Outputs of livestock research activities in *Gumara-Maksegnit* Watershed

Reducing land degradation and farmers' vulnerability to climate change in the highland dry areas of north-western Ethiopia
Project end workshop

Bahr Dar

June 20, 2016

Summary of Research Activities

Research Commodity	No. Activities
Forage	3
Animal breeding	1
Animal nutrition	3
Total	7

Development and implementation of a pilot village-based goat improvement scheme

Objectives

- To increase productive performance and economic value of indigenous goats through selective breeding

- To develop & demonstrate model village for community-based utilization & conservation of local breed

Approaches

- Village selection and community mobilization

- Animal identification and data collection

- Bucks selection and management

Outputs

- Community based goat improvement scheme with **56 participants** have been established

- 27 best bucks were selected on simple sire selection method (physical observation)

- 28 best bucks/sire were selected based on their **breeding value of six month weight and farmers selection criteria**

- Trends in weight improvement across the year
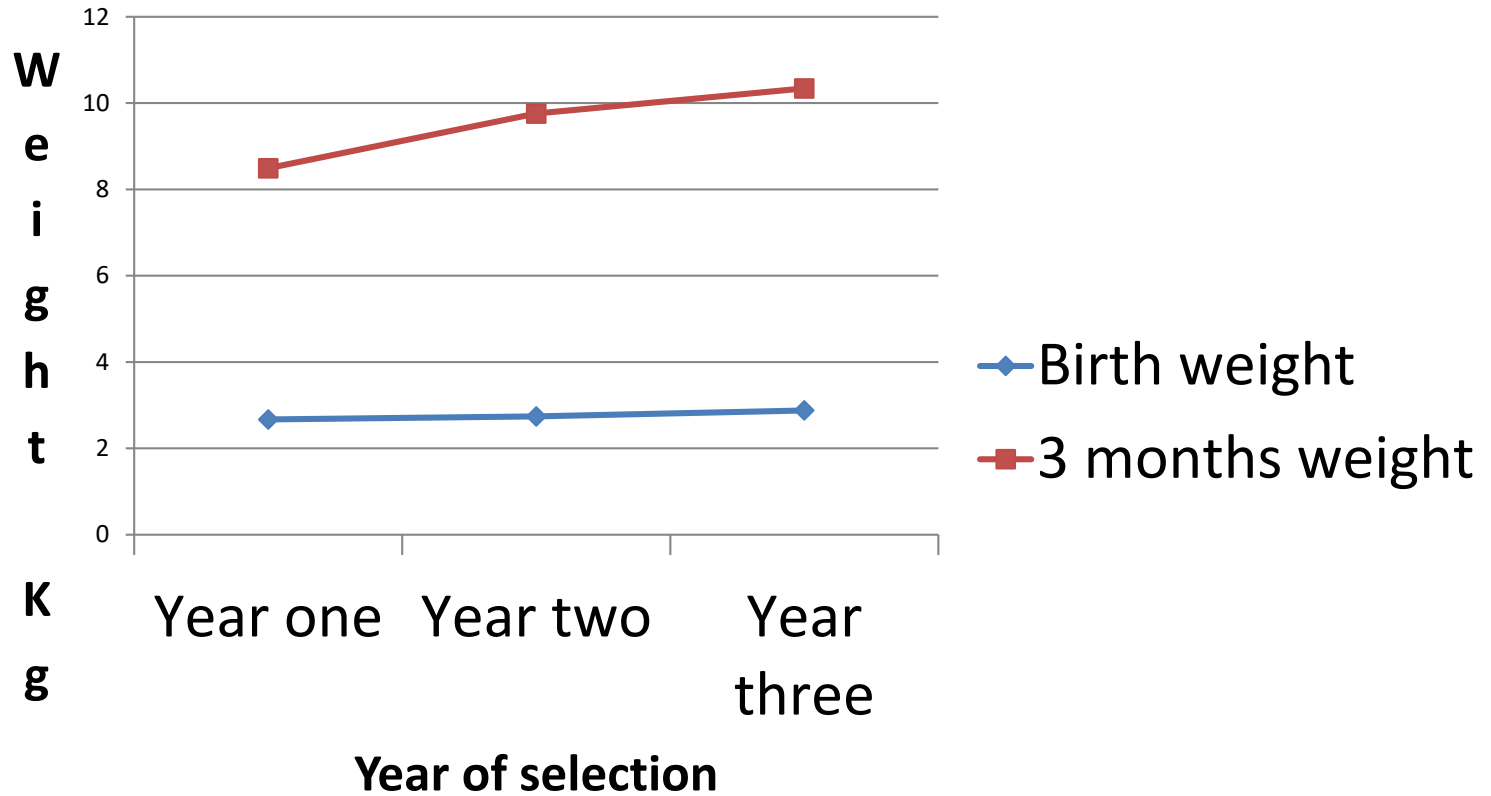
Performance Evaluation of Prickly Pear Cactus, *Opuntia ficus- indica (L.)* for fodder production in *Gumara- Maksegnit* Watershed, North Gondar, Ethiopia

