kg ha<sup>-1</sup>), other agronomic practices are uniformly applied.

[Data collected]

-10 random plants within each plot will be used as data collection. Plant height, panicle length, average number of tiller per plant, number of productive tillers per plant, days to 50% heading and psychological maturity, biological yield, grain yield, straw yield, and harvest index.

[Others]

-Soil study of the site was performed by analyzing soil texture, pH, available P, total N, and Organic Carbon.

[Stakeholders]

1 FRG (10 farmers), Ministry of Agriculture and Rural Development officers, DAs.

## Results:

-No significant influence on biomass, straw and grain yield of teff, and harvest indices.

- Positive marginal rate of return only for 10, 15 and 30kg ha<sup>-1</sup> seeding rates, with 10kg ha<sup>-1</sup> the superior marginal rate of return.

-FRG members preferred lower seedling rates, preference order of 5, 10, 15 kg ha<sup>-1</sup>.

-Lower seed rates did not result in greater weed problem in this area.

## Farmers participation:

Site selection, land preparation, sowing, regular stand evaluation and final stand evaluation, sharing the experience to non-participant farmers during farmer's field day.

## Research team:

Agronomist, Soil scientist, and Plant pathologist.

## Contacts (Principle investigator):

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# 12 [QS02]

Farmers' Participatory Seed Quality Assessment on Smallholder Farmers Saved Seed on Major Grain Crops in Wolaita Zone, Southern Ethiopia



**Wolaita Sodo University (SNNR region) / ongoing**

**Duration:** May 2011-November 2011

**Budget:** 39,800 Birr

## Background:

The formal seed sector in Ethiopia has not met the needs of vast majority of small farmers. Informal seed system, particularly the use of home-saved and untreated seed is a common crop production practice by Wolaita farmers, and the quality of the seed they use are a major reason for low productivity of their crop production.

## Objective:

- To recognize seed quality at small holder farmers through evaluation of seed quality performances.
- To determine the capability of farmers to produce good quality seeds, weaknesses in farmers' seeds and provide a venue for improvement.
- To facilitate knowledge transfer and enhance the skill of the farmers with respect to quality seed and maintenance.

## Methods:

### Experiment 1: Laboratory test

[Data collected] Physical purity, germination test, speed of germination, moisture content, seed weight, insect infestation, and disease occurrence.

-Soil data was analyzed to find soil texture, pH, available P, total N, OC, and electrical conductivity.  
[Stakeholders]  
2 FRG (20 farmers each), extension workers, DAs

### Experiment 2: Field Experiment

Treatments	Replications/site	Trial farmer sites
6	4(RCBD)	2

[Location] Wolaita Zone, Duguna Fango Woreda, Edo Kebele

[Treatment]

Farmers saved seed, farmers' seed after sorting, farmers saved seed after purity and germination test, and certified seed

[Plot design]

Plot size (3m x 3m), spacing (rows 30cm, plots 0.75m, plants 10cm, blocks 0.75m), fertilizer (DAP 100kg $ha^{-1}$ )

[Data collected]

Stand count per plot after emergence/before final harvest, 50% flowering and physiological maturity dates, plant height, number of branches per plant, pods per plant, seeds per pod, grain yield, total biomass, and harvest index.

[Others]

### Experiment 3: Survey questionnaire

Questionnaire for 40 households regarding seed and other farming practices.

## Results:

To be notified.

## Farmers participation:

- Participate in sample collection, site selection, land preparation, sowing, regular evaluation and final stand evaluation
- Seed quality evaluation before and after experiment
- Sharing their experience to non-participant farmers during field day

## Research team:

Agronomist, Plant pathologist, Soil scientist

## Contacts (Principle investigator):

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# 13 [QS03]

Participatory Evaluation of Seed Extraction Techniques to Improve Seed Quality and Yield in Tomato (*Lycopersicum esculentum*)

Wolaita Sodo University (SNNR region) / ongoing

**Duration:** May 2011-December 2011

**Budget:** 40.000 Birr



## Background:

In Wolaita, the office of agriculture and rural development each year provides tomato seeds which can be purchased from any supermarkets. However, these seeds do not always meet the quality and the varieties are not well identified. Also, they are not well stored, and not adaptable to local environment which causes farmers fail to produce the crop.

## Objective:

- To identify the best seed treatment technique that improves seed quality and subsequent yield in tomato.
- To disseminate knowledge and skill of seed treatment techniques for farmers and other stakeholders.

## Methods:

Treatments	Replications/site	Trial farmer sites
8	3(RCBD)	1

[Location] Wolaita Zone, Sodo Zuria Woreda, Mante Gerera Kebele

[Treatment]

HCL (5%, 10%), H<sub>2</sub>SO<sub>4</sub> (5%, 10%), Sodium Carbonate (5%), Wood Ash, Hot water treatment, Fermentation

[Plot design]

Plot area (4.5m x 3.0m), Spacing (rows 90cm plots 50cm, plants 30cm, blocks 1m)

[Data collected]

Both vegetable and yield data will be collected.

[Others]

-Preliminary germination test was performed in WSU laboratory to find out germination rate and percentage before conducting the field work.

-Field soil was analyzed for soil texture, pH, available P, total N, and organic carbon.

[Stakeholders]

1 FRG (12 farmers), Zonal Experts, DA, and peasant association.

**Results:** to be notified.

## Farmers participation:

Participate in seed extraction, awareness creation and on the job training. Involve in site selection, land preparation, sowing, and other agronomic practices. Identify the effect of treatments, yield evaluation during harvest, and share the experience to other non-member farmers.

## Research team:

Horticulturist, Soil scientist, and Plant protectionist.

## Contacts (Principle investigator):

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# 14 [QS04]

Participatory Development and Promotion of Quality Seedling Production Technology for Stevia (*Stevia rebaudiana Bertoni*) and Lemon Verbena (*Alloysia triphylla L*)



**Wonde Genet ARC (Oromia region) / ongoing**

**Duration:** May 2011-November 2012

**Budget:** 39,980 Birr

## Background:

The Arsi Negele woreda is endowed with suitable climatic conditions for Stevia and lemon verbena, which already have open profitable market of a kilo of fresh leaf Stevia sold by 20 Birr, and lemon verbena by 15 Birr. However, the existing information for proper cultivation and exploitation of the crop is very limited in the focus area.

## Objective:

- To identify the economical condition for the development of quality seedlings of stevia and lemon verbena, as well as evaluating the agronomic and chemical traits of them under farmer field condition.
- To induce Stevia and lemon verbena quality seedling production technologies to the farmers, and give chance for them to select and validate the best technologies based on their own criterion.
- To diversify the income source of farmers by introducing new commodity technologies to cope up the possibility of the risk comes from single cropping.

## Methods:

Treatments	Replications/site	Trial farmer sites
12	3(RCBD)	2

[Location] West Arsi Zone, Arsi Negele woreda, Sembero Rogicha Kebele, Dawe Kebele

[Treatment]

Tree levels of part used (top, middle, and bottom), four levels of node number (3, 5, 7, 9) in factorial combination, for two seasons (wet and dry)

[Plot design]

Twenty pots were considered per treatment in each replication. Best seedlings will be multiplied and planted on 10x10m plot size at a spacing of 40cm x40cm for stevia and 60 cm x 60cm for lemon verbena).

