Promoting fodder production to assist with the nutritional supplementation of livestock in winter and drought periods in the Nkwezela community in KwaZulu-Natal

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The nutritional value of natural veld deteriorates in winter. Poor quality grass results in inadequate nutrition for livestock. Uncontrolled veld fires during mid-winter and beginning of spring exacerbate this problem by further reducing the amount of available forage. There is a lack of knowledge on cultivated pasture establishment by small-scale and subsistence farming sector (McDonald, 2007), but the establishment of pastures is a possible solution for feed shortages during winter.

The objectives of the study were the following:

- To introduce pasture that can grow in the area
- To promote the establishment of fodder under dryland conditions
- To introduce capital extensive methods of fodder establishment.

Study Site

The study was carried out at Nkwezela community in the Bulwer area of the KwaZulu-Natal. Bulwer is a small town that is 120km away from Pieter- maritzburg. The dominant veld type is Moist Highland Sourveld in grassland vegetation and the indicator species are *Alleloropsis semialata* and *Monocybium cereeiiforme*. Altitude ranges from 1008-1496 m above sea level and the extent of cultivation is widespread. The potential soil erosion is low risk. The Bio-Resource Group (BRG) is Moist Highland with the vegetation pattern consisting of mainly grassland and indicator species are *Acacia dealbata, Acacia measnsii* and *Hyparrhenia hirta.* Bio-resource unit (BRU) is 117916ha. The veld condition score is 75 and Current Grazing Capacity = 1.9 with a Potential Grazing Capacity of 1.5ha/LSU. (Camp, 1997)

Materials and Methods

Selection of participants

Criteria for selection of participants were a farmer with livestock next to the road for easy access to the demonstration with a well fenced garden and willing to prepare land without payment of labor. Two farmers were selected to participate and two neighbors were given seeds to replicate what has been learnt in the trial plot.

Site selection and identification

One strata of the same soil type was selected, area of the village was one where farmers let the animals graze in the same camp with same grass quality. Researcher Design Farmer Implemented technique (RDFI) was used at site 1 and 2 (RDFI1 and RDFI2) and the demonstration site was planted and maintained by a researcher and monitoring by both researcher and the farmer. The Farmer Designed Farmer Implemented technique (FDFI) used at site 3 and 4 (FDFI3 and FDFI4), a demonstration was planted and maintained by the farmer inputs supplied same as the researcher demonstration also monitored by the researcher and the farmer.

Soil sampling

Soil sampling was done to check if lime was required, but fertilizer application was not done according to soil analysis recommendations. Planting without soil tests is a current practice by majority of local farmers. Phosphate fertilizer, Di-amino phosphate (DAP) was broadcasted during the seedbed preparation and incorporated by hand using a fork and spade.

Pasture planted

The species planted were Stooling rye, Secale cereale (SR) and oats, *Avena sativa* (O) each. Neighbors were given seeds and fertilizer to plant on their own after being shown in the researcher's demonstration trial. Planting was done in a 5m x 5m area. The seeds were broadcasted in March and no irrigation was applied.

Planting

All plots were planted on the same day. The following quantities were used: 310 g of Di-amino phosphate (DAP) was applied to a 5m x 5m area- not according to recommended rate but there was no lime was required =both oats (O) and Stooling rye (SR) 310 g x 4 seeds broadcasted evenly by hand for both O and SR. 500g of LAN for 5m x 5m area = 2kg in 4 sites at 5cm tall. Observation after two weeks for germination was done. All four plots germinated except in FDFI2 where the seedlings were sparse because of chickens and birds.

Pasture management

The plots were grazed in August. LAN was applied in September during first rains to all four plots.

Field day

A field day was arranged where all neighbors and livestock owners from two neighboring villages were invited to evaluate the demonstration plots.

Results and discussion

Oats and Stooling rye seeds were broadcasted, as mentioned, and no weed competition was experienced in RDFI1, FDFI3 and FDFI4. Observations were done after 2 weeks to check germination. In all three sites O and SR germination was good.

