**2019年发展中国家环境友好型肥料的生产施用及示范研修班项目简介表**

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| 项目名称 | 2019年发展中国家环境友好型肥料的生产施用及示范研修班 | | | | | |
| 承办单位 | 华南农业大学 | | | | | |
| 举办时间 | 2021年10月12日至11月10日 | | | 项目语言 | | 英语 |
| 举办方式 | 线上 | | | 应用软件 | | Zoom |
| 邀请国别 | 发展中国家 | | | 计划人数 | | 25人 |
| 培训目标 | 在短期内基本掌握生物有机肥、有机无机复肥、控释肥等主要环境友好型的生产（包括原料、工艺、设备）性能及使用方法和效果的基本知识，为利用所在国的资源生产高效低成本的环境友好型肥料、提高作物产量、消除环境污染做出贡献。 | | | | | |
| 报名条件 | 专业背景 | ·领域或专业：土壤、肥料相关领域或专业  ·工作岗位：发展中国家从事土壤、肥料管理的高级技术员或官员  ·级别、学历学位或其他相关资质要求：无 | | | | |
| 年龄 | 不高于受援国法定退休年龄 | | | | |
| 健康状况 | 身体健康，能够按时参加线上培训课程 | | | | |
| 语言能力 | 学员英语听、说、读、写能力满足听课及研讨交流要求 | | | | |
| 其 它 | 能够使用Zoom，完成项目日程 | | | | |
| 培训内容介绍 | 主要培训课程  植物营养学概论：介绍植物营养学研究的意义、植物营养元素的种类、判断必需营养元素的标准；植物对营养物质的吸收运输过程及其调控机制；部分必需营养元素的生理功能及植物适应养分缺乏和毒害的机制等。  环境友好型肥料概论：介绍生物有机肥、有机无机复肥、控释肥等三种环境友好型肥料的特点、意义及其在发展中国家的发展前景。  控释肥、有机无机复肥专题：介绍利用工农业废物生产有机无机复肥和高效低成本控释肥的技术、肥效及环境效应。  肥料新技术专题：介绍磷肥、镁肥的活化技术以及施肥防病技术。  生物肥料的制造与应用：介绍生物肥料的发展概况、影响微生物活性的因素、生物肥料的制造工艺、生物肥料的生物效应。  堆肥技术与设备：介绍利用园林废弃物、城市生活垃圾进行堆肥的技术及关键设备。  畜牧废弃物的处理与利用：介绍畜牧场粪便与废水的成分、特性、处理与资源化利用技术、侧重粪便堆肥制作和厌氧出水利用的关键技术。  无土栽培技术：介绍无土栽培发展的简单历史、现状和趋势、目前主要应用于生产的无土栽培技术类型、建设要求和几种主要作物的无土栽培管理技术等。  加肥灌溉专题：介绍加肥灌溉技术在果树、蔬菜栽培中的应用。  城市污泥处理利用与管理法规：介绍污泥中重金属和有机污染物的检测与安全使用。  中国的平衡施肥技术：介绍以测土为主的平衡施肥技术、以植物营养诊断为主的平衡施肥技术和有机肥的计量技术  肥料中C、N、P在土壤中的转化及其环境效应：介绍肥料中有机碳在土壤中的转化及其对全球气候变化的影响；肥料氮素在土壤中的转化及其对环境质量的影响；肥料磷素在土壤中的转化及其对水体富营养化的影响。  有机农业概述：介绍有机农业以及与其他可持续农业的相同相异性；有机农产品的市场准入及相关肥料问题。  养分资源的根层调控与管理：介绍养分资源在根层的转化特点及调控、养分资源调控产品及根层调控集成技术的具体内容。  生物固氮在农业中的应用：介绍生物固氮将空气中的氮转化为氨而被植物利用，但这一系统有寄主特异性，根瘤的形成和结瘤的效率的取决于一系列的共生决定因子。  大豆磷效率相关根系性状的遗传改良：介绍根系育种的主要理论和实践方法及其研究进展、并对根系性状细胞工程改良、根系性状分子标记辅助选择、根系性状分子设计等新技术的应用前景进行了分析和展望。  学员需准备的材料  为顺利开展交流研讨，请准备与研修主题相关的交流材料，如：（1）专业和所在单位的自我介绍；（2）本国或所在地区肥料生产及使用现状及存在的问题；（3）本国与其他国家或国际组织在肥料生产及使用领域开展合作的情况；（4）本国与中国的农业合作等。  结业测试/评估  提交论文或举行综述报告会 | | | | | |
| 举办地点 | 广东省广州市 | | 参观考察地点 | | 待定 | |
| 备注 | 1. 本次研修班使用云平台进行线上培训，需要学员准备网络、电脑、麦克风、摄像头等有关设备。  2. 请学员遵守培训班的相关规定和教学纪律，出勤记录将作为颁发培训结业证书的依据。  3. 课前准备：需提前10分钟进入线上教室准备，将个人姓名改为英文（与护照一致）姓名-国别简称。  4. 纪律要求：在项目实施过程中，请严格遵守项目日程安排，不得擅自安排与培训无关的活动、不得无故退出培训等。  5. 学员按照日程安排准备相关研讨材料，按照要求准备相关素材。  6. 信息安全：为保护信息安全和个人隐私，上课内容请不要分享到任何社交媒体，课程资料会在课后发给学员。 | | | | | |
| 承办单位简介 | 华南农业大学是一所国家级的重点大学，位于美丽的“花城”广州，迄今已有100多年的办学历史，形成以农业技术和生命科学为主导、工、文、理、经、管、法等多学科协调发展的专业特色，学校拥有良好的教学与科研条件，为国内外培养了大批的科学、技术与管理型人才。学校的师资力量雄厚，教授、副教授1500余人，博士生导师309人，学术型硕士生导师863人，专业型硕士生导师1243人。目前全日制在校生4.6万余人，其中本科生3.8万余人，研究生8000余人，来自48个国家的留学生130余人。  中国国际农业培训中心是中国政府在联合国开发计划署、粮农组织和世界粮食理事会的协助下，设立于华南农业大学执行援外培训的基地，其宗旨是面向发展中国家传授具有中国特色的先进农业技术。  中国国际农业培训中心始建于1988年，承办多双边援外培训项目，内容涉及农业经济管理、甘蔗栽培、水稻栽培、农作物病虫害防治、生物肥料、蚕桑生产与管理等领域。至今，共承办了44期培训班，接待了来自100个国家和地区的1094名中高级农业技术员和管理官员。 | | | | | |
| 承办单位联系方式 | 联系人：李慧玲  办公电话：0086-20-85280035；  手机：0086-13763364212  电子邮件地址：cicat@scau.edu.cn; 1551392526@qq.com | | | | | |

**Seminar on Production, Application and Demonstration of Eco-friendly Fertilizer for Developing Countries**

**Project Profile**

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| Name | Seminar on Production, Application and Demonstration of Eco-friendly Fertilizer for Developing Countries | | | | |
| Organizer | South China Agricultural University | | | | |
| Date | October 12th to November 10th, 2021 | | Language | | English |
| Form | Online seminar | | Platform(app) | | Zoom |
| Countries invited | Developing Countries | | Number of Participants | | 25 in total |
| Objectives | The course is to impart basic knowledge and Chinese practical techniques in environmentally friendly fertilizers to the participants. The participants, after this training course, are expected to apply the technology acquired at CICAT and be able to work for manufacture (including raw materials, process, equipment) and application of environmentally friendly fertilizers (biofertilizer, organic-inorganic fertilizer, controlled-release fertilizer etc.) in their respective countries. This will contribute to using the resources of the home countries to manufacture environmentally friendly fertilizers with high efficiency and low cost, increasing crop yield and elimination of environmental pollution. | | | | |
