



FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative



Women selling a variety of livestock feeds in northern Ghana
Photo: Solomon Konlan

GHANA

Feed the Future Innovation Laboratory for Small Scale Irrigation (ILSSI) Irrigated Fodder in Northern Ghana

Key messages

- Both *Brachiaria ruziziensis* (Congo grass) and *Sorghum alnum* (Forage sorghum) are well adapted to northern Ghana and offer good potential for adoption as livestock fodder.
- *Brachiaria ruziziensis* and *Sorghum alnum* provide both good yields and nutrient values as fodder, though further economic analysis needs to be done to compare the economic returns of these versus other feed sources.
- Dry matter yields of these grasses, produced after the first harvest, were insufficient for selling during the dry season. Regrowth yields could be enhanced by improving agronomic approaches to fodder cultivation.
- Fodder plots would benefit from being fenced off, using locally available materials such as *Gliricidia* stems, in order to avoid destruction of these plots by animals.
- The most promising land for use in perennial fodder production is fenced off transition-zone land.
- The success of irrigated fodder production can be hindered by land tenure issues and also by the high land value of irrigation areas, which could be used for other high value crops.
- Fodder producers would increase income by aligning peak production yields with seasons of greatest demand, such as for ram fattening, and thereby benefit from higher fodder prices.
- Improving the packing and/or bundling of irrigated fodder into acceptable sizes/weights will make it more suitable for market sale.
- Further research needs to be conducted to more clearly establish the market, and actual sale prices, for irrigated fodder.
- Fodder production can be enhanced by investing in farmer capacity development on fodder seed production, fodder storage and conservation techniques, and the development of profitable fodder production business models.

Research into fodder production

As part of Feed the Future Innovation Laboratory for Small Scale Irrigation (ILSSI), research was conducted in Bihinayili, in the Savelugu District of Northern Region, and Zanlerigu in the Nabdam District of Upper East Region, of Ghana, to establish the potential for irrigated fodder production. ILSSI (2015 to 2018) evaluated the yields and seed production of, and farmer's preferences for, three different forage grasses - *Chloris gayana* (Rhode grass), *Brachiaria ruziziensis* (Congo grass) and *Sorghum alnum* (Forage sorghum) - and one forage legume (*Lablab purpureus*), because of its drought tolerance.

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These forage types were cultivated on 100m² sized plots. *Cajanus cajan* was also planted as hedges around pilot farmers' plots for demarcation and additional fodder production. Following poor performance the cultivation of *Chloris gayana* was ceased in 2015.

Agronomic data, including plant height, density and dry matter yield, was collected at 4, 8 and 12 weeks after planting, and regeneration capacity was evaluated at 4 week harvest intervals. Data on nutritional values of the various irrigated fodder species were collected. A survey of the market potential for livestock fodder, including price and quality aspects, was carried out. Following destruction of plots sown with fodder seed by roaming animals in both research sites in 2016, a selection of plots were fenced off for fodder production using *Gliricidia* stems in 2017.

Research results

ILSSI research found that livestock production systems in Ghana can be enhanced if good quality fodder becomes more readily available. Producing irrigated fodder as a cash crop can be profitable. It has the potential to improve the productivity and quality of livestock and so raise household incomes. ILSSI also found that there is sufficient water to meet dry season irrigated fodder water requirements in many parts of the country. As detailed in Figures 1 and 2, results revealed that forage grasses produce the highest yields when harvested at 12 weeks after planting.

Brachiaria and *Sorghum* are promising forage for northern Ghana. *Brachiaria* yields in 2015 were 2.8t/ha. Yields of *Sorghum* were better than those of *Brachiaria* at 12 weeks after planting, but only *Brachiaria* could be harvested again 8 weeks after being cut in 2017, indicating that yields decrease with increases in harvest frequency.

The crude protein content of irrigated fodder was found to range from 9.2% - 10%, which is above the minimum requirement of 6-8% for livestock growth and health. The crude protein content of irrigated fodder is higher than most basal feeds (natural pasture, dry grass, straws and cereal crop stovers) all of which are largely depended on as sources of animals feed in northern Ghana, particularly in dry season. Estimated market prices of irrigated fodder, by the buyers at the livestock market, show that irrigated fodder has a per kg market value relative to other available feeds on the market. Since irrigated fodder has better nutritional value than natural pasture or straw consumer education will be required to ensure irrigated fodder prices reflect its true value to livestock.

Further information

This brief has been produced by the ILSSI project: ilssi.tamu.edu

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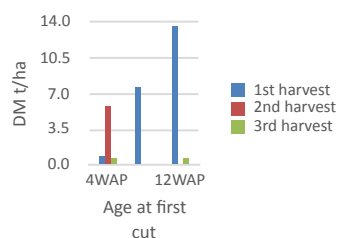


Figure 1: Yield of *Brachiaria* at different ages and harvest frequency
Source: Project results

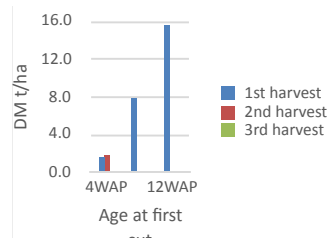


Figure 2: Yield of *Sorghum* at different ages and harvest frequency
Source: Project results

Sample name	Unit of measure	Unit weight (kg)	Price of feed (GH¢)
Maize bran	Bowl	1.2	1.5
<i>Faidherbia albida</i> fruits	Basin	2	5
Bambara bean pods	Bowl	0.9	1
Groundnut haulms	Bundle	1.7	3.7
Cowpea haulms	Bundle	0.5	1.7
Corn mill waste flour	Bowl	2.5	2
Rice bran	Bowl	1.8	0.5
Cowpea pods	Bowl	0.8	1.5

Table 1: Unit weight and price of feed options in northern Ghana

Forage species	Biomass (kg)	Sale price	*Wet season (GH¢)	*Dry season (GH¢)
<i>Brachiaria</i>	15	4.0	7.6	15.2
<i>Sorghum</i>	9	-	4.5	9.1
Lablab	19	3.0	9.5	19.0
<i>Cajanus</i>	7.5	2.0	3.8	7.50

*Prices offered by buyers for subsequent sale of irrigated fodder.
1 Ghana Cedi = 0.22USD

Table 2: Biomass, and wet and dry season sale prices for researched fodder options

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