

PAT 2009; 5 (1): 1-13 ISSN: 0794-5213

Online copy available at

[www.patnsukjournal.net/currentissue](http://www.patnsukjournal.net/currentissue)



Publication of Faculty of Agriculture, Nasarawa State University, Keffi

## Farmers' Perceptions and Management Practices of Weaver Bird Pests in Niger State, Nigeria

Bright<sup>1</sup> E.O., Tologbonse<sup>2</sup> E.B. and Ogunyemi<sup>3</sup> S.

1. National Cereals Research Institute, P.M.B. 8, Bida, Nigeria.

2. National Agric Extension & Research Liaison Services Ahmadu Bello University, Zonal Office, Bida, Nigeria

3. Department of Crop Protection and Environmental Biology University of Ibadan, Nigeria.

### ABSTRACT

Weaver birds pests are one of the major constraints to rice production in Nigeria. The perceptions, knowledge and current weaver bird pest management practices of rice farmers were determined through a survey conducted in Niger State, Nigeria in April 2005. A semi-structured validated questionnaire was used to elicit information from 70 randomly selected rice farmers representing 10% of the rice farmers from two major rice producing agricultural cells. Descriptive statistics were used to analyse the data. The respondents were mostly middle aged (30-49 years old), and most had non-formal education (63%). Farm size was mainly smallholdings of 3 acres (1.2 hectares) and below. Almost all the respondents had received advice from extension agents (E.A) who always visited them. However, the overall perception indicated that all the sources of information available to the respondents; radio, television, neighbours, E.A and parent were important except the newspaper. Weaver birds were the most important pest when they occurred at certain periods of the year. Weaver birds removing seeds from panicle was perceived as serious by 85.7% of farmers. All the farmers (100%) aided with photographs, identified village weaver birds; *Ploceus cucullatus* Muller and the red-headed weaver bird *Quelea erythrogastra* Hartlaub as the notorious weaver birds attacking their rice crop every year. Human bird scarer was the most effective method of control (64.3%) and the most common (90%). About 38% of the farmers considered the control method as cheap while 23% rated it costly. About 43% of the respondents indicated that they spent less than ₦5, 000 while 27% spent above ₦7, 000 to control the birds. Complementary methods with an ecological approach, applying pesticides as a last resort are warranted.

**Keywords:**

### INTRODUCTION

Weaver birds are among the biotic constraints that caused decline in the yield potential of irrigated lowland rice from potential yield of 5t ha<sup>-1</sup> to an average yield of 2.8t ha<sup>-1</sup> (Singh *et al*; 1977). They are often locally abundant and are major pests on farms (Park, 1974; Funmilayo and Akande, 1974) and major pests of rice in Badeggi, Niger State, Nigeria (Bright, 1988, 1995; Bright & Ogunyemi, 2000) the principal study area.

Traditional methods usually rely on scaring birds by merely deflecting the birds to neighbouring growing crops, a common but costly management strategy (Bruggers, 1980). Long term studies of weaver birds' seasonal population fluctuations had suggested that the farmer could plan his cropping calendar to avoid planting that would prevent crop fruiting when the weaver bird pest population was high (Bright and Ogunyemi, 2002b). Information of farmers' perceptions of the ecology, pest status and their current weaver birds pest control methods can make an important contribution to this study. Studies examining specifically, perceptions and management practices of Nigerian rice farmers are rare. Farmers' perception, belief and management strategies therefore need to be documented (Heong 1984; Heong and Escalada 1999) for they are thought to influence the success of pest management practices compared to other factors. The socioeconomic conditions and culture of farmers are thought to influence the success of weaver bird pest management practices compared to other factors, such as the technology availability to manage the pest problem (Manikowski, 1988). Gaps have been known to exist in farmers' indigenous knowledge of pest biology and ecology (Bentley, 1992). Therefore studies of farmers' knowledge of pest management should be appraised and their perception as well as identify gaps in their knowledge and areas where scientists and extension agents could provide vital inputs to assist farmers. This study reports on information on weaver bird pest management gathered through farmers surveys conducted in Niger State, Nigeria.

