Farmers Perceptions of “Danzazzalau”: Disease Affecting Onions (Allium cepa L.) in Kebbi State, Northwestern Nigeria

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Abstract
A recurrent constraint to sustained production of onions in Kebbi State, northwestern Nigeria, has discouraged production by farmers. A study was conducted between June and July of 2015 in six Local Government Areas (L.G.As) of Kebbi State, namely Birnin Kebbi, Aliero, Jega, Maiyama, Shanga and Yauri to appraise perception of farmers on the occurrence and extent of devastation of the disease colloquially called “Danzazzalau” in Hausa Language. Structured questionnaires were administered to farmers at each of the seven communities visited per L.G.A. Responses derived from the Statistical Programme for Social Science (SPSS) package show that above 50% of the respondents from Aliero, Shanga, Yauri and Maiyama recalled a disease with similar symptoms that occurred within the last 10 years. According to 74.4% of respondents, initial symptoms were noticed early on 4 to 6 week old transplants. The disease is widespread in Kebbi State with above 60% farmers from Aliero, Jega, Maiyama, Shanga and Yauri responding to have experienced ≥ 90% loss of crop. With infected stands, 47.10% of the farmers uproot affected stands 18.50% reduce frequency of watering while 14.3%, spray synthetic pesticides as management practices for the disease. The common symptoms described by the farmers for “Danzazzalau” include sudden leaf curl with dried leaf tip, which is similar to the symptoms of basal rot of onion.

Keywords: Kebbi State, “Danzazzalau”, perception, disease, onion, farmers

Introduction
Onion, (Allium cepa L.) is a highly valued vegetable crop used to spice many dishes. The crop is used either as matured bulb or green vegetable, when harvested early (Anyanwu, 2003). It is second to tomatoes among other vegetables in use as cooking condiment (Hussani et al., 2000). FAOSTAT (2013) estimated global production at 73 x 10^6 metric tons harvested from 3.6 million hectares as in 2008 but production had declined to 66,829, 917 metric tons in 2013. Currently, Nigeria is ranked 25th among producing countries of the world but 4th highest producer in Africa (FAOSTART 2013). Amans (1996) and Inuwa (2001) noted that onion is cultivated principally in the semi-arid regions of Nigeria, which comprises the northern States of Kebbi, Kano, Sokoto, Borno, Bauchi, Jigawa, Katsina and Zamfara.

Worldwide, onion production is limited by many biotic factors including bacterial, viral, parasitic flowering plants, nematodes and fungi. Emechebe et al. (1980) showed major diseases reported from Northern Nigeria the purple blotch (Alternaria porri), black mold diseases (Aspergillus niger), neck and bulb rot (Botrytis alli), Onion twister (Colletotrichum cingulata), downy mildew (Peronospora destructiver), pink rot (Pyrenochaeta terrestris) and the bulb rot (Fusarium oxysporum) as very important.

A disease referred to as “Danzazzalau” was first reported at Aliero and Maiyama Local Government Areas (L.G.As) by Kebbi Agricultural and Rural Development Authority (KARDA) to the Institute for Agricultural Research (IAR) in 2009. By 2015 Cropping Scheme/Research Extension and Famers

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Input Linkage System (REFILS) meeting, the increased devastation and spread of the disease was reported in four L.G.As: Maiyama, Aliero, Jega and Yauri by the (KARDA) staff representative. The characteristic symptoms of the disease include drying of leaves beginning from the tip, abnormal protrusion and curling of the stalk from which they describe and name the disease “Danzzazalau” in Hausa language, which literally means “Protrusion”. The purpose of this study was to assess farmers’ knowledge, perception and management of “Danzzazalau” disease on onions in Kebbi State.

Materials and Methods
Structured questionnaires were administered to elicit information on occurrence and strategies used by farmers to manage the “Danzzazalau” disease in Kebbi State. Six Local Government Areas (L.G.As) namely Birnin Kebbi, Aliero, Jega, Maiyama, Sanga and Yaure were selected for the interaction. Specific locations of visited farm communities are presented in Fig. 1. Sample size of administration totaled 168 respondents in four farm communities per L.G.A were visited. At each farm community, five onion cultivated fields were visited during the interaction and samples of seed, soil, diseased and healthy (symptomless) plants were collected. The interactions and visits took place between June and July 2015 while individual interactions for administration of the questions took approximately 45 minutes per respondent. The local dialect, Hausa, was used for communication through a guide and assistance provided by the Kebbi State Agricultural Development Project (KADP). Farmers’ responses were coded and subjected to analysis using the Statistical Programme for Social Science (SPSS) (Version 11.0). Results were summarized in descriptive statistics.

Results and Discussion
Average farmers’ age was 49.4 years, with 52% of respondents within the 50 years and above age bracket (Fig. 1). Males evidently dominated the strenuous cultivation aspect of producing the onion crop. This is attributed to cultural and religious background of the visited communities within the State. Unlike the subtler services done in onion cultivation such as seed priming, seed threshing, sorting, and marketing which are the reserve of the female gender in the State, the physical/energy expending aspects are carried out by the males (Taibat et al., 2014). Simonyan et al. (2011) reported that in most parts of middle and southern Nigeria, the females have ownership of the farms and they actually engage in most farm activities especially where the cost of hiring labour and capital workers is prohibitive.