[Data collected]

- Data on survival rate was collected every week
- Plant height, leaf number/plant, fresh and dry leaf yield/plant, fresh and dry leaf yield/plot will be collected at harvest.
- Essential oil and crude extract content will be calculated.

[Others]

- Six months old stevia and one year old lemon verbena grown at Wondo Genet ARC are used.
- 4 demonstrations are done (start of nursery seedling raising, final stage of nursery raising, field evaluation,

and displaying of the result) for FRG farmers and non-FRG farmers in the surrounding areas.

[Stakeholders]

2 FRGs (10 farmers each)

**Results:** Top cutting position with 3 nodes for stevia and bottom cutting position with 3 to 5 nodes for lemon verbena could be recommended for the development of quality seedlings under good nursery management

## Farmers participation:

- Providing land for experiment
- Management of trial site
- Experience sharing with other non-FRG members

## Research team:

Beemnet Mengesha (Breeding in horticulture), Muluken Philipos, and Hassen Nurhussain (Socio-economics and extension), Solomon Abate (Agronomist), H/Slassie G/Meskel (Horticulture), Mihret Mekonnen (Crop protection)

## Contacts (Principle investigator):

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# 15 [QS05]

Seed Multiplication Rate Study of Different Cultivars of Wheat for Optimizing Seed Quality and Productivity

**Bahir Dar University (Amhara region) / ongoing**

**Duration:** May 2011-Jun 2012

**Budget:** 40,000 Birr



## **Background:**

Amhara Region is 2<sup>nd</sup> contributor of wheat total production of the country. Different wheat agronomic practices were recommended for different regions. There was no evidence of seed rate study and recommendation in northwestern Ethiopia. It is assumed that the current rate is national blanket recommendation. Farmers use higher seed rate for grain production which affects seed quality, production and productivity, though lower seed rates lead to higher multiplication factors.

## **Objectives:**

- To determine the optimum seed rate for higher seed quality and productivity.
- To improve the skills of FRG farmers in producing high quality seed (pre-basic to certified classes of seeds) for surrounding market.

## **Methods:**

Treatments	Replications/site	Trial farmer sites
5seed rates and 2 varieties	3 (RCBD)	2

[Location] West Gojjam Zone, Yilmana Densa Woreda, Debremai Kebele, Geregera Kebele

[Treatment]

2 varieties (Dinkinesh, Gasay) of 5 seed rates (75, 100,125,150, 175 kg ha<sup>-1</sup>)

[Plot design]

Plot size (4m<sup>2</sup>), 8 rows at 20 cm spacing and 2.5 m row length, fertilizer (N 100kg/ha-1, P<sub>2</sub>O<sub>5</sub> 161kg/ha<sup>-1</sup>)

[Data collected]

- Agronomic and seed quality traits
- Genetic (field level) and physical seed purity (lab analysis)
- Farmers evaluation scores at different growth stages (1-4)

[Stakeholders]

2

2 FRGs ( 25 farmers each), DAs at woreda level, Researchers at BDU and Adet ARC from various disciplines

**Results:** to be notified.

## **Farmers' participation:**

Joint evaluation at emergence, tillering, heading, maturity and post harvest seed characteristics

## **Research team:**

Breeder (2), Protection (1), Socio-economist/ extension (2), Crop agronomy (1), animal science (1), natural resource (1), Mechanization (1).

## **Contacts (Principle investigator):**

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# 16 [QS06]

Participatory Evaluation and Demonstration of Animal Drawn Compactor for Teff Seed Production



**Bahir Dar AMFSC (Amhara Region) / ongoing**

**Duration:** May 2011-December 2012

**Budget:** 75,000 Birr

## **Background:**

West and east Gojjam zone, one of the dominant crops is Teff, but the farmers cannot utilize new technology due to lack of appropriate technology in the region as well as in the country. To produce teff trampling is one of the crucial operation and done by huge amount of animals. Nowadays, most farmers decrease their number of animals due to lack of animal feed and grazing land, which could be a serious challenge for trampling.

## **Objective:**

- Increase smallholder productivity with timely and proper land operation
- To evaluate animal drawn compactor for Teff production under farmers' circumstances.
- To demonstrate these technologies to farmers, extension personnel and stakeholders.

## **Methods:**

Treatments	Replications/site	Trial farmer sites
3	1	3

[Location] West Gojjam Zone, Adet Woreda, Debre Mawi Kebele, Burie Woreda, Wadra Kebele, Bahir Dar Ketema Woreda, Wereb Kebele

[Treatment]

Local practice (trampling with animal), compactor, non-trampled

[Plot design]

Plot size (minimum 10m x 20m)

[Data collected]

Field condition, agronomical data, quality of Teff seed (germination %, 1000 seed weight (g), farmers perception)

[Others]

Cost benefit analysis will be performed.

[Stakeholders]

2 FRGs (16 male/2 female and 15male/ 3female farmers), Zonal, Woredas and kebeles agricultural office experts, DAs

**Results:** to be notified.

## **Farmers participation:**

Delivering testing field, preparation of testing plots as traditional practice, contribution of human and animal power in each farming practice (ploughing, harrowing, weeding, harvesting and threshing), and evaluation of the technology.

## **Research team:**

Agriculture mechanization (2), Mechanical engineer, and Economist.

## **Contacts (Principle investigator):**

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## 3. Seed Treatment

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# 17 [STs01]

Participatory Evaluation of Seed Treating Fungicide Against Bulb Rot of Onion at Fogera

Adet ARC (Western Amhara region) / Completed

Duration: January 2011-March 2011

Budget: 14,910 Birr



## Background:

Onion has been a major cash crop of the small scale farmers in Fogera plain. However, the productivity of onion has yield loss of up to 40% in the area due to the spread of pathogen which can destabilize food security. At the moment, majority of farmers do little or nothing to control diseases, and have very little or no knowledge of onion bulb rot control.

## Objective:

In order to insure the sustainability of onion production in Fogera plain,

-identify and demonstrate effective fungicide against basal rot of onion.

-promote farmers awareness on causes, symptoms, epidemiology and management of bulb of onion.

## Methods:

Treatments	Replications/site	Trial farmer sites
7	3	2

[Location] South Gonder Zone, Fogera Woreda, Quar Kebele

[Treatment]

See table 1 (control: no treatment)

[Plot design]

size of the plot (3mx3m), spacing (rows 40cm, ridges 20cm, plants 10cm), fertilizer rate (61kg $ha^{-1}$  of DAP and UREA)

[Data collected] Plant height, diseases incidence %, and total yield qha $^{-1}$

[Others]

Economic analysis was performed.

[Stakeholders]

## Results:

-Chemical Agixyl 407 showed the best effect of plant treatment, giving the lowest diseases incidence and the highest total yield of onion followed by Iprodione.

-Agrixyl 407 gave the highest net benefit. (Table 1) -

Farmers agreed that Agrixyl 407 showed the best effect for plant treatment.