## **METHODOLOGY**

A rice farmers' survey was undertaken at two villages (Badeggi and Edozhigi) in Lavun and Bida Local government areas of Niger State, Nigeria. A semi-structured questionnaire was developed and validated: The farmers population was supplied by the Niger State, Agricultural Development Programme Zonal Office, Bida. Out of 301 rice farmers population in Badeggi cell and 405 in Edozhigi cell, approximately 10% were randomly selected interviewed on the field. Seventy farmers consisting of 30 in Badeggi and 40 in Edozhigi were interviewed on their knowledge, perceptions and practices of weaver bird pests control. The questionnaire consisted of 45 questions, which were divided into six sections. The first and second sections summarised demographic and socio-economic characteristics. The third section began with questions on the role of extension agent. The fourth highlighted the sources of information used by the farmers. The fifth section considered the rice environment/ecology used by the farmers and the damage inflicted by the bird pest. Farmers were asked what part of the rice was attacked and how and when was damage severe. Photographs of the two major pests species were presented to the farmers to enhance adequate identification. The sixth section asked farmers questions on the cost of controlling the weaver bird pests activities on the rice crop. Four enumerators who understood the local languages were used to

administer the questionnaires in the two villages. The data were analysed using descriptive statistics presented as means, frequencies and percentages. .

## RESULTS AND DISCUSSION

### **Farmer socio-economic characteristics.**

About 19% of the respondents were below 30 years (young), 42% middle aged (31-50years) and 39% above 50 years (old) . All (100%) of the respondents were male and 91% were married (Figure 1). Sixty three percent (63%) had non formal education and only 14% had attended secondary school. The respondents' family size consisted of 53% below 10 persons and all the respondents were farmers but only 79% belong to farmers' organization. Farm size was mainly small holdings (3 acres and below) (54%). This is in agreement with some researchers that majority of Nigerian farmers are small scale farmers with small farm holding (Alfred, 2000; Tologbonse, 2004)

### **Farmers' contact with extension agent and information sources.**

Visits by extension agents (90%) to the farmers were very encouraging, and almost all respondents had received advice on bird control (78.6%) from extension agent (Figure 2). The extension agents had always (62%) visited the farmers and had been their important source of advice (77.1%) on bird control (Table 1). Although advice had also been received from fellow farmers (66%) and from parents (62%).

About 45% rated radio as very important, and 88% rated newspaper as slightly important while about 57% rated Extension Agents as very important (Table 2). However, the overall perception indicated that all the sources of information namely; radio, television, neighbours, E.A and parent were important to the farmer except newspaper (Table 2). This is in agreement with the findings of Tologbonse *et al* (2006).

### **Farmer perceptions.**

Farmers' perceptions were determined from their varying opinions expressed on series of specific questions. Rain-fed lowland rice was planted between July and August (70%), irrigated lowland rice between June and July (68.2%) and upland between May and June (91.7%) (Figure 2). Production Technologies publication by National Cereals Research Institute Badeggi had recommended the month of June as sowing time for upland rice and July to August for lowland rice. The farmers responses indicated that they followed the recommended time of planting.

Weaver bird was the most important pest of cultivated rice and all respondents could recognize the birds from the photographs shown to them (Table 3). Forty percent of farmers rated weaver bird as very serious pest while 86% opined that they inflicted

