Mineral Nutrition (S. Cesco)

Learning outcomes - The course aims at improving the knowledge about the mechanisms underlying the soil availability, root uptake, translocation and allocation of mineral nutrients in fruit tree crops. This knowledge will allow to manage the fertilization practices in orchards according to the physiological needs of plants.

Course contents – General aspects of ion uptake mechanisms of plants: short (roots) and long (xylem and phloem) transport and allocation. Ion uptake by leaves (mechanisms underlying foliar fertilization). Forms and availability in the soil-plant system, plant contents, metabolic functions, symptoms of deficiency/excess, fertilizers and their field application of macro (N, P, K, Ca, Mg) and micronutrients (B, Zn, Fe, Mn, Cu) in relation to a sustainable and efficient use of the source. Examples of biofortification (Si, Se, Ni) and nutrient interactions (e.g. N vs Fe, N vs S, Fe vs S).

Teaching methods: The course consists of lectures (18 hours frontal lessons) during which the Professor presents the different topics. Practical lessons and laboratory activities (12 hours excursions/laboratory) conducted by the Teacher and the Teaching Assistants are also foreseen.


Assessment methods: Assessment (at the end of the course) is conducted via oral examination that includes a) questions to assess the knowledge and understanding of the course topics and b) questions designed to assess the ability to transfer these skills to case studies of crop production. Space will also be dedicated to the evaluation of the ability to rework the experience of the laboratory.

Attribution of a single final mark awarded on the basis of the following criteria: the clarity of the response, the ability to summarize, evaluate, and establish relationships between topics, the independence of judgment, the ability to rework.

Teaching tools Course topics will be presented using Power Point presentations and at the end of a single lesson a paper copy will be distributed directly to students.