

Constructed wetland systems for agricultural wastewater treatment

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ETS Ingeniería Agronómica.
Aula 8C

Program:

31 Enero 2023 (15:30 – 17:30)

Topics: Types of agricultural wastewaters. Definitions and regulatory frameworks. Conventional systems for wastewater treatment and natural treatment systems. Phytoremediation, an overview. Agricultural water management and phytoremediation of wastewater. Indices of environmental quality and pollutant removal efficiency.

01 Febrero (15.30 – 17.30)

The main phytoremediation systems for the treatment of wastewater. Wetlands and constructed wetlands. Extensive phytoremediation. Case studies and scientific reports.

03 Febrero (15:30 – 17:30)

Constructed wetlands for pollution control. Free Water Surface system (FWS). Horizontal subsurface flow system. Vertical subsurface flow system. The phytoremediation 2.0. French vertical flow system. Case studies and scientific reports.

06 Febrero (15:30 – 17:30)

Plant species for constructed wetland systems: classification, morphological characteristics, pollutants removal efficiencies. Role and functions of macrophytes in the constructed wetlands. Planting, establishment and maintenance. Monoculture and polyculture systems. The main agronomic aspects of a constructed wetland.

08 Febrero (15:30 – 17:30)

Substrate selection and characteristics of the main constructed wetland systems. Classification of the main bacterial populations and role and functions of the microorganisms in the constructed wetlands systems.

09 Febrero (15:30 – 17:30)

Mechanisms and results for water quality improvement. System start-up. Water balance and pollutant removal efficiency when considering evapotranspiration in a constructed wetland.

13 Febrero (15:30 – 17:30)

Constructed wetlands for winery wastewater treatment. International case studies. An overview of the applications in Italy and Spain. Agronomic and environmental benefits and criticisms.

15 Febrero (15:30 – 17:30)

Constructed wetlands for dairy wastewater treatment. International case studies. An overview of the applications in Italy and Spain. Agronomica and environmental benefits and criticisms.

16 Febrero (15:30 – 17:30)

Constructed wetlands for olive mill wastewater treatment. International case studies. An overview of the applications in Italy and Spain. Agronomic and environmental benefits and criticisms.

21 Febrero (15:30 – 17:30)

The reuse of treated wastewater from constructed wetlands in agriculture: considerations and perspectives from an agronomic point of view. International case studies.

22 Febrero (15:30 – 17:30)

Scientific experiences regarding the reuse of treated wastewater for irrigation of turfgrass, horticultural and herbaceous crops under Mediterranean conditions.

23 Febrero (15:30 – 17:30)

Effect of climatic conditions and season on pollutant removal efficiency of constructed wetlands. Case studies and scientific reports.

27 Febrero (15:30 – 17:30)

Application of the main mathematical models for the design of FWS, HSSF, VSSF and hybrid systems constructed wetlands: the Kadlec & Knight and Reeds, Crites & Middlebrooks and Cooper methods.

01 Marzo (15:30 – 17:30)

The design of HSSF system. Preparation of a project on a constructed wetland plant taking into consideration a typical Spanish farm.

02 Marzo (15:30 – 17:30)

The design of VSSF and hybrid systems. Preparation of a project on a constructed wetland plant taking into consideration a typical Spanish farm.