damage by removing rice from panicle (Table 3). All (100%) respondents indicated that weaver birds damage rice (Figure 3) feeding on rice for food and about 82% said that the damage on rice reduced grain yield considerably (Table 4). Human bird scarer was the most effective method of control (64.3%). It had remained the most common (90%). The farmers also recognized the occurrences of rodents (98.6%), frogs (55.7%) and water ducks (1.4%) on rice fields. They were usually moderately serious pests (44.3%) but occasionally became serious (35.7%). The months of September to November (54.2%) and June to August (32.8%) were identified as period of severe damage. Research findings had indicated that in Niger State, rodent caused rice crop losses that ranged from 19.8% to 46.9% (Bright and Ogunyemi, 2001a) Most farmers (77.1%) realized that some varieties of rice were more susceptible to bird damage. Our investigations have however shown that some morphological and/or physiological traits of the rice crop could reduce rodents and weaver birds damage (Bright, 2004). Other control methods included spreading video tapes over the crop (14.3%), spreading fish net over the crop (10%), treating seeds with chemicals (12.9%) and erecting a scare-crow (4.3%). Scare-crow was rather inefficient and uncommon in that it is often not mentioned in bird pest control. Many thought damage did not occur same time every year. Some opined that damage started during October to December (46.3%). Most of the farmers indicated that damage ended during October to December (70.2%). They claimed the birds were seen during June to September (66%). Other farmers opined that the birds disappeared during the months of January to March (Table 5). Clearly there were major seasonal fluctuations in the study area that had been established by research (Bright and Ogunyemi, 2001b). The farmers appeared to have recognized that observable fact. More interactions between research and indigenous knowledge are warranted.

**Cost of control.** Table 6 revealed that about 38% of the respondents reported that the cost description of birds was cheap 23% opined that it was costly. However, in terms of monetary value 43% spent below ₦5, 000 and 27% above ₦10, 000 to control birds on their rice field. This may be the situation with farmers who used their children to scare birds on small farms

## CONCLUSION

In the study area, farmers identified weaver birds as a major pest of rice and applied a number of physical and chemical methods. Guarding, human scaring which was used most by the farmers, definitely consumed the time of their family. This was not probably included in their estimate costing of ₦5,000 and ₦10,000 control expenditure. There are increasing needs for effective environmentally safe, humane, and non-lethal

control techniques. Control methods can be integrated to provide vital environmentally safe methods that would ease the economic burden of rice farmers. An array of complementary control methods such as; timing of planting to avoid bird damage, morphological traits of the crop that repel the birds, physical techniques like flash tapes and pesticides as a last resort are pest control strategies recommended and being re-evaluated (Bright, 1995; Bright and Ogunyemi 2001b; Bright, 2004)

## REFERENCES

- Alfred, A. R. (2000). Banana and Plantain marketing activities among women in Urban Nsukka, Enugu State, Nigeria. In Olowu, T. A. (Ed) Agricultural Extension and Poverty Alleviation in Nigeria Proceedings of the 6<sup>th</sup> Annual National Conference of Agricultural Extension Society of Nigeria. Pp 31-40
- Bentley, J. W. (1992). The epistemology of plant protection: Honduran campesino knowledge of pests and natural enemies. In R. W. Gibson and A. Sweetmore (eds) Proceedings of a Seminar on Crop Protection for Resource-Poor Farmer (Copenhagen: Technical Centre for Agricultural and Rural Cooperation/Natural Resource Institute), pp. 107-118.
- Bright, E.O. (1988). Species composition of weaver bird pests of rice in Badeggi, Niger State, Nigeria *Int. Rice Res. Newsl.* 13(6): 43.
- Bright, E.O. (1995). Aspects of ecology pest status and control of *P. cucullatus* Muller and *Q. erythroptus* Hartlaub in the rice fields in Niger State, Nigeria. University of Ibadan M. Phil dissertation.
- Bright, E. O. & Ogunyemi. S. (2000). Diet and foraging habits of village weaver bird *Ploceus cucullatus* and red-headed quelea *Quelea erythroptus* in rice field habitats. *Afr. J. Pl. Prot.* 10: 71-81.
- Bright, E. O. & Ogunyemi. S. (2001a). The status of rodent pests in upland and irrigated lowland rice fields in Badeggi, Niger State, Nigeria. *Niger. J. of Pl. Prot. Vol. 19:1-10*
- Bright, E. O. and Ogunyemi. S. (2001b). Trends in major weaver bird numbers in the rice fields of Badeggi, Niger State, Nigeria. In: Salako, F. K; S. T .O. Lagoke, A. B. J. Aina, D. Eruvbetin and O. A. Dipeolu (editors). *Enhancing agricultural resourcebase for youth development, industrial development and export.* Proceedings of the 35<sup>th</sup> Annual Conference of the Agricultural Society of Nigeria September 16-20, 2001 University of Agriculture, Abeokuta, Nigeria
- Bright, E. O. (2004). Field comparison of interspecific rice varieties and improved sativas to damage by rodents and weaver birds. 3<sup>rd</sup> Biennial Regional Rice Research Review (4Rs 2004) Africa Rice Congress. Accra, Ghana 27-30 September 2005

