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Management problem of crop residues production in Aliero Local Government Area of Kebbi State, Nigeria

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Abstract

A study was conducted to examine the management problems of crop residues production in five villages within Aliero Local Government Area of Kebbi State, Nigeria. A structured questionnaire was administered to 75 respondents within the study area. The data collected was analyzed using simple statistical tools such as frequency counts and percentages. The family size of the respondents showed that more than half (52.41%) had 5-8 members. Majority of the respondents were within the age categories of 23-32 (39.60%) and 32-42 years (33.30%). It was observed that most of the respondents were male (78.08%) with different educational background. The study revealed that about 47.95% of the respondents were farmers. Mixed cropping is common to the household with cereal and legume crops combination; sorghum/groundnut (6.85%), millet/groundnut (28.03%) and sorghum/cowpea (36.99%). Various storage methods existed among the house hold in handling crop residues as majority (45.21%) kept crop residues on the roof tops and the least (9.59%) kept crop residues on the tree branches. Crop residues were from groundnut straws, cowpea straws, maize stover, millet stover and rice straws with sorghum stover constituting the highest (30.14%). Majority of the respondents (39.74%) source their crop residues from self production. The study also showed that all the respondents encountered one or more management problems which limit crop residue production and they include high cost of irrigation (78.08%), inadequate storage structures (75.34%) and inadequate capital (68.86%) among others constitute the prominent problems to crop residue production in the study area.

Keywords: management problem, crop residues, production

Introduction

Crop residues availability is an important nutritional factor for ruminant production among the traditional small holders in Nigeria (Agishi, 1979). They are seasonally produced become available only after cropping period and, if they are not used immediately, they have to be conserved until needed. They are characterized with low digestibility, metabolizable energy, nitrogen and contents of available minerals and vitamins (Agishi, 1979). Crop residue management is a growing public concern in many countries in Africa, including Nigeria (Abebaw, 2008). The first goal of any crop residue management system is to maximize the economic benefit from the waste resource and maintain acceptable environmental standards. The difficulty of handling and storing crop residues has not been given adequate attention by researchers (Hilmeson *et al*., 1984, Owen and Aboud, 1988). Devendra (1982) reported that problems of pest infestation, moulding, fire risk and exposure to weather decreased the nutritive value of rice straw and other crop residues. The availability of crop residues at the farm level depends not just on production levels but also on a variety of social and economic factors (Hilmerson *et al*., 1984). It is estimated that, Nigeria has about 71.2 million hectares of

available agricultural land, out of which about 36 million hectares of land are being currently utilized for agricultural production (FOS, 2006). Among the constraints facing livestock production in developing countries is inadequate feed supply. Large scale crop residues utilization is very common in the northern grassland ecology (Onwuka *et al*., 1997) which has been used to reduce the cost of feeding ruminants especially during the dry season. The large quantities of crop residues produced in Nigeria can play a significant role as a potential animal feed.

The availability of crop residues at the farm level depends not just on production levels but also on a variety of social and economic factors such as land, crop and animal ownership patterns, cultural practices, the use of modern crop varieties and the opportunities for market and non-market exchanges, all these influence a farmer's access to the residues that are locally produced (Hilmeson *et al*., 1984)

The availability of production and management information of crop residues can best take off by understanding the production situation of the farmers with a view to appreciating their challenges and thus how best to provide needed assistance. However, there is a dearth of information on the management problem of crop residue production in the study area. The present study was therefore designed to address this.

Materials and methods

Study area

The research was carried out in five villages of Aliero local government area comprising of Sabiyal, Kashin zama, Gumbulu, Danware and Jigabirni. The local government area is located in the south east of Kebbi state and lies between lat. 12^0 12^i N and long. 4^0 22^i E in the Sudan savannah agro-ecological zone. Semi-arid climate is common to the study area. It is characterized by erratic and scanty rainfall that lasts for about four months (May-September) and long dry period (October-April). The major occupation of the population is farming which is characterized by mixed farming (KARDA, 2012).

Data collection and analysis

A structured questionnaire was designed in order to obtain data. The questionnaire was distributed randomly among the population in the five villages. The questionnaires were read to them and their responses were recorded at the appropriate column. The questionnaires were both closed and open ended, in which the respondents were given alternative choice answers, and sometimes allowed to write or say all they wish. A population of 15 people from each selected village was chosen making a total of 75 respondents to evaluate the management problems of crop residues production among these farmers.

Statistical tools such as frequency distribution and percentage were used in analyzing the collected data.

Results and discussion

A total of 73 questionnaires were recovered out of 75 copies distributed. The social characteristics (Table 1) of the respondents revealed that 78.08% were males and 21.92% were females. Majority of the respondents were within the age categories of 23-32 (39.60%) and 32-42 years (33.30%). Educational background of the respondents indicated that 38.36% and 36.99% had Quranic and primary education, respectively and 17.81% and 6.85% had obtained secondary and post-secondary education, respectively. The family size of the respondents showed that more than half (52.41%) had 5-8 members. According to Zeller *et al*. (1998) who reported that household size has been

identified to have either positive or negative influence on adoption and production level. Majority of the respondents (47.95%) were farmers, 30.14% were traders and 21.92% were civil servants. The age groups of the respondents in the two categories could be regarded as a responsive in the struggle to make ends meet. There is a close relationship between the ages of the respondents and their marital status, (Table 1), majority of the respondents were within the age categories of 23-32 and 33-42 years, respectively which could be regarded as agile and responsive to take care of their own family. Majority of the respondents were farmers which could be attributed to their living in the rural area where most of the business to earn a living is by farming. This observation is in line with the study of Sanda and Kaka (2013).

