

**EFFECT OF BANANA DISEASES ON BANANA PRODUCTION
A CASE STUDY OF NYIBWA SUB-COUNTY LUWEERO DISTRICT**

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ABSTRACT. This research is instrumental in such a way that it points out the most important aspects of Banana production. In banana diseases, the researcher concentrated on identification of various banana diseases, their causes, magnitude of their effect and possible ways of controlling them in the Area of Study. This Study was designed in such a way that it employed both qualitative and quantitative methods of data collection which include; Research question (Questionnaire), Sampling techniques, Experimental method, Analytical method, Descriptive approach, and Review. Basing on the research findings, out of 80 Respondents, 28% of the Respondents reported that banana diseases were mainly caused by attack by banana pests especially weevils. Planting of diseased planting materials (15%), poor cultivation methods (20%), harsh climatic conditions (19%) and continuous pollution in banana gardens (18%), were also forwarded by the Respondents during interview. Efforts should be made by various Actors such as extension workers and the agricultural Officers to educate farmers on how to identify disease prevalence, prevent and control. This is aimed at increasing banana production in the region

Key words: Banana Diseases and Banana Production

Background to the Study.

Bananas are big perennial herbs with an underground stem referred to as a corm, which is the true stem of the banana plant (Grace et al., 2023). The corm produces aerial shoots which arise from the lateral buds which develop into eyes and later suckers. The non-stop vegetative boom of suckers perpetuates the corm's lifestyles and hence the perennial reputation of the banana plant. The aerial shoot is called a pseudo stem and grows to the height of 2 to 8 m relying on the variety and the conditions (Allan et al., 2023). The pseudo stem includes massive overlapping leaf bases which are tightly rolled spherical each different forming a cylindrical structure nearly forty-eight cm in diameter. The roots are initiated from the corm and that they variety from 50 to a hundred cm in duration; occasionally sub-horizontal roots reach 3 m (Collins et al., 2023). The corm additionally consists of the apical meristem from which the leaves and in the end the flora is initiated. On average, every plant produces 35 to 50 leaves in its increase cycle. in line with Rugalema and Mathieson (2009), it's far mounted that eighty-five% of the East African farmers grow bananas despite the fact that they mix it with other vegetation like maize (*Zea mays*), beans

(Phaseolus), root and tuber plants, the bananas are discovered to provide very high yields contributing to meals security and people livelihood (Collins et al., 2023). The recent research executed in Tanzania, Kagera location, notwithstanding their efforts of adding manure, mulching, surface irrigation, amongst different excellent farming strategies, the banana yields had been terrible (magazine et al., 2023). In Uganda especially Nyimbwa Sub- County, Luwero district; over 53% of the banana vegetation had been significantly suffering from Banana Wilt in spite of top agronomical practices completed through farmers, in addition to outreach facilities supplied by means of Agriculture college students and teachers of Ndejje university. This has in the end resulted into decreased banana yields and consequently, meals lack of confidence in the area (Oliver et al., 2023). it's far from this point of view that the researcher felt it vital to conduct this research with the intention to set up the effect of Banana Wilt ailment (BWD) on Banana manufacturing in Nyimbwa Subcounty, Luwero District.

Problem Statement

Banana sicknesses which include Banana Wilt disorder (BWD), Banana Xanthomonas sickness (BXD) and Fusarium Wilt disease (FWD) are the maximum detrimental illnesses affecting Banana production inside the complete African international locations; these sicknesses had been first mentioned approximately 40 years in the past in Ethiopia on Ensete, that's associated with banana (Oromo et al., 2023). out of doors Ethiopia, Banana sicknesses have been first reported in Uganda in 2001 and have now spread to almost all of the principal banana generating districts in Uganda in particular Luweero, Kisoro, Masaka, amongst others; a purpose why this research become completed in Nyimbwa Sub- County where they have attacked banana flora more and more. As discussed in advance, banana illnesses have caused decreased family and country wide meals protection and earnings (Tushemereirwa, 2004; Tushemereirwa, 2003).