- Bruggers, R.L. (1980). The situation of grain eating birds in Somalia. Pp 5-16. In: *Proc. 9<sup>th</sup> vertebr. Conf.* Frenno, Carlifornia.
- Funmilayo, O. and Akande, M. (1974). The ecology economic impacts and control of vertebrate pests of upland rice in the western state of Nigeria. Research Bulletin NO. 5, Institute of Agricultural Research and Training. University of Ife, Ibadan. 41pp.
- Heong, K. L. (1984). Pest control practices of rice farmers in Tanjung Karang, Malaysia. *Insect Science and its Application*, 5(3), 221-226.
- Heong, K. L. and Escalada, M. M. (1999). Quantifying rice farmers' pest management decision beliefs and subjective norms in stem borer control. *Crop Protection* 18, 315-322.
- Manikowski, S. (1988). Aerial spraying of quelea. *Tropical Pest Management*, 34 (2): 133-140.
- Misra, D. C. (1996). Monitoring extension programmes and resources. In Swanson, B. E; Bentz, R. P. and Sofranko, A. J (ed) *Improving Agricultural Extension Manual* FAO pp. 147-156.
- Park, P.O. (1974). Granivorous bird pests in Africa. *Span*. 17 (3): 126-12
- Singh, B. N., S. Fagade, M. N. Ukwungwu, S. Williams, S. S. Jagtap, O. Oladimeji, A.E. O. Okhidievbie, (1977). Rice growing environments and biophysical constraints in different agro-ecological zones of Nigeria. *Met. Journal* 2 (1): 35-44.
- Tologbonse, E. B. (2004). Adoption of improved rice technology by farmers in the Inland Valley Swamps of the Middle-Belt Zone of Nigeria. Unpublished Ph.D Thesis submitted to the Department of Agricultural Extension and Rural Development, University of Ibadan, Ibadan. 300pp
- Tologbonse, E. B; Mesini, O. and Tsado, J. H. (2006). Farmers perception of sources of information in relation to adoption of improved rice production technology by farmers in Inland Valley Swamps of Middle Belt Zone, Nigeria. *Journal Of Agricultural Extension. Vol. 9 pp 63-72*