Objective

- To evaluate the performance of different Cactus cultivars for fodder production in the model village of Gumara- Maksegnit watershed

Approaches

- **Treatments:**
  - *Sulhuna*
  - *Gerao*
  - *Dilaledik*
  - *Gerwanlayele*
  - *Ameudegaado Belesa*
  - Local

- RCBD with three replications

Output

Treatment	Number of cladodes formed per plant	Length to width ratio	Average weight per cladode (g)	Dry matter yield (t/ha)	Dry matter percent (DM%) of cladodes
Sulhuna	5.0^a	1.64	497.22^a	2.75^a	13.19
Gerao	3.33^b	1.77	375.24^{ab}	1.18^{bc}	13.08
Dilaledik	4.22^{ab}	1.83	386.05^{ab}	1.63^{ab}	12.90
Gerwanlayele	3.17^b	1.69	200.01^{bc}	0.65^c	12.81
Ameudegaado Belesa	3.89^{ab}	1.75	479.22^a	1.90^{ab}	13.34
Local	3.44^b	1.71	280.56^{bc}	0.98^{bc}	13.62
Mean	3.84	1.73	369.71	1.48	13.15

- Cultivar *Sulhuna, Dilaledik* and *Ameudegaado Belesa* gave the highest number of cladodes per plant, average weight of cladodes and dry biomass yield

Evaluation of intercroping Vetch in sorghum for intensifying existing production systems in the Gumara-Maksegnit watershed

Objectives

- To explore the production potential of diversified sorghum- forage legumes intercropping systems under different planting patterns

- To evaluate the possible amount of forage produced from a place which will not be utilized by the crop

Approaches

Treatments

- Sole sorghum (V_0)
- Sorghum in 75 cm row spacing plus Vetch with simultaneous planting (V_1)
- Sorghum in 75 cm row spacing plus Vetch planted 2 weeks after sorghum planting (V_2)
- Sorghum in 75 cm row spacing plus Vetch planted 3 weeks after sorghum planting (V_3)
- Sorghum in 150 cm row spacing plus Vetch with simultaneous planting (V_4)
- Sorghum in 150 cm row spacing plus Vetch planted 2 weeks after sorghum planting (V_5)
- Sorghum in 150 cm row spacing plus Vetch planted 3 weeks after sorghum planting (V_6)

Experimental design**:** RCBD with three replications

Output

- The two year intercropping trail showed that there is **a possibility of introduction of the Vetch forage species in sorghum plantation** without adverse effect on the sorghum yield

- **Intercropping of Vetch after two weeks at 75cm row spacing** of sorghum plantation gave a reasonable sorghum and Vetch yield

Evaluation of the adaptability of different Sweet Lupine varieties in *Gumara- Maksegnit* watershed, North Gondar, Ethiopia

Objective

- To evaluate the adaptability and yield performance of sweet lupine cultivars under the ecological condition of Gumara-Maksegnit watershed

Approaches

Treatments

- Bora
- Probor
- Sanabor
- Vitabor
- Haags

RCBD with three replications

Outputs

- The analysis of variance showed that there is **no statically difference among the tested cultivars** for important forage parameters dry mater yield and grain yield.