Table 1 Result of economic analysis

Treatment	Total Marketable yield ( q/ha)	Costs of chemical (birr/ha)	Gross benefit in (birr/ha)	Net benefit (birr/ha)
Agripos 600	132.2	525	39660	39135
Iprodione 50%	145.7	470	43710	43240
Agixyl 407	146.4	520	43920	43400
Mancoxyl 72 WP	131.8	395	39540	39145
Victory 72 WP	137	440	41100	40660
cruzate	85.18	600	25554	24954
Control	128.15		38445	38445

## Farmers' participation:

-Treating of chemicals

-Evaluation of treatments (plant vigor, leaf color, population size as the criteria of selection)

-Participation for field day to demonstrate the effect of treatments.

- 2FRGs (6 female, 44 male)

## Research team:

Pathologist, Crop breeder, Socio-economist /extension researcher, and Allium crop agronomist

## Contact (Principle investigator):

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# 18 [STs02]

## Effect of Chemical Seed Dressings for the Management of Cutworm on Pepper

**Adet ARC (Amhara region) / Completed**

**Duration:** December 2010-March 2011

**Budget:** 14,980 Birr

### Background:

Pepper is widely grown in north western Ethiopia by large scale as well as small scale farms. However, its production and productivity has been decreased due to cutworm. Judicious use of chemicals is preferred for cutworms, and Cruiser 350FS, Dynamic 400FS, and Gauch 350FS are some of the known seed dressing chemicals tested for the control of soil insects and some foliar insects in different areas



### Objective:

To determine the effect of seed dressing chemicals against cutworm on pepper under FRG based research approach

### Methods:

Treatments	Replications/site	Trial farmer sites
7	3(RCBD)	2

[Location]

West Gojjam Zone, Mecha Woreda, Kudmi Kebele, South Gonder Zone, Fogera Woreda, Avuana Kokit Kebele

[Treatment] Cruiser 350S, Dynamic 400FS, and Gauch 350 FS of company recommendation (5ml/kg of seed) and half of it of the three chemicals.

(Control: no treatment)

[Plot design] Plot size (3m x 2m), Spacing (row 10cm, plots 100cm), fertilizers (Urea and DAP), weeding, and other agronomic practices.

[Data collected] Seeding height, seedling weight, damaged seedling in the nursery, damaged plant in the field.

[Others]

-Preliminary germination test of both treated and untreated seeds are done in the lab.

-Seeds produced by local farmers are used.

[Stakeholders]

Woreda agricultural extension experts, DAs and farmers

### Results:

Seed dressing chemicals caused significant reduction in cumulative damaged seedlings at the time of transplanting over the untreated control in both locations (Table 1 and Table 2)

### Farmer participation:

-Site selection, Material preparation and Follow up and evaluation

- 2FRGs (Male: 48, Female: 3)

### Research team:

Horticulturist, Plant scientist, Crop protectionist, and Economist

### Contacts (Principle investigator):

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Table 1: Effect of seed dressing chemicals on pepper seedlings against cutworm at Kudmi

Treatments	Seedling height	Seedling Weight	Damaged seedling	Reduction in seedling damage over control (%)
Cruiser 5 ml/kg	19.50 <sup>a</sup>	13.57 <sup>a</sup>	38.00 <sup>c</sup>	63.92
Cruiser 2.5 ml/kg	18.39 <sup>a</sup>	12.32 <sup>a</sup>	53.33 <sup>b</sup>	49.37
Dynamic 5 ml/kg	20.62 <sup>a</sup>	13.63 <sup>a</sup>	40.67 <sup>c</sup>	61.39
Dynamic 2.5 ml/kg	19.00 <sup>a</sup>	13.37 <sup>a</sup>	53.33 <sup>b</sup>	49.37
ApronStar 5 ml/kg	19.69 <sup>a</sup>	13.56 <sup>a</sup>	37.33 <sup>c</sup>	64.56
ApronStar 2.5 ml/kg	18.58 <sup>a</sup>	12.83 <sup>a</sup>	56.67 <sup>b</sup>	46.20
Untreated Control	17.96 <sup>a</sup>	11.83 <sup>a</sup>	105.33 <sup>a</sup>	-

Table 2: Effect of seed dressing chemicals on pepper seedlings against cutworm at Ayuana

Treatments	height	Weight	seedling	Reduction in Seedling damage over control (%)
Cruiser 5 ml/kg	20.45 <sup>a</sup>	13.57 <sup>a</sup>	22.67 <sup>bc</sup>	72.35
Cruiser 2.5 ml/kg	19.70 <sup>ab</sup>	11.07 <sup>a</sup>	29.33 <sup>b</sup>	64.23
Dynamic 5 ml/kg	20.25 <sup>a</sup>	14.33 <sup>a</sup>	17.33 <sup>c</sup>	78.87
Dynamic 2.5 ml/kg	19.72 <sup>ab</sup>	11.50 <sup>a</sup>	26.67 <sup>bc</sup>	67.48
ApronStar 5 ml/kg	20.40 <sup>a</sup>	14.30 <sup>a</sup>	22.67 <sup>bc</sup>	72.35
ApronStar 2.5 ml/kg	19.63 <sup>ab</sup>	11.80 <sup>a</sup>	23.33 <sup>bc</sup>	71.55
Untreated Control	17.55 <sup>b</sup>	10.70 <sup>a</sup>	82.00 <sup>a</sup>	-

# 19 [STs03]

Demonstration of Apron Star 42WS Seed Dressing Chemical Against Cutworm (*Agrotis segtum*) on Chickpea at Dembia Woreda, North Gondar



**University of Gondar (Amhara region) / Completed**

**Duration:** December 2010-March 2011

**Budget:** 15,000 Birr

**Background:**

Ethiopia is the biggest chickpea growing country in Africa with a share of 48% production, but its average grain yield has remained extremely low. This mainly resulted from farmers using indigenous/local chickpea that are nonresistant to insect pests. Most lately sown crops are exposed to cutworm damage, but farmers are adapted to late planting for escaping of water logging, physiological wilting, and occurrence of Fusarium wilt-root complex problems. Chemical Apron Star has the property to prevent wilt-root complex disease as well as controlling cutworm.

**Objective:**

To evaluate and determine the efficacy of Apron Star 42 WS against cutworm.

**Methods:**

Treatments	Replications/site	Trial farmer sites
2	1	1

[Location] North Gonder Zone, Dembia woreda, Guramba Michael kebele

[Treatment]

Seeds treated with Apron Star 42 WS (control: no treatment)

[Plot design]

Paired plot or simple comparison, Variety (Arerti), Plot size (100m<sup>2</sup>), Spacing (plots 2m), Seed rate (150kgha<sup>-1</sup>), Chemical rate of 250g/100kg of seeds, Equal frequency of weeding.

[Data collected]

Number of plants per plot/ Stand counting at emergence, time of emergency of seedlings, number of plants damaged by cutworm per plot, wilted/ dried plants per plot, farmer perception about the chemical and the crop.