| Requirements for trainee | Professional background | --Area or specialty: Soil, fertilizer  --Position: Technician and officials in soil science, fertilization and fertilizer production  -- Level, academic degree or other relevant qualification requirements: -- | | | |
| Age | Should not be higher than the legal retirement age | | | |
| Health status | Healthy and able to participate in online seminar on time | | | |
| Language | Fluent in listening, speaking, reading and writing in English | | | |
| Others | Able to use Zoom, and able to complete the project schedule | | | |
| Training content | 1. Primary training courses   **Introduction of Plant Nutrition:** Significance of plant nutrition, the classification of plant nutrients and the criteria for plant essential elements. It also introduces the process of ion uptake and transport, the physiological functions of some essential nutrients and the possible mechanisms of plants in adaptation to nutrient deficiency and toxicity.  **Introduction of Environmentally Friendly Fertilizers:** Feature and significance of environmentally friendly fertilizers and the development prospect in developing countries.  **Organic-inorganic Fertilizer (OIF) and Controlled-release Fertilizer (CRF):** Technology, fertilizer effect and environmental effect of OIF, CRF with high efficiency and low cost.  **New Technology for Fertilizers:** Manufacture and effect of P and K fertilizers with high efficiency, fertilization with controlling of soilborne disease.  **The Manufacture and Application of Biofertilizer:** The development of microbial compound fertilizer. The factors affecting the living microbial numbers of microbial compound fertilizer. The manufacturing technology of microbial compound fertilizer. The efficiency of microbial compound fertilizer.  **Composting Technology of Municipal Solid Waste:** Technology and key equipment for composting of municipal solid wastes and yard wastes.  **Livestock Waste Treatment and Recycling:** Composition and feature of animal waste, technique of treatment and recycling, focusing on the manure composting and anaerobic effluent recycling.  **Biological Nitrogen Fixation in Agriculture:** Nodule formation and determinants required for symbiosis between legumes and rhizobia.  **Basic Principles and Application of Soilless Culture:** The history, actuality and trends of the development of soilless culture will be introduced briefly. The main types of soilless culture used in plant production, the basic requirement of the soilless culture facilities and the management of several plants of soilless culture will be also taught.  **Fertigation and Its Application:** Application of fertigation in the culture of fruit trees and vegetables.  **Sewage Sludge Management and Regulations:** Test methods of heavy metals and organic pollutants in sludge and safe application are introduced.  **Balanced Fertilization Techniques in China:** Balanced fertilization techniques mainly based on soil analysis and testing, and mainly based on plant nutrition diagnosis; and techniques in qualifying organic manures in balanced fertilization.  **The Transformations of Fertilizer C,N,P in Soil and Their Environmental Effect:** The transformations of fertilizer organic C in soil and its effect on global climate change; the transformations of fertilizer N in soil and its effect on environmental quality; the transformations of fertilizer P in soil and its effect on water eutrophication.  **Introduce of Organic Agriculture:** organic agriculture and its similarity and differences between other forms of sustainable agriculture; marketing of organic products; and issues related to (bio) fertilizers.  **Management and Regulation of Nutrient Resources in Root Layer:** Transformations of nutrient resources will be told about in root layers of plants. Methods of root layer controls will be discussed, and the products of nutrient resource control and integrative techniques of root layer control will be introduced and explained in details.  **Biological Nitrogen Fixation in Agriculture:** Nodule formation and determinants required for symbiosis between legumes and rhizobia.  **Genetic Improvement of Root Traits as Related to P Efficiency in Soybean:** The objective of this study is to provide fundamental new insights into the physiological, genetic and molecular mechanism of P efficiency in soybean so as to provide theoretical basis of genetic improvement of soybean varieties in South China.  Materials to be prepared  To facilitate communication, please prepare relevant materials on the seminar theme, including: (1) Introduction of your profession and the organization you are working for; (2) Current status and existing problems of fertilizer manufacture and application in your country; (3) The Cooperation between your country and other countries or international organizations in the field of fertilizer manufacture and application; (4) The agricultural cooperation between your country and China; etc.  3. Final test/assessment  Summit the summary report, or final report presentation | | | | |
| Host City | Guangzhou City, Guangdong Province | | Cities to visit | To be determined | |
| Remarks | * The training program will be held online, which requires participants to prepare necessary equipment and devices such as reliable internet connection, computer, microphone, camera, etc. * During the training, please follow the schedule and discipline. The attendance record will be the basis for issuing the certificate. * Preparation before class: enter the virtual classroom 10 minutes in advance and change your name to English name (consistent with that on passport)-nationality abbreviation * Disciplinary requirement: during project implementation, please follow strictly the project agenda. * Participants need to prepare discussion materials relevant to the subject according to the schedule and submit relevant materials as required. * Information security: for the security of information., please do not share the course content on any social media, and the course materials will be shared to the participants after class. | | | | |
| Introduction of organizer | Located in Guangzhou, the beautiful “City of Flowers”, South China Agricultural University (SCAU) is one of the leading agricultural universities in China. Since the founding of the university more than 100 years ago, we have valued a tradition of excellence and have developed into a research-intensive, academically friendly institution. Featuring agricultural technologies and life sciences, the university also offers a broad range of degree programs in engineering, sciences, humanities and social sciences, management and law. The university is advanced in teaching and research facilities, and our graduates have made significant contributions as outstanding scholars and professionals in scientific, technological and management fields. Our distinguished faculty includes members of the Chinese Academy of Sciences and the Chinese Academy of Engineering and more than 1500 professors and associate professors, There are 309 supervisors for Ph.D programs, 863 supervisors for academic master degree programs and 1243 advisors for professional master degree programs. The total enrollment of regular students is over 46,000, comprising over 38,000 undergraduates, over 8,000 graduates and more than 130 international students from 48 countries.  The China International Center for Agricultural Training (CICAT), set up in SCAU under the coordination of the Chinese Government, the UNDP, the FAO, and the WFC, is designated to disseminate China’s advanced agricultural technologies for developing countries.  Sponsored by Chinese government, CICAT has been organizing the foreign aid training projects since its establishment in 1988. By the end of 2019, CICAT has successfully organized 44 training programs for 1094 participants from 100 countries and regions, engaged in Agricultural Management and Leadership, Agricultural Economics and Management, and Bio-technologies including Crop Diseases and Pest Control, Bio-fertilizers, Rice Cultivation, Sugarcane Cultivation, and Sericulture Production and Management, etc. | | | | |
| Contact of the Organizer | Contact: Ms. LI Huiling  Tel.: 0086-20-85280035  Phone: 0086-13763364212  Email: cicat@scau.edu.cn; 1551392526@qq.com | | | | |