The area was well fenced and no chickens got in, and the house was far from trees- no birds disturbed the performance of the grass. These were the reasons that caused the success of oats in all 3 out 4 sites. If soil fertility was a problem, Stooling rye would have not germinated next to the eaten oats. Soil type was similar in all four sites. Farmers have been using kraal manure to fertilize crops. It was very important to eliminate cost as much as possible for the farmers to buy in the technology. The herbage height in these sites was 50cm as the researcher designed and managed trials in the farmers' sites Grazing height was measured by a ruler before flowering in August after the Field day I order to measure if the herbage was above the 4 grazing height for cattle since they pull be tongues. A grazing height for cattle is 15cm according (Sehested et.al. (2004).

In RDFI2 germination was not good, because the farmer's own chickens ate oats seeds. Birds also got in because the site was close to trees and replanting was done in second site, but the oats failed and assumptions were due to reduced soil moisture. Stooling rye did well in all four sites.

The RDFI1 and FDFI2 was exactly the same in basal cover, herbage height and weed free.

In June, a field day was organized and attended by 20 people. There were comments that all attendees wanted their gardens to be planted with pastures. Farmers were encouraged to come during the planting times so that they learnt to plant at their homesteads. A list of varieties that can be planted in winter was given to the farmers during the field day.

The purpose of the demonstration was to show farmers what could be planted in winter and that could be done in a larger area to over winter livestock. Farmers saw the green and attractive fodder in the middle of August and September. This indicated that it is possible to plant green fodder without irrigation. Grazing oats before flowering kept it short and delayed flowering until October. Farmers allowed one sheep or one goat per time for two hours of grazing.

Grazing pressure was minimal and animals were sometimes allowed to stay a few hours in the oats and Stooling rye per day. The grass was too tall for sheep, but they were only exposed to a lush green feed at home and the veld was dry. One farmer, who had a goat that kidded in winter, grazed the pasture and was able to nurse the kid and produced enough milk.

Future research

- A trial for broadcasting versus row planting pastures with the same seeding rate, specific fertilizer application and same time was identified.
- The area needed to keep a certain number of animals throughout the difficult months without buying other supplements.
- No analysis of samples was done to measure if the dry matter (DM) content was comparable to the normal forage DM despite of minimum inorganic fertilizer applied.

Conclusion

- Farmers developed confidence in oats and Stooling rye due to the fact that they did well without irrigation.
- Farmers learnt more about the fodder crop seeds, because pasture seeds were unfamiliar to them. Farmers used to see green pastures without knowing how to plant them when passing commercial farms.
- Farmers have learnt that pastures are possible to plant by hand equipment like spade, forkspade and handhoe.

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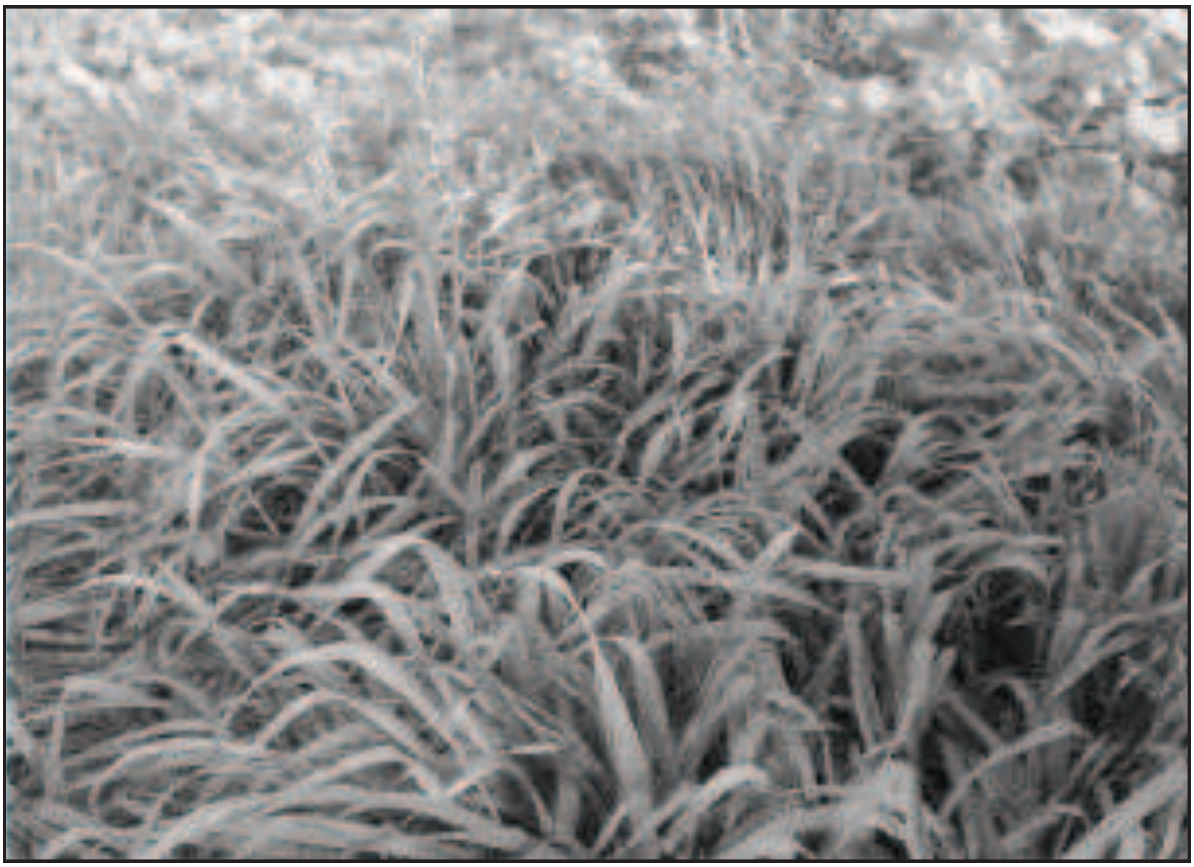