(collected by 1m<sup>2</sup> sized quadrant)

[Stakeholders]

FRG (25 farmers), Debre Zeit ARC, Gonder ARC, North Gondar Zone Seed Laboratory Office, Dembia Woreda Agricultural and Rural Development Office (Experts and DAs).

**Results:**

-Early seedling emergency, faster growth of seedlings, less damaged/infested by cutworm was found with the seeds treated with Apron Star 42 WS.

-No significant difference in number of plants attacked by Fusarium wilt-root rot.

-FRG indicated that improved variety, seed dressing chemical, and techniques used for conducting and evaluating the research were very attractive and useful.

-Manuals were distributed for FRG and development agents (DAs) on chickpea production and protection.

**Remarks:**

-Majority of FRG indicated that this type of research approach and technology should be undertaken for other crops (e.g. fenugreek and grass pea) and in the main growing season of chickpea.



**Farmers participation:**

Site selection up to evaluation of the research.

**Research team:**

Agricultural Entomologist and Agronomists(2)

**Contacts (Principle investigator):**

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# 20 [STs04]

Effect of Pre-sowing Fungicides Seed Treatment on Seed Germination, Emergence and Seedling Vigor in Maize (*Zea mays*)

**Wolaita Sodo University (SNNP region) / Completed**

**Duration:** November 2010- January 2011

**Budget:** 14,800 Birr

**Background:**

Maize is accounting for 21% of cropland and contributing about ¼ of the cereal production in Ethiopia. However, the national average yield of crop is far below the average figure for the world, and one of the biggest constraints among the biotic stresses is disease. Seed treatment is known to be one of the cheapest and safest methods for direct control of seed/soil-borne diseases.

**Objective:**

- To evaluate the effect of chemical seed treatment on germination, emergence and seedling vigor of maize under laboratory and field condition
- To identify the effective fungicides used for pre-sowing seed treatment of maize
- To facilitate knowledge transfer and enhance the skill of the farmers about pre-sowing seed treatment technology.

**Methods:**

**Experiment 1** :Laboratory experiment

Trial location: Wolaita Sodo University

[Data collected] Germination rate up to 8 days (daily), mean germination rate and germination percentage

**Experiment 2:** Pot trial

Trial location: Wolaita Sodo University research and demonstration site on sterilized soil and soil from maize field

[Data collected] Seed emergence, Fresh weight of shoot and root, seedling shoot length and shoot dry weights of 45 days after seedling emergence. (Three seedlings from each treatment were used)

**Experiment 3:** Field trial

Treatments	Replications/site	Trial farmer sites
4	4(RCBD)	2

[Location] Wolaita Sodo University research and Wolaita Zone, Duguna Fango Woreda, Edo Kebele

[Treatment]

Mancozeb, Metalaxil, Redomil (control: no treatment)

[Plot design]

Plot size (3.6m x 3m), Spacing (rows 30cm?, plots 1m), fertilizer (DAP 100kg $ha^{-1}$ , Urea 46kg $ha^{-1}$ ), other agronomic practices conducted equally, disease and insect check regularly.

[Data collected]

Seedling height, number of leaves, fresh weight, and dry weight of shoots.



[Others]

Soil texture, pH, P, N, K and organic carbon were analyzed.

[Stakeholders]

2 FRGs (10 farmers each), DAs, and 3<sup>rd</sup> year plant science students at WSU.

**Results:**

-Significant influence on pre-sowing fungicides, especially on Metalaxil on improving the germination, seedling height, average leaf number, fresh and dry shooting weight of maize seedling was found. Farmers, based on their own criteria, also preferred Metalaxil, as the first choice during seedling stand evaluation.

**Farmer participation:**

In-depth awareness creation training on the Pre-sowing seed treatment methods, Handling of treated seeds, Field preparation, and Seed sowing and fertilizer application method and evaluate the seedling stand.

**Research team:**

Plant pathologist, Agronomist, and Soil scientist.

**Contacts (Principle investigator):**

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# 21 [ST01]

Participatory Evaluation of Different rates of Fungicides (Mancozeb and Apron plus 50%) for the Control of Groundnut Root Rot (*Sclerotium rolfsii* Sacc. [teleomorph]) in Eastern Hararghe

**Fedis ARC (Oromia region) / Ongoing**

**Duration:** May 2011-June 2013

**Budget:** 20,184 Birr



## Background:

Groundnut is produced widely by significant number of farmers and is a source of income for a large number of small-scale farmers. However, soil born diseases such as root rot, and wilting are bottlenecks for its production, and yield losses reach more than 80 % in heavily infested fields.

## Objective:

- To select the most effective, least costly chemical, and select the exact rate of chemical for the control of root rot disease of groundnut in coordination with farmers in the area.
- To establish knowledge network among FRG, non-FRG farmers and other stakeholders.

## Methods:

Treatments	Replications/site	Trial farmer sites
7	3(RCBD)	1

Trial location: East Hararghe Zone, Fedis Woreda

[Treatment]

Mancozeb (Dithane M-45):15, 20, 25gm per Kg of seed,

Apron plus 50% (Apron XL): 5, 10, 15 gm per 4Kg of seed. (control: no treatment)

[Plot design]

Plot size (3m x 3.6m), spacing (rows 60cm, plant 20cm), no fertilizer, equal timing of weeding and earthening up

[Data collected]

Plant stand harvest (%), emergency date, plant height(cm), days to flower, number of flower, number of branch per plant, number of seed per pod, number of pod per plant, Tsw(g), grain yield(kgha<sup>-1</sup>), DI(%), Disease severity (1-9 scale), Insect incidence(%), MD, HD, Farmers assessment, Cost of input-output

[Others]

All data will be analyzed using IRRISTAT.

Partial budget analysis will be performed.

[Stakeholders]

1 FRG (10-15 farmers), DAs, extension workers, NGOs, SMS

**Results:** To be notified.

## Farmers participation:

Select site, prepare seed, execute recommended practices, encourage visit by others

## Research team:

Crop protectionist, Agricultural economist, and Pulse and oil crops breeder

## Contacts (Principle investigator):

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# 22 [ST02]

Participatory Evaluation of Seed Dressing Insecticides for the Management of Tef Shoot fly (*Delia armbourgi*) at Wag-Lasta Area



**Sekota DARC (Amhara region) / Suspended**

**Duration:** May 2011-December 2013

**Budget:** 39,950Birr (2011)

## Background:

Tef is covering 30% of the total acreage of the cereals and about 26% of the whole area cultivated with annual field crops in Ethiopia. However, the annual yields are often low and are subject to extreme fluctuations. Insect pest problems are factors of low yields, and problem becomes more serious with the lower rainfalls. Especially in dry land areas like Waghimira, shortage of rainfall causes the severe yield loss.

## Objective:

To select the best seed dressing insecticide for the management of tef shoot fly

-To evaluate economic feasibility of seed dressing insecticides for the management of teff shoot fly

-To promote the best seed dressing insecticides for the management of tef shoot fly

## Methods:

Treatments	Replications/site	Trial farmer sites
5	4(RCBD)	2

[Location] Wag-Himera Zone, Sekota Woreda, Woleh Kebele, North Wollo Zone, Lasta Woreda, Shumeshiha Kebele

[Treatment]

ApronStar 42WS, Gaucho 70WS of 500ml/qt and 250ml/qt of seed respectively.

