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Research Note :

PREVALENCE OF LEAF BLIGHT DISEASE CAUSED BY *Phytophthora colocasiae)* IN *TARO* IN THE AOWIN SUAMAN DISTRICT OF GHANA

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ABSTRACT : Studies on the prevalence of leaf blight disease in taro were conducted in the Aowin Suaman District of Ghana. The studies comprised a survey to assess the incidence and severity of the taro leaf blight disease in ten communities in the district in two seasons. It was observed that there was a high incidence (an average of 99% in wet season and 92% in dry season) of the disease in the district and was present in all the surveyed communities. But the disease was not too severe during the period of study (8-25% damaged in both wet and dry season) though there was a significant difference (P< 0.05) between the severity in the dry and wet season in the communities.

Keywords : *Colocasiae, Phytophthora, leaf blight, severity, incidence*

Taro (*Colocasia esculenta* var, *antiquorum*) is one of the most important food crops in Ghana (Ackah *et al.,* 2). It is a hunger crop and cultivated in almost all the ten regions of the country (Ackah, 1). The corm is used for flour for bakery and in the preparation of local dishes. The corm is also high in carbohydrates (Shakywar *et al.,* 7). The leaves are well eaten in the country and it is an excellent source of vitamins. A lot of village folks depend on this crop for their livelihood. The farmers obtain regular income from the production as well as food for the family (Ackah, 1).

Despite the important of taro as an importance food security crop in Ghana; its production is affected by a leaf blight disease caused by Phytophthora colocasiae. Marian Raciborski first described *Phytophthora colocasiae* in 1900 from Java. It was first reported in Ghana in 2012 (Omane *et al.,* 6). It is the most destructive fungal disease responsible for heavy yield losses (25 to 50%) of taro (Mishra, 5; Grade and Joshi, 4). In addition, this pathogen causes a serious postharvest decay of taro corms.

Over the years, this disease has spread to most growing communities in the country and farmers, who depend on this crop for food and as a source of income, are losing their livelihood. However, the level of intensity of this disease in these growing districts is not known. Conducting studies to understand the taro leaf blight situation in some of these districts will help us to know the state of the disease in the country so that a good and effective management strategy can be adopted to control it and help improve food security and livelihood in these districts.

Surveys to establish incidence and severity of the leaf blight disease in the district were conducted in the rainy and dry seasons. Ten (10) taro growing communities in the district were randomly selected and in each community three (3) taro farms were selected. A total of thirty (30) farms were selected in all. Thirty plants were then selected for the assessment in each farm. The diagonal pattern was used during selection of plants for assessments on a farm. At every five paces, a plant is assessed for presence or absence of leaf blight. Percentage incidence was then determined by the given formula;

$$\text{Disease incidence} = \frac{\text{Infected plants}}{\text{Total plants}} \times 100$$

Disease severity was scored using a modified scale of 0-6 (Table 1) as described by Little and Hills, (1978) with 0= 0% of leaf area damaged to 6= 94-100% leaf area damaged by the leaf blight. The data collected were subjected to analysis using GenStat Discovery Edition. Significance was established at P< 0.05. Climatic data during the period of the survey were obtained from the meteorological department.

Figure 1 shows the incidence of taro leaf blight disease in the ten communities. Incidence was generally high ranging from 89% to 100%. Figure 2, presents the level of incidence of the taro leaf blight disease in the district in the dry and wet seasons. From the figure, it could be observed that there was a highly significant difference between the incidence in the dry and wet season. The wet season recorded the highest

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incidence of 99% whilst the dry season recorded the lowest incidence of 92%.

Table 1 : Key for scoring disease severity.

Disease Score	Nature of Infection (%)	Description
0	No visible symptoms	
1	1-7% of leaf area damaged	
2	8-25% of leaf area damaged	
3	26-50% of leaf area damaged	
4	51-75% of leaf area damaged	
5	75-93% of leaf area damaged	
6	94-100% of leaf area damaged	

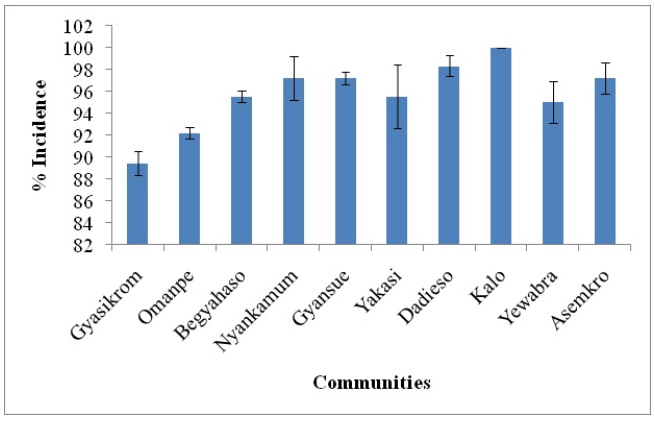

Figure 1: Incidence of taro leaf blight in the ten communities in the Aowin Suaman district.
Vertical Bars Represent Standard Error.

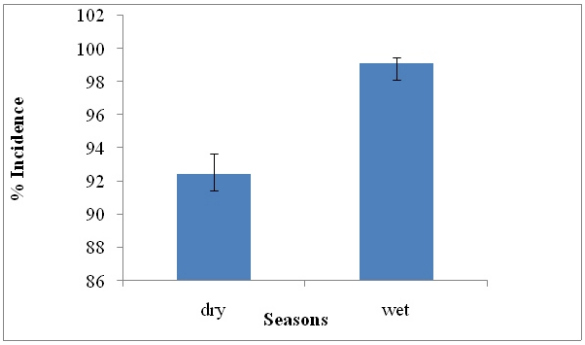

Figure 2 : Mean incidence of TLBD in both the dry and wet seasons in the district.

