Photo report on tree Lucerne (Chamaecytisus palmensis) research in Africa RISING sites in Ethiopia

17 October 2014
Tree Lucerne

**Distribution:** Native to Spain and exotic species to Ethiopia and elsewhere

**Ecology:** 2,000 metres above sea level and above; requires well-drained soils

**Uses:** As fodder (foliage contains 17-22% crude protein), fuel and for apiculture; contributes to erosion control, land reclamation, nitrogen fixation (fixes up to 100 kg N ha\(^{-1}\)), provides shade, good to intercrop with crops

**Biomass production:**
- With annual rainfall of 600-1,000 mm, established shrubs planted in rows 5 m apart can produce 15-20 kg edible dry matter/plant when harvested once a year
- At a planting density of 1,000 trees/ha, annual yields of 15-20 t/ha can be expected
- Plantations in Australia produce 10 t/ha of edible dry matter from a single annual cutting
- Research in New Zealand has found that tree Lucerne can produce up to 13.7 tons of edible dry matter per season when planted at 2,500 plants/ha.
- Tree Lucerne provided 11 t/ha dry matter at Holetta Research Centre in Ethiopia
Research questions for Africa RISING

1. What are the possible niches in the landscapes to grow tree Lucerne?
2. Who are the interest groups/farm typologies that need to participate in growing tree Lucerne?
3. Which product/s and/or service/s of tree Lucerne interest farmers?
4. How much biomass can tree Lucerne produces on a seasonal basis if farmers in Africa RISING sites spatially or temporally integrate the species at various niches?
5. Where will the introduction and performance of tree Lucerne will be more successful and productive in Africa RISING sites?
First year research

- Identification of interest among farmer groups for the action research
- Awareness creation and training provided to farmers and development agents
- Seeds obtained and seedlings produced
- Evaluation and confirmation of farm-level planting sites/niches
- Baseline data collection to cluster farmers into different farm types
- Backstopping of planting and management activities
- Data collection on early performance of planted seedlings
- Experience-sharing visits to areas with tree Lucerne success stories
Preliminary observations

Tree Lucerne planted with *Rahminus prinoides* (high value cash crop) showed fast and healthy growth 2 months after planting (Basona Worena)
Tree Lucerne can reach up to 90 cm within 2 months if planted in the right place and with good management practices (Basona Worena)
Farmers train branches of 2-3 years old tree Lucerne to remove chaff or straw from the grain (Basona Worena)
An innovative farmer allocated a small plot of land to tree Lucerne (Basona Worena)
A woman cultivating tree Lucerne around the homestead (Lemo)
Women actively manage tree Lucerne around the homesteads (Endamehoni)
Children actively participate in the management of tree Lucerne (Endamehoni)
Farm level integration of tree Lucerne and apple (Sinana)
Tree Lucerne flowers - a potential plant species for bee fodder (Endamehoni)
Challenge: Browsing by wild animals and free grazing (Basona worena)
Challenge: Defoliation by worms (Basona worena)
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Challenge: Poor follow up, weeding and site selection (Basona Worena)
Challenge: Unidentified disease or nutrient deficiency (Sinana)
Follow up actions

- Arrange a field day to share farmer – to – farmer lessons
- Develop livestock feeding strategies with supplementation using tree Lucerne fodder
- Collect data on growth and biomass of tree Lucerne
- Conduct trade–off analysis for various competing uses of tree Lucerne
- Produce a manual on how to plant, manage and utilize tree Lucerne
Africa RISING CGIAR partners in Ethiopia
Africa RISING local partners in Ethiopia

- **Academic institutions:**
  - Wachemo, Mekelle, Madawolabu, Debre Berhan and Hawassa universities; Maichew Agricultural College

- **Regional research organizations:**
  - Amhara Regional Agricultural Research Institute, Southern Agricultural Research Institute, Tigray Agricultural Research Institute, Oromia Agricultural Research Institute

- **Federal research organizations:**
  - Ethiopian Institute for Agricultural Research, Ethiopian Health and Nutrition Research Institute

- **Offices of Agriculture:**
  - Endamekoni (Tigray), Basona Worena (Amhara), Lemo (SNNRP) and Sinana (Oromia)

- **Agricultural Transformation Agency**
Credits

Produced by Africa RISING Project in Ethiopia
Compiled by Kindu Mekonnen
Photos: Kindu Mekonnen

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Africa Research in Sustainable Intensification for the Next Generation

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