

Contents

1 The Nature of Soil Organic Matter and Innovative Soil Managements to Fight Global Changes and Maintain Agricultural Productivity	1
Alessandro Piccolo	
2 The Kyoto Protocol and European and Italian Regulations in Agriculture	21
Davide Savy, Antonio Nebbioso, Rocío Dánica Cónedor, and Marina Vitullo	
3 Field Plots and Crop Yields Under Innovative Methods of Carbon Sequestration in Soil	39
Carlo Grignani, Francesco Alluvione, Chiara Bertora, Laura Zavattaro, Massimo Fagnano, Nunzio Fiorentino, Fabrizio Quaglietta Chiarandà, Mariana Amato, Francesco Lupo, and Rocco Bochicchio	
4 Carbon Sequestration in Soils by Hydrophobic Protection and In Situ Catalyzed Photo-Polymerization of Soil Organic Matter (SOM): Chemical and Physical-Chemical Aspects of SOM in Field Plots	61
Riccardo Spaccini and Alessandro Piccolo	
5 The Stable Isotopes Approach to Study C and N Sequestration Processes in a Plant–Soil System	107
Giuseppe Celano, Francesco Alluvione, Mostafa Abdel Aziz Ali Mohamed, and Riccardo Spaccini	
6 Impact of Innovative Agricultural Practices of Carbon Sequestration on Soil Microbial Community	145
Valeria Ventorino, Anna De Marco, Olimpia Pepe, Amalia Virzo De Santo, and Giancarlo Moschetti	

7	Effects of Methods of Carbon Sequestration in Soil on Biochemical Indicators of Soil Quality	179
	Edoardo Puglisi and Marco Trevisan	
8	Biological and Biotechnological Evaluation of Carbon Dynamics in Field Experiments	209
	Carmine Crecchio, Silvia Pascazio, and Pacifico Ruggiero	
9	Measurements of CO₂ and N₂O Emissions in the Agricultural Field Experiments of the MESCOSAGR Project	229
	Angelo Fierro and Annachiara Forte	
10	Effects of Carbon Sequestration Methods on Soil Respiration and Root Systems in Microcosm Experiments and In Vitro Studies	261
	Antonio Gelsomino, Maria Rosaria Panuccio, Agostino Sorgonà, Maria Rosa Abenavoli, and Maurizio Badiani	
11	New Modeling Approach to Describe and Predict Carbon Sequestration Dynamics in Agricultural Soils	291
	Stefano Mazzoleni, Giuliano Bonanomi, Francesco Giannino, Guido Incerti, Daniela Piermatteo, Riccardo Spaccini, and Alessandro Piccolo	