THE EFFECT OF PLANT PARASITIC NEMATODES ON POST HARVEST QUALITY OF GROUNDNUTS (*Arachis Hypogaea*)

MARDHIAH BINTI M. HARKAM

FACULTY OF AGROTECHNOLOGY AND FOOD SCIENCE
UNIVERSITI SULTAN ZAINAL ABIDIN

2010

The effects of plant parasitic nematodes on post harvest quality of groundnuts (Arachis Hypogaea) / Marahaini M. Markam.

THE EFFECT OF PLANT PARASITIC NEMATODES ON POST HARVEST QUALITY OF GROUNDNUTS (*Arachis Hypogaea*)

By

Marahaini binti M. Markam

Research Report submitted in partial fulfillment of

the requirements for the degree of

Bachelor of Science in Agrotechnology (Post Harvest Technology)

DEPARTMENT OF AGROTECHNOLOGY

FACULTY OF AGROTECHNOLOGY AND FOOD SCIENCE

UNIVERSITI MALAYSIA TERENGGANU

2010

ENDORSEMENT

The project report entitled **The Effects of Plant Parasitic Nematodes On Postharvest Quality of Groundnuts (*Arachis hypogea*)** by **Marahaini binti M. Markam** , Matric No **UK15413** has been reviewed and corrections have been made according to the recommendations by examiners. This report is submitted to the Department of Agrotechnology in partial fulfillment of the requirement of the degree of Bachelor of Science in Agrotechnology (Post Harvest Technology), Faculty of Agrotechnology and Food Science, Universiti Malaysia Terengganu.

.....

(NAME)
Main supervisor
-Stamp-

PROF. DR. ABDUL RAHMAN ABD. RAZAK
Lecturer
Department of Agrotechnology
Faculty of Agrotechnology and Food Science
Universiti Malaysia Terengganu
21030 Kuala Terengganu.

Date:

DECLARATION

I hereby declare that the work in this thesis is my own except for quotations and summaries which have been duly acknowledged.

Signature : .....

Name : Marahaini binti M. Markam

Matric No. : UK 15413

Date : 4 April 2010

ACKNOWLEDGEMENT

Since I am solely responsible for my Final Year Project, I want to thank you several people for their assistance. This includes first, my supervisor, Prof. Dr. Abdul Rahman bin Abdul Razak, who is willing to spend his time and never hesitated to guide me and advise me from time to time. I am grateful to him for many helpful discussions and ideas from which I always benefit and have leaded this project from its conception to its completion.

Besides, I thank all the lab assistants of Post Harvest Laboratory and all the officers in UMT's greenhouse for their commitment and assistance which have helped me to complete this project.

Throughout the process in completing this project, I have always been able to count on the continuing support and friendship of my course mates and friends. I express my sincere gratitude for their friendship and for all their help and encouragement.

I thank my family for always being there through my difficult times. Their inspired support has supported me in developing this project and motivated me to higher achievements.

Last but not least, I want to acknowledge the efforts of Universiti Malaysia Terengganu in managing the flawlessness of this Final Year Project for giving us such a good experience which is beneficial for our future.

ABSTRACT

The objective of this study is to investigate the effects of plant parasitic nematode towards groundnut plants and production. This is due to the problem in kenaf plantation by Lembaga Tembakau Negara (LTN) in Telaga Papan, Merang, Terengganu where plant parasitic nematode had been a serious constraint of the field production. The nematode infected soil in the kenaf field was sampled and used for two tests. The first test was bioassay with tomato and kenaf plants where galls and egg masses caused by nematode was found respectively in the plants roots. The number of galls and egg masses occurred in kenaf roots was higher compared to the tomato. The second test was conducted for groundnut plantation where two sets of groundnut plantations were prepared in two separate culverts. One of them filled with sample soil and the other with the control soil. Both culverts were planted with 15 groundnuts variety menglambu. The growth of the plants from sample soil seemed stunted with yellowing leaves and chlorosis compared to the plants from control soil which is healthier. After staining with boiling Fuschin Acid, the observation under compound microscope showed the presence of plant parasitic nematode in the roots of the groundnut plants from sample soil. The yield production by the plants in nematode infected soil, which is estimated by the weight and number of pods produce by plants was lower than the plant production from control soil. The total weight produced from sample soil is 26%, lower than the production in control soil which is 74%. The pods from sample soil also showed lower quality in aspect of colour and sizes and some lesions were observed.

ABSTRAK

Objektif kajian ini adalah untuk mengkaji kesan nematoda perosak tanaman ke atas tanaman dan hasil tanaman kacang tanah. Ini adalah berikutan dengan masalah yang dihadapi oleh penanaman kenaf oleh Lembaga Tembakau Negara (LTN) di mana nematoda perosak tanaman telah menjadi penghalang terhadap hasil tanaman. Sampel tanah telah diambil di ladang penanaman kenaf tersebut untuk digunakan terhadap dua ujikaji. Ujikaji pertama ialah bioassay terhadap tanaman tomato dan kenaf di mana pembengkakkan dan telur didapati pada bahagian akar kedua-dua tanaman tersebut. Bilangan pembengkakkan dan telur pada akar pokok kenaf lebih tinggi berbanding pada akar pokok tomato. Ujikaji kedua pula diadakan pada tanaman kacang tanah di mana dua set penanaman dilakukan pada dua bekas penanaman yang berasingan. Satu daripadanya diisi dengan tanah kawalan. Kedua-duanya ditanam dengan 15 pokok kacang tanah variety menglambu. Tanaman pada tanah sample menunjukkan pertumbuhan yang terbantut beserta dengan kekuningan dan klorosis pada daun berbanding dengan pokok dari tanah kawalan yang lebih sihat. Selepas pewarnaan dengan larutan asid Fuschin mendidih, pemerhatian di bawah mikroskop menunjukkan kehadiran nematoda perosak tanaman di dalam akar pokok dari tanah sampel. Hasil tanaman pokok dari tanah sampel, yang dikaji dari segi jumlah berat dan bilangan biji kacang dihasilkan adalah kurang daripada hasil tanaman dari tanah kawalan. Jumlah berat hasil tanaman dari tanah sampel ialah 26% jauh lebih rendah dari hasil tanaman tanah kawalan iaitu 76%. Biji kacang yang dihasilkan dari tanah sampel juga menunjukkan kualiti yang rendah dari segi warna, saiz, dan juga kehadiran luka-luka pada kulit kacang.