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SEED-BORNE FUNGAL INFECTONS ASSOCIATED WITH GREEN GRAM (*VIGNA ADIATA*) IN LANGTANG NORTH L.G.A OF PLATEAU STATE

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ABSTRACT

A survey was carried out on the seed-borne fungal infections associated with green-gram in six villages of Langtang North Local Government Area of Plateau State. The villages includes: Gazum, Dadur, Kuffen, Pilgani, Zamko and Mban.The isolation and identification of fungal pathogens were done in the Agronomy laboratory, Plateau State College of Agriculture, Garkawa Green gram seeds were randomly collected from five Green gram producing farmers in the six villages. Detection of seed-borne fungi was by blotter standard method. The treatments were arranged in a completely randomized design (CRD) replicated five times. The fungal pathogens isolated were; Fusarium spp, Penicillium ssp, Aspergillus niger, and Coletotrichum lindemuthanium,The frequency of occurrences were; Dadur 14.7%, 18.75, Gazum 16.0%; kuffen 88.7%; Pilgani 6.7% and Zamko 23.3%. The occurrences of fungal isolates were significantly higher in seed samples from Kuffen Village compared to others. There was no detection of Fusarium spp in Pilgani.

Key words: Green gram, incidence, seed-borne fungi, infection, survey, blotter method.

INTRODUCTION

Green gram (vigna radiata) is annual legume crops grown for their seeds. The green grams could be green, black or yellow in colour. The green colour green grams are the most commonly grown in Nigeria (Caswell, 1981). Grams are native crops of India. It is cultivated in several countries of Asia Africa and The Americas (Wikipedia, 2010). The dried beans are prepared by cooking or milling. They are eaten whole or split. The seed or the flour may enter a variety of dishes like soup porridge, snakes, breas, noodles and even ice cream. Green gram also produces great sprout, which can be sold in health food shop or eaten at home. Crop residues of *vigna radiata* are useful fodder. Green gram sometime specifically grown for hay, green manure or as a cover crop (Wikepedia, 2010). Green grams are consume locally in Nigeria and serve as source of vegetable protein for rural dwellers (Abolusoro, 2001). Green gram nutritionally contains, carbohydrates 62g, sugar, 6.6g, dietary fiber 16.g, fat1.15g, protein 23.86g and vitamin C which is 4.8mg (Wikipedia, 2010).

One of the major problems contributing to low yield of green gram is lack of adequate protection against seed- borne fungal infection. This problem is compounded by the continuous use of infected seeds by the farmers. The result is poor germination due to rottening of seeds and damping off diseases i.e dead of seedlings after emergence from the soil. These diseases under severe infection will lead to poor establishment and heavy yield losses. Infected seeds become discolored reducing also the market and nutritional value. Neergard (1969) reported that seed-borne diseases may perpetuate and cause permanent, sometimes inconspicuous depreciation of yields, or they may initiate devastating epidemics.

Seed is the most important input in crop production, paucity of information on seed-borne fungal diseases of Green gram is a problem and there is need in order to prove quality seeds for the local farmer. This problem is limiting the need to increase yield and improve the health and seed quality of the crop by controlling seed-borne fungal pathogens. It is therefore, important to carry out survey on the occurrence and incidence of seed-borne fungal diseases. This will encourage development of appropriate control measures to reduce or

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eliminate pathogenic inocula from green-gram seeds. It will ultimately improve productivity and optimum yield of green-gram for the subsistence farmer. This work is aimed at assessing the occurrence and incidences of seed-borne fungal diseases of Green-gram in Langtang North Local Government Area, Plateau State.

MATERIALS AND METHODS

The experiment was conducted at the agronomy/soil science laboratory of Plateau State College of Agriculture, Garkawa in February, 2010. Green gram seeds of 2009 cropping season were collected randomly from farmers in six major villages of Langtang North Local Government Areas namely: Gazum, Kuffen, Pilgani, Dadur, Mban and Zamko, Four hundred seeds of green gram were taken at random from the sample of each village. The seeds were plated with 30 seeds per plate and replicated five times respectively. Treatment were arranged in a completely Randomized Design (CRD). The blotter standard method was used for detecting seed-borne fungi where three pieces of filter papers (blotters) were soaked in sterilized distilled water (SDW) and were lined in 11cm diameter Petri dishes according to the International Seed-Testing Association (ISTA, 1996). The seeds were incubated for 7 days at ambient condition of light and temperature (30 ± 2^0 C) Reference is made to the reference manual Barnett and Hunter (1987) for identification of each seed-borne fungi infection on individual seed. Percentage germination was also taken. Data obtained was subjected to statistical analysis, according to the procedures outlined for CRD by Obi (2006). The Fishers Least Significant Differences (FLSD) was used to separate significant differences between means.