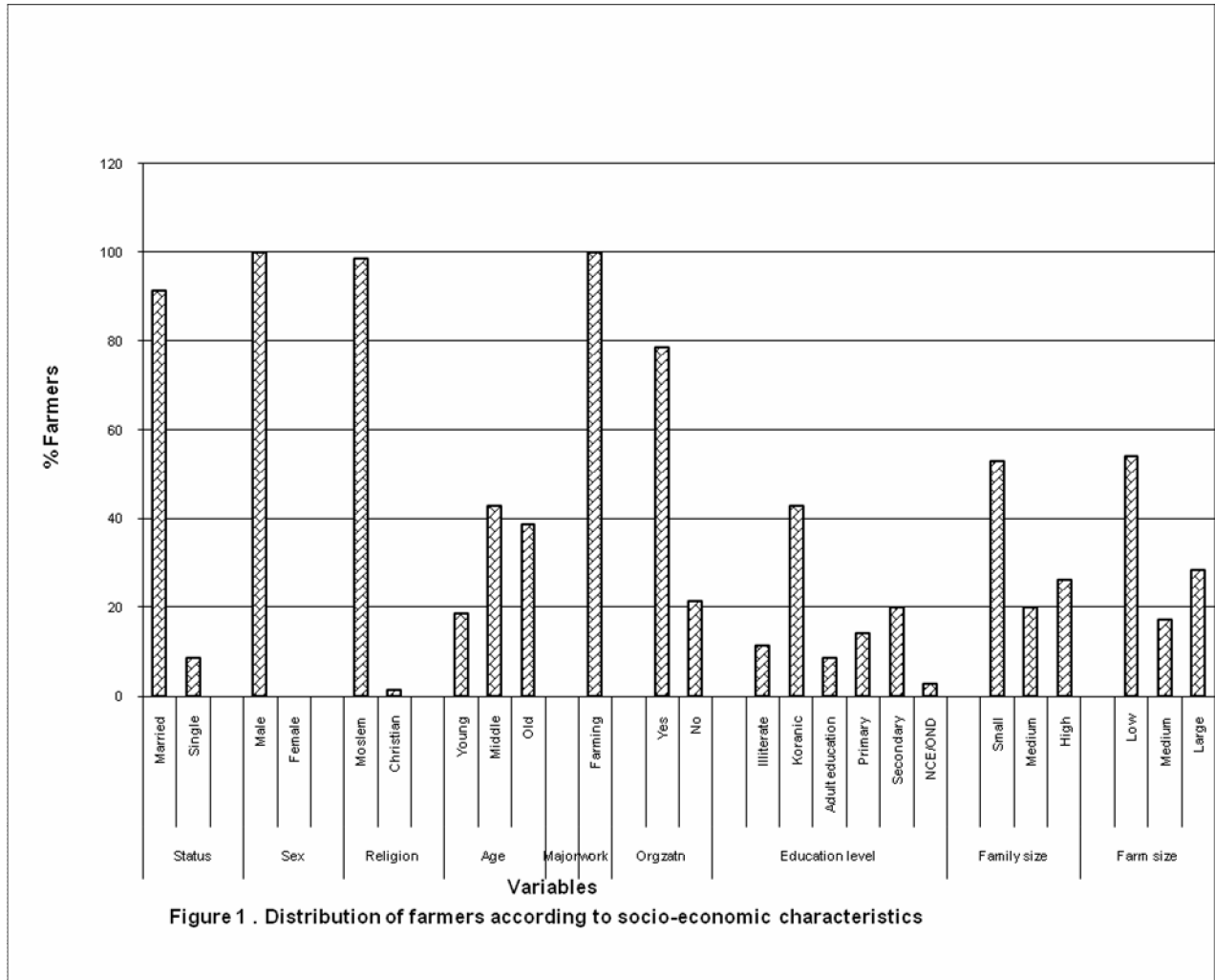
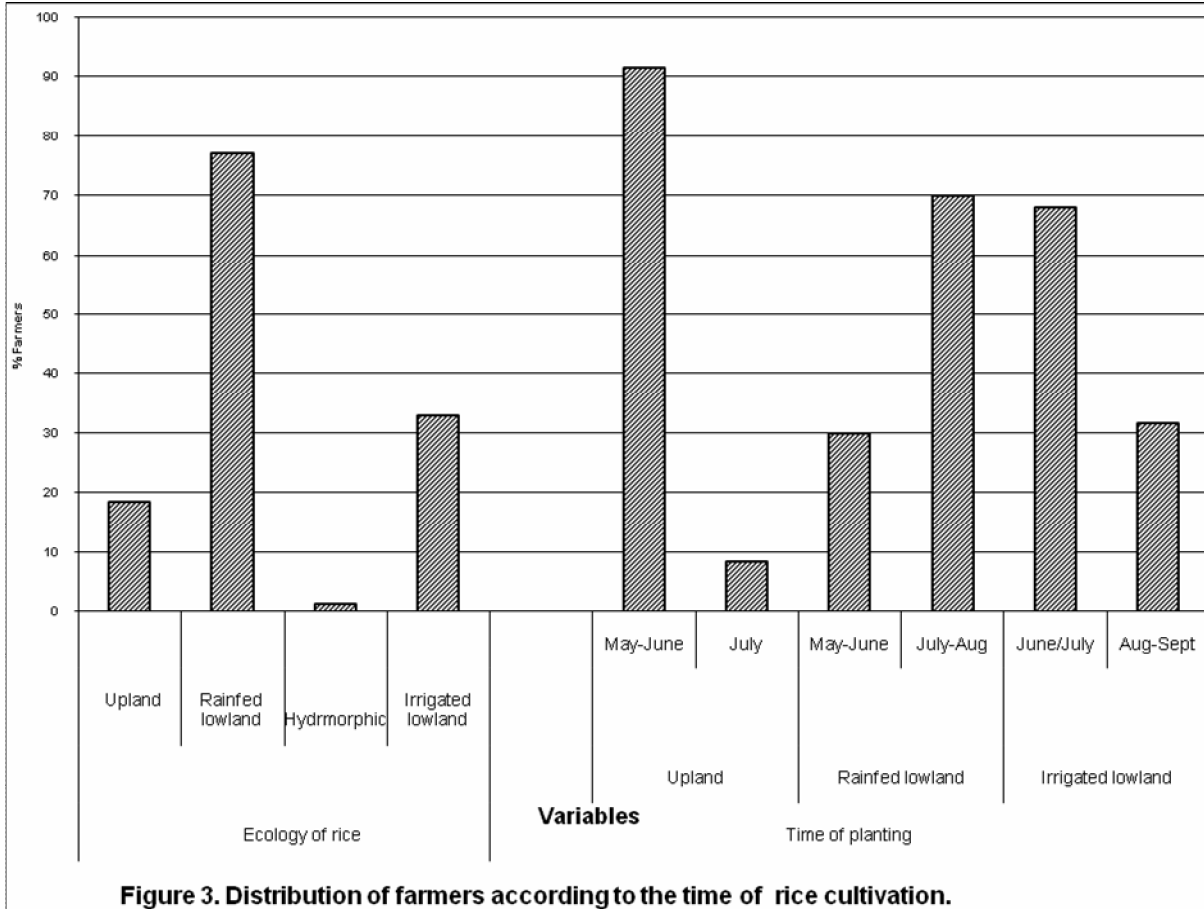


