

LIST OF TABLES

Table 1.1 Different kinds of remote sensing data(Elachi and Van Zyl 2006)	4
Table 1.2 Electromagnetic spectrum and some of its applications(Ulaby et al. 2014)..	8
Table 1.3 Radar frequency band and their applications (not with IEEE standards)(Sharma 1991)	9
Table 2.1 Specifications of bistatic Scatterometer system.....	36
Table 3.1 Linear regression results between bistatic scattering coefficient and soil moisture.....	54
Table 3.2 Optimization of ANN model parameters.....	57
Table 3.3 Performance indices during training.....	58
Table 3.4 Performance indices during validation	58
Table 4.1 Summary of the ground truth data with measurement dates	67
Table 4.2 Angular variation of polynomial regression results for HH-polarization....	70
Table 4.3 Angular variation of polynomial regression results for VV- polarization...	70
Table 4.4 The statistical difference between FFBPANN-I and FFBPANN-II model.	73
Table 4.5 Linear regression results between observed and FFBPANN estimated values of crop variables for three different data sets	79
Table 5.1 The measured values of crop variables of kidney bean and soil moisture content during its entire growth period of the reference crop bed.....	83
Table 5.2 Result of regression analysis between bistatic scattering coefficients and kidney bean crop variables at different incidence angles for HH- and VV- polarization	84
Table 5.3 The values of coefficients of equation (5.1) and result of regression analysis	85
Table 5.4 Values of fitting parameters of Gaussian function for kidney bean crop variables	86
Table 6.1 Wheat crop variables at its various growth stages	102
Table 6.2 Optimized ANN model parameters	106
Table 6.3 Results of regression analysis between bistatic scattering coefficients and wheat crop variables at different incidence angles for X-band at HH- polarization .	110
Table 6.4 Results of regression analysis between bistatic scattering coefficients and wheat crop variables at different incidence angles for X-band at VV- polarization	110
Table 7.1 Chickpea crop variables at its various growth stages	119
Table 7.2 Results of regression analyses between bistatic scattering coefficients and chickpea crop variables at different incidence angles for X-band at HH- polarization	122
Table 7.3 Results of regression analyses between bistatic scattering coefficients and chickpea crop variables at different incidence angles for X-band at VV-polarization	123