

研 / 究 / 生 / 课 / 程 / 精 / 编 / 教 / 材

A Course
of English for Postgraduate Students
of Agricultural Extension

农业推广硕士英语教程

全国农业推广硕士专业学位教育指导委员会 组编

■ 郁仲莉 主编

A Course
of English for Postgraduate Students
of Agricultural Extension



ZHEJIANG UNIVERSITY PRESS
浙江大学出版社

研 / 究 / 生 / 课 / 程 / 精 / 编 / 教 / 材

A Course
of English for Postgraduate Students
of Agricultural Extension

农业推广硕士英语教程

全国农业推广硕士专业学位教育指导委员会 组编



ZHEJIANG UNIVERSITY PRESS
浙江大学出版社

图书在版编目 (CIP) 数据

农业推广硕士英语教程 / 郁仲莉主编. —杭州: 浙江大学出版社, 2008.11

研究生课程精编教材

ISBN 978-7-308-06269-5

I. 农… II. 郁… III. 农业技术—技术推广—英语—研究生—教材 IV. H31

中国版本图书馆 CIP 数据核字 (2008) 第 156342 号

农业推广硕士英语教程

郁仲莉 主编

责任编辑 诸葛勤 (zhugeq@126.com)

封面设计 刘依群

出版发行 浙江大学出版社

(杭州天目山路 148 号 邮政编码 310028)

(E-mail: zupress@mail.hz.zj.cn)

(网址: <http://www.zjupress.com>)

<http://www.press.zju.edu.cn>)

电话: 0571-88925591, 88273066 (传真)

排版 杭州中大图文设计有限公司

印刷 杭州杭新印务有限公司

开本 787mm×1092mm 1/16

印张 23.75

字数 790 千

版印次 2008 年 11 月第 1 版 2008 年 11 月第 1 次印刷

印数 0001—2500

书号 ISBN 978-7-308-06269-5

定价 39.90 元

版权所有 翻印必究 印装差错 负责调换

浙江大学出版社发行部邮购电话 (0571)88925591

主 编 郁仲莉 (南京农业大学)

副主编 余 洁 (南京农业大学)

编 者 (按汉语笔画顺序排列)

王凤英 (南京农业大学)

史宝辉 (北京林业大学)

李建华 (中国农业大学)

余 洁 (南京农业大学)

郁仲莉 (南京农业大学)

程 倩 (南京农业大学)

主 审 王耀庭 (南京农业大学)

A Course
of English for Postgraduate Students
of Agricultural Extension

序

呈现在读者面前的是由郁仲莉副教授主编的《农业推广硕士英语教程》。作为从事数十年农业院校英语教学并主编、主审过多本农业英语教材的老教育工作者，我欣慰地看到郁仲莉这一代教师在教育理念和教育实践上继承传统、勇于创新的不懈努力。本教材既全面反映了编写者丰富的研究生英语教学和科研经验，又准确体现了农业推广硕士这一特殊学位类型的英语学习的要求。

具体来看，这本教材有以下几个显著的特点：第一，学用有机结合。通过大量实用、新颖和前沿的农业推广领域的英文文献，为学生提供了一个其他方式难以取得或替代的英语学习环境，这里不再有“学用分离”，有助于培养学生学习英语，特别是用英语为专业服务的兴趣和信心。第二，结构编排包括主辅课文设计和课文练习设计合理而充分。每篇课文的辅助材料在专业点和语言点上都构成了对主课文的补充和扩展。每一课的练习不仅有课堂后的书面作业，更有适合于课堂上的分组集体讨论等题目，因此把教材创新和教学创新很好地结合了起来，对教学双方有效使用教材也有一定的引导作用。第三，每篇课文的注解不再拘泥于语言本身，关注的主要是从专业知识角度出发的难点和重点。这里重要的不是孤立的英语字词或语法的意义，而是英语作为交际手段所传达出的专业信息。学生不必将英语作为一门学问来学习（这是我国高校英语教学长期以来“费时低效”的一个重要原因），而是作为一个工具、一个媒介来使用，在使用中锻炼和提高英语水平。

