ACKNOWLEDGEMENTS

Apart from the efforts of research student, the success of any thesis work depends largely on the encouragement and guidelines of many others. I take this opportunity to express my sincere gratitude to all those people who have been instrumental in the successful completion of this thesis. It gives me immense pleasure to express my heart-felt gratitude to all those who have been there all the while, during my research period extending their help in every possible way in accomplishing the course.

In the first outset, with all my sincerity and high regards, I express my deep sense of gratitude to my research guide Prof. Garge Sandhya Kiran, Head, Department of Botany, for giving me the opportunity of working with her at Ecophysiology and RS-GIS Laboratory as well as for her meticulous guidance, constant encouragement, inspiring discussions and valuable suggestions throughout this investigation that helped me to accomplish this thesis. Under her supervision, I successfully overcame many difficulties and learned a lot. She used to review my thesis progress and give her valuable suggestions. Her words always inspired me and bring me to higher level of thinking. I could not have imagined having a better research guide for my Ph.D study.

I take this opportunity to sincerely acknowledge my university, The Maharaja Sayajirao University of Baroda for providing financial assistance in the form of University Research Fellowship which buttressed me to perform my work comfortably. My sincere thanks are due to Prof. A.C.Sharma, Dean, Faculty of Science and Prof. Nikhil Desai, Ex.Dean, Faculty of Science, for providing me the research facilities. I would like to gratefully acknowledge Prof. Arun Arya, Ex.Head, Department of Botany, Prof. M. Daniel, Prof. Vinay M. Raole, Prof. Aruna Joshi and other senior teachers of

the department for their constant motivations, encouragement and advices in my work. Cooperation given by all non-teaching staff of my department during my research tenure is thankfully accredited.

The road to my Ph.D started with training at SAC, ISRO, Ahmedabad. I take this opportunity to say heartful thanks to Dr. Parul Patel, Scientist, SAC, ISRO for providing very good training on RISAT and building confidence in me to start my work on microwave remote sensing. I am also extremely indebted to Dr. S.S.Manjul, Scientist, SAC, ISRO for all his guidance and teachings and specially for giving me training in 'Spectral studies of crops using two different spectroradiometers'. I gratefully acknowledge Prof. R.G. Kothari, Dr. Dipti Oza, Prof. Rakesh Srivastava, Prof. V. Kalamkar, Dr. Prakash Samnani and other teachers for sharing their valuable time and knowledge during my Ph.D course work. It's my pleasure to acknowledge Dr. T.M.V.Suryanarayana, Assistant Professor, Department of Mechanical Engineering, Faculty of Technology and Engineering for his valuable suggestions and generous help in my work.

I extend my thanks to Agriculture Department, District Panchayat, Vadodara for providing me necessary information on different agricultural crops. I am very grateful to farmers who provided me a great help during my field visits. My thanks are due to Shailesh bhai, Bhailal bhai and Vikram, persons from Botanical garden, Department of Botany, for providing all their help in my experiment at wirehouse.

I wish to record my special thanks to my many student colleagues and labmates for providing a stimulating and fun filled environment. My thanks go in particular to Ms. Kinnary Shah with whom I entered the laboratory and started my work. Thanks for

her friendship and moral support. I am ever indebted to Ms. Alpana Revdandekar and I

admire her distinguished helping nature. Dr. Preeti Baria for her constant support,

motivation and help, deserves a special mention here. My special appreciation goes to

Dr. Ashwini Mudaliar for her encouragement and many rounds of discussions with her

on my research helped me a lot. I am indebted to Dr. Usha Joshi for her valuable help,

discussions and support. I am also thankful to Ms. Deepika Singh for accompanying me

during my field studies. I very much appreciate Mr. Jayrajsinh Jadeja for his enthusiasm

and willingness to help me in my inversion problems. I wish to thank all my friends for

their love, care and moral support.

Last but not the least, the prayers & solace afforded by my parents Manjit Singh

Malhi and Harjinder Kaur Malhi, brother Talvinder, sister Baljinder and other well

wishers are greatly appreciated. I would like to pay high regards to all of them for their

sincere encouragement, inspiration, patience and understanding, unconditional support

both financially and emotionally throughout my degree and lifting me uphill this phase

of life. I owe everything to them.

Above all, my offering of huge thanks from the depth of my heart to the

Almighty without whose blessings my research work would not have been fructified.

Thank God for the wisdom and perseverance that he has been bestowed upon me during

entire tenure of my research, and indeed, throughout my life.

Malhi Ramandeep Kaur M.

Department of Botany

Faculty of Science

The Maharaja Sayajirao University of Baroda

Vadodara 390 002. Gujarat (India)

Date: 21/01/2015

V