Acknowledgments

First of all, I deeply praise God for his blessing during my hard time and His guidance to finish my PhD program. I would like to express my gratitude to my supervisor Professor Elke Pawelzik as well as my co-supervisor Professor Nobert Claassen. The completion of this thesis would not have been possible without the support of my colleagues, friends and family.

I am much indebted to Professor Elke Pawelzik for her familiar acceptance since the beginning of my study, for her confidence on me to do this project and to develop my own ideas, for valuable scientific comments and discussion, and for the support after DAAD sponsorship. I would like to express my grateful acknowledge to Professor Nobert Claassen for his willingness to be the coreferee, suggestions, valuable discussions, and correction in particular plant nutrition part in my thesis. Hermann Ernst from Lorenz Bahlsen Snack World GmbH, Gerhard Müller from IKEGO Hankensbüttel, and Marie-Laure Girard from Yara International GmbH, I would like to thank you as initiator in the project, for the financial of the experiment and mineral analysis, and for the valuable discussions. I would like show appreciation to Dirk Niebuhr in Hankensbüttel, Henning Olvermann in Gross Oesingen, Uwe Rodewald in Langwedel, who had grown the potato plant in their area. My deepest thanks are going to Reinhard Hilmer, Jürgen Kobbe and Hans-Dieter Vohrmann for technical assistance in the field experiment and in freeze-drying the samples, and to Marco Hanke for the HPLC analysis, Cornelia Conradt for N-Leco analysis. Dr. Anna Keutgen, Sandra Handt, Bettina Egger, Gunda Jansen, and all staffs of the Institute of Agricultural Chemistry I want to thank for being kind and helpful during my years in the institute.

Thanks to my mother, father, and sisters; this work I dedicated to you. Special thanks are going to my wife Rita Andini and my daughter Audrey Azzura Aini, who had brought more color and cheerfulness during my study.

Göttingen, 1st September 2005

Muhammad Ikhsan Sulaiman