



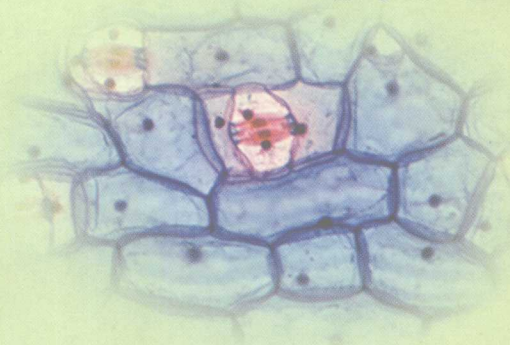
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中德技术合作林业培训与进修项目示范教材

植物组织 培养技术

ZHIWU ZUZH
PEIYANG JISHU

张东方 主编



东北林业大学出版社

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内 容 简 介

本书从整体上分为两大部分：第一部分是植物组织培养理论和技术；第二部分是实验。前部分介绍了植物组织培养的基本理论，所需的仪器设备及其用具，培养基的成分、种类及选择，植株组织培养快繁技术，植物组织培养脱毒技术，植物组织培养技术在育种中的应用以及植物组织培养中常出现的问题及可能解决办法；第二部分从教学的角度设计了 15 个实验。本书适合做商品花卉、园林植物和林学专业大专层次的植物组织培养技术课程的教材，也适合于用做农林行业相关植物组织培养技术短期培训和进修教材，同时也可作为植物组织培养工作人员以及组培爱好者的参考书。

Brief Introduction

The book includes two parts: theories and techniques of plant tissue culture and experiments. The former covers the basic theory of plant tissue culture, the necessary equipment and utensils, media components, sorts and choice of media, rapid reproduction technique of plant tissue culture, shoot apical meristem culture for virus-free plants, application of tissue culture technology in plant breeding such as pollen anther culture, embryo culture, plant protoplasm culture and somatic hybridization, etc. and the problems common in plant tissue culture and the measures to solve. The latter is 15 experiments designed according to the purpose of teaching. The book can be used as a textbook for the students who major in commercial flowers, garden plants and forest science in colleges or polytechnic schools. It is also a textbook for short-term training and advanced study course of tissue culture in agriculture and forestry trades; meanwhile, those who work on tissue culture or are lovers of tissue culture can take it as a reference book.

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中德技术合作林业培训与进修项目示范教材

出版说明

中德技术合作林业培训与进修项目是中华人民共和国和德意志联邦共和国在林业领域的技术合作项目，项目的目标是由北京林业管理干部学院和地方林业院校的教师们利用培训与进修的方式向林业专业人员和管理人员传授现代林业知识与技能，以推动我国林业的可持续发展。

1999年9月中德技术合作林业培训与进修项目正式启动，5年来，项目为北京林业管理干部学院和选定的5所项目网络学校培训了数以百计的师资，这些师资目前正在各学校的教学、培训一线岗位上发挥着骨干的作用。为了更好地扩散项目引进的德国先进林业技术与教学经验，服务于区域林业建设，由项目协调委员会牵头成立了项目示范教材编委会，并组织各校接受过培训的教师，结合各项目网络学校的优势领域和当地特色，编写了6本项目示范教材。从2004年秋季起，陆续提供给各类林业职业院校和培训机构选用。此外，项目还资助了杨凌职业技术学院凤县林科教一体化实验示范基地面向林农编写的经济林生产实用教材。

在教材编写初期，项目办邀请了一批在相关学术领域有一定造诣的专家学者对此次出版的6本教材的大纲进行了严格的评审，以保证教材的质量。本系列教材从目前林业职业教育的特点出发，结合各项目网络学校多年职业教育、培训的经验，并吸收了德国先进的教育、培训理念，有很强的实用性，适于林业职业

院校和培训机构进行教学、培训使用。

希望各林业职业院校和培训机构积极推广和选用本系列教材，并在使用过程中，注意总结经验，及时提出修改意见和建议，使之不断完善和提高。

中德技术合作林业培训与进修项目
示范教材编委会

2004 年 6 月

Instruction

Demonstrative Teaching Material of Sino – German Cooperation Project: Basic and Further Training in the Forestry Sector

Sino – German Cooperation Project: Basic and Further Training in the Forestry Sector has been carried out in line with a cooperative agreement signed between the People' s Republic of China and Germany. Its major objective is that the docent staff of Beijing Forestry Management Staff College (BFMSC) and various regional Forestry Colleges transfer modern forestry knowledge and techniques to technicians and management staff in the forestry sector of China so as to ensure that its forestry can achieve sustainable development.

