

September 2010

Submitted on behalf of  
the No-Till Club of KwaZulu-Natal

THE RELATIVE IMPORTANCE OF FUNGI FREQUENTLY ASSOCIATED WITH  
DISEASED MAIZE CROWNS AND ROOTS AS SOILBORNE PATHOGENS OF MAIZE  
AND ROTATION CROPS, AND THE INTERACTION BETWEEN FUNGAL  
PATHOGENS AND PARASITIC NEMATODES ON MAIZE

#### FACET 4

THE ROLE AND IMPORTANCE OF SOILBORNE DISEASES AND MICROBIAL  
DIVERSITY AND ACTIVITY IN MAIZE PRODUCTION AS AFFECTED BY CROP  
ROTATIONS, BIOCONTROL PRODUCTS, CHEMICAL BIOCIDES, SOIL  
DISTURBANCE AND RESIDUE COVER

#### FACET 1

THE ROLE AND IMPORTANCE OF SOILBORNE  
DISEASES AND THEIR INTEGRATED  
MANAGEMENT IN SUSTAINABLE MAIZE  
PRODUCTION

Final Report

ANNEXURE FF

# LIST OF CONTENTS

## THE ROLE AND IMPORTANCE OF SOILBORNE DISEASES AND THEIR INTEGRATED MANAGEMENT IN SUSTAINABLE MAIZE PRODUCTION

Description Page

**FACT I**

THE ROLE AND IMPORTANCE OF SOILBORNE DISEASES AND MICROBIAL DIVERSITY AND ACTIVITY IN MAIZE PRODUCTION AS AFFECTED BY CROP ROTATIONS, BIOCONTROL PRODUCTS, CHEMICAL BIOCIDES, SOIL DISTURBANCE AND RESIDUE COVER

EXECUTIVE SUMMARY ..... 1

INTRODUCTION ..... 7

OBJECTIVES ..... 10

MATERIALS AND METHODS ..... 10

STATISTICAL ANALYSES ..... 17

RESULTS AND DISCUSSION ..... 18

General information on parameters measured ..... 18

Crown and root rot severity ..... 19

Fungi associated with crowns and roots ..... 19

Nematodes ..... 23

Microbial diversity and activity in soil ..... 30

ROTATIONAL EFFECTS ..... 30

Growth, plant and soil analysis ..... 30

Crown and root rots ..... 40

Fungi associated with crowns and roots ..... 42

Nematodes ..... 46

Microbial diversity and activity in soil ..... 46

85	.....	WHEAT STRAW COVER EFFECTS
84	.....	TILLAGE EFFECTS
83	.....	CHEMICAL BIOCIDES EFFECTS
83	.....	BIOCONTROL AGENT EFFECTS
82	.....	ROTATIONAL EFFECTS
82	.....	SUMMARY AND CONCLUSIONS
79	.....	Microbial diversity and activity in soil
78	.....	Nematodes
77	.....	Fungi associated with crowns and roots
75	.....	Crown and root rots
68	.....	Growth, plant and soil analysis
67	.....	WHEAT STRAW COVER EFFECTS
64	.....	Microbial diversity and activity in soil
63	.....	Nematodes
62	.....	Fungi associated with crowns and roots
61	.....	Crown and root rots
60	.....	Growth, plant and soil analysis
60	.....	TILLAGE EFFECTS
58	.....	Microbial diversity and activity in soil
57	.....	Nematodes
56	.....	Fungi associated with crowns and roots
56	.....	Crown and root rots
55	.....	Growth, plant and soil analysis
55	.....	CHEMICAL BIOCIDES EFFECTS
52	.....	Microbial diversity and activity in soil
50	.....	Nematodes
50	.....	Fungi associated with crowns and roots
50	.....	Crown and root rots
49	.....	Growth, plant and soil analysis
49	.....	BIOCONTROL AGENT EFFECTS

Description

Page

Page	Description
92	THE RELATIVE IMPORTANCE OF FUNGI FREQUENTLY ASSOCIATED WITH DISEASED MAIZE CROWNS AND ROOTS AS SOILBORNE PATHOGENS OF MAIZE AND ROTATION CROPS, AND THE INTERACTION BETWEEN FUNGAL PATHOGENS AND PARASITIC NEMATODES ON MAIZE
92	EXECUTIVE SUMMARY
93	INTRODUCTION
95	MATERIALS AND METHODS
96	RESULTS
113	Summary of pathogenicity tests
113	CONCLUSIONS
116	REFERENCES