In Uganda, Nyimbwa sub-county specially, Banana diseases have made the livelihoods of the humans in Nyimbwa sub-county very difficult by way of drastically contributing to low yields and decreased income of the smallholder farmers (Derrick et al., 2023). The sickness has already depleted numerous masses of acres of banana plantations in general in Ndejje, Kisooba and other close by villages of Nyimbwa Sub-County. The most affected households consist of the ones headed by way of orphans and the elderly, who've no different alternative method of survival besides banana. reviews from Luwero rural District Agricultural, Cooperatives and livestock branch display that greater than fifty-nine hectares of banana plantations capable of producing yields valued over Ush.164 million in line with yr. have been uprooted

after being affected by Banana Wilt ailment (Oscar et al., 2023). No matter the governments' efforts to educate and rent Agricultural officers, extension worker and farm professionals each at the sub-county and District stage, Banana illnesses are nevertheless a totally massive risk to banana manufacturing in Nyimbwa sub-county.

Specific objectives.

- To identify different diseases affecting banana production in Nyimbwa Sub- County.
- To examine various causes of banana diseases in banana plantations in Nyimbwa subcounty.
- To assess the magnitude of the effects caused by the banana diseases and suggest ways of addressing it in the Study area.

Research Questions.

- Which diseases affecting banana production in Nyimbwa Sub- County?
- What are the various causes of banana diseases in banana plantations of Nyimbwa subcounty?
- What is the magnitude of the effect caused by banana diseases and how can it be addressed?

Methodology

Research design.

This Study was designed in such a way that it employed both qualitative and quantitative methods of data collection which include; Research question (Questionnaire), Sampling techniques, Experimental method, Analytical method, Descriptive approach, and Review.

Questionnaire approach was used to obtain satisfactory data concerning the effect of Banana Wilt Disease on Banana Production in Nyimbwa sub-county, Luwero District. Sampling method was similarly used to confirm the data that was collected and to obtain confidential data from the Respondents.

Other approaches such as descriptive, analytical and review was also used to ensure the quality of data collected before it is disseminated. The research design was also conducted following three main phases; Conceptual phase, narrative phase and finally, Interpretive phase.

Study population.

This study was specifically conducted among community members who was selected from the four main villages of Nyimbwa sub-county and other important respondents who was selected from other parts of Luwero district. The study sample includes the category of people to whom data was collected from, their sex, experience and the number of people (respondents) was interviewed. This was done as illustrated in the table 1 below;

Table 1 showing study Population samples

Category	Population	Sample size	Technique
Farmers	32	07	Random
Contact famers	39	10	Purposive
Extension Workers	08	02	Random
District Agriculture Officer	01	01	Random
Total	80	20	

Source: Primary data 2020

In this research, the researcher used 80 respondents which include; children, parents, medical staff and the sub-county chief.

Data collection methods.

Data was collected using Questionnaires, Interview guides and by observation.

Sampling Techniques.

Using sampling techniques such as random sampling technique, household-heads was chosen randomly from four (4) selected villages of Nyimbwa sub-county; which was 80 respondents in total, according to this research.

Successful data collection was achieved by using systematic random sampling method for which a list of community members was obtained from the L.C.1 representatives of four villages; and this was to make the process very easy.

Data analysis.

The data that was collected from the respondents was verified, compiled, coded and summarized before being analyzed using the Statistical Package for Social Sciences (SPSS) Windows Software Version 16.0 (Nelson et al., 2022). Both quantitative and qualitative methods of data analysis was used.

For quantitative data, descriptive and inferential statistics was applied. In descriptive statistics, frequencies, percentages, mean, standard deviation and range, was calculated. In inferential statistics, the t-test method was used to determine whether it had been any significant difference in banana production before banana wilt disease and after different methods of control have been applied/ adopted. The criterion to be used for the t-test was that the findings of the study was considered significantly different if the d-value was less than 0.05.

RESULTS

Table 2: Shows common diseases affecting banana plants

Response	Frequency	Percentage
Fusarium wilt	28	35
Yellow Sigatoka	20	25
Black Sigatoka	14	18
Banana Xanthomonas wilt	18	22
Total	80	100

Source: Primary data 2020.

According to table 2 above, out of 80 Respondents, 35% of them forwarded that Fusarium wilt was the most affecting disease of banana in Nyimbwa sub-county, as evidenced from the table. Other diseases such as yellow sigatoka (25%), Black sigatoka (18%) and Banana Xanthomonas wilt (22%), also affected banana plants in the study area. It is important to note that yellow sigatoka and Black sigatoka sometimes occur simultaneously on banana plants resulting in total damage of a plant.

