

**INCIDENCE AND SEVERITY OF BEAN  
ANTHRACNOSE BY *Colletotrichum  
lindemuthianum* ON VARIED AGES OF  
COMMON BEAN (*Phaseolus vulgaris* L)  
INOCULATED USING DIFFERENT  
METHODS**

BY

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# INTRODUCTION

- Common bean (*Phaseolus vulgaris L*), also referred to as dry bean, is an annual leguminous plant that belongs to the genus, *Phaseolus*.
- Common bean contains high protein content, is a good source of energy and provides folic acid, dietary fiber and complex carbohydrates.
- In common beans (*Phaseolus vulgaris L.*), bean anthracnose caused by *Colletotrichum lindemuthianum* is one of the most widespread and economically important diseases, found mainly in tropical and subtropical bean-growing regions of the world.

## Introduction cont'

- Diagnosed symptomatically by dark brown to black sunken lesions on cotyledons and stems. Underside leaf, linear dark brick-red lesions on veins.
- Yield losses due to bean anthracnose can reach 90–100% when susceptible genotypes are grown in conditions favourable for the pathogen during the growing season.
- A clear understanding of its seed-borne nature, survival mechanism and its host's most susceptible stage of growth is a step in managing the disease.

# **PROBLEM STATEMENT**

Bean anthracnose is one of the most widespread & economically important diseases. It causes yield losses reaching to 90-100% under favorable conditions. In Kenya, this has exacerbated the problem of food security. The need to come up with strategies to manage the disease is a matter of importance.

## **JUSTIFICATION:**

- In view of the importance of the crop and the effect of the fungal disease on yield, there is need to identify at what age of plant does infection start so as to find possible control measures.

# OBJECTIVES

## **GENERAL OBJECTIVE:**

- To reduce yield losses in common bean (*Phaseolus vulgaris* L) production by determining at what stage of growth is infection more severe in order to employ possible control measures.

## **SPECIFIC OBJECTIVES:**

- To determine incidence
- To determine severity
- To determine at what stage of growth is infection more severe.

# MATERIALS AND METHODS

- Seeds of common bean (No. B) were sown in plastic pots containing sterile soil at three sowing dates of seven days interval in order to have plants of varying ages (25, 18 and 11 days) at inoculation date.
- Three methods (smearing, spraying and soil inoculation) were used, and three pots were used for each inoculation method for the various ages.
- The seedlings for the control were treated with distilled water.
- All plants were covered with polythene bags to increase humidity.

## Materials and methods cont'

- Labeled pots were arranged in a CRD with 3 replications.
- 2 days after inoculation polythene bags were removed & assessment done.
- Disease incidence was taken once at 7DAI by counting No. of diseased plants expressing it as a percentage of total plants in three pots.
- Disease severity was determined by percentage of diseased leaves per plant.
- All data was subjected to statistical analysis using ANOVA and means separated using LSD.

# RESULTS

## Severity:

- For spraying method, at 7DAI, 14DAI & 21DAI there was no significant difference btw 11 and 18 DAS. Also plants at these ages had higher disease severity.



**Anthracnose severity on varied ages of Common Bean inoculated by spraying.**

<b>Treatment</b>	<b>Sampling Period</b>			<b>Mean Severity</b>
	<b>7 DAI</b>	<b>14 DAI</b>	<b>21 DAI</b>	
<b>11 DAS</b>	<b>60.67a</b>	<b>70.33a</b>	<b>80.67a</b>	<b>70.56 a</b>
<b>18 DAS</b>	<b>59.00a</b>	<b>68.67a</b>	<b>79.00a</b>	<b>68.89 a</b>
<b>25 DAS</b>	<b>34.33b</b>	<b>45.00b</b>	<b>58.00b</b>	<b>45.78b</b>
<b>Control</b>	<b>0.00c</b>	<b>0.00c</b>	<b>0.00c</b>	<b>0.00c</b>
<b>L. S. D</b>	<b>4.98</b>			
<b>CV(%)</b>	<b>6.4</b>			

**Data are means of three replications; means followed by the same letter (s) along the columns are not significantly different. Treatment means do not include pretreatment population data.**

- For smearing there were significant differences btw the different plant ages. Those inoculated at 11DAS recorded the highest disease severity, followed by 18 and 25 DAS respectively.

**Anthracnose severity on varied ages of Common Bean inoculated by smearing.**

<b>Treatments</b>	<b>Sampling Period</b>			<b>Mean Severity</b>
	<b>7 DAI</b>	<b>14 DAI</b>	<b>21 DAI</b>	
<b>11 DAS</b>	<b>55.33a</b>	<b>67.33a</b>	<b>77.33a</b>	<b>66.67a</b>
<b>18 DAS</b>	<b>48.00b</b>	<b>58.33b</b>	<b>68.67b</b>	<b>58.33b</b>
<b>25 DAS</b>	<b>26.67 c</b>	<b>36.67c</b>	<b>44.67c</b>	<b>36.00c</b>
<b>Control</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>L. S. D</b>	<b>3.55</b>			
<b>CV(%)</b>	<b>5.2</b>			

**Data are means of three replications; means followed by the same letter (s) along the columns are not significantly different. Treatment means do not include pretreatment population data.**