这本教材是我国农科英语教材和专业学位英语教材编写工作中的一项新的尝试。毫无疑问，这项尝试的价值及其有效性的切实发挥还有赖于广大师生认真并创造性地使用该教材。是为序。

俞保丽

2008 年秋

前言

《农业推广硕士英语教程》为全国农业推广硕士专业学位教育指导委员会组织编写并推荐的农业推广硕士研究生教材，由全国农业推广硕士专业学位教育指导委员会资助出版。

数年前我国一些高校开始招收农业推广等专业学位硕士、博士，并开设相关英语课程，本教材的编写工作也随之启动。为了编写出一本针对性强、尽量贴近农业推广研究生英语学习特点和需要的英语教材，编者在前期工作上花费大量时间，了解农业推广专业学位培养的要求和学生的特点，精心构思和选材。

编写好这样一本教材，需要克服诸多的困难。首先要研究农业推广硕士专业学位研究生培养方案，了解培养方案中包含的领域和方向，教材的编写才能做到有的放矢，贴近和配合培养方案。其次是选材，编者认为材料最好选自学生熟悉的农业推广领域，学生可以既学英语，又能获得专业信息，在熟悉的语境中不知不觉提高英语水平。然而，农业推广涵盖面较广，选材既要体现共性的要求，让不同方向的学生都能使用；又要体现一定的个性，使各大方向的学生都能发现一定量的针对自己方向的内容。这样的选材方针给编写工作带来的一个重要问题就是专业知识。这是长期以来困扰各科类英语教材，包括各专业学位英语教材编写工作的问题。英语教师大多缺乏专业知识背景，这就给搜集资料和鉴别、筛选资料带来很大困难，更不用说编写过程中面对专业术语、专业概念时内心的惶惑和障碍。后果之一就是降低文章的难度，避开专业谈语言，学生往往所获甚少。如果由专业教师负责编写这类英语教材，专业知识问题或许不大，但教材的编排和设计上很难处理好语言问题，实现语言教学的目的。因此由专业教师亲自编写自己领域需要的英语教材的情况还不多见。

本教材的编写队伍基本上摆脱了这个困境，我们的队伍主要由长期从事研究生英语教学（包括专业学位研究生英语教学）的一线教师构成，熟知研究生英语的教学规律，了解研究生的实际状况。主编曾于 1998—1999 学年在农业推广发达的荷兰专门进修过农业推广课程，并于 2002 和 2003 年连着两次得以参加荷兰方面为亚洲校友在泰国和越南分别组织的第十期和第十一期短期进修班（refresher course），更新过去学习的知识。这些学习经历为本教材的选材提供了丰富的资源，更为编写工作打下了良好的专业知识基础，使得本教材的编写能够兼顾语言和专业，切实体现农业推广硕士英语教材的特色。主编于 2001 年编写出版了《农业科技英语》（经济贸易类专业用）和教育部推荐研究生教学用书《英语写作与翻译实用教程》（第二版），为本教材的编写积累了一定的经验，这也是我们获得本教材编写任务的重要原因之一。

几度寒暑，几番奋斗，本教材终于完工并得以顺利出版，可以为专业学位的英语教学服务，同时也接受广大师生的评判。虽然编者将教材仔仔细细、反反复复地审阅、修改，认真检查每一个细节，从标点符号到单词拼写，从格式到版面，从注释到练习，慎而又慎，因为任何一点疏忽，都可能令读者困惑，甚至误导读者。但挂一漏万，难免还有不尽如人意之处。相信任何疏漏都难逃读者的火眼金睛，我们期待读者的批评和帮助。