(control: no treatment)

[Plot design]

Plot size (4m x 3m), spacing (plots 1m, replications 1.5m), fertilizer (Urea and DAP as recommended), weeding, and other agronomic practices as recommended.

[Data collected]

Stand count no. /100cm<sup>2</sup>, number of dead heart plants/100cm<sup>2</sup>, number of panicles at harvest /100cm<sup>2</sup>, damage score, number of tillers and heads /100cm<sup>2</sup>, grain yield /plot

[Others]

-Preliminary germination test for treated seeds and untreated seeds has been done in the laboratory.

-Economic advantage of different shoot fly management insecticides will be evaluated.

[Stakeholders]

2 FRGs (6 farmers each), DAs, Agricultural experts at Woreda levels.

**Results:** The result of the study indicated that, the chemicals that were tested are not effective for the target insect. Thus, further study is crucial by incorporating other systemic seed dressing chemicals for the management of tef shoot fly in the area.

## Farmers participation:

Providing land, evaluation at stages, execution and management of trials, and participating trainings.

## Research team:

IPM, Plant scientist, Agricultural extension researcher, and Resource economist

## Contacts (Principle investigator):

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# 23 [ST03]

Effect of Seed Treatment on Seed Born Disease of Hot Pepper and Onion: -in the Case of Central Rift Valley of Ethiopia

**Adami Tulu ARC / Ongoing**

**Duration:** May 2011-November 2011

**Budget:** 20,000 Birr

## Background:

Central rift valley area of east shewa zone is well known producers and suppliers of tropical vegetables like tomato, onion, cabbage, hot pepper and green beans. However, the production and productivity has been decreasing due to the bacterial disease of vegetable crops. Over 90% of the Connecticut pepper plantings inspected over the last five years were infected with bacterial leaf spot which reduce profit and sometimes resulting in complete crop failure.

## Objective:

- To evaluate different seed treatment option that can improve field survival rate of hot pepper and onion.
- To create awareness about seed treatment options among farmers.

## Methods:

Treatments	Replications/site	Trial farmer sites
6	4	1

[Location] East Shoa Zone, Adami Tulu Jido Kombolcha Woreda, Edokonpola Kebele, Dugda Woreda, Bekele girisa Kebele.

[Treatment]

Apron star as recommended , Mancozeb 80WP as recommended, immerse with hot water at 50C, immerse with hot water at 50C with (1)Apron star of half of the recommended, (2)Mancozeb 80WP of half of the recommended.

(control: no treatment)

[Plot design]

Hot pepper (Commonly grown by farmer's mareko fana variet), Onion (Bombey red),

[Data collected]

Date of germination, germination percentage, leaf number, stem thickness, root number, root length and



root to shoot ratio, seedling vigor (scale), seedling height, disease and insect if any.

[Stakeholders]

2 FRGs (producing hot pepper and onion respectively), DAs,

**Results:** To be notified.

## Farmers participation:

40 farmers in 3 FRGs

## Research team:

Horticulture, Extension researcher, plant pathology

## Contacts (Principle investigator):

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## 4 Farmer saved seed

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# 24 [FSS01]

Participatory Evaluation of Farmer-saved and Purified Seed for Agronomic Performance in Wheat

**Mekele University (Tigray Region) / ongoing**

**Duration:** July 2011-June 2014

**Budget:** 40,000 Birr (2011)

## Background:

One of the main problems that reduce the yield of wheat in Tigray region is the prevalence of weeds like wild oats, and that is related to the use of impure farmer saved seeds. Farm-saved seeds have also immature and broken seeds, foreign materials, among others which causes negative effects on the crop stand. However, the awareness of the farmers on the use of clean or certified seed is limited. Also, little or no attention is given on the amount of moisture content of the grains for storage.

## Objective:

- Evaluate the agronomic performance of farmer-saved and purified (refreshed) wheat varieties on farmer's fields
- Estimate cost-benefit of use of farmer-saved and purified seeds
- Introduce appropriate seed storage and cleaning technologies to FRG members.

## Methods:

Treatments	Replications/site	Trial farmer sites
2	9	9

[Location] South Eastern Zone, Enderta Woreda, Didba Kebele

[Treatment]

Refreshed seed and farmer-saved seed.

[Plot design]

Plot size (0.125 ha)

[Data collected]

Days to emergence, plant height (cm), number of tillers/ plant, leaf number/ plant, days to flowering, spike length, number of seeds per spike, grain yield, and stover yield.

[Others]

Germination test and purity analysis were carried out before sowing in the experimental plots.

[Stakeholders]

9 FRGs (18-20 households each), extension workers, local administrative bodies, ISSD project, CASCAPE project

**Results:** to be notified.



## Remarks:

Two hundred seeds from purified and farmer-saved have been taken for the germination tests before the field experiment.

## Farmers' participation:

Provides land for trials, cover cost of land preparation, weeding and harvesting, manage trials, discuss progress among FRG farmers, keep the activity record.

## Research team:

Agronomist, Entomologist, Agricultural Extension researcher, and Animal scientist.

## Contacts (Principle investigator):

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# 25 [FSS02]

Sustaining Bread Wheat Productivity through Evaluation and Promotion of Quality Seed Production

**Alamata ARC (Tigray Region) / ongoing**

**Duration:** June 2011-November 2013

**Budget:** 40,000 Birr



**Background:**

Bread wheat is one of the major staple crops in southern Tigray, but the average yield is lower than that of national average yield. This is due to insufficient availability of quality seed, absence of seed producers, and insufficient seed distribution system.

**Objective:**

- To identify the difference in quality between the conventional farmers saved seed and the seeds received complete cleaning and selection.
- To introduce and promote possible intervention methods for the production of quality bread wheat seed.
- To increase farmers participation in the production of quality bread wheat seed

**Methods:**

Treatments	Replications/site	Trial farmer sites
6	4(RCBD)	2

[Location] 1 site each at Fala and Hashenge in Ofla woreda

[Treatment]

Farmer saved seed with/without applying seed cleaning/selection with salt solution/water.

[Plot design]

Plot size (100m<sup>2</sup>), seed rates (150 kg ha<sup>-1</sup>), fertilization amount, weeding, and roughing as recommended.

[Data collected]

- Weight of immature seeds and dusts
- pre-germination test
- days to emergency
- dry matter weight per 1m<sup>2</sup> of 1 month plant
- stand count after emergency and at harvesting stage
- number of tillers, plant height, leaf number, and days to booting
- seed yield per unit area measured
- perception of farmers
- cost of production and revenue

[Stakeholders]

2FRGs (10 farmers each), Woreda experts, DAS

**Results:**

To be notified.

**Remarks:**

Field days, farmers field school, experience sharing from FRG team from Tabia level to Woreda and regional level will be performed.

**Farmers participation:**

Land preparation, weeding, roughing, harvesting

**Research team:**

Breeder (3), Horticulturist, Weed researcher, Protection researcher, and Extension researcher.