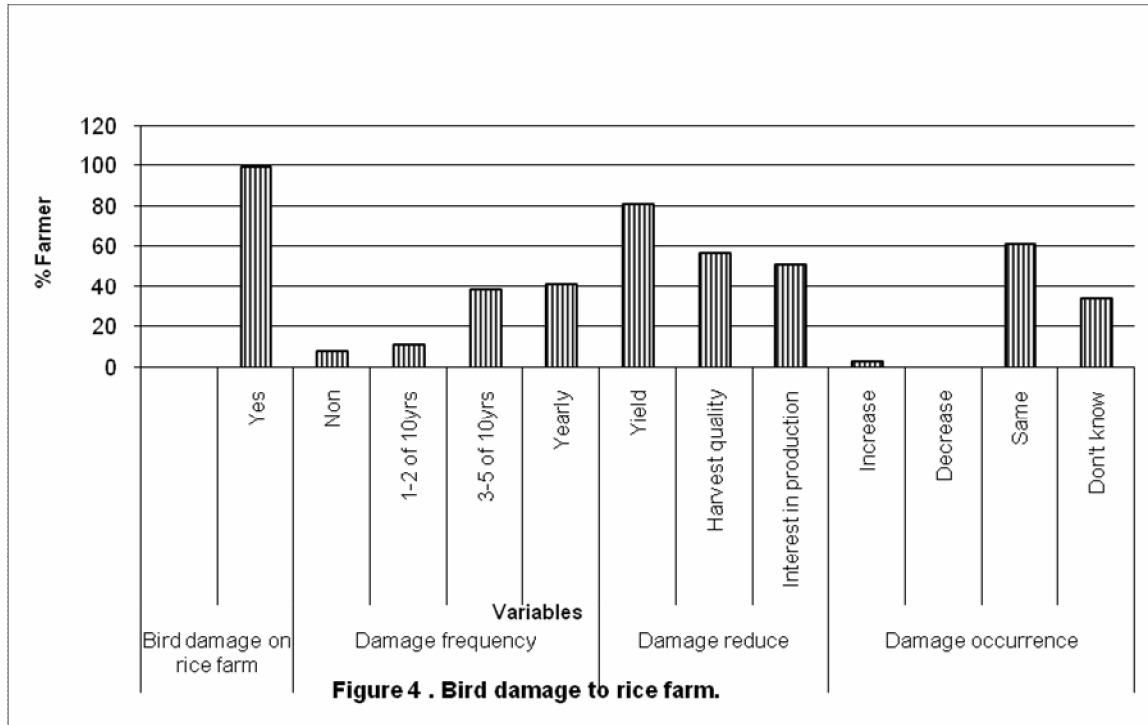
Figure 1 . Distribution of farmers according to socio-economic characteristics

