

**Sudan University of Science and Technology  
College of Graduate Studies**



**Impact of Inorganic and Bio-Organic Fertilizers Application  
on Soil Fertility and Sugar beet (*Beta vulgaris.L*) Growth**

**تأثير تطبيق الأسمدة غير العضوية و الحيوية عضوية على خصوبة التربة و نمو  
محصول بنجر السكر**

**A thesis Submitted in Partial Fulfillment for the Requirements of  
Ph.D. Degree in Soil Science**

**By**

**Wael Awad Marajan Mohammed**

**BSc. Upper Nile University 2001**

**MSc. Gezira University 2008**

**Supervisor: Prof. Mohamed Ahmed Elhag Hadad**

**Department of Soil and Water Science**

**College of Agricultural Studies**

**Sudan University of Science and Technology**

**2018**

# *DEDICATION*

*To my family*

*Parents and brothers*

*To my small family*

*My wife*

*My daughters*

*To my friends*

*To everyone who helped me*

## *ACKNOWLEDGEMENTS*

I would like to express my sincere appreciation and gratitude to Prof. Mohamed Ahmed Elhag Hadad my major supervisor for his guidance and constructive criticism during this work.

Special thanks to Prof. Mohamed Osman Gaafer my Co-supervisor. Also my special thanks to my friend Mohammed Ahmed, lab technician in College of Natural Resources and Environmental Studies, University of Bahri, for his support and help.

I would like to express specially thanks to my brothers and sisters in department of soil and water labs, College of Agricultural Studies, Sudan University of Science and Technology for their assistance.

Special thanks to University of Bahri administration for financial support.