
BANANA WILT DISEASES AND BANANA PRODUCTION. A CASE STUDY OF BUFUMBO SUB-COUNTY BULAMBULI DISTRICT

Gimuyi David¹, Kyomuhendo Charlotte², Natukunda Charles³

1, 2, 3 Metropolitan International University

ABSTRACT.

The study aimed at the effect of banana wilt diseases on banana production with a case study of Bufumbo sub-county bulambuli district and it was guided by the following objectives; To identify different diseases affecting banana production in Bufumbo Sub- County, to examine various causes of banana diseases in banana plantations in Bufumbo subcounty and to assess the magnitude of the effects caused by the banana diseases and suggest ways of addressing it in the Study area. 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 mainly used so as to obtain satisfactory data concerning the effect of Banana Wilt Disease on Banana Production in Bufumbo sub-county, Bulambuli District. Sampling method was similarly used to confirm the data that was collected and to obtain confidential data from the Respondents. This study was specifically be conducted among community members who was selected from the four main villages of Bufumbo sub-county and other important respondents who was selected from other parts of Bulambuli district. From the findings, out of 80 Respondents, 23% of them reported that banana diseases caused very serious loss in yield in Bufumbo 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. 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 Bufumbo sub-county.

Key words: banana, wilt, diseases and production

Background to the Study.

Bananas are large perennial herbs with an underground stem called a tuber, which is the true stem of the banana plant. The mushroom produces aerial shoots that emerge from lateral buds that develop eyes and later suckers. The continuous vegetative growth of the suckers preserves the life of the tubers and thus the permanent state of the banana tree (Richard et al., 2022). The aerial shoot is called a pseudo stem and grows to a height of 2 to 8 m, depending on the variety and conditions. The pseudo stem consists of large overlapping leaf bases that are tightly coiled around each other to form a cylindrical structure nearly 48 cm in diameter. The roots emerge from the corm's eye and reach a length of 50 to 100 cm; occasionally sub horizontal roots reach 3 m (Blomme and Ortiz, 2000) (Cand et al., 2022). The corm also consists of an apical meristem from which leaves and eventually flowers are initiated. On average, each plant produces 35 to 50 leaves in its growth cycle. The banana is a major food crop in East African countries and throughout the Great Lakes region. In Uganda; especially in the eastern region, banana is the most important food for more than 2.5 million people (URT, 2006) (Richard et al.,

Statement of the problem

2023). The eastern region is often referred to as the “Land of Bananas” because of the large number of bananas grown there (FAO-Rugalema, 2009). The Eastern region produces more than one-third of Uganda's total banana production; which was estimated at 2.6 million tons in 2013. Banana dominates the diet of Bagisu people in Bulambuli sub-county. In this sub-district, 85% of households grow bananas and an estimated 2.2 million people depend heavily on bananas as a source of carbohydrates (URT, 2006). In Uganda, especially Bufumbo Sub-County (Grace et al., 2023), Bulambuli District; more than 53% of banana trees were severely affected by Banana Wilt despite good agronomic practices carried out by farmers, in addition to field facilities provided by Busitema University agriculture students and lecturers (Allan et al., 2023). This eventually led to a decrease in banana yields and subsequently food shortages in the region. In this view, the researcher felt it necessary to conduct this research to determine the effect of Banana Wilt Disease (BWD) on banana production in Bufumbo Sub-County, Bulambuli District.

Banana diseases such as Banana Wilt Disease (BWD), Banana Xanthomonas Disease (BXD) and Fusarium Wilt Disease (FWD) are the most devastating diseases affecting banana production throughout African countries; these diseases were first reported about 40 years ago in Ethiopia Ensete, which is related to the banana. Banana diseases were first reported outside Ethiopia in Uganda in 2001 and now they have spread to almost all major banana producing areas in Uganda especially among Bulambuli, Sironko, Mbale, Manafwa, Bududa; the reason why this research was carried out in Bufumbo Sub-County where they were increasingly attacking banana trees. As mentioned earlier, banana diseases have resulted in reduced household and national food and income security (Tushemereirwa, 2004; Tushemereirwa, 2003). In Uganda, specifically in Bufumbo Sub-District, banana diseases have made the livelihoods of people in Bufumbo Sub-District

Specific objectives

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

Methodology

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 mainly used so as to obtain satisfactory data concerning the effect of Banana Wilt Disease on Banana Production in Bufumbo sub-county, Bulambuli District. Sampling method was similarly used to confirm the data that was collected and to obtain confidential data from the Respondents. This study was specifically be conducted among community members who was selected from the four main villages of Bufumbo sub-county and other important respondents who was selected from other parts of Bulambuli district. The study sample includes the category of people to whom data was to be collected from; their sex, experience and the number of people (respondents) was interviewed. 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

very difficult as they have contributed significantly to low yields and reduced incomes of smallholder farmers (Collins et al., 2023). The disease has already depleted several hundred acres of banana plantations mainly in Bufumbo, Mbigi malungi, Buzemunwa and other surrounding villages in Bufumbo sub-county. Among the most affected families are those headed by orphans and old people who have no other alternative means of survival apart from bananas. Reports from the Department of Agriculture, Cooperatives and Livestock in Bulambo Rural District show that over 75 hectares of banana plantations capable of producing yields worth over Ush. Despite the government's efforts to train and employ agricultural officers, extension workers and farm specialists both at the district and sub-county levels, banana diseases are still a major threat to banana production in Bufumbo sub-district.