本书的特色与宗旨

如前所言,本教材编写的指导思想与一般的在职类研究生英语教材有所不同。一般的在职类研究生英语教材,名义上是为不同类别的专业学位研究生编写,但编写风格和模式与普通英语教材几乎没有区别,课文依旧是从不同的报刊书籍或网上裁剪下来的豆腐块文章,内容与学生的实际工作几乎没有关联或少有联系,重点还是在词汇、语法、句法等语言基本知识上,没有自己的特色。专业学位研究生虽然由于种种原因英语基础差,但是,以他们的工作特点和实际需要,英语教学应该是能够帮助他们提高实际应用英语的能力,最终达到以英语为工具为专业服务的目的。重复过去的学习形式和内容不仅无助于他们提高英语水平,而且会导致厌学情绪。学生缺乏新鲜感,学习没有兴趣,教师也发挥不出创造性,教学双方都没有热情,效果可想而知,缺课率就是一个明证。这样的教学很容易沦为一种摆设,造成资源的浪费。

本教材编写所遵循的指导方针,一是“学用结合”:学生学英语的过程也就是使用英语的过程。课内外的口笔头练习,让学生不仅学英语而且也使用英语,英语成为学习新知识的工具,并且在使用的过程中提高英语水平和应用英语的能力。改变以往学用分离,只学不用,学了忘、忘了学,反反复复学英语,费时低效的现象。二是“结合专业学英语”:课文选自专业书刊,长度适中,内容保持相对的完整性。学生在学习英语的同时,还可以获取对工作有用的专业信息,读来有亲切感,有吸引力,又可以加深其学习英语的兴趣。更重要的是,通过课文学习和课内外练习,学生可以自然而然地掌握科技英语的阅读能力和一定的科技英语说写能力,同时积累大量英文科技词汇,语言学习与专业学习相辅相成,提高学习效率,特别是提高学生以英语为工具从事专业活动的能力。三是“兼顾语言教师与专业教师的教学需求”。由于农业推广英语教学的师资构成既包括语言教师,也有专业教师,本教材的编写充分考虑这一特点,采用灵活的编写方针和模式,使本教材既适合语言教师使用,也适合英语水平较好的专业教师使用,适用性广。本教材为语言教师扫除了可能的专业知识障碍,方便语言教师顺利组织语言教学和课内外活动;同时也为专业教师扫除了可能的语言知识障碍,便于专业教师更好地发挥自身的专业优势,将语言教学与专业内容有机地结合起来。语言教师和专业教师都能很好地发挥自身的优势,有助于农业推广硕士英语教学走出“为开课而开课”、纯属“摆设”的尴尬境地,真正为人才培养服务。

本书的结构

本教材共12个单元,每单元由A、B、C三篇内容相关的课文组成,课文后是注解,对文章中的难点、重点从语言到专业知识提供详细的解释和翻译。A课文为主课文,课文后有四个练习。练习一要求学生用英语解释课文中的专业词汇或词组并翻译,既练习了英语表达技能,又学习、巩固了专业知识。练习二是从课文中取出的难句或长句,要求学生根据所给的词填空并翻译句子,让学生通过练习不仅增添语感,提高语言的应用水平,还排除了课文中的难点,加深了对课文的理解。练习三是段落填空,依然是根据所给的词填空,但段落来自课外,内容与课文接近,目的是锻炼学生在理解的基础上掌握或温习语言的用法。练习四是讨论题,目的是让学生对课文有一个宏观的把握,全面了解课文的内容和思想。讨论题围绕课文发问,但回答问题不限于课文。许多问题都是开放性的,要求学生结合自己的实际工作经验、当地的实际情况来回答。将课本知识和实际工作结合在一起,再用英语表达出来,有一定的挑战性,无疑也很锻炼人。通过这四个练习,尤其是练习一、二、四,学生应该能够把A课文学得很透彻,并且英语表达的熟练度会