Results on age groups shows that onion cultivation is done by adults who through experience know instinctively how to handle and nurture the delicate crop. David et al.,
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(2009) reported that at the ages of between 15 and 64 years somebody has the energy to carry out productive ventures. Most of the farmers 61, 58, 51 and 34% in L.G.As such as Aliero, Maiyama, Jega, Shanga and Yauri have had experience in cultivating onion on the field 15 to 25 years.

Although the discussion with farmers did not seek information regarding the literacy and competence, hands on experience through repeatedly gained through cultivating same crop for 15-25 years would show knowledge on the necessary husbanding of the crop. Taibet et al., (2014). As well as Ibrahim and Adamu (2008) reported this same range of experience, 21 to 30 years in onion farming within same area. All the responding farmers in Birnin Kebbi, Aliero, Jega and Maiyama indicated that they do cultivate onion as a dry season crop, while 96 and 64% farmers in Yauri and Shanga cultivate in both seasons (Fig. 3).

Farmers mostly cultivate the crop during the dry season (between September and April) which as reported by Taiwo and Ayanwale (2014) was successful in Kebbi State due to availability of facility for supplementary irrigation. The high incidence of pest and diseases prevalent under hot humid condition of the rainy season, restricts the cultivation of onion to the dry season in most...
locations within the Sudan Savanna ecological zone Simonyan et al. (2011). Dogondaji et al., (2005) asserted that production of crops under rain-fed conditions is very low, with yields of rain-fed rice and cowpeas at about 0.5 t/ha which under fadama conditions increases to between one and two tonnes/ha for rice, 10 to 15 tonnes for onion, and 5 tonnes/ha for tomatoes. As a result, net farm incomes would increase from 35,000 Naira under rain fed conditions to at least 80,000 Naira, which encourages most farmers in Kebbi State to practice irrigation farming. Also Anyanwu (2003) reported that greater part of onion production in Nigeria is undertaken in northern part of the country specifically Kaduna, Kano, Jigawa, Katsina, Sokoto, Plateau, Kebbi and Bauchi States during the dry season.

Majority farmers (54%), produce onions for dual purposes (bulb and seed) compared with 39 % who cultivate for bulb production only, while 2.4 % grow onions for other purposes. (Fig. 4). Most of the farmers produce onion for dual purposes (bulb and seed), with only a few involved in seed production only. According to Khokhar (2014), seed production is a vital part in onion cultivation and is a highly specialized business requiring some intrinsic knowledge. Most farmers (above 50%) from Aliero, Shanga, Yauri and Maiyama recalled experiencing the “Danzazzalau” over 10 years on their onion farms (Fig. 5).

The farmers from all the locations (above 50%) indicated that they do not treat seeds prior to sowing on nursery beds, while 29% and 18% from Shanga, Jega and Birnin Kebbi respectively indicated the use of seed dressing chemicals such as Apron Star and Dress Force before sowing (Fig. 6). Apparently, most of the respondents do not treat their seeds with fungicides before sowing. This implies that these seedlings are predisposed to seed-borne diseases. Lesly et al. (2002) found that onion farmers who did not treat seeds and sterilize nursery soil before sowing encountered diseases from the nursery stage while those who treated seeds before sowing and sterilized the soil by burning straw or husk on the nursery bed before sowing had minimum disease infection.

Majority of the respondents (above 60%) indicated first observation of “Danzazzalau” symptoms after transplanting the seedlings into fields compared with 29 and 39% of farmers from Aliero and Maiyama who observed the

![Figure 4: Purpose for onion cultivation in L.G.A of Kebbi State](image1)

![Figure 5: Duration of “Danzazzalau” occurrence L.G.A of Kebbi State](image2)
symptoms when bulbs are formed (Fig. 7). With 70% farmers recalling occurrence of the disease for about 10 years, the crop losses due to the disease confirms findings by Taiwo and Ayanwale (2014) that diseases are the major factors responsible for decline in onion production in Kebbi State.

Figure 6: Pre-sowing management practices on onions in Kebbi State

Figure 7: Stages of first symptom observation by farmers in Kebbi State

Figure 8: Yield loss due to “Danzazzalau” attack in Kebbi State
Characteristic symptoms of the disease noted and described by the farmers include plant wilt beginning from the tip, followed by an abnormal protrusion and curling of the central main leaf from which the appellation “Danzazzalau” which in Hausa language literally means “Protrusion” was coined.

With respect to loss incurred due to the disease, above 60% farmers from Aliero, Jega, Maiyama, Shanga and Yauri responded having experienced over 90% yield loss (Fig. 8). Response on initiatives taken to address an infected crop indicated that 47% rogued, 18.5 % reduced irrigation frequencies and about, 14% increased the rates of pesticide application or regimes (Fig. 9). These data define the relative importance of the crop in the socio-economic program of the respondents. The farmer is ready to commit further finances to keep the crop going by transplanting fresh seedling, invest more on irrigation and pesticide issues looking for solution.

**Conclusion**

The disease occurs in the six Local Government Areas in Kebbi State of Nigeria. This disease poses a serious threat to the production and biodiversity of this important vegetable crop. Most farmers uproot affected stands, reduce irrigation frequency and apply pesticides as management practices. Urgent interventions are necessary to halt this emerging epidemic in Kebbi State.

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**References**


Figure 9: Management Practices in Onion Farms Applied by Farmers


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Figure 1: Visited Local Government Areas of Kebbi State

Source: Modified from the Administrative Map of Kebbi State