

# 土壤環境科學系

## 教育目標

土壤是孕育萬物最重要的場所，也提供多種生態系演變的環境。沒有健康土壤環境就沒有安全的水源及農產品。本系教學目標為配合國家發展需要及迎合國際學術潮流，培養兼顧基本學理，專業知識及實際操作能力之學生。

## 課程規劃

本系設有學士、碩士、及博士班。課程重點涵蓋基礎物理、化學、生物、及數學，進而土壤物理、土壤化學、土壤微生物、植物營養與肥料、土壤調查、土壤生態、土壤與地下水污染、地質、農業氣象、營養與病害、環境工程、遙測、及奈米科技等多方面專業領域。課程具備專業知識的傳授與實作訓練。鼓勵學生參與跨領域整合研究及參與國內外研討會、產學合作、交換學生等提昇學生科技潛能、人文素養、及國際觀。

## 主要研究領域

### ◆環境化學與污染防治

以化學、光化學、奈米材料光催化等理論發展土壤及水體污染整治，利用黏土礦物修飾網版印刷碳電極快速測定各種汙染物質。

### ◆環境微生物與生態

建立臺灣本土微生物基因庫，以微生物生態觀念發展各種有益微生物作為肥料及農藥、廢棄物處理、有機汙染物降解、連作障礙修復、生物復育退化及受重金屬汙染土壤。

### ◆土壤肥力與植物營養

以土壤、植物、微生物、及水分等基礎研究探討多向間交互作用關係，並應用於植物營養、作物肥培、廢棄物利用、重金屬汙染地改良、營養與病害、無土栽培等。

### ◆環境資源與資訊

遙測技術開發應用於精準施肥及農作物產量估算及土壤環境資源調查與利用規劃。

## 教研成果

本系成立逾70年，畢業系友超過3000餘人，分佈於各行各業且表現卓著，於公私立大專院校、政府部門、研究機構及產業界擔任要職。已有14位系友獲頒中興大學傑出校友殊榮。

教師亦獲學術界與校內多項獎項，如國際環

境科學委員會（SCOPE）環境終身成就獎，行政院傑出科技貢獻獎、農委會優秀農業人員，教育部終身國家講座、學術獎、優秀教育人員獎、特優教師獎，科技部傑出特約研究員獎、特約研究員獎、傑出研究員獎、技術移轉獎，傑出青年教師獎、國十大傑出農業專家、中興大學講座教授、特聘教授、產學績優、教學特優、服務特優、興人師獎等。與國內外各公私立機構合作研究計畫平均每年50餘件約5千萬元。近五年發表於國際SCI期刊、重要學術期刊、研討會、專書章節等848餘篇，獲國內外專利23件，技術轉移計74件。經營「土壤調查試驗中心」與「農產品驗證中心」進行食品、土壤及農業資材分析及產銷履歷及有農產品驗證，做為學生進入職場的重要實務學習。



▲ Inductively coupled plasma mass spectrometry instrument



▲ 上方土壤無滅菌，下方滅菌後七天，顯示健康土壤生態是生產健康農產品的基石。  
Soils which suffered sterilization may be easily contaminated by other bacteria.

## Mission

Soil is the foundation of all terrestrial life forms. It provides the environments for various ecological systems. Without healthy soil, safe water sources or safe agricultural products would not exist. The department aims to nurture soil science students with the strong professional knowledge and practical skills required for national development and trends in academic study.

## Curriculum

The department provides programs in undergraduate, master, and doctoral degrees. The core courses include basic Physics, Chemistry, Biology, and Mathematics; and advanced Soil Physics, Soil Chemistry, Soil Microbiology, Soil Fertility and Fertilizers, Soil Survey, Soil Ecology, Soil and Groundwater Pollution, Agriculture and Climate, Plant Nutrients and Diseases, Remote Sensing, and Nanotechnology. We emphasize the transfer of professional knowledge as well as the training of practical skills, and encourage students to engage in interdisciplinary research projects, and to participate in academic conferences, industrial collaborations, and student exchange programs to enhance their international perspective.

## Core Research Topics

- ◆ Environmental Chemistry and Pollution Remediation  
Develop technology for soil and water pollution treatment based on chemistry, photochemistry, nanomaterial, photocatalysis, and other theories. In addition, perform rapid analysis of pollutants with clay-modified electrodes for soil and water bodies.
- ◆ Environmental Microbiology and Ecology  
Establish an indigenous microbial gene pool of Taiwan; develop a diverse ecological concept of beneficial microorganisms as fertilizers and pesticides, waste treatment organisms, and organic pollutant degraders; resolve continual cropping problems; and bioremediate degraded and heavy metal-polluted soils.
- ◆ Soil Fertility and Plant Nutrition  
Study the complex interactions among soils, plants, microbes, and water for plant nutrient management; develop a functional fertilizer formula; recycle agricultural waste materials in bioenergy and composts; remediate heavy metal-polluted soils, study plant nutrients and disease control; and develop soilless culture technologies and other applications.



▲精準農業在小規模耕作系統之應用  
Precision Agriculture for Small Scale Farming Systems



▲微生物脂肪酸鑑定系統  
Sherlock™ Microbial Identification System : Fatty Acid Analysis, PLFA & Bacterial ID

- ◆ Environmental Resources and Information  
Apply remote sensing technology for precision agriculture (i.e., precise fertilization and production estimation) and for the survey and planning of land resources.

## Achievements

Our department has existed for more than 70 years, and has produced more than 3,000 graduates. Our graduates are performing well in the fields of public and private universities, government departments, research institutes, and business industries. To date, 14 graduates have been honored with the NCHU Excellent Graduate Awards.

Our faculty has achieved great success in academia. Awards include Scientific Council of Environment (SCOPE): Lifetime Achievement Awards on Environmental Science; The Executive Yuan: Outstanding Contribution Award in Science and Technology; Ministry of Education: Academic Award, Outstanding Education Member Award, Outstanding Teacher Award; Ministry of Science and Technology: Distinguished Research Fellow Award, Special Research Fellow Award, Outstanding Research Awards, Technology Transport Award; Distinguished Agricultural Personnel by Executive Yuan, Top 10 National Agricultural Experts, Chair Professorships and Distinguished Professorships by NCHU, Excellence in Industrial–Academic Collaboration, Excellence in Teaching, Excellence in Services, and other teaching awards. On average, more than 50 research projects valued at NT\$50 million are received each year. We have published more than 848 peer-reviewed articles in international Science Citation Index journals, conferences, and book chapters in the last 5 years. We have obtained 23 industrial patterns and 74 technological transfers. Regarding our contribution to society, the department has established the Soil Testing and Survey Center and the Agricultural Products Approval and Certification Center in leading analysis and food safety certification systems, and extending training courses for audits.