逐步提高。

课文 B 和课文 C 为辅助性课文,目的是扩大学生的阅读量,巩固学习课文 A 后获得的“成果”。课文 B 后有两个练习,练习一与课文 A 的练习二一致,目的也一样,增强对语言的敏感度,加深对课文的理解;练习二为讨论题,检查学生对课文的理解,并引导学生思考一些实际问题。课文 C 后只有讨论题,要求学生泛读课文,了解文章的大意,并根据课文和实际工作回答问题。书后配备的练习答案供学生自习后自我检查、自我更正、自我提高,也有利于学生进一步理解课文。

如何使用

编者 2001 年出版了由农业部科教司及中华科教基金会资助的“九五”高等农业院校规划教材《农业科技英语》(经济贸易类专业用),由于可选用的专业学位研究生英语教材不多,这本《农业科技英语》被一些院校选作专业学位研究生英语教材。有些读者在用了此书后与编者交流学习的体会,交流中编者发现,学生在复习和自学时多少沿用旧时的学习习惯,在个别词句上反复琢磨,欲将每一个词都研究透彻。遇到不能解决,确切地说是学生自己无法用汉语“翻译”的词句,就感到不安。所以有读者来电索要课文的译文,希望编者提供一个完整的课文译文,有了汉语版本的课文才觉得心里踏实。其实,这不符合专业学位英语学习的初衷和要求,还会降低效率、挫伤信心。读者可以反复品味、学习、模仿一些优秀的词句表达,但没有必要钻牛角尖。编者之所以不提供课文完整译文,目的也是要将学生的注意力从点引向面,从个别词句的理解引向篇章理解,从整体上抓主要信息,提高英语阅读效率和学习效率。

本教材在内容上涉及四大主题:以农民为中心的农业推广(farmer-led extension),推广中的性别问题(gender and extension),果蔬、家禽和营销(growing vegetables and fruits, poultry and marketing),以及可持续农业(sustainable agriculture)。如何使用、使用多少,应根据实际情况而定,包括学校的特点、学生的来源和构成、学生的基础、教师的背景和兴趣、相关规定等。除了课堂教学,学生也可以根据自己的兴趣和实际需要选择地使用。

传统的在职研究生英语教学常常是教师照本宣科,将课文从头至尾过一遍,用汉语解释或翻译一遍;如果任课的是英语教师,则主要找些语言点解释一下,给几个例句。本教材的编排结构贯穿了现代教学理念,要求任课教师的作用是组织者(organiser)、推进人(facilitator)和协调者(coordinator)。文章的阅读和课文后配备的练习都可以由学生自己完成,教师通过练习检查学生的自习情况、对文章的理解程度,围绕讨论题组织学生分组或大班讨论。

讨论题有的是课文上可以直接找到答案的,由于学生英语水平不一,可以允许学生在课文上先找出答案、画线标记,再读出、背出、复述或用自己的语言给出答案。有的讨论题需要结合本国、本地的实际情况,可以让学生稍做准备,打个草稿或腹稿,再在组里或全班交流。如果教师能根据自己的经验也参与讨论,则效果更佳。总之,教师要设法调动每一位学生积极参与讨论,既交流信息、交流经验,又锻炼语言表达能力,还有助于提高学生在公众面前表达自己观点的能力和胆量,增强自信心。

鸣谢

本教材的编写和出版得到南京农业大学研究生院、中国农业大学研究生院、浙江大学出版社以及其他一些单位的支持和关心,得到全国农业推广硕士专业学位教育指导委员会的支持和出

版资助。农科院校研究生英语教学界资深教授王耀庭审阅了教材，并提供宝贵意见。早在 20 多年前就编写出版农业部农业英语教材的资深教授俞保丽欣然为本教材作序。南京农业大学外国语学院英语系丰芸、张一、张燕、冯武、甘仁杰、宋诗颖、李源等同学以及青年教师邵存林、彭松林等都认真参与了本教材的输入、校对。在此一并深表谢意。