**Contacts (Principle investigator):**

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# 5 Irrigated vegetables

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# 26 [IRV01]

Participatory Onion Production and Technology Adaptation, Evaluation and Demonstration under Irrigated Condition of Sogido-Saraweyeba Irrigation Schemes



**Melkassa ARC (Oromia region) / Ongoing from 2012**

**Duration:** May 2012-December 2014

**Budget:** 80,017.97 Birr/Year

## **Background:**

Under the existing knowledge, the farmers and agro-pastoralists have started to improve their livelihood of their families in the area. Thus, if they get improved technologies such as improved crop varieties, better management and crop production knowledge, they will more improve their livelihood by the income obtained from sales of high value crops (e.g. Onion) production by irrigation. Supplementing such developments by introducing improved agricultural technologies is believed to enhance the livelihood of the community and innovative capabilities of the farmers through Farmers Research Group approach. Therefore, filling the agricultural technology gap and realizing the purpose, irrigation development scheme requires scientific support through the intervention of research.

## **Objective:**

- To identify adaptable and appropriate onion varieties for the target irrigation scheme
- To identify appropriate crop management practices, including water management, for onion production in the targeted irrigation scheme
- 

## **Methods:**

Treatments	Replications/site	Trial farmer sites
6	3 (RCBD in factorial arrangement)	1

[Location] East Shewa Zone, Fantale Woreda, Sogido/Saraweyba

[Treatment] 3 varieties of onions with 2 different irrigation practices (farmer and improved irrigation practices)

[Plot design] RCBD with 3 replications

[Data collected] farmers assessment data on establishment(%), maturity, number of bolter plants, yield (marketable and total), splits and thick necked %, bulb size, bulb color, TSS%, disease and insect reactions, soil data and water measurement

## **[Stakeholders]**

Farmers (18 farmers in 1 FRG with 4 females), DAs, Woreda BoA, East Shewa Zone water resource office, Researchers

## **Results:**

- to be notified

## **Farmers' participation:**

-18 farmers (13 male and 5 female)

## **Research team:**

Agronomist, Pathologist, irrigation researcher, Econ./Extension researcher

## **Contacts (Principle investigator):**

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# 27 [IRV02]

Participatory Evaluation, Selection and Demonstration of Tomato (*Lycopersicon esculantum*) Varieties Using Irrigation System

**Fedis ARC (Oromia region) / Ongoing from 2012**

**Duration:** February 2012-February 2014

**Budget:** 40,000 Birr/ year

## **Background:**

Irrigation is particularly necessary in the dry season and supplementary irrigation is needed in the wet season. This pattern of irrigation decreases the risk of production failure in the wet season and assure utilization of residual moisture in the dry (summer) season (Palanisami, 2002). The primary objective of irrigation is to apply water at the right period and in the right amount since maintenance of adequate soil moisture throughout the growing season of a crop is necessary to expect optimum plant growth and yield with due consideration to the dwindling water resource availability.

## **Objective:**

- To evaluate and select better yielding and disease resistant tomato varieties using irrigation system.
- To compare water use efficiency and yield of tomato varieties under Alternative furrow and farmer practiced furrow irrigation system.
- To demonstrate best performing tomato varieties under Alternative furrow irrigation system

## **Methods:**

Treatments	Replications/site	Trial farmer sites
10	(RCBD)	2

[Location] West Hararghe Zone, Hirna Woreda, Tiraa Kufise Kebele

[Treatment]

5 varieties (1 local check) and 2 different irrigation methods

[Plot design] RCBD with 2 replications

[Data collected] farmers' assessment/ feedback on the technology, cost of input (land labor, capital), output gained (yield and other social values if any), yield, pest and disease incidence (%), agronomic practices, water use, irrigation frequency, cost of irrigation

[Stakeholders]

Farmers (30 farmers and 2 FRGs), 2 DAs, 2 Woreda BoA, 6 Researchers

**Results:** to be notified

**Farmers' participation:**

30 farmers (female 4, male 26)

**Research team:**

Irrigation engineer, agro-economist, horticulture scientist, plant pathologist, soil scientist, food science and post harvest technology scientist

**Contacts (Principle investigator):**

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## 6 Forage Improvement in Pastoral and Agro-pastoral Areas

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# 28 [FOR01]

Participatory Evaluation and Demonstration of Herbaceous Forage Species in the Agro-pastoral Areas of Aba'ala Woreda Afar National Regional State



**Mekelle Univ. (Tigray region) / Ongoing from 2012**

**Duration:** May 2012-December 2014

**Budget:** 40,000 Birr/ year

**Background:**

Aba'ala woreda in Afar as elsewhere in the marginal areas of the region has remained unexposed to any sort of development and research activity related to feed improvement and development for many years. This coupled with frequent drought has resulted to rangeland degradation, reduction in feed availability both in quality and quantity and reduction in livestock productivity. Therefore, there is a need to seek for the possible opportunities/technologies to alleviate feed shortages and to improve the productivity of the mainstay of the people in the area. Hence, it is with intension (alleviation of livestock feed shortages) that this research proposal is designed and the research is planned.

**Objective:**

- To demonstrate different improved herbaceous forage species to the area
- To develop/select appropriate forage production technology fitting into the project area
- To evaluate the performance of different forage species under arid and semi-arid environmental condition
- To improve livestock feed availability and improve livestock performances

**Methods:**

Treatments	Replications/site	Trial agro-pastoralist sites
4	5	5

[Location] Zone II, Aba'ala woreda, Adiharemali Kebele, Wokrigubi Kebele

[Treatment]

4 forage crops (Lablab, cow pea, Rhodes grass, alfalfa)

[Plot design] 5 replications

[Data collected] germination rate at lab, sowing date, germination date, vigor, resistance to moisture stress, flowering date, seed setting date, biomass yield, yield and disease and pest occurrence, agro-pastoralists' perception and species preference, soil moisture, temperature, relative humidity

[Stakeholders]

Agro-pastoralists (20 agro-pastoralists in 1 PRGs), DAs, Researchers

**Results:**

- to be notified

**Agro-pastoralists' participation:**

- 20 pastoralist (15 male, 5 female) in 1 PRG

**Research team:**

Range land management scientist, Agronomist, Pathologist, Extension researcher, animal feed scientist

**Contacts (Principle investigator):**

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# 29 [FOR02]

Participatory Demonstration of Quality Seed Production on Alfalfa and *Panicum antidotale* at Gursum Woreda, Somali Region, Ethiopia



**Fafen ILRDC (Somali region) / Ongoing from 2012**

**Duration:** May 2012-December 2014

**Budget:** 40,000 Birr/ year

## **Background:**

Due to a significant shrinkage of rangelands for grazing and browsing taken by every encroaching farmlands and rangeland degradation expressed in the form of the reduction or disappearance of these palatable grasses browses species, there is significant decline in the amount of fodder available for livestock. This coupled with frequent drought and expanding invasive species has caused a tremendous decline in the performance of livestock species negatively affecting the livelihood of the pastoral and agro-pastoral community.

Hence, this project targets this evident challenge and aims to address by multiplying seeds of improved forage species which has been previously tested by SoRPARI and found adaptable and disseminate then to the end users.

