

631.4

G116F

2000

RELATIONSHIP OF ALTITUDE, SOIL pH, AND POPULATION DENSITY  
OF FUSARIUM SPECIES IN SELECTED TOWNS OF CAVITE

THESIS

FLOREDELINA REYNOSO GARAY

Department of Crop Protection  
CAVITE STATE UNIVERSITY  
Indang, Cavite

March 2000



*C*  
RELATIONSHIP OF ALTITUDE, SOIL pH AND POPULATION DENSITY OF  
*FUSARIUM* SPECIES IN SELECTED TOWNS OF CAVITE

Undergraduate Thesis  
Submitted to the Faculty of the  
Cavite State University  
Indang, Cavite

In partial fulfillment  
of the requirements for the degree of  
Bachelor of Science in Agriculture  
(Major in Crop Protection)



*Relationship of altitude, soil PH and  
population density of fusarium species in*  
631.4 G16 2000  
T-2036

FLORDELINA R. GARAY  
March 2000

## ABSTRACT

GARAY, FLORDELINA REYNOSO, Cavite State University, Indang, Cavite. March 2000. "Relationship of Altitude, Soil pH and Population Density of *Fusarium* Species in Selected Towns of Cavite". Adviser: Dr. Adelaida E. Sangalang.

*Fusarium* species were isolated from soil samples obtained at altitudes 0-80m, 81m-290m, 291m-500m and 501m-1000m above sea level. Six species of *Fusarium* were isolated namely; *F. oxysporum*, *F. solani*, *F. equiseti*, *F. semitectum*, *F. moniliforme* and *F. proliferatum*.

The most abundant species isolated from all the samples were *F. oxysporum* and *F. solani* both at higher and lower elevation. *Fusarium moniliforme* and *F. proliferatum* were not isolated at 500 m altitude.

The population density of *F. solani* and *F. oxysporum* were higher in most acidic soil.

Based on the frequency of isolates *F. solani* and *F. oxysporum* were found in all soil samples of all altitudes. *Fusarium equiseti* and *F. semitectum* were found in 83.33 % of all soil samples. *Fusarium moniliforme* and *F. proliferatum* were found in 33.33% and 49.99% in all soil samples of all altitudes respectively.

Population density of different *Fusarium* species was highly correlated with altitude. *Fusarium moniliforme* was found highly correlated with lower altitude. *Fusarium equiseti* was found with the least number of isolates compared with the other four *Fusarium* species. *Fusarium oxysporum* and *F. solani* were found with the highest number of isolates in all soil samples of all altitudes.

## TABLE OF CONTENTS

	Page
BIOGRAPHICAL DATA	iii
ACKNOWLEDGMENTS	iv
ABSTRACT	vi
LIST OF TABLES	ix
LIST OF FIGURES	x
LIST OF APPENDIX FIGURES	xi
LIST OF APPENDIX TABLES	xii
INTRODUCTION	1
Importance of the Study	2
Objectives of the Study	2
Scope and Limitation of the Study	3
Time and Place of the Study	3
REVIEW OF RELATED LITERATURE	4
MATERIALS AND METHODS	8
Preparation of Media	8
Sampling Sites	9
Sampling Procedure	12
Determination of Soil pH	12
Identification of <i>Fusarium</i> Species	13

RESULTS AND DISCUSSION	15
SUMMARY, CONCLUSION AND RECOMMENDATION	24
Summary	24
Conclusion	24
Recommendation	25
LITERATURE CITED	26
APPENDICES	29

## LIST OF TABLES

Table		Page
1	The pH of soil collected at different altitudes from selected towns of Cavite	10
2	Population density of <i>Fusarium</i> species in the 12 sampling sites at different altitudes	16
3	Frequency of <i>Fusarium</i> species isolated at different altitudes from selected towns of Cavite	17
4	Relationship of population density of different <i>Fusarium</i> species to pH and altitude	20

## LIST OF FIGURES

Figure		Page
1	Map of Cavite showing the location of the sampling areas	11
2	Relationship between population density of the different <i>Fusarium</i> species and pH in different sampling sites	19
3	Relationship between population density of different <i>Fusarium</i> species and altitude in different sampling sites	22

## LIST OF APPENDIX FIGURES

Appendix Figure		Page
1	The author while collecting the soil samples	30
2	Photomicrograph showing the formation of (a) macroconidia and (b) microconidia in false head of <i>Fusarium solani</i> on CLA	31
3	Photomicrograph showing the formation of (a) macroconidia and (b) microconidia in false head of <i>Fusarium oxysporum</i> on CLA	32
4	Photomicrograph showing the formation of (a) macroconidia and (b) hyphae of <i>Fusarium equiseti</i> on CLA	33
5	Photomicrograph showing the formation of (a) macroconidia and (b) microconidia and rabbit shaped appearance of <i>Fusarium semitectum</i> on CLA	34
6	Photomicrograph showing the formation of (a) macroconidia and (b) and long chain of microconidia of <i>Fusarium moniliforme</i> on CLA	35
7	Photomicrograph showing the formation of (a) macroconidia and (b) microconidia in false head of <i>Fusarium proliferatum</i> on CLA	36



## LIST OF APPENDIX TABLES

Appendix Table	Page
1      Number of isolates of various <i>Fusarium</i> species from different soil samples from different altitudes	37
2      Relative density of <i>Fusarium</i> species from soil at different altitude from selected towns of Cavite	38

# RELATIONSHIP OF ALTITUDE, SOIL pH AND POPULATION DENSITY OF *FUSARIUM* SPECIES IN SELECTED TOWNS OF CAVITE

Flordelina R. Garay

---

A thesis manuscript presented to the Faculty of the Department of Crop Protection, College of Agriculture, Forestry, Environment and Natural Resources, Cavite State University, Indang, Cavite in partial fulfillment of the requirements for the degree of Bachelor of Science in Agriculture (major in Crop Protection) with Contribution No. BSA-2000-02-021. Prepared under the supervision of Dr. Adelaida E. Sangalang.

---

## INTRODUCTION

The genus *Fusarium* is one of the most economically important genera of fungi. It includes many pathogenic species which cause a wide range of plant diseases (Nelson *et al.*, 1981). The genus has a widespread distribution. Its representatives occur in all major agro-climatic regions of the world (Burgess 1981). Some species of *Fusarium* like *F. oxysporum*, *F. solani*, and *F. roseum* are the most frequently reported species from grasslands in general and from individual types of grasslands (Ebbels, 1974). *Fusarium* species are prominent and characteristic members of native grassland and prairie communities. The worldwide distribution of *Fusarium* species is reflected in its occurrence over a wide range of soil pH. They are very common in alkaline to neutral calcareous soils and acidic soils (Warcup 1957).