Source: field survey, 2005



| Source: field survey, 2005





Source: field survey,2005

**Table 1: Distribution of farmers by their contact with Extension.**

Variable	Frequency	%
<b>Received advice in bird control (n = 70)</b>		
- Yes	55	78.6
- No	15	21.4
<b>Ever visited by E. A. (n = 70)</b>		
- Yes	63	90.0
- No	7	10.0
<b>Description of Extension Agent's visit (n =70)</b>		
- Never	2	2.9
- Rarely	6	8.6
- Occasionally	18	25.7
- Always	44	62.9
<b>From whom advice on bird control ever received (n =70)</b>		
Parent	44	62.86
E. A.	54	77.14
Farmer	42	66.0

Source: field survey,2005

**Table 2: Distribution of farmers according to perception of information sources.**

Information Sources	Rating of information sources				Sum Total	Mean	Overall Perception
	Very Important	Important	Slightly Important	Not Important			
Radio (n = 51)	23(45.1)	24(47.1)	4(7.8)	-	172	3.37	Important
TV (n =18)	6(33.3)	8(44.7)	3(16.7)	1(5.6)	55	3.06	Important
Neighbour/Friend (n = 64)	31(48.4)	33(51.6)	-	-	223	3.48	Important
E. A (n = 51)	29(56.9)	18(35.3)	3(5.9)	1(2.0)	177	3.47	Important
Newspaper (n = 8)	-	-	7(87.5)	1(12.5)	15	1.88	Not important
Parent (n = 48)	27(56.3)	20(41.7)	1(2.1)	-	170	3.54	Important

\*Figures in parenthesis are %

Source: field survey,2005

**Table 3. Description of bird damage.**

Variable	Frequency	%
<b>Bird problem on farm at:</b> (n =70)		
Planting	7	10.0
After germination	12	17.1
Milky	12	17.1
Maturity	58	82.9
Harvest	20	28.6
After harvest	14	20
<b>Could identify bird that cause damage</b>		
Yes	70	100
<b>Could identify bird from Photograph</b>		
Yes	70	100
<b>See bird every month of year</b> (n =69)		
Yes	23	33.3
No	46	66.7
<b>Part of rice crop damaged by identified birds</b>		
Seed/grains	70	100
<b>Stage at which bird damage rice</b> (n =70)		
Seeding	14	20
Seedling	5	7.1
Nursery bed	7	10
Transplanting	7	10
Flowering	11	15.7
Milky	64	91.4
<b>*Type of damage perceived as more serious</b> (n 670)		
Removing/picking planted seed	25	35.7
Trampling on seedling	6	8.57
Removing grains/seed from panicle	60	85.7
<b>Why bird damage rice</b>		
Feed on rice for food	70	100