本教材选用的材料均为编者在国外学习期间亲自搜集带回，谨向所有提供资料的机构和专家表示感谢。

最后，特别感谢我爱人陈建波博士。由于他的宽容和支持，我可以在必要的时候远离家务，腾出时间专心编写教材。更重要的是他以自己在经济学、管理学等方面广博的知识以及良好的英语语言素质成为本教材编写的重要后盾，是本教材的专业顾问，帮助解决了许多专业疑难问题。他也是本教材的第一位读者，从专业学者的角度提供了许多建设性意见。

郁仲莉

2008 年秋于金陵

Contents

序

前言.....-1-

Unit 1 Agricultural Extension in Developing Countries

- Text A Problems and Ideas in Agricultural Extension.....1
 Text B Training Agricultural Extension Workers.....10
 Text C Adoption and Diffusion of Innovations.....20

Unit 2 Management Planning and Policy

- Text A Managing Agricultural Extension.....34
 Text B Programme Planning.....51
 Text C Group Promoters in Rural Development.....68

Unit 3 Farmer-led Extension

- Text A Concepts and Practices in Farmer-led Extension.....78
 Text B Roles and Responsibilities in Farmer-to-farmer Extension (1).....88
 Text C Roles and Responsibilities in Farmer-to-farmer Extension (2).....97

Unit 4 Issues and Problems in Farmer-to-farmer Extension

- Text A Selection of Farmer-extensionists.....107
 Text B Payment and Time Allocation.....115
 Text C Other Issues and Problems.....127

Unit 5 Understanding How Gender Affects Agricultural Production

- Text A Gender Factors and Women's Roles in Agriculture.....131
 Text B Constraints Women Farmers Face: Barriers to Access (1).....141
 Text C Constraints Women Farmers Face: Barriers to Access (2).....147

Unit 6 Improving the Delivery of Extension to Women Farmers

- Text A Gender in Agricultural Extension.....155
 Text B Communicating with Farmers.....169

Text C	Monitoring and Evaluation.....	178
Unit 7 Pest Control in Growing Vegetables and Fruits		
Text A	Natural Methods for the Prevention of Pests in Cultivated Plants.....	181
Text B	Natural Methods of Pest Control.....	198
Text C	Pesticides.....	210
Unit 8 Poultry		
Text A	Poultry in Context.....	219
Text B	Integration of Poultry Production into Agricultural Systems in the Tropics.....	227
Text C	Marketing Poultry Products.....	235
Unit 9 The Wheels of Trade		
Text A	Developing Markets for Business Services.....	247
Text B	Setting the Terms of Discussion: A Model for the Delivery of BDS.....	257
Text C	A Fresh Analysis of a Traditional Approach.....	266
Unit 10 Farming for the Future		
Text A	Sustainable Agriculture.....	274
Text B	Agricultural Research and Extension.....	285
Text C	Additional Options for LEIA.....	294
Unit 11 LEISA in Perspective (1)		
Text A	In Search of Sustainability.....	301
Text B	Processes That Cause Change and Affect Sustainability.....	307
Text C	Is Agricultural Intensification Ecologically Sustainable?.....	316
Unit 12 LEISA in Perspective (2)		
Text A	Different Expressions of LEISA.....	326
Text B	Participatory Learning, Planning and Action toward LEISA.....	333
Text C	Building Bridges to LEISA.....	341
Key to Exercises.....		347
Bibliography.....		369

Unit 1

*Agricultural Extension in Developing Countries***Text A Problems and Ideas in Agricultural Extension**

Until recently, the majority of people in what we now call the developing countries lived a relatively unchanging life, producing food in the same way as their ancestors. Their methods of production were usually well adapted to the local environment, involving minimum risk and ensuring enough food for the family in all but exceptional years. But, in the last 50 years, the relative equilibrium of traditional societies has been greatly disturbed.

Populations have expanded rapidly as a result of decreased mortality and high birth rates, and the pressure of human numbers has caused traditional systems of land-use and the conservation of the fertility of the land to break down. The growth of towns and the number of people involved in nonagricultural activities have led to an increasing demand for agricultural products. This has placed an even greater strain on soil and pasture resources which are being used up rapidly, especially in semi-arid areas.