- The dry mater yield and grain yield were ranged from 1.23 to 1.72 ton/ hectare and 1069.57 to 1778.16 kg/hectare in the first year, respectively

- Use any off the varieties in the study area and similar agro-ecology and farther studies on the agronomic practice and animal evaluation are recommended

Evaluation of on-farm goat fattening practice using cow pea hay with concentrate in *Gumara-Maksegnet* watershed, Amhara region, Ethiopia

Objective

- To generate best cost forage based fattening feed formulation for rain feed area

Approaches

Treatments

- T_1=Browsing alone
- T_2=Browsing + recommended level of concentrate
- T_3=Browsing + cowpea hay
- T_4=Browsing + cowpea hay (50%) + recommended level of concentrate (50%)
- T_5=Browsing + cowpea hay (75%) + recommended level of concentrate (25%)
- T_6=Browsing + cowpea hay (25%) + recommended level of concentrate (75%)

The experimental animals were allocated randomly for six feed treatment groups after stratified by their body weight

Output

Initial Weight (kg), Final Weight (kg), Total Weight Gain (kg) and Average Daily weight Gain (g) of fattening goat

Treatments	Initial weight	Final weight	Total weight gain	Average daily weight gain
Browsing alone	28.03	29.30[c]	0.93[c]	10.37c
100% concentrate	27.3	35.33[a]	8.03[a]	89.26[a]
100% Cow pea	28.7	32.87[b]	4.17[b]	46.3[b]
50%con +50%CowPea	29.5	34.76[ab]	5.27b	58.52[b]
75%con+25%CowPea	27.23	36.8[a]	9.56[a]	106.3[a]
25%con+75%CowPea	28.53	34.51[ab]	5.98[b]	66.48[b]
Overall	28.2	33.88	5.65	62.87

- 25% concentrate with 75% cow pea hay (T6) was identified as economically feasible feeding package

Evaluation of growth performance of yearling sheep using cultivated forages developed under stock excluded area in Gumara -Maksegnit watershed

Objectives

- To evaluate fattening potential of yearling sheep fed on different combinations of Sesbania and Napier grass

- To develop Napier-Sesbania grass based feeding strategy for cut and carry system.

Approaches

Treatments

- – Farmers practice
- – Grazing+ 85Napier grass +15%Sesbania
- – Grazing + 400 gm concentrate

The experimental animals were allocated randomly for three feed treatment groups after stratified by their body weight

Output

Treatment	Initial weight kg	Final weight kg	Net gain in kg	Daily weight gm
T1	20.47	22.95b	2.48b	27.59b
T2	20.00	25.28a	5.21a	57.96a
T3	20.90	26.17a	5.27a	58.52a
Mean	20 .46	24.8	4.34	48.27

•**85% Napier grass and15% Sesbania** was found as the best feeding strategies based on its economical feasibility (High marginal rate of return)

Sheep fattening with urea treated *tef* straw and other supplements in   Gumara-maksegnit-watershed. North Gondar Ethiopia

Objectives

- To compare the supplementary value of forag legume, concentrate and urea treated crop residues on fattening potential of sheep

- To assess economic feasibility of the supplements

Approaches

Treatments

- T1=farmers practice

- T2= Grazing+ urea treated tef straw + 300 g concentrate

- T3 = Grazing+ urea treated tef straw + 400 g forage legume (Vetch)

Output

Treatment	Initial weight kg	75 day weight	Net gain in kg	Daily weight gm
T1	17.37	18.87b	1.5c	20.00c
T2	17.4	23.30a	5.9a	78.67a
T3	17.47	21.80a	4.33b	57.78b
Overall mean	17.41	21.32	3.91	52.15
LSD	2.51	2.87	1,42	18.95
CV	11.7	10.92	29.5	29.53

Capacity building

Farmers and SMS training on improved livestock husbandry

- Three days training were organized on improved livestock husbandry
  - breed improvement (focused on community based goat improvement)
  - forage development
  - improved animal nutrition (goat fattening)
  - health improvement and the importance and procedure of cooperative establishment

Number of participants by their profession and sex

Profession	M	F	Total
Farmers	100	6	106
Kebele DA	3	1	4
Woreda Agriculture SMS	2	-	2
Woreda Cooperative SMS	5	-	5
Total	**110**	**7**	**117**

Experience sharing tour of researchers and SMS to Holeta and Adamitulu research centers

Objectives

- To shop different livestock technologies

- To get experience in livestock research managements

Participants

- 5 researchers from GARC and 4 SMS from G/Zuria Agriculture office

Thank you!