\*Multiple responses. Source: field survey, 2005

**Table 4: Perception of bird damage to rice farm.**

Variable	Frequency	%
<b>Bird damage on rice farm (n = 70)</b>		
- Yes	70	100
<b>Frequency of bird damage (n = 70)</b>		
- No losses in last 10yrs	6	8.57
- Losses in 1-2 out of 10 yrs	8	11.43
- Losses in 3 ó 5 out of 10yrs	27	38.5
- Losses every year	29	41.43
<b>*Effect of bird attack experiences on rice crop (n=70)</b>		
- Reduce yield	57	81.43
- Reduce harvest quality	40	57.14
- Reduce interest in rice production	36	51.43
<b>Bird attack occurrence (n ó 70)</b>		
- Increase	2	2.9
- Decrease	1	1.4
- Same	43	61.4
- Don't know	24	34.3
<b>Other animals damage (n = 70)</b>		
Rat	69	98.6
Frog	39	55.7
Water duck (=:woshi-woshi)	2	2.9
Moorhen (=:Bishengi)		
<b>Description of bird damage (n = 70)</b>		
Very serious	28	40
Serious	21	30.0
Moderately serious	19	27.1
Not serious	2	2.9
<b>Description of other animals damage (n =70)</b>		
Very serious	12	17.1
Serious	25	35.7
Moderately serious	3	44.3
Not serious	2	2.9
<b>Months of severe damage (n =70)</b>		
Jan	4	5.7
June ó Aug	23	32.8
Sept ó Nov	38	54.2
Dec	5	7.1
<b>Varieties more susceptible to bird damage (n =70)</b>		
Yes	54	77.1
No	16	22.9
<b>Damage same time yearly (n =67)</b>		
Yes	29	43.3
No	38	56.7
<b>Bird damage starts (n =69)</b>		
June-July	18	26.1
Aug-Sept	19	27.5
Oct-Dec	32	46.3
<b>Bird damage ends (n =67)</b>		
Jan-Feb	18	26.9
June-Aug	2	3.0
Oct-Dec	47	70.2

\*Multiple Response Source: field survey,2005

**Table 5. Farmers' perception of when weaver birds are seen and not seen.**

Variable	Frequency	%
<b>Months birds were seen (n =50)</b>		
Jun-Sept	33	66
Oct-Dec	17	34
<b>Months birds were not seen (n = 49)</b>		
Jan óMarch	21	42.9
June óAug	4	8.2
Nov óDec	24	49

Source: field survey, 2005

**Table 6: Distribution of farmers according to control strategies.**

Variables	Freq.	%
<b>Bird control methods used (n =70)*</b>		
Human bird scarers (HS)	63	90
Chemical poison on seeds (CS)	9	12.9
Local concoctions	2	2.9
Scare-crow	3	4.3
Net	7	10
Video cassette	10	14.3
<b>Description of control methods in farmers' locality (n =70)</b>		
Very effective	40	57.1
Stop some damage	28	40.0
Do little damage	2	2.9
<b>Cost description (n=67)</b>		
Very costly	1	1.5
Costly	15	22.4
Moderately costly	6	9.0
Cheap	25	37.3
No cost	20	29.9
<b>Cost of control (n = 70)</b>		
Low (below ₦5,000)	30	42.9
Medium (₦ 5,000 to ₦ 10,000)	21	30.0
High (above ₦ 10,000)	19	27.1

\* Multiple response

Source: field survey, 2005