## **Objective:**

- To demonstrate improved forage production targeted towards improved supply of high quality improved forage seeds for further scaling up/ dissemination
- To facilitate dissemination of improved forage seed production techniques and knowledge among the FRGS member farmers in the selected villages.
- To demonstrate and train local communities in the management and utilization of pastures and forages.

## **Methods:**

Treatments	Replications/site	Trial farmer sites
2	3	3

[Location] Jijiga Zone, Gursum Woreda, Aroaska Kebele, Golmarodi Kebele, and Kubijaro Kebele

[Treatment]

2 species of forage crops

[Plot design/ Plot size: 20m x 20m = 400m<sup>2</sup>] RCBD with 3 replication s

[Data collected] planting date, germination date (50%), flowering date (50%), harvesting date, biomass yield

[Stakeholders]

Agro-pastoralists (20 agro-pastoralists in 3 FRGs), DAs, Researchers

## **Results:**

- To be notified

## **Farmers' participation:**

21 agro-pastoralists (15 male and 6 female)

## **Research team:**

Animal science, Animal production and health scientist, range scientist, research extension and socio-economist

## **Contacts (Principle investigator):**

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# 30 [FOR03]

Demonstration and Evaluation of Improved Forage Species in Benatsemay Woreda of South Omo Zone

Jinka ARC (SNNP region) / Ongoing from 2012

**Duration:** May 2012-December 2014

**Budget:** 40,000 Birr/ year

**Background:**

Due to land scarcity and crop-dominated farming there has been limited spontaneous introduction of improved pasture and forages (Alemayehu, 2002). Food security in area is highly affected by poor livestock managements and crop production due to erratic rainfall and old traditional subsistence farming. The livelihood characterized by bimodal type of rainfall which begins mid of February and the area has a good potential for irrigated agricultural development. On the other hand, currently agro-pastoralists are producing some forage crops in their back yard, in conservation base and at bordering sites as fencing by pre-scaling up in JARC collaboration with EIAR. However, agropastoralists prioritize food crop when planting time arrives. Besides, the agro-pastoralists in the area don't give attention to collect and store.

**Objective:**

- To identify high yielding improved forage varieties at on-farm
- To alleviate feed shortage during dry season thereby increasing productivity and quality of forage species
- To establish recommended agronomic practices of the selected forage varieties for the areas' selection criteria

**Methods:**

Treatments	Replications/site	Trial agro-pastoralist sites
4	2 (RCBD)	12

[Location] South Omo Zone, Benatsemay Woreda, Chali Kebele, Kako Kebele

[Treatment]

african foxtail (*cenchrus ciliaris*), rhodes grass (*chloris gayana*), *lablab lablab purpureus*, *vigna unguiculata*

[Plot design] four treatment, two kebeles, within each Kebele 6 trail pastoralists, having 2 PRG with total of 20 pastoralists, and each trail pastoralist receives two treatments randomly.

[Data collected] stand count, date of sowing, seed rate, date of germination, plant height, seed yield, DM yield, attitude of agro-pastoralist and cost of production



[Stakeholders]

Agro-pastoralists (20 agro-pastoralists in 2 PRGs), DAs, Experts

**Results:**

- to be notified

**Agro-pastoralists' participation:**

- 2PRGs, 10 (6male and 4 female) households for each FRG

**Research team:**

Range and forage management researcher, Animal nutritionist, Animal Breeder

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# 31 [FOR04]

Participatory Evaluation of Rangeland Forage Improvement in Lowland Areas of Borana Zone, Southern Ethiopia

**Yabello PARC (Oromia region) / Ongoing from 2012**

**Duration:** May 2012-January 2015

**Budget:** 46,884 Birr/ year



## **Background:**

Currently, the adverse effects of bush encroachment on the performance of the pastoral economy are being acknowledged. Local and international non-governmental organizations and some government departments are conducting range rehabilitation, involving hand clearing of woody species along highways and near settlements, on an experimental basis. So far, little is known about the effects of bush encroachment control in terms of the responses by the encroaching woody species. It is undeniable fact that Borana pastoral and agro-pastoral settings has been encroached by bush, shrubs and trees overtime, that has resulted in loss of potential grazing sites within the settings being the most pressing development challenge in the locality. This fact, indeed need appropriate intervention timely, on research evidence based and scientifically justifiable and sound technological approaches.

## **Objective:**

- To improve rangeland productivity, utilization and conservation systems in Borana pastoral areas
- To understand the perceptions of the communities on the impacts of currently available bush thinning technologies
- To test the effectiveness of bush thinning with the combination of fire
- To enhance hay production as a reserve for drought periods

## **Methods:**

Treatments	Replications/site	Trial farmer sites
6	2	2

[Location] Borana Zone, Yabello Woreda, Dire Woreda

[Treatment]

1. 0% thinning
2. 0% thinning with fire
3. 50% thinning
4. 50% thinning with fire
5. 100% thinning
6. 100% thinning with fire

[Plot design] 2 replications

[Data collected] Basal cover, litter cover, herbaceous layer composition, dry matter yield of grass and non-grass species, dead and re-sprouted bush after treatment application, economic parameters

[Stakeholders]

Pastoralists (20 pastoralists in 2 PRGs), PA leaders, DAs

## **Results:**

- to be notified

## **Pastoralists' participation:**

- 20 pastoralists (12 male and 8 female)

## **Research team:**

Animal, range and wildlife scientist, Natural resource economist, Rural Development and agricultural extension researcher

## **Contacts (Principle investigator):**

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## 7 FRG based research activities at Farmer Training Centers (FTCs)

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# 32 [FTC01]

Participatory Evaluation and Determination of N and P fertilizer Application Rate on Yield and Yield Components of Upland Rice (NERICA-4) at Bambasi District in Benishangul – Gumuz Region



**Assosa ARC (Benishangul Gumuz region) / Ongoing from 2012**

**Duration:** May 2012-December 2014

**Budget:** 40,000 Birr/ year

## Background:

Rice research activity has been conducted in the region for the past few years and some promising varieties have been adapted and under production in the area. Among the released NERICA varieties, NERICA-4 had better yield advantage over others under research and farmers’ field. Yet, improvement of its production has not been possible due to a number of soil-plant-management related factors. Apparently, low soil fertility and inadequate nutrient management are among the major factors determining its yield level. Continuous cropping, high proportions of cereals in the cropping system, and the application of suboptimal levels of mineral fertilizers by farmers aggravates the situation in the area.

## Objective:

- To determine the optimum N and P fertilizer rates for upland rice (NERICA-4) in the area under Nitosol condition.
- To enhance farmers knowledge about using optimum rates of fertilizer for rice production.
- To capacitate the initiative of FTC for technology generation and dissemination to farmers.