RESULTS AND DISCUSSION

Table 1 shows the incidence of seed-borne fungal infection and germination of green gram from six villages in Langtang North Local Government Area. Seed-borne fungi occurred in all the seed samples collected from the villages of the study area.

The incidence of fungal infection differed significantly ($P \leq 0.05$) across the villages assessed.

TABLE 1: The incidence of seed-borne fungal infection and germination of green gram seeds from six villages in Langtang North Local Government Area

VILLAGES	OCCURRENCE	INCIDENCE(%)	GERMINATION(%)
Dadur	+	14.7	72.0
Mban	+	18.7	66.7
Gazum	+	16.0	86.7
Kuffen	+	88.7	11.3
Pilgani	+	6.7	91.3
Zamko	+	23.3	72.7
FLSD($P < 0.05$)		15.70	19.06

Kuffen village recorded the highest incidence of 88.7%which differed significantly from those of other villages. The lowest percentage incidence of seed-borne infection was observe in Pilgani (6.7%) which however was statistically similar to the percentage infection recorded in Dadur(14.7%), Gazum (16.0%), Mban (18.6%) villages. The percentage of green gram seeds germination also differed significantly ($P \leq 0.05$) across the villages assessed. A higher germination percentage was recorded in Pilgani (91.3%) which was statistically similar to that of Gazum (86.7%). Percentage seed germination of green gram in Dadur, Mban and Zamko were 72%, 67% and 73% respectively, the lowest germination percentage 0f 11.3% was obtained in Kuffen village. The implication of the different percentage germination of green gram seed is that seed-borne fungi infection affects the germination of seeds.

Kuffen village for instance recorded significantly high incidence of seed-borne fungi of 88.7% and this was manifested in the low germination percentage of 11.3% of seeds from the area. Conversely, pilgani recorded a very low incidence of seed-borne fungal infection and had high seed germination percentage of 91.3%. Thus inverse relationship implied that with increase in the incidence of seed-borne fungal infection in green gram, percentage seed germination decreases. This result is in agreement with an earlier report by Agrios (1988) that seed-borne fungi can cause reduction in seed germination.

TABLE 2: The percentage occurrence of different seed-borne fungi of green gram in six villages after 7 days incubation.

Villages	*Penicillium* spp	*Aspergillus* niger	*Fusarium* spp	*C.Lindemuthanium*
Dadur	2.67	1.33	0.67	10.00
Mban	9.33	0.67	0.67	6.67
Gazum	3.33	6.00	2.67	4.00
Kuffen	42.00	22.67	2.67	22.00
Pilgani	2.67	0.67	0.00	2.67
Zamko	2.67	1.33	0.67	3.33
FLSD ($p \leq 0.05$	1.50	2.75	1.05	3.32

The percentage occurrence of different seed-borne fungi non green gram in six villages after 7 days incubation period are presented in table 2. Fungi detected includes *Penicillium ssp*; *A. niger*, *Fusarium ssp* and C. *lindemuthanium*. There was a significant difference in the percentage occurrence of different seed-borne fungi detected in seed samples from the six villages of Langtang North Local Government Area.

Penicillium spp occurrence was significantly higher ($P \leq 0.05$) in Kuffen compared to the other villages assessed. The occurrence of *A. niger* was significantly higher in samples from Kuffen and Gazum compared to the other villages though the occurrence is much higher statistically in Kuffen compared to Gazum. There was no detection of *Fusarium ssp* in Pilgani village. The fungus C. *lidemuthanium* was predominant in Kuffen village.

Quality seeds are characterized by high percentage germination, purity and freedom from seed-borne pathogens. In this survey a wide range of seed-borne fungi were detected in green gram in Langtang North Local Government Area. These fungi caused seed deterioration resulting in poor or low germination of the affected seeds (Agrios, 1988).

CONCLUSION

Green gram from Langtang North Local Government Area was assessed for occurrence of seed-borne fungi. *Penicillium spp, A. niger, Fusarium spp* and *C. lindemuthanium were indentified.* The occurrence of these fungi and their reported effect means that they can adversely affect production of green gram if not properly checked. .

RECOMMENDATION

The use of seed dressing chemicals and control of vectors can reduce effect of these fungi green gram thus enhancing high yield of the crop.

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