

ALLEY FARMING AS AN INTERVENTION IN THE FEED SUPPLY GAP IN SOUTHERN NIGERIA

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Abstract: An initial survey conducted in southeast and southwest Nigeria revealed that ruminant animals are fed mainly on grasses. Preliminary results of field trials showed poor establishment and growth of six woody species tested on an acid and low fertility soil. Present level of alley farming awareness is low but when eventually adopted by livestock farmers, it could help improve the quality of forage fed to ruminant livestock in southern Nigeria. Constraints to alley farming identified include shortage of woody species suited to acid soils, maintenance of hedgerows and lack of extension programs.

1. Introduction

Ruminants, especially sheep and goats, occupy a very important position in livestock production by the rural populace in Nigeria. FAO (1988) put the population of sheep and goats in Nigeria at 13.2 and 26.0 million heads respectively. Ruminants possess the unique advantage of efficiently converting roughage into good quality products like meat and milk in addition to providing manure, hide and skin, etc. In humid and sub-humid West Africa, small ruminant production is generally done with few inputs. Even when production constraints such as diseases are reduced and flock size growth is encouraged, the realization of the full potentials of small ruminants may eventually be constrained by feed resources [Sumberg et al. 1987]. Available livestock feeds are of low nutritive value, especially during the dry season, thereby occasioning a staircase type of growth observed in livestock due to lack of continuity in feed supplies. The superiority of the multi-purpose/leguminous plants over grasses as livestock feeds during the dry season has been emphasized. Le Houérou (1980) indicated that browse plants flourish in the dry season and have relatively higher nutrient contents than the available grasses which are low in quantity and quality.

Agriculture is a major form of land use in southeastern Nigeria (4° 15' to 7°N and 5° 49' to 9° 39' E) which occupies an area of 75,500 km² [Okafor and Fernandes 1989]. Realizing the sustainable nature of fodder tree legumes in farming systems, this study was undertaken to (a) establish N₂-fixing trees in the rural areas with a view to increasing livestock feed package availability for small ruminants.

2. Materials and Methods

A reconnaissance survey was conducted among small ruminant farmers in Cross River and Ogun States of Nigeria. Information was sought concerning types and numbers of livestock kept, feed types and their sources/availability; problems encountered, awareness of alley farming and its advantages, willingness to establish alley farms, etc.

A field trial was conducted with hedgerows of *Gliricidia sepium*, *Leucaena leucocephala* (var K 28), *Senna spectabilis*, *Senna siamea* and *Albizia lebbeck*. The field trial was located on the Teaching and Research farm of the Faculty of Agriculture, Ogoja Campus of the Federal University of Uyo, Cross River State, Nigeria. Ogoja is located in the derived savanna ecozone. The soil at the experimental site is an acidic and sandy Ultisol. The total annual rainfall is 1200 mm with a 4-5 months dry season.

Tree spacing was 4 m between hedgerows and 0.5 m within rows in the alley farming plots; 1 m and 0.25 m in the intensive feed garden plot and 2 m and 0.5 m in the site adaptability trial. Seeding rate was 2 per hole in all trials. Maize was planted in between the tree rows at a spacing of 1 m between rows and 0.5 m within rows.

3. Results and Discussion

3.1 Field trials

Germination two weeks after planting (WAP) was low. At 5 WAP *Gliricidia* had grown the tallest with a mean height of 4.73 cm, followed by *Leucaena* and *S. spectabilis* and *S. siamea*.

At 16 WAP the surviving plants had few lateral shoots. These data demonstrate the difficulties associated with the establishment of these browse species by direct seeding in acid soils.

3.2 Feeding trials

Given the poor early growth due to low germination, a comprehensive feeding trial could not be carried out. However, the prunings, 12 months after planting, were fed to West African dwarf goats to observe their acceptability of the leaves. The goats showed a preference for *Leucaena* and *S. spectabilis* leaves. Even though *S. siamea* leaves were luxuriant the goats did not relish them, probably because they are unpalatable.

3.3 Awareness of alley farming in Ogun State

The survey by Onwuka et al. (1991) showed that although alley farming is practiced by IITA/ILCA in Ibadan, the acceptance by farmers is low. The current level of awareness in Ogun State is only about 20% although 65% of the respondents indicated that they would be interested in alley farming if given land, seeds and credit.

In Ogun State in southwestern Nigeria, a few attempts were made to encourage alley farming by the National Livestock Production Department (NLDP) State Office at Abeokuta and Odeda Local Government areas. Unfortunately the hedgerows were not maintained by the participating farmers. The survey also indicated the need to introduce tree species which have food value (e.g. *Cajanus cajan*) in the alley farming package, especially species adapted to local soil conditions.

3.4 Feeding habits and management of livestock

Studies by Ekpenyong and Onwuka (1987) and Onwuka and Umoh (1990) indicate that in southern Nigeria, sheep and goats roam freely, and feed on natural vegetation. They are also given kitchen wastes such as banana, plantain, yam, cassava and cocoyam peels, and stalks of green vegetables, e.g., *Talinum* and *Telfaria* spp. However, in certain parts of southeastern Nigeria, they are confined during the planting and cropping seasons and are fed cut grasses and kitchen wastes. The amount of protein provided is small. During the dry season, the grass available is coarse and so the performance of the livestock is reduced until the next rainy season when fresh forage is again available. Livestock keeping is a part-time activity with minimal, if any, investment by the owners [Sumberg et al. 1987].

3.5 Need for alley farming as forage source

Alley farming certainly has great potential as a source of feed for small ruminants in southern Nigeria [Reynolds and Atta-Krah 1989] given that grasses do not grow all year round and that the available browse species have higher nutrient contents in the dry season. Tree foliage can reduce the loss of weight by the animals during the dry season, if fed energy supplements [Onwuka 1986]. The forage yield from alley farming is considerable although it requires proper management to provide day-to-day fodder over a period of time [Reynolds and Atta-Krah 1989]. This potential should be tapped in southern Nigeria where the West African dwarf breeds of sheep and goats thrive and require feed for sustenance, production and resistance to diseases.

4. Conclusion

The feed supplies for ruminant production can be boosted by augmenting with forage from alley farms. Use of suitable species well adapted to acid soils and good establishment of hedgerows are important. There is a need for better contact with farmers to facilitate the adoption of the alley farm technique. This may require educating extension workers to enable them create more awareness among the farmers.

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