## Methods:

Treatments	Replications/site	Trial farmer sites
16	3 (RCBD)	3 with FTC1

[Location] Mother trial: 1 FTC site in Sonka FTC, Assosa Zone, Bambasi Woreda

Baby trials: Assosa Zone, Bambasi Woreda, Sonka Kebele, Mender 46 Kebele, Mender 49 Kebele

[Treatment] Four levels of N(0,46,92,138kg/ha) and four levels of P (0, 10, 20, 30kg/ha)

[Plot design] RCBD with 3 replications

[Data collected] Days to 50% heading, days to maturity, plant height at maturity, disease, number of filled and unfilled grain per panicle, number of fertile and unfertile tillers per plant, plants and capsules aspect (1-5 scale), number of panicle per plant, number of seed per panicle, thousand seed weight, grain yield (kg/ plot), farmer observation, comments and suggestion during all meeting and discussion

## [Stakeholders]

Assosa Research Center, Agricultural offices, world vision (NGO), both FRG and non-FRG members,

## Results:

- To be notified

## Farmers’ participation:

- 15 farmers (10 male and 5 female)

## Research team:

Soil scientist, Agronomist, Rural Development researcher

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# 33 [FTC02]

Evaluation & Promotion of Improved Tef Technologies in Two Selected Districts of East Wollega and Horo Guduru Wollega Zones

**Bako ARC (Oromia region) / Ongoing from 2012**

**Duration:** June 2012-December 2014

**Budget:** 40,000 Birr/ year

**Background:**

It was observed under field evaluation in 2011 main cropping season at Bako, row planting of teff were found to be promising in field performance and hopefully expected to double crop productivity. Combination of variety evaluation with sowing method can hopefully quadruple teff productivity. To do so, FTC is the appropriate place to train, aware and convinces farmers for adoption of new agricultural technologies that can change their livelihood. Therefore, an extensive FRG based participatory evaluation and promotion of teff technologies on FTC of unaddressed districts will be pressing issues to be addressed by the current project.

**Objective:**

- To evaluate recently varieties under row planting and broad casting method
- To multiply and disseminate the selected variety (ies) along with its full package to the end users thereby increase household income.
- To build seed channel (Farmers to farmers’ seed diffusion mechanism) To identify farmers’ selection criteria
- To reinforce the capacity of farmers to multiply and diffuse seeds of varieties selected by them

**Methods:**

Treatments	Replications/site	Trial farmer sites
8	6	0

[Location]

- 3 FTC site in East Wollega Zone, Jimma rare woreda, Haro Guta Kebele, Gemeda Kebele, Keku Kalu Kebele
- 3FTC sites in Horro Guduru Wollega Zone, Leka Dulecha Woreda, Alle Kawisa Kebele, Horda Kewisa Kebele, Bedho Kebele

[Treatment] Three improved varieties (Kuncho, Guduru, and Kena), one local variety with broadcasting and row planting

[Plot design] RCBD with 3 replications (FTCs considered as replication)

[Data collected]

Development agents and farmers collect data: Days to emergence, days to heading, plant vigor, and uniformity

Researchers collect data: Plant height, Panicle length, Grain yield per plot

Researchers collect data: plant height, panicle length, grain yield per plot



[Stakeholders]

Farmers Training Center, District Agriculture office, Development Agents of FTC

**Results:**

- to be notified

**Farmers’ participation:**

- 15 farmers (12 male and 3 female) in each FTC site

**Research team:**

Agronomist, Pathologist, Plant breeder, Socio-economist, agro-economist

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# 34 [FTC03]

On-farm Quantification and Demonstration of the Extent of Soil Erosion and Nutrient Loss from Slope Farmland under Millet Production in Kaffa Zone, Ethiopia

**Bonga ARC (SNNP region) / Ongoing from 2012**

**Duration:** Jun 2012-December 2014

**Budget:** 40,000 Birr/ year



## Background:

Farmers are not willing to construct conservation structures on slop lands for reduction of soil loss while slope land for crop production is essential to feed their family and for income. Besides, millet production is very common in the study area. The importance of the study has significant response for direct value of soil, environment, society (reduced pollution of rivers, reduced sediment in canals and roads), reduction of fertilizer which all result in high economic benefit to farmers and other beneficiaries as a whole. Creating awareness about the impact of erosion on the production and productivity should therefore be crucial.

## Objective:

- To demonstrate known facts to farmers that serious erosion is taking place
- To determine the nutrient loss due to soil erosion under millet production
- To estimate the economic value of nutrient loss due to erosion

## Methods:

Treatments	Replications/site	Total trial farmers
6	3	6

[Location] 1 FTC site in Kafa Zone, Gimbo Woreda, Shomba kichib Kebele, 6 farmer field at their own farmlands with slope category of 10-15% and 16-20% in Gimbo woreda Shomba kichib kebele

[Treatment]

Factorial experiment with two main plots (10-15% slope and 16-20% slope) and three subplots (with control, with traditional, and with introduced) (control: no structure to prevent erosion)

[Plot design] 3 replications

[Data collected] measurement of sediments at catch pit, Soil analysis on N, OM, texture, av.P, pH, K and CEC, bulk density of soil.

[Stakeholders]

Farmers (32 farmers(M:24 F:8) in 1 FRGs), DAs,Woreda experts, kebele administration, Researchers

## Results:

- To be notified

## Farmers' participation

32 farmers (24 male and 8 female)

## Research team:

Soil and water conservation scientist, Agroforestry researcher, Breeder, Socio-economist

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# 35 [FTC04]

Participatory Evaluation and Selection of Improved Tomato Production Technologies at Erer Valley Areas of Harari Regional State.

Haramaya Univ. (Oromia region) / Ongoing from 2012

**Duration:** June 2012-December 2014

**Budget:** 40,000 Birr/ year

## Background:

The region has great potential for tomato production in terms of physical environment and market opportunities, availability of irrigated water, altitudinal location (between 1300 to 2200 m.a.s.l), temperature (annual average 17 to 20°C), high tomato demand from the three nearby populated cities (Harar, Dire Dawa and Jijiga) and being located in the country important export outlet (Djibouti and Hargesa, of Somalia) push for the need to support small holding farmers solve their productivity problems. This project intended for the same through participatory evaluation and selection of improved production practices using improved varieties.

## Objective:

- To evaluate improved tomato varieties with its improved production management practices with FRG farmers and
- To develop farmers technical capacity in recommended tomato production management packages

## Methods:

Treatments	Replications/site	Trial farmer sites
3	3	3 and 1 at FTC

[Location] one FTC site in Erer Woreda Erer Woldeya Kebele, three farmers' field at Sofi Woreda Erer Hawaye and Hrewe Kebeles

[Treatment]

Chali, Cocholo, and one local variety

[Plot design] RCBD at farmers' field with 3 replications

[Data collected] soil type, dates of seeding, seedling transplanting, fertilizer application, onset flowering, 50% flowering, maturity, disease occurrence, tomato spoiled in %, cost of land preparation, planting including seeding, chemicals, harvesting, selling price/kg, total cost, total revenues, net benefit, agenda of meeting, date and list of attendants, list of the members participating in activities, their



responsibilities, socio-demographic characteristics of participating members, list of non-members who attend demonstrations and field days, meteorological data

[Stakeholders]

Farmers, DAs, Woreda staffs

## Results:

-to be informed

## Farmers' participation:

- 64farmers (40male and 24 female)

## Research team:

Extension researcher, plant protection/ agronomist

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