The Project was formally launched in Sep. 1999. During the past five years, it has trained hundreds of teaching staff for the BFMSC and 5 regional networking forestry colleges, and these ever trainees of the project are now playing back – born roles on their training and education positions on the front of the forestry sector. To better diffuse the advanced technology and teaching experience introduced from Germany by the Project in order to meet the increasing demand of the regional forestry construction, the Steering Committee of the Project took the lead to organize the teaching staff trained by the Project to constitute an Editorial Committee, who has compiled a set of demonstrative teaching material of 6 courses by summarizing the academic strengths of each networking school and their local conditions. From the fall of 2004, it will be experimentally applied by various vocational forestry colleges and training

institutions. Meanwhile the Project has also sponsored the Experimental and Demonstrative Site for Forestry Research and Education of Yangling Vocational & Technical College in Fengxian County for their compilation and edition of a series of practical teaching material on production of economic forests, targeting mainly at forestry farmers.

During the initial period of the editorial process, the Project invited a number of scholars and experts excelling in relevant fields to carefully revise the program of the 6 courses to ensure that this set would reach the expected quality. Departing from the characteristics of the current situation of forestry vocational education in China, combing the extensive experience in vocational training and education accumulated by the concerned networking colleges with the advanced educational and training concepts introduced from Germany, this series boasts of strong practicability for forestry vocational colleges as well as for training institutions .

We do hope that it can be adopted and spread by forestry vocational colleges and training institutions around the country, from whom, we warmly welcome any suggestions and opinions to make further publications even better.

Editorial Committee of Demonstrative Teaching Material,
Sino – German Cooperation Project:
Basic and Further Training in the Forestry Sector

June, 2004

前 言

植物组织培养技术在我国生产实践中被得到了越来越广泛的应用,尤其对于难以用种子繁殖及无性繁殖系数较低的名优花卉、珍稀树木、优良新品种等,利用组织培养进行快速繁殖充分体现了其优越性;对于感染病毒的栽培植物、茎尖组织培养脱毒技术能够恢复品种优良特性,给生产带来可观的经济效益。组织培养技术在其他方面的应用也越来越广泛、越来越深入。随着我国科技的进步,组织培养技术无论在技术上还是在应用规模上都将会得到进一步发展。

植物组织培养技术的应用规模扩大,必然对组培人才的需求量增加。目前,我国农林高职、高专相关专业相继开设了植物组织培养技术这门课程。植物组织培养技术方面的书很多,但适合大专层次以及林业行业该岗位培训和进修的教材并不多见。我们在高职教学中开设这门课程多年,也一直酝酿编写这本教材。中德技术合作林业培训与进修项目给我们提供了机会,使我们的愿望得以实现。

本书由张东方主编并统稿,其中绪论,第一、第二、第四、第七章,实验1~10、14由张东方编写;第三、第五章由宋涛编写;第六章,实验11、12、13由任建武编写。本书由北京林业大学教授陈晓阳主审。

由于时间仓促,加上编者水平有限,书中一定存在错误和不足,欢迎各位专家、教师和广大读者提出宝贵意见。

编 者

2004年6月

Preface

Plant tissue culture technology has got wider and wider application in production of our country. Rapid regeneration by tissue culture had enormous advantage especially to famous flowers, rare trees and new varieties that are difficult to be propagated by seeds and have a low reproduction speed; to the cultivated plants infected by virus, shoot apical meristem culture can regain their fine qualities and bring about great economic benefits. The application of tissue culture in other aspects is also becoming wider and deeper. With the development of science and technology in our country, tissue culture will get a great progress not only in its technique but also in the scale of its utilization.

The extensive application of tissue culture results in the increasing demand of qualified personnel. At present, the relative specialities of vocational technique colleges and schools in agriculture and forestry have been added the course of plant tissue culture technology. There are books on plant tissue culture, but there are not many suitable for those students and for basic and further training in forestry sector. We have been taught this course in vocational technique colleges for a few years, and we have considered editing this book. Thanks a lot to the project "Sino-German Technical Cooperation "Basic and Further Training in the Forestry Sector" Project for giving us the support that makes our wish become true.

This book has mainly been edited by Mr. Zhang Dongfang. Chapter 1, 2, 4, 7 and Experiment 1 ~ 10, 13, 14 have been written by Mr. Zhang Dongfang; Chapter 3, 5 by Mr. Song Tao and Chapter 6 and Experiment 11, 12, 13 by Mr. Ren Jianwu. Chen Xiaoyang, Professor of Beijing Forestry University, has examined the book.

Because of the limited time as well as the limited level of editors' knowledge and technology, there must be errors and shortages in the book. Welcome specialists, teachers and other readers to give us valuable suggestions.

Authors

June, 2004

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