

Contents

1	Introduction and Basic Sensing Concepts	1
	Alexandre Escolà and Ruth Kerry	
2	Satellite Remote Sensing for Precision Agriculture	19
	David J. Mulla	
3	Sensing Crop Geometry and Structure	59
	Eduard Gregorio and Jordi Llorens	
4	Soil Sensing	93
	Viacheslav I. Adamchuk, Asim Biswas, Hsin-Hui Huang, Jonathan E. Holland, James A. Taylor, Bo Stenberg, Johanna Wetterlind, Kanika Singh, Budiman Minasny, Chris Fidelis, David Yinil, Todd Sanderson, Didier Snoeck, and Damien J. Field	
5	Sensing with Wireless Sensor Networks	133
	Vasileios Liakos and George Vellidis	
6	Sensing for Health, Vigour and Disease Detection in Row and Grain Crops	159
	David W. Franzen, Yuxin Miao, Newell R. Kitchen, James S. Schepers, and Peter C. Scharf	
7	On-Combine Sensing Techniques in Arable Crops	195
	Dan S. Long and John D. McCallum	
8	Sensing in Precision Horticulture	221
	Manuela Zude-Sasse, Elnaz Akbari, Nikos Tsoulas, Vasilis Psiroukis, Spyros Fountas, and Reza Ehsani	
9	Sensing from Unmanned Aerial Vehicles	253
	Ryan R. Jensen, Perry J. Hardin, Eduardo Galilea, José A. Martínez-Casasnovas, and Austin Hopkins	

10	Sensing for Weed Detection	275
	S. Christensen, M. Dyrmann, M. S. Laursen, R. N. Jørgensen, and J. Rasmussen	
11	Applications of Sensing to Precision Irrigation	301
	Yafit Cohen, George Vellidis, Carlos Campillo, Vasileios Liakos, Nitsan Graff, Yehoshua Saranga, John L. Snider, Jaume Casadesús, Sandra Millán, and Maria del Henar Prieto	
12	Applications of Optical Sensing of Crop Health and Vigour	333
	James A. Taylor, Evangelos Anastasiou, Spyros Fountas, Bruno Tisseyre, Jose P. Molin, Rodrigo G. Trevisan, Hongyan Chen, and Marcus Travers	
13	Applications of Sensing for Disease Detection	369
	Ana Isabel de Castro Megías, Claudia Pérez-Roncal, J. Alex Thomasson, Reza Ehsani, Ainara López-Maestresalas, Chenghai Yang, Carmen Jarén, Tianyi Wang, Curtis Cribben, Diana Marin, Thomas Isakeit, Jorge Urrestarazu, Carlos Lopez-Molina, Xiwei Wang, Robert L. Nichols, Gonzaga Santesteban, Silvia Arazuri, and José Manuel Peña	
14	Conclusions: Future Directions in Sensing for Precision Agriculture	399
	Ruth Kerry and Alexandre Escolà	
	Index	409