From the Figure 3, it could be observed that Nyankamum recorded the highest in severity of 2.06 but was not significantly different from Yewabra which also recorded 2.03. The severity in those communities was not also different from that in Kalo. Omanpe recorded the lowest severity of 1.67 but was not significantly different from the other communities.

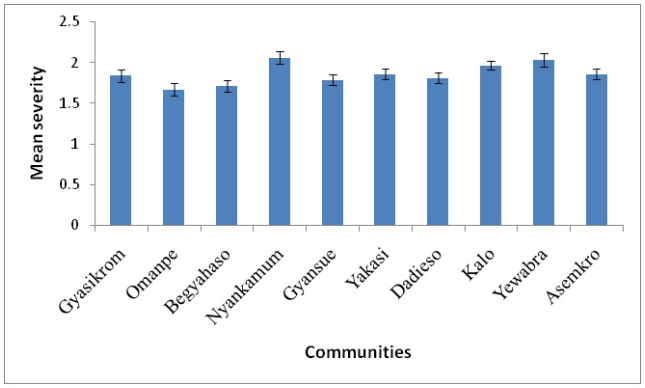

Figure 3 : Severity of the taro leaf blight disease in the ten communities in the district in both seasons.

Figure 4 shows the severity of taro leaf blight disease in both the dry and wet season in the district. The dry season recorded a severity of 1.51, whilst the wet season recorded a severity of 2.21. It could be observed from the figure that the disease was severe in the wet season than the dry season.

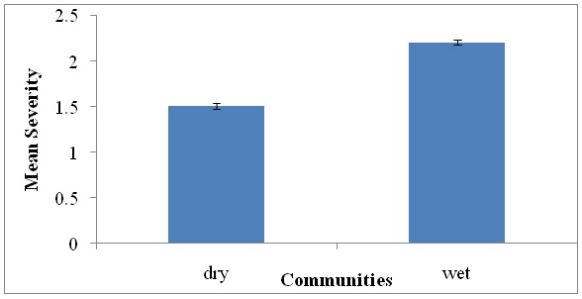

Figure 4 : Severity of taro leaf blight disease in both dry and wet season in the Aowin Suaman district.

Results of survey conducted in the Aowin Suaman district indicate a high incidence of taro leaf blight disease in the 10 communities. Incidence levels higher than 90% indicate a high presence of the disease in the district. The widespread nature of the disease in the district could be due to the fact that spores are produced on the leaves and spread in wind and rain to other plants nearby. Also the transport of planting materials from other farmers field may account for the wide spread of the disease in the district. The district is a tropical rainforest with a monthly temperature of 27° C and an annual rainfall between 1500 and 1800 millimetres, a condition that favours the spread of the disease (Grade, and Joshi, 4).

Disease severity recorded in the study area was however on a lower side. When condition for the disease development are favourable, disease severity could be high and a high damage due to the disease could be recorded. Disease development has been identified to be favoured by a high relative humidity (90%-100%) and a high temperature (15°C-35°C) with 28°C as optimum (Brooks, 3). If the temperature is high, and the relative humidity is favourable, the disease becomes very severe. During the survey, the average monthly temperature recorded in both the dry and wet season was 20°C and 22°C and the relative humidity was 58% in the dry and 76% in the wet. Though the temperature was favourable, the relative humidity was low and not favourable at the period of study and this may account for the low severity of the disease in the study area. The experiment reveals that the disease is widespread in the district and under favourable conditions, it will be very destructive. The disease is therefore a major constraint to taro production in the Aowin Suaman District.

REFERENCES

1. Ackah, F. K. (2014). Prevalence and management of leaf blight disease of Taro (*Colocasia esculenta* (L) Schott) In the Aowin Suaman district of Ghana. (Unpublished *Master's Thesis*). University of Cape Coast. Ghana
2. Ackah, F. K., Puije, G.C. Van der and Moses, E. (2014). First evaluation of taro (*Colocasia esculenta*) genotypes against leaf blight (*Phytophthora colocasiae*) in Ghana, *HortFlora Res. Spectrum,* **3**(4) :390-391
3. Brooks, F. E. (2005). Taro leaf blight. *The Plant Health Instructor.* DOI: 10.1094/ PHI-I- 2005-0531-01.
4. Grade, U.A. and Joshi, M.S. (2003). Influence of weather factors on the incidence of leaf blight of colocasia. *Ann. of Plant Protec. Sci.* **11** (1):168-170.
5. Mishra, R.S. (1997). Disease of tuber crops in Northern and Eastern India. *Technical Bulletin Series* : **22**. CTCRI, Kerala. India: 5-29.
6. Omane, E., Oduro, K. A., Cornelius, E. W., Opoku, I. Y., Akrofi ,A. Y., Sharma, K; Kumar, P., Lava, and Bandyopadhyay, R. (2012). First Report of leaf blight of taro (*Colocasia esculenta*) caused by *Phytophthora colocasiae i*n Ghana. APS. **96** (2): 292.
7. Shakywar, R. C., Pathak, S. P., Pathak, M. and Singh A. K. (2012). Evaluation of taro (*Colocasia esculenta* var. antiquorum) genotypes against leaf blight (*Phytophthora colocasiae*) under eastern Uttar Pradesh condition. Hortflora Res. Spectrum; **1**(2): 184-186.

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