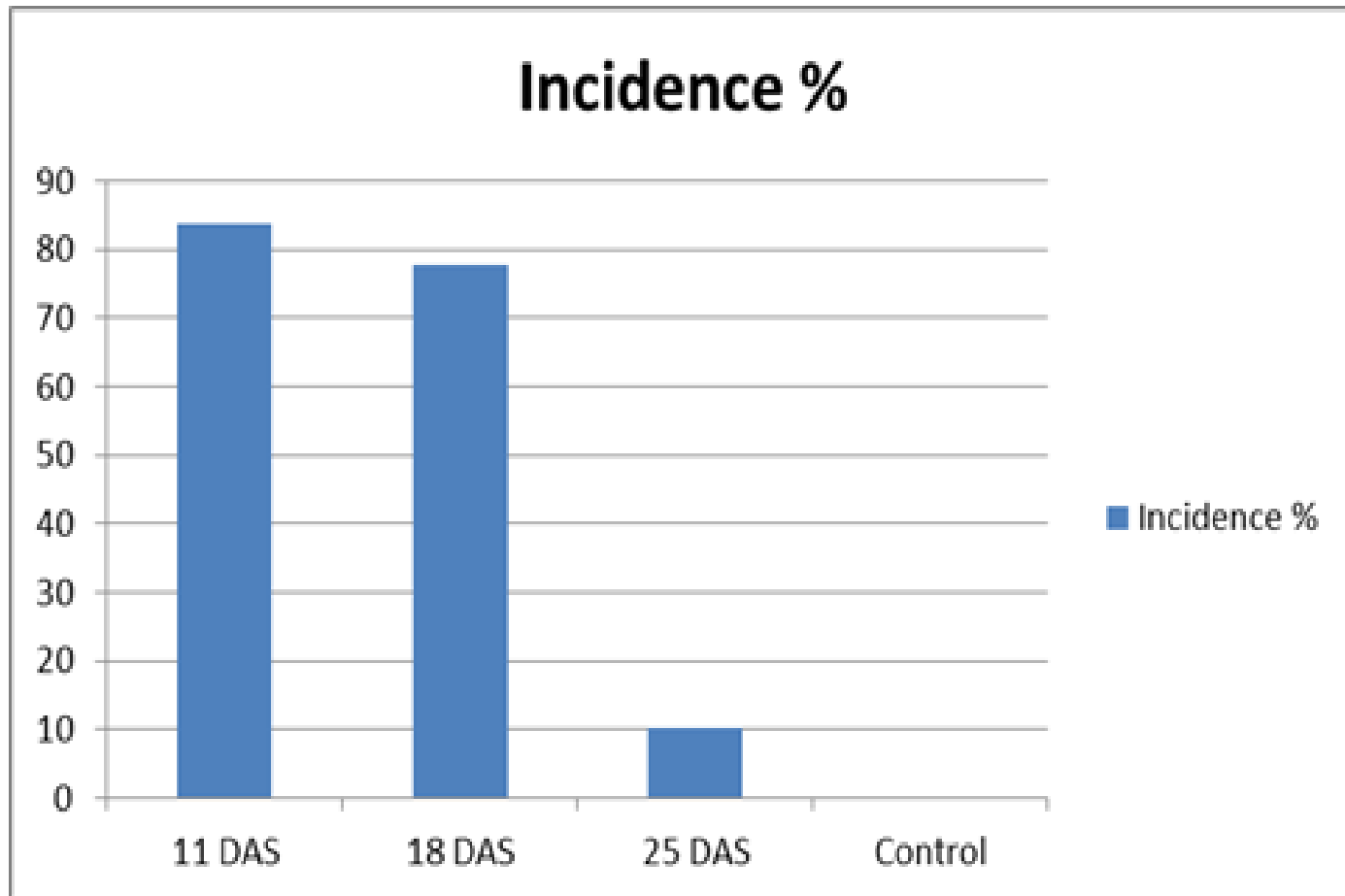
- For soil inoculation, disease severity after 7DAI & 14DAI on the ages of 11DAS & 18DAS was not significantly different. Still the age of 25DAS had the lowest severity.

**Anthracnose severity on varied ages of Common Bean inoculated using soil inoculation.**

<b>Treatment</b>	<b>Sampling Period</b>			<b>Mean Severity</b>
	<b>7 DAI</b>	<b>14 DAI</b>	<b>21 DAI</b>	
<b>11 DAS</b>	<b>9.33a</b>	<b>8.67a</b>	<b>11.00a</b>	<b>9.67a</b>
<b>18 DAS</b>	<b>8.33a</b>	<b>8.00a</b>	<b>8.33b</b>	<b>8.22b</b>
<b>25 DAS</b>	<b>5.67b</b>	<b>5.67b</b>	<b>6.33c</b>	<b>5.89c</b>
<b>Control</b>	<b>0.00c</b>	<b>0.00c</b>	<b>0.00d</b>	<b>0.00d</b>
<b>L. S. D</b>	<b>1.06</b>			
<b>CV(%)</b>	<b>10.5</b>			

**Data are means of three replications; means followed by the same letter (s) along the columns are not significantly different. Treatment means do not include pretreatment population data.**

# Incidence:



# DISCUSSION

- Age of plant played a significant role in disease infection.
- It was observed that the younger the plant the more susceptible to infection for all inoculation methods.
- This agrees with Agrios (2005) who reported that plant age is important in disease infection and young plants are more susceptible.
- Age also affects development of an infection. According to Shukla and Chand (1975) they reported that susceptibility on younger leaves could be attributed to more stomata, higher N and moisture content than in older leaves.

- Also as plants get older, the tissues become lignified therefore making it difficult for pathogen to penetrate into tissue.



# CONCLUSION AND RECOMMENDATION

- From the study it can be concluded that anthracnose infection is high at younger stages of plant growth under favourable conditions.
- Therefore I do recommend that control measures be directed at that stage in order to manage further disease progress.

**THANK YOU**