

LIST OF TABLES

Table 2. 1. Comparison of Radar Systems Based on Frequency, Bandwidth, and Resolution.	12
Table 2. 2. State-of-the-art review of soil thickness estimation methods. The table compares previous studies based on measurement tools, required time, scalability for large areas, destructive nature, and reported accuracy.	26
Table 4. 1. Precision and accuracy results for topsoil thickness estimation at various radar heights and measurement points. Estimation could not be performed at 10–20 cm due to undetectable surface reflections. Results were only obtained at 25 cm and 30 cm.	47
Table 4. 2. Results of topsoil thickness estimation for actual thicknesses of 30 cm, 40 cm, and 50 cm using an aluminium plate as subsurface reflector. The best performance was observed at 30 cm.	50
Table 4. 3. Estimation results from lab tests without subsurface reflectors. The setup represents field like conditions using a natural soil-floor boundary.....	53
Table 4. 4. Summary of A-scan measurement results at three field locations under weed-covered and weed-free conditions.	55
Table 4. 5. Comparison of actual and estimated topsoil thickness at 10 positions along the B-scan at Loc 1.....	62
Table 4. 6. Comparison of actual and estimated topsoil thickness at 10 positions along the B-scan at Loc 2.....	63
Appendix B. 1. Estimated Results for Height Variations and Thickness Variations.	83
Appendix B. 2. Estimated Results under Actual Conditions in Various Locations: Without Weeds.....	83
Appendix B. 3. Estimated Results under Actual Conditions in Various Locations: With Weeds.....	83
Appendix B. 4. Estimated results at each point in B-Scan Loc 3: Without Weeds.	84
Appendix B. 5. Estimated results at each point in B-Scan Loc 3: With Weeds. ..	86