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Nota di contenuto	Plant Roots Growth, Activity and Interaction with Soils; Contents; Preface; 1. Plants, Roots and the Soil; 1.1 The evolution of roots; 1.2 Functional interdependence of roots and shoots; 1.2.1 Balanced growth of roots and shoots; 1.2.2 Communication between roots and shoots; 1.3 Roots and the soil; 1.3.1 The root-soil interface; 1.3.2 Root-induced soil processes; 2. Roots and the Architecture of Root Systems; 2.1 Nomenclature and types of root; 2.2 Root structure; 2.2.1 Primary structure; 2.2.2 Secondary structure; 2.3 Extension and branching; 2.3.1 Extension; 2.3.2 Branching 2.3.3 Root hairs 2.4 The root tip; 2.4.1 The root cap and border cells; 2.4.2 Mucilage; 2.5 Architecture of root systems; 3. Development and Growth of Root Systems; 3.1 Measurement of root systems; 3.1.1 Washed soil cores; 3.1.2 Rhizotrons and minirhizotrons; 3.1.3 Other techniques; 3.2 Root system development; 3.3 Size and distribution of root systems; 3.3.1 Mass and length; 3.3.2 Depth of rooting; 3.3.3 Distribution of roots; 3.4 Root:shoot allocation of dry matter; 3.5 Root longevity and turnover; 3.6 Modelling of root systems; 4. The Functioning Root System; 4.1 Root anchorage

4.1.1 Uprooting; 4.1.2 Overturning; 4.2 Water uptake; 4.2.1 The concept of water potential; 4.2.2 The soil-plant-atmosphere continuum; 4.2.3 Water uptake by plant root systems; 4.3 Nutrient uptake; 4.3.1 Nutrient requirements of plants and the availability of nutrients; 4.3.2 Nutrient movement in soil solution; 4.3.3 Nutrient uptake and movement across the root; 4.3.4 Nutrient uptake by root systems; 5. Roots and the Physico-Chemical Environment; 5.1 Temperature; 5.1.1 Root development and growth; 5.1.2 Root orientation; 5.1.3 Other root functions; 5.2 Gravity and other tropistic responses
6.1.1 Root-rhizosphere communication; 6.1.2 Interactions with bacteria; 6.1.3 Interactions with fungi; 6.1.4 Interactions with protozoa; 6.1.5 Interactions with nematodes and mesofauna; 6.2 Symbiotic associations; 6.2.1 Rhizobia and N fixation; 6.2.2 Mycorrhizas; 6.3 Root pathogens and parasitic associations; 6.3.1 Fungal diseases; 6.3.2 Nematodes; 6.3.3 Parasitic weeds; 6.4 Root herbivory by insects; 7. The Rhizosphere; 7.1 Rhizodeposition; 7.1.1 Quantities of rhizodeposits; 7.1.2 Composition of rhizodeposits; 7.1.3 Nitrogen rhizodeposits; 7.2 Chemical changes affecting nutrient acquisition
7.2.1 Rhizosphere composition and replenishment

Sommario/riassunto

The root system is a vital part of the plant and therefore understanding roots and their functioning is key to agricultural, plant and soil scientists. In Plant Roots Professor Peter Gregory brings together recent developments in techniques and an improved understanding of plant and soil interactions to present a comprehensive look at this important relationship, covering: Root response to, and modification of, soils
Genetic control of roots' responses to the environment Use of modern techniques in imaging, molecular biology and analytical chemistry