Figure 1. Stooling rye

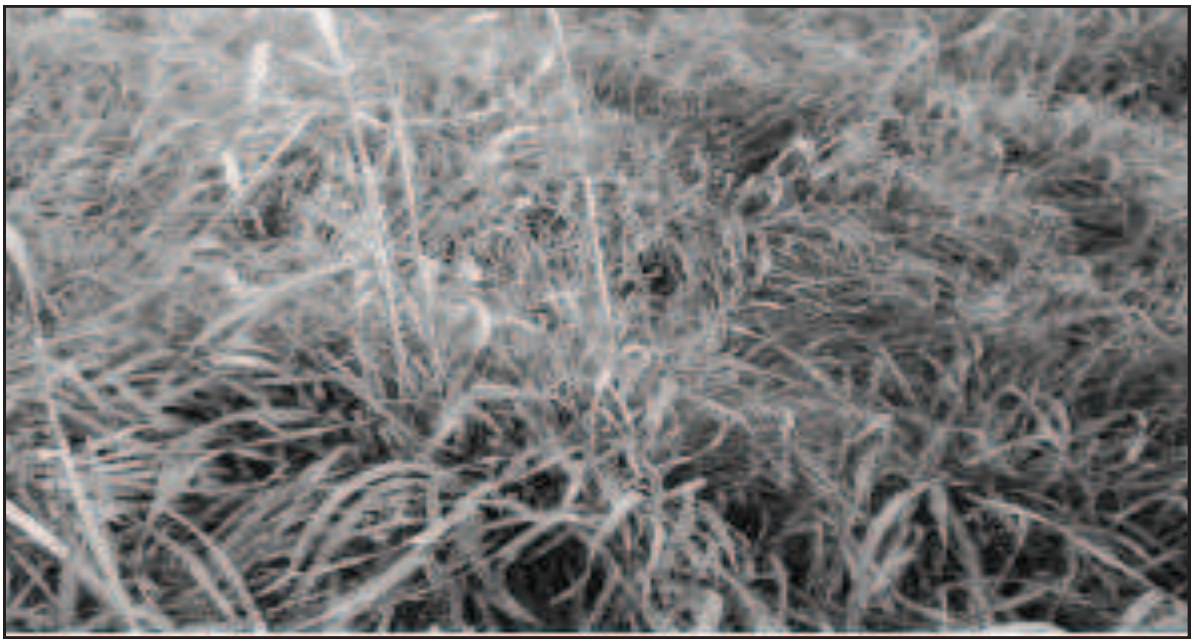

Figure 2. Oats