Received: 12.11.2023

Accepted: 19.11.2023

Published on: 30.11.2023

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.

RESULTS

Table 1: 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 2022.

According to table 1 above, out of 80 Respondents, 35% of them forwarded that Fusarium wilt was the most affecting disease of banana in Bufumbo 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

According to the research conducted, a number of causes of banana diseases were forwarded by respondents and were summarized in table 5 below;

Table 2: 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

Received: 12.11.2023

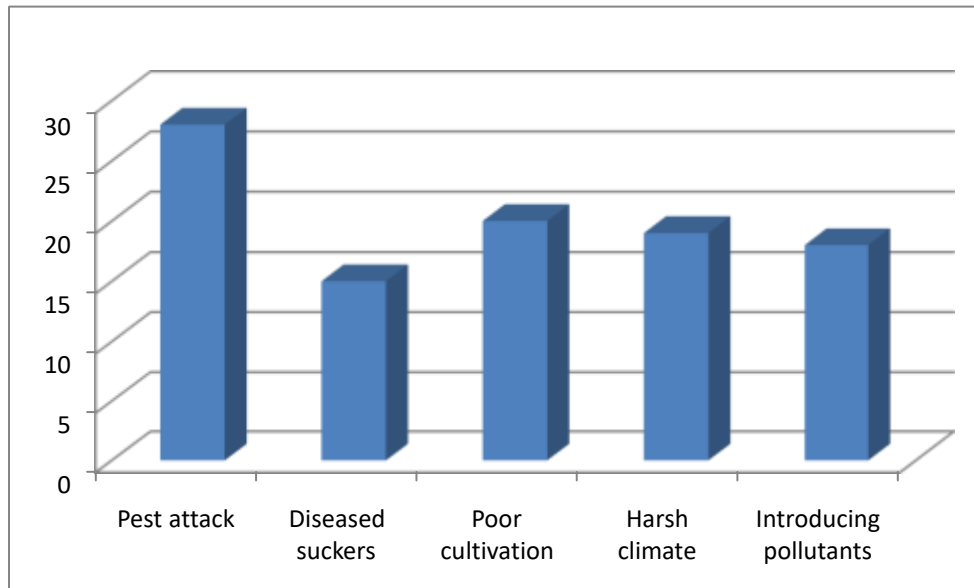
Accepted: 19.11.2023

Published on: 30.11.2023

Source: Primary data 2022

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 Bufumbo sub-county. This data was presented using column chart below;

Figure 1: Shows representation of various causes of banana diseases



Source: Primary data 2022.

Magnitude of the effect caused by banana diseases on banana plants

A number of effects due to diseases were registered during interview conducted from different respondents and they were summarized in table 6 below;

Table 3: Shows the magnitude 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 2022.

Received: 12.11.2023

Accepted: 19.11.2023

Published on: 30.11.2023

According to table 3 above, out of 80 Respondents, 23% of them reported that banana diseases caused very serious loss in yield in Bufumbo 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 Bufumbo 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 2022.

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.

The study has conclusively established that the effects of banana diseases are; low crop yields, low quality yields and income losses at household as well as national level. These effects have been felt not only in the study area but also in whole Central region and beyond.

Received: 12.11.2023

Accepted: 19.11.2023

Published on: 30.11.2023

Recommendations

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 Bufumbo 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.

References

- Allan, K., Charles, N., Moses, N., Kazaara, A. G., & Nelson, K. (2023). *The Effect of Operation Wealth Creation on Youth Farmers Development: A Case Study of Labongo Layamo Sub County, Kitgum District*. 7(2), 50–63.
- Cand, A. R., Ijeoma, P., Blessing, A., Janice, A. B., & James, T. (2022). *Students' Sick-Role Behavior and Course Completion in Public and Private Universities in Uganda*. 6(6), 125–126. <https://doi.org/10.1007/s10578-014.Patterson>
- Collins, A., Kazaara, A. G., & Kazaara, A. I. (2023). *Agricultural Loans and Farmer's Livelihood in Uganda a Case Study of Nyakayojo Sub County in Mbarara District*. 7(3), 40–46.
- Grace, M., Kazaara, A. G., & Kazaara, A. I. (2023). *Factors Associated with Potato Yields' Variations In South Western Of Uganda. Case Study: Kanungu and Kisoro Districts*. 7(3), 198–205.
- Nelson, K., Christopher, F., & Milton, N. (2022). *Teach Yourself Spss and Stata*. 6(7), 84–122.
- Niyonzima, E. (2023). *Assessing the Impacts of Rural-Urban Migration on Agriculture Production in Rwanda: A Case Study of Huye District, in Southern Province*. 7(4), 1–15.
- Richard, A., B, A. I., Janice, B., Omolaja, M., & James, T. (2022). *Course completion among the students in Public and Private Universities in Uganda*. 6(7), 47–48.
- Richard, A., Deus, T., James, T., Ijeoma, A., & Janice, B. (2023). *The impacts of using music instruments on learning in post- secondary institutions in Uganda*. 7(3), 35–39.