ACKNOWLEDGEMENT

I take this privilege to express my deep gratitude and profound indebtedness to my esteemed Supervisor Dr Jaspal Singh, Professor of Agronomy, Khalsa College of Veterinary & Animal Sciences, Amritsar for his scholarly guidance, perseverance, invaluable suggestions and inspiration provided to me at various phases of research work and successful completion of this dissertation in this form.

I wish to express my gratitude and fervent thanks to Dr JS Bal, Dean, Faculty of Agriculture and Forestry, Guru Nanak Dev University, Amritsar for providing me administrative help and timely guidance.

I am extremely thankful to Dr Swaran Singh Saini, and Dr Sukhraj Singh Dhillon (Retd. Agricultural Scientists) from the Department of Agronomy, PAU, Ludhiana for their meticulous guidance, candid discussion and benevolent criticism during my research investigation.

My thanks are also due to Dr BS Gill, Dr. US Tiwana and Dr. Kulbir Singh Saini from the Department of Agronomy, Dr Dalwindwer Jit Singh, Dr. Joginder Singh Manchanda, Dr Varinderpal Singh and Dr. Jagdip Singh from Department of Soils, PAU, Ludhiana for providing me lab facilities for essential oil extraction and plant analysis and advising me on nitrogen studies. Dr. JS Chinna from FASS, Gurdaspur is also acknowledged for assisting me on economic analysis.

Appreciative thanks are extended to Dr JK Dhar, Chief Scientist and Head, Quality Control and Quality Assurance IIIM (CSIR), Jammu and Dr RS Sidhu, Dean, College of Basic Sciences and Humanities, PAU, Ludhiana for the quality analysis of mentha essential oil. My sincere thanks are equally due to Dr RK Mahey and Dr Surjit Singh Senior Scientists from Department of Agronomy, PAU, Ludhiana for suggesting me valuable tips during their visits to my research experiment.

I am really grateful to my younger friend Dr Satpal Singh, Assistant Agronomist and his wife Dr Ruma Devi, District Extension Specialist (Vegetables) from Regional Research Station, PAU, Gurdaspur for their unbound help, moral support and motivation during the writing of this manuscript. They deserve appreciation from the core of my heart.

Innovative farmer S. Yudhvir Singh of village Dalla, District Gurdaspur is highly applauded for allowing me to conduct research experiments at his field and providing me all the inputs and assistance for the noble cause of farming community. Retd. Prof. Hari Singh from village Rampur District Kapurthala is also acknowledged for the arrangement of mentha suckers, extraction and marketing of mentha oil.

Finally, I bow my head to my respected parents for their untold sacrifice and blessing of whom I could achieve all this. Words are inadequate to express my special thanks to my caring wife Komal, daughter Sugandha and son Rohineesh for their patience and love who despite of their suffering, during my study period, made the environment, cheerful and healthy. My younger brother Navjesh Chopra, his wife Rajni and children Riya and Parteek deserve appreciation for their regard and making me feel at home by providing all kind of help while doing lab work.

Above all, I pay my sincere offering to the Almighty God with whose grace I have been able to complete my research project and add a new dimension to my life

(Sumesh Chopra)