By far the most difficult problem is how to provide a livelihood for a rural labour force which is expected to double by the end of the century. A more intensive and productive use of land can help to solve the problem. To achieve this millions of farmers must be given access to agricultural education, the necessary production supplies, and markets.

Advice and assistance for farmers to help them improve their methods of production and marketing is called **agricultural extension**. However, agricultural extension should not be seen only in the context of increasing agricultural output. Extension is part of the effort to achieve a balanced social and economic development of rural areas. This is necessary in order to maintain the increase in productive capacity.

Early extension programmes

The term extension was first used in connection with education about 100 years ago to describe the method of spreading knowledge from the University of Cambridge in England to the great mass of people outside its walls. The earliest exponent of this system was Richard Moulton, a lecturer in literature. He and his companions travelled from town to town teaching adults, who, because of their employment in factories and offices, were unable to receive formal university

education. Although the early extension teaching was not concerned with agriculture, it featured 4 elements common to modern agricultural extension programmes:

1. the knowledge to be extended
2. the people to be served
3. a central extension organisation
4. the extension agent or contact man.

The term agricultural extension has come from the USA. Until 1914, lectures by university teachers to the general public were called extension lectures, but with the passing of the Smith-Lever Act in that year, the term came to be used mainly for non-formal education for the farming community. The purpose of the Act was to aid the spread of useful and practical information to farmers and their families on subjects relating to agriculture and home economics. State universities and colleges, called land grant colleges, were set up for research, training and evaluation.

Agricultural extension got going in the British colonies in the late 1920s. At this time it was realized that farmers were spending a lot of time meeting their subsistence needs; if they could improve their efficiency, more labour and land could be released for the production of surpluses for the market. Increased attention was given to the needs of farmers. The emphasis moved away from crops to the people growing them.

Extension problems in developing countries

At independence, many of the developing countries inherited an administration aimed primarily at increasing export production, gathering statistics and maintaining law and order. The goals of new nations related more to community development. There was then a tendency to modify the organization of extension programmes in order to serve the diverse needs of the communities. This led to conflicts between departments, poorly coordinated effort and disappointing results. Governments grew impatient with the slow, plodding extension worker and his farmer clients, and sought alternative means of increasing the production of small farmers.

Some of the criticism of extension services appears to have been justified. Statistics showing increases in production as a result of extension work are often exaggerated and conceal inefficiency. However, much of the criticism of agricultural extension has arisen from inadequate understanding of the special problems involved in bringing about social and economic change within rural societies in the twentieth century.

The population problem Increases in population soon swamp any improvements in services. In economically advanced countries, the ratio of extension workers to farmers lies between 1:350 and 1:1,000, whereas most developing countries are lucky if they have one to every 5,000 farm families. A Latin American extension worker once complained that despite the 30,000 school teachers in his country, there were still large numbers of children who were unable to read. What could he hope to achieve in the way of agricultural progress with only 30 staff?

Inappropriate content A high ratio of extension workers to farm families is, however, of

little practical value if the extension message is inappropriate. Farm improvements well adapted to surplus labour, unsophisticated skills and scarce capital are generally not available. Setbacks have been caused by inappropriate technology and institutions borrowed from economically advanced countries. A lot of money has been wasted on the promotion of techniques which were of little help to poor farmers. Many recommended practices have been insufficiently profitable to justify their inclusion in extension programmes. Without a good understanding of farm management, extension workers have been unable to reassure farmers about the benefits of proposed changes.

Lack of practical skill Extension workers are often lacking in practical ability as a result of poor training and selection. Frequently their demonstration plots show how much they have to learn from the farmers they are supposed to teach. A major criticism of the US extension workers in Latin America was that they were preoccupied with extension methods rather than farm technology. For example, experts in audio-visual aids were skilled in design and presentation, but lacked the practical training in agriculture necessary to test and demonstrate agricultural improvements.

Lack of supporting services The extension services in economically advanced countries are aimed at rural societies which are highly specialised. For many years, small farmers and farm workers have been leaving rural areas for employment in the towns. In Britain less than 2 per cent of the working population are directly employed in agriculture. Those remaining have security of tenure, and access to credit, markets and farm supplies. Most of them can read and write, receive the farming newspapers, and have their own radio and television sets. Farming programmes have a wide audience. The extension worker is also supported by representatives of commercial firms selling a multitude of products. Farmers are easily reached because roads, telephones and postal services are well developed. Farming interests are well represented in parliament.

In developing countries the situation is very different. Fifty to 80 per cent of households are dependent on agricultural employment. The great majority are poor and illiterate. Private commercial suppliers of seed, agricultural chemicals, tools and spare parts are often absent. Too often farmers have the frustrating experience of getting less money for their marketed produce than they rightly expected. Costs of transportation are high and markets for tropical agricultural produce are highly competitive and unstable. Profits are often siphoned off by moneylenders, merchants and landlords, or the market may be dominated by large foreign-owned plantation companies. Peasant organisations are frequently suppressed. In such cases little can be achieved by the lone extension worker.

The management problem

In most developing countries, extension services are organised along similar lines to civil service agencies, with offices at the national, provincial (state), district and rural council levels. Complex organisations such as these have problems of communication between the upper and lower levels. All instructions and reports have to be transmitted through each link in the chain. Complex chains of command cause delays and distortion of the extension message.

Programmes are usually planned and decisions taken by senior staff who tend to be out of touch with local problems and the day-to-day difficulties facing the farmer and the extension worker. There is barely any feedback to the decision-makers because intermediate staff are reluctant to pass back information which might imply criticism of their superiors.

The extension agent, the most important link in the chain, is often the least supported with transport, equipment and technical guidance. Supervision is usually inadequate. Too often, salaries and staff accommodation absorb most of the extension budget.

The workload of an extension agent may be very heavy. Tasks include:

1. writing applications for credit and subsidies for farmers
2. filling in many questionnaires and forms for headquarters
3. setting up and maintaining demonstration plots and distributing supplies.

The extension agent may be the only government officer operating at the local level, and may thus be given various non-agricultural tasks as well. Very little time is left for working with farmers or for in-service training. The little agricultural work that is done is rarely systematically planned or supervised. Extension agents hardly ever have a plan of work, and when they do the plan is often too vague to be checked and may have little relevance to the needs of the farmers. Senior staff have neither the means nor the inclination to check on performance.

Extension workers generally spend too much time in their offices and not enough time in the field. The attempt to implement inappropriate extension programmes meets with apathy and sometimes hostility from farmers. The extension worker is torn between loyalty to the farmers and loyalty to his employers and, not surprisingly, takes refuge behind his desk in bureaucratic tasks.

The reluctance of extension workers to identify with farmers and share their anxieties is often the result of values acquired at school. The educational system is often geared to developing skills for employment in office jobs in the capital. In fact, education provides a means of escaping from rural areas. Promotion within the civil service is usually best obtained through an office job under the eye of the director rather than by hard work in remote rural stations.

Making agricultural extension more effective

There is little that can be said about improving extension that has not been said before. Many of the so-called new ideas about agricultural extension often turn out to be earlier visions not put into practice.

Devising solutions

The success or failure of an extension programme depends on the relevance of its content and the degree of popular interest it generates. It is essential for an extension programme to be preceded by a field survey in which the management objectives of farmers and their problems are identified and acceptable solutions devised. This should be carried out by a team of specialists, preferably from the district headquarters, assisted by local extension staff. Extension programmes are expensive in terms of the recurrent budget thus justifying thorough diagnosis.

The need to improve the content of extension, especially in connection with food crops, has promoted the setting up of international research centres such as the International Rice Research Institute (IRRI) in the Philippines and the International Maize and Wheat Improvement Centre in Mexico. Innovations in the production of both cash and food crops are essential if a profitable programme is to be assembled for subsistence farmers.

The advances which have been achieved by IRRI and similar institutions are the result of cooperation between extension and research staff. Innovations can only be adapted to the needs of local farmers by coordinated effort. Appropriate technology can be evolved only on the fields of farmers.

Coordinating extension with other services

The principal lesson to be learned from agricultural extension over the last 50 years is that extension programmes succeed only when linked to research, the organised delivery of farm inputs and outputs, and credit and attractive prices for farmers. National extension services have contributed little in isolation because technical information without other facilities cannot assist the farmers. While it is true that extension workers should not get personally involved with organising credit, distributing supplies and marketing, they should be familiar with the activities of credit agencies and farm suppliers and be able to coordinate their work with them. In Latin American countries, officers of credit agencies are a major source of extension assistance.

Recognition of the interlocking nature of agricultural-production systems lies behind such approaches to rural development as package programmes, contract farming, integrated development and community development. These approaches involve coordinated action by the development agency in a number of interrelated areas. Integrated development emphasises the importance of improved social services as well as the technical improvements of agriculture within a region. Underlying community development is the recognition that if people are to change their attitudes to agricultural progress, they must first have a good reason. Learning new agricultural practices is a means to an end and not an end in itself. Progress must begin with changes in the attitudes of people themselves.

In all approaches to rural development, the role of the extension worker is basically the same: to demonstrate acceptable improvements and seek ways of bringing their adoption within the grasp of farmers. This work has long been central to rural development because extra production must always come first in order to:

1. increase farmers' incomes
2. increase off-farm employment by spreading the extra income in various employment-giving ways
3. increase government revenue and help pay for other services such as clinics, schools and water supplies.

Most rural development too easily slips into these other services because it is much easier and more popular to build schools and clinics, etc. than to increase output. The result is that there is no radical cure of poverty which springs from low productivity.

The extension worker must coordinate as well as convey technical information. As middle man between research, marketing, supply and credit agencies, and the farmer, the extension worker explains the needs of farmers to these agencies and informs farmers of the opportunities available to them.

Selection and training of extension workers

Extension is often the department in a ministry which holds the lowest public esteem. This can be improved by more rigorous selection and training of extension workers together with better pay and conditions to the level of other government workers.

If field staff are to be able to communicate with and motivate farmers and help them solve their everyday problems, it is essential that they are recruited from rural areas. In some countries, farmers themselves are being recruited to assist full-time extension workers and act as intermediaries between farmers and extension staff.

An extension worker must be a good technician and must be kept up to date with changes in agricultural practice. Training which emphasises participation and involvement is essential so that extension staff can learn how to help the farmers.

Knowledge of agriculture and a few communication techniques will not be sufficient preparation work. Extension staff will need to know how their agency is organised. Management training should also be part of higher-level extension courses.

Extension methods

In areas where there are large numbers of small farmers, group work is more practicable than individual farm visits. Apart from the large number of farmers, there are other good reasons why working with groups is more appropriate in developing countries. Farmers often have a high awareness of group requirements and are controlled by powerful religious and group rules. They prefer to imitate those with values and technical competence similar to their own. Group methods provide a familiar, secure setting.

Where extension workers have concentrated their efforts on selected progressive farmers, the average farmer has shown little interest in changing his practices. If contact farmers are needed, they should be elected by the group and not selected by officials.

The purpose of extension work is to awaken the desire for technical, economic and social change and to teach practical and managerial skills. All extension work should be based on group discussion, practical demonstration and participation. Teaching methods borrowed from the school classroom are not acceptable in non-formal education.

Among educationists in general there is a tendency to confuse education with educational equipment. In the rural areas of developing countries, the more complex the teaching equipment, the less likelihood there is that it will be effective. Radio and television can be important in reaching large numbers of people with useful information. However, their effectiveness depends on close cooperation between programme producers, extension workers and listening groups at the village level.