Various causes of banana diseases on banana farmlands

Table 3: Shows various causes of banana diseases on banana farmlands

Response	Frequency	Percentage
Attack by banana pests such as weevils, which introduce pathogens to banana plants.	23	28
Planting diseased sucker in banana farmlands resulting in buildup of diseases.	12	15
Poor cultivation methods causing wounds on banana suckers which provide pathways for entry of pathogens.	16	20
Harsh climatic conditions reducing the water content of banana plants, eventually resulting into wilting of banana plants.	15	19
Introducing pollutants into banana fields reducing plant resistance and enhances disease outbreak.	14	18
Total	80	100

Source: Primary data 2020

Basing on the research findings, out of 80 Respondents, 28% of the Respondents reported that banana diseases are mainly caused by attack by banana pests especially weevils. Planting of diseased planting

materials (15%), poor cultivation methods (20%), harsh climatic conditions (19%) and continuous pollution in banana gardens (18%), were also forwarded by the Respondents during interview. It is evident that banana pests rapidly cause banana diseases resulting into food insecurity in Nyimbwa sub-county. This data was presented using column chart below;

Magnitude of the effect caused by banana diseases on banana plants

Response	Frequency	Percentage
Banana diseases have caused very serious loss in banana yields	18	23
Serious destruction of banana plants in the gardens leading to total loss in production causing food insecurity.	24	30
Poor quality banana yield/ produce harvested leading to low nutrient value obtained.	16	20
Loss of banana plant condition leading to reduced tolerance to harsh environmental conditions.	22	27
Total	80	100

Source: Primary data 2020.

According to table 6 above, out of 80 Respondents, 23% of them reported that banana diseases caused very serious loss in yield in Nyimbwa sub-county. 30% of them reported of destruction of banana plants by different diseases, 20% of them talked of poor-quality harvest while 27% documented loss of plant condition which as well as reduced tolerance to climatic conditions. With the evidence from table 6, plant destruction by diseases had the highest magnitude and therefore, contributed a lot to food insecurity in Nyimbwa sub-county.

Possible ways of controlling banana diseases on banana gardens

Table 4: Shows possible ways of controlling banana diseases.

Response	Frequency	Percentage
Creating awareness about various diseases by educating farmer on their cause, prevention and control.	20	25
Advising farmers on use of cultural methods of controlling banana diseases such as use of clean planting materials.	16	20
Extension services implementing adoption of good farming methods such as crop-rotation.	22	28

Breaking off male-buds from banana plants to control wilt diseases in banana farmlands.	14	17
Genetic engineering to improve on the breeding breeding efficiency of banana plants.	08	10
Total	80	100

Source: Primary data 2020.

According to table 4, out of 80 Respondents, 25% of them emphasized on creating awareness on the cause, prevention and control of banana diseases as one of the possible ways of controlling banana diseases from the study area. Other Respondents talked of use of cultural methods (20%), extension services to be brought closer (28%), breaking off male-buds from banana plants (17%), while 10% of the Respondents advocated for genetic engineering so as to improve the nature of banana genes due to genetic variation.

Conclusions.

Currently, Plant diseases in Uganda are a major concern. The government and most nongovernmental organizations have struggled to root out this vice from society since many people have lacked food due to damage caused by banana diseases. Banana diseases are mainly caused by poor cultural methods of cultivation, including use of diseased planting materials and government authorities ought to carry out crack down of these practices if Uganda is to attain its vision 2040.

Recommendations.

Basing on the results of the study, farmers and extension workers are therefore, encouraged to have a collective effort in improving banana production using sustainable approaches such as use of good farming methods. In order to address the situation, the study recommends the following measures, which range from the household to regional and national levels:

- The government should establish strategies to empower the local authorities and other key stakeholders with capacity, knowledge and skills needed to boost up banana production by controlling banana diseases in Nyimbwa sub-county.
- Efforts should be made by various Actors such as extension workers and the agricultural Officers to educate farmers on how to identify disease prevalence, prevent and control. This is aimed at increasing banana production in the region.

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