Table 1: Social characteristics of the respondents

Items	Frequency	Percentage (%)
Gender/sex		
i. Male	57	78.08
ii. Female	16	21.92
Age (years)		
i. 23-32	29	39.60
ii.33-42	24	33.30
iii.43 above	20	27.10
Family size		
i. 5-8	38	52.41
ii. 9-12	24	32.88
iii.13-16	11	14.71
Educational status		
i.Quranic school	28	38.36
ii. Primary school	27	36.98
iii. Secondary school	13	17.81
iv. Post secondary school	5	6.85

Source: field survey, 2015

Mixed cropping is dominant among the respondents (Table 2) in the study area with the main cultivated crops as sorghum and cowpea (36.99%) then followed by maize and cowpea (28.77%) and the least cultivated crop is onion with maize grown along the side of the onion beds. Although, the results of farmers cultivating onion crop was not taken into consideration during the studying period. This is due to the fact that residue from onion crop is not utilized by livestock according to the information gathered from the respondents.

The common crop residues (Table 2) were those from groundnut and cowpea (28.77%), millet (30.14%), sorghum (27.40%), maize (12.33%) and the least was from rice straws (1.37%). This finding was in line with the works of Alhassan *et al*., 1983; Alhassan, 1986; Onwuka *et al*, 1997. These authors reported that maize and sorghum stovers play major part in ruminant feeding in the Northern part of Nigeria. The sources of crop residues (Table 2) as indicated by the majority (39.73%) were completely self producing. While about 2.74% rely on the purchase of crop residues from the market.

Table 2: Crops cultivated, type and source of crop residues

Parameters	Frequencies	Percentage (%)
Type of crops cultivated		
maize/cowpea	21	28.77
sorghum/groundnut	5	6.85
millet/groundnut	19	28.03
sorghum/cowpea	27	36.99
Type of crop residues		
Grasses	0	
Groundnut/cowpea straws	21	28.77
Maize stover	9	12.33
Sorghum stover	20	30.14
Millet stover	22	30.14
Rice straws	1	1.37
Source of crop residues		
Self production	29	39.73
Self production/purchase	17	23.29
Self production/bush	25	34.25
From the bust	0	0.00
From the market	2	2.74

Source: field survey (2015)

Different storage type existed for crop residues handling in the study area (Table 3) with those storing crop residues on the roof tops constitute the majority (45.21%). About 30.18% of the farmers heaped crop residues at home particularly at the backyard where a room is built for such purpose, 15.07% of the farmers heaped crop residues on the field and only about 9.59% hanged crop residues on the tree branches which constitute the least in the study area. This observation is similar with the findings of Akinola *et al*. (2015) who reported various storage methods existed among households in Kano State in the handling of crop residues. The open storage methods (Table 4) which constituted the majority are reflection of inadequate storage facilities in the study area.

Table 3: Crop residues handling

Parameters	Frequencies	Percentages (%)
Close storage	22	30.14
Open storages:		
roof tops	33	45.21
tree branches	7	9.59
in situ/field	11	15.07

Source: field survey (2015)

Several reasons were identified as shown in Table 4 by our respondents as regards to the problems associated with crop residue production in the study area. Majority of the respondents (78.08%) were of the opinion that high cost of irrigation, inadequate storage structures (75.34%) and high cost of labour (64.38%) were the main factors limiting crop residue production in the study area. While the least (6.67%) respondents identified flood as a threat to crop residue production.

According to Akinola *et al*. (2015), capital, credit and land are among the economic constraints factors limiting crop residues usage and production in Nigeria. This

report was in agreement with the present study where more than half (69.86%) of the respondents were of the opinion that inadequate capital which is among the main force among factors limiting crop residues production in the study area. Larger family size could be associated with a greater labour force being available to the household for the operation of farm activities (Akinola *et al*., 20015). In the absence of sufficient family labour, the cost of hiring labour (Table 4) can limit the crop residue production in the study area. Aruya *et al*. (2016) reported that inefficient management practices such as open dumping and burning of crop residues as a result of ignorance of the effective management and utilization skills limit the production of crop residues. This could probably a reflection of inadequate storage structures (Table 4).

Table 4: Constraints to crop residues production

Parameter	Frequency	Percentage (%)
High cost of irrigation	57	78.08
Problems of flooding	5	6.67
Inadequate capital	51	69.86
High cost of labour	47	64.38
High infestation of pests and diseases	41	56.16
Seasonality in production	35	47.95
____	33	45.21
High cost of fertilizer/manure	28	38.36
Inadequate storage structures	55	75.34

Source: field survey (2015)

Conclusion

Crop residue is an important component in Nigeria farming system. Improvement is however needed in the production of these residues in order to improve the output of our animals. This improvement can be achieved by developing or adopting technologies that will enhance the production, conservation and preservation of quality forage crop species. Based on the findings of this study, chances are that the management problems encountered by the respondents in the production of crop residues can be improved.

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