



普通高等教育“十二五”规划教材

烟草专业英语

YANCAO ZHUANYE YINGYU

主编 许春平 张峻松



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内容提要

《烟草专业英语》是烟草专业的主要专业选修课程。该教材选自原版烟草专业英文书籍,分16章,内容涉及烟草分类、烟草栽培、土壤与肥料、遗传与育种、烟草病虫害、烟叶调制、烟叶醇化、烟叶化学、烟叶物理特性、烟草配方、烟草香味成分、无烟烟草等方面。选材广泛,风格多样。本书可作为烟草种植、烟草工程专业的英语教材,内容涉及整个烟草种植、加工和化学等领域,也可作为从事烟草方面技术人员学习英语或者其他科研人员了解烟草的入门参考书。

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Chapter 1 Introduction

★掌握烟草的定义、分类、中式卷烟基本知识以及本书的基本内容。

1. What is Tobacco?

Tobacco is a kind of special plant containing nicotine, belong to *Solanaceae*, *Nicotiana*.

From seed to smoke, the culture, manufacture and use of tobacco involve a continuous chain of events. Each step in those events represents a single link of the long chain, and each link is of equal significance. Weakening of any single link produces a product of inferior quality; breaking the chain or eliminating any single link may produce a nonusable product.

Tobacco is similar to most agricultural products in that it begins with a single seed which is a carrier of genetic information. Environmental elements provide the proper conditions needed for the full expression of such genetic information. Human intervention through cultural practices, for example, influences the degree or fullness of gene expression, such as development of plant and leaf characteristics in the field. Postharvest manipulation charts the course of physiological and biochemical changes toward desired quality and thus usability.

Tobacco differs from other crops in that it is used mostly for combustion. Variables of botanical, physical and

nicotine 尼古丁, 烟碱

Nicotiana 烟草属

Solanaceae /sələ'neisi/ 茄科植物

inferior 下级; 次品; 差的; 下等的

chain /tʃein/ 链

intervention /ɪntə'venʃən/ 干预

postharvest /'pəʊst'hɑ:vɪst/ 采后, 收获后

usability /ju:zə'biliti/ 可用性

combustion /kəm'bʌstʃən/ 燃烧

botanical /bə'tænikəl/ 植物的

chemical characteristics of leaf tobacco determine degrees of combustibility, smoke composition, taste and aroma and, thus, product acceptability.

combustibility /kəm,bʌstə'biliti/

可燃性

acceptability /ək,septə'biliti/

可接受程度

stepwise process

循序渐进的过程

all in all

总之

From seed to smoke involves a long, stepwise process, which is a science as well as an art. Tobacco (*Nicotiana tabacum* L.) is one of the most, if not the most, studied species today in plant and biological science, physics and chemistry, and in bioengineering and technology. For example, in one month alone there were 231 scientific reports involving tobacco. All in all, much is known about tobacco, but much has yet to be learned and much has yet to be fully understood and appreciated.

2. The Importance of Tobacco

During the twentieth century tobacco has become one of the most economically important agricultural crops in the international marketplace. Not only do farmers in over 100 countries depend upon tobacco as a major source of cash income, but an entire industry, from a diverse manufacturing sector to distribution and retail outlets, has grown to be a major economic force in many industrial and developing countries. Along with the growth in the tobacco industry, local and national governments in many countries have reaped added benefits through the collection of tax revenues. The growth in the tobacco industry has been supported by numerous scientific and technical advances in the last century. Indeed, one could speculate that without these achievements the tobacco industry would not have reached the level of global importance it has today.

3. The Challenges of Tobacco

Despite the rather remarkable advances for tobacco as an agricultural industry, it would seem that few other industries have faced as many challenges and changes in recent years. The globalization of the tobacco industry, new

diverse 不同的;多种多样的

distribution 分布;分配;批发

outlet 批发商店

revenue 税收

speculate /'spekjuleit/

推测;思索

globalization /,gləʊbəlaɪ'zeɪʃən/

全球化

legislation and efforts by external forces have greatly altered the environment in which the tobacco industry operates. While many in the tobacco industry have continued to strive to produce a high quality tobacco leaf for superior consumer products, the new, dynamic environment has made it difficult to keep that focus. Indeed, many individuals throughout the tobacco industry are focusing on new issues to more effectively meet the needs of this ever-changing environment. These challenges should be considered positive, as it will be through effectively meeting these challenges that the tobacco industry will provide for the next hundred years.

4. Research of Tobacco

While consumer preferences drive raw product requirements, it is the purchaser of the leaf that must implement many of these changes. Leaf quality and price are often deciding factors in the implementation effort. As we move to the future of tobacco products, as well as other consumer products, we will see an increasing use of biotechnology to enhance a product's usability and value. Because of certain unique characteristics of the tobacco plant, it has been widely used in genetic studies for over 75 years. Rapid advancements in knowledge of genetics and technological creativity have provided remarkable tools to genetically improve the tobacco plant. These improvements could be targeted towards fine-tuning the plant to achieve certain characteristics including improved agronomic performance and pest resistance.

From 2000 to 2010, 100 000 papers on tobacco were published, from the 100 000 scientific reports, not only have we learned about the basic plant science, but they have contributed to our knowledge of chemistry, physics, engineering and health science. In the late 1980s, compounds identified in tobacco and smoke amounted to

operate

经营

dynamic /dai'næmik/

动态

agronomic performance

农艺性状

pest resistance

抗虫能力

fine-tuning

微调

broad-based 广泛的 慎重的
Chinese-style cigarette

中式卷烟

the State Tobacco Monopoly
Administration

(STMA) 国家烟草专卖局

guideline /'gaɪdlaɪn/ 指导方针

Virginian-type cigarette

烤烟型卷烟

blended cigarette 混合型卷烟

5 000. Now the amount is estimated to be well over 6 000.

This course is to introduce the concept that from tobacco to its chemical composition, each step is important. Here, in summary, we also wish to emphasize that although much is known about tobacco, even much more is not yet understood. We have to treat tobacco with respect.

Many of the advancements in tobacco science have arisen from research conducted at public institutions including universities and government agencies. A reduction in public support for future tobacco research has already occurred in some countries. This will undoubtedly make it more difficult to address the research needs of growers and manufacturers, as well as hamper the development of the next generation of tobacco scientists. Broad-based support for research will have to come from within the industry, and consequently, research programs must be carefully evaluated for their cost effectiveness, value to the industry and the ease of supplying the research results at the farm level.

5. Development of Chinese Tobacco Industry

Tobacco use was first introduced into China during the sixteenth and seventeenth century from the west via Philippines and Vietnam, to the south of China, and via Korea to the northeast of China.

(a) Chinese-Style Cigarette

In 2003, the State Tobacco Monopoly Administration (STMA) officially released a Guideline on China's Tobacco Scientific and Technological Development. The guideline has presented the basic concept of Chinese-style cigarette for the first time, as well as the detailed requirements for focusing on developing Chinese-style Virginian-type cigarette, actively researching and developing Chinese-style blended cigarette, attaching importance to the fundamental status of tobacco leaves,

aggressively reducing tar content level, caring more for public health and promoting the harmonious tobacco and social development.

(b) *Characteristics of Chinese-style Cigarettes*

The "Chinese-style cigarettes" refer to an style of cigarettