

Bilingual Textbook of Forage Cultivation

牧草栽培学双语辑要

主编 龙明秀 呼天明



高等教育出版社

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内容简介

本书共 10 章, 绪论主要从牧草产业发展的角度阐释牧草的重要性, 世界牧草生产格局与供求态势, 中国牧草产业现状与前景, 本课程的性质、任务及内容等。第 1 章至第 4 章为总论部分, 主要介绍牧草的分类, 牧草的生长繁殖特性与规律, 牧草生长发育与光、温、水、土等气候及环境因子的关系, 人工草地的建植与管护, 牧草混播及草田轮作技术等。第 5 章至第 9 章为各论部分, 主要介绍主要豆科牧草、禾本科牧草、禾谷类饲料作物、根茎瓜类饲料作物等的植物学特征、生物学特性、栽培技术、饲用价值与利用方式等。第 10 章主要介绍牧草的起源、分布及区划的原则与依据, 并概述了我国牧草的九大分区。

本书主要作为草业科学专业本科生教材使用, 同时也适用于动物科学、水土保持等专业, 也可以作为研究生或草业科学相关教学和科研人员的参考书。

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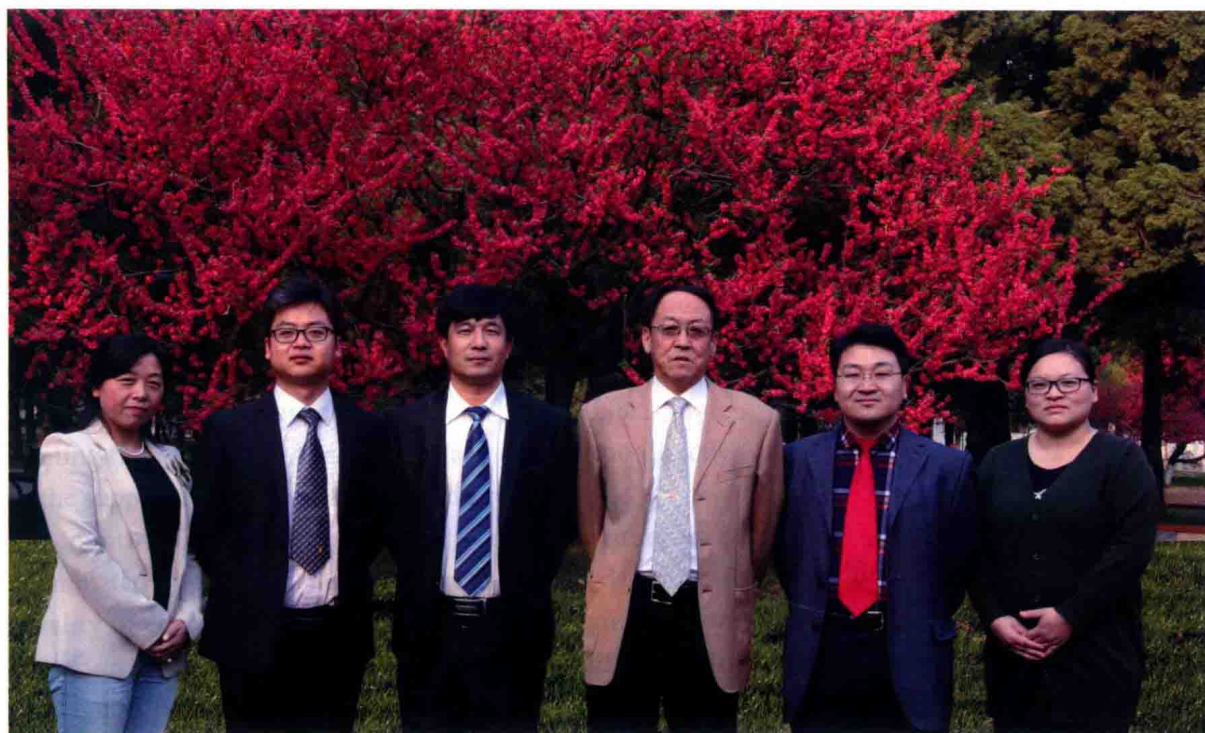
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本书作者，左起依次为龙明秀、何树斌、许岳飞、呼天明、杨培志、何学青

Preface 前言

Grass, as a producer of the most extensive coverage of the Earth, is able to maintain the life circle of the entire planet along with other producers by photosynthesis which allows solar radiant energy into biosystem and feeding herbivores in the form of organic matter with bioenergy, by which means energy is passed on from one species to another.

Grass is the forgiveness of nature-her constant benediction. It has immortal vigor and aggression to protect the ecological safety year after year. It bears no blazonry or bloom to charm the senses with fragrance or splendor but its homely hue is more enchanting than the lily or the rose. Forage production directly affect the supplication of animal food and products.

Accounting for more than 40% of national territory area and dominated by perennial herbal plants, rangeland determines the quality of ecological environment to a great extent. Lawn developed in high-cost urban land makes a great difference to the urban air quality and people's feelings and mood. Cultivated grassland can develop into an independent industry and its amount and quality is also an important indicator of animal husbandry modernization for a region and even for a country. Accordingly, forage cultivation is a systematic technique connecting the restoration improvement of rangeland vegetation, the establishment of cultivated grassland and the establishment of lawn in urban area.

Since 1942 when professor Wang Dong, the founder of modern grassland science in China, pioneered to teach and study forage science, the major of grassland science has been developed with great speed in Northwest A&F University. To be specific, postgraduates have been cultivated to study forage science from 1986; undergraduates and postgraduates were enrolled in 2000 and 2003 separately to study the major of grassland science; and then doctoral students were recruited in 2006 when the major was the secondary discipline of animal hus-

草——作为覆盖地球最为广阔的生产者，通过光合作用使太阳辐射能进入生命系统，并连同其他生产者使太阳辐射能以含能有机物的形式，经由草食动物，传递给一个又一个生物种群，进而维系整个地球生命界。

草是自然界的宽宥，不断地赐福于我们。它虽不如鲜花娇艳，更不像树木结果，然而年年岁岁、岁岁年年给予我们生态庇护，牧草生产直接影响动物性产品的供给。

占国土面积 40% 以上，以多年生草本植物建群的天然草地很大程度上决定着我国生态环境的优劣。寸土寸金的城市土地上的草坪则关乎城市的空气质量和人们的心情状态。人工草地不仅可以形成独立的产业，其多寡优劣更是一个地区乃至一个国家畜牧业现代化的重要标志。而牧草栽培则是关联天然草地植被修复改良、人工草地建植、城市草坪建设的系统技术。

自 1942 年我国现代草业科学奠基人王栋教授率先开展牧草学教学和研究以来，西北农林科技大学的草业科学学科经长期快速发展，1986 年在饲料科学硕士点开始培养牧草学方向研究生，2000 年招收草业科学专业本科生，2003 年招收草业科学硕士生，2006 年作为畜牧学二级学科招收草业科学博士生，2011 年晋升为草业科

bandry science; until 2011, grassland science was successfully promoted to the first-level discipline and approved to be the key discipline of Shaanxi Province. After decades of unremitting efforts of several generations, a young and vibrant team with more than twenty people for teaching and research has been gradually formed in the department of grassland science in Northwest A&F University. "Forage cultivation" was approved as the national excellent course in 2010 and the project of national excellent resource sharing course in 2013. In the respect of scientific research, our team has undertaken a number of national and provincial major scientific research projects and international cooperation projects, focusing on the collection, evaluation, cultivation and utilization of forage resource and the forage adversity biology.

As modern education tends to be more and more international, we have been exploring and trying to bilingually teach the course of forage cultivation with the textbook *Forages* of original edition from America. However, for this course is characterized by extremely practical application and distinct regional feature, during the course of bilingual teaching we found that the system and content of the original textbook from America cannot be well applied to the practical forage production in China. Coupled with the reason that the original textbook is too expensive for students to afford, it is urgent to compile a bilingual textbook of forage cultivation which is well matched with the regional feature of our country. Therefore, the members of our team with years of teaching and practical experience and insights organized and compiled the *Bilingual Text of Forage Cultivation* based on existing domestic outstanding textbooks and teaching materials of original edition from America.

This text is divided into two main parts, general theories and special forages. Part 1 generally elaborated the basic knowledge of forage agronomy and regular techniques and principles for forage cultivation including the growth and reproduction characters of forages, the relationship between forage and the environment, the establishment and management of pastures etc. Accordingly, part 2 mainly illustrated the botanical and biological characteristics and the techniques of cultivation and utilization of the most common but very important cultivated forages and forage crops in practical production in China.

学一级学科并获批陕西省重点学科。历经几代人几十年的不懈努力，西北农林科技大学草业科学系已形成了一支具有 20 余人的年轻并充满活力的教学科研团队。“牧草栽培学”课程于 2010 年获批国家精品课程，2013 年获批国家精品资源共享课。科学研究方面，围绕牧草资源收集评价、培育利用和牧草逆境生物学，承担了多项国家及省部级重大科研项目及国际合作项目。

在教育越来越国际化的大趋势下，我校早在 2006 年就已经开始了“牧草栽培学”双语教学的探索与尝试，并选用美国原版教材 *Forages*。然而，因本课程是一门实践性极强的应用型课程，具有明显的地域性。双语教学过程中，我们深感原版教材的体系和内容与我国的饲草生产实际存在较大出入，加之原版教材价格昂贵，学生无力承担。因此亟待编写一本适宜于我国地域特色的双语版教材。鉴于此，本课程教学团队结合多年的教学经验和感悟，根据国内现有的优秀中文教材和美国原版英文教材，组织编写了这本《牧草栽培学双语辑要》。

《牧草栽培学双语辑要》分为总论和各论两大部分。总论包括牧草的生长繁殖特性、生长发育与环境、人工草地的建植与管护等，从总体上阐述牧草栽培的农艺学基础、常规技术和原则。各论部分主要介绍我国生产上常见的重要栽培牧草及主要饲料作物的植物学特征、生物学特性及栽培利用技术等。

本教材突出的特色是，形式上文字简练、图文并茂；语言上，以英文

The prominent features of this work are concise and well-illustrated in form, written in English and supplemented by Chinese interpretation in language to cater to the teaching requirement, focusing on the regional features and taking into account of the discipline systematicness at the same time and the difference between north and south in geography. We greatly appreciate Professor Roger Gates from South Dakota State University of United States for linguistic modification and polish in English.

This edition might appear mistakes or other problems for the limitation of authors' practical experience and academic accomplishment. Since it is the first attempt to compile a bilingual textbook, we appreciate if readers give us more advice and comments to perfect and optimize the next edition.

*By Prof. Hu Tianming,
Aug 2016, In South Dakota State University of America*

为主，辅以中文释义，以满足教学需要；地域上，既注重区域特色，又兼顾学科的系统性和南北差异，适用于草业科学专业教学和相关科研人员参考使用。感谢美国南达科他州立大学的 Roger Gates 教授给予全书的英文修改及润色。

由于作者生产实践经验和学术素养所限，编写双语教材亦属新的尝试，全书还可能存在着这样或那样的问题，敬希读者不吝指正，以便再版时更臻完善。

呼天明
2016年8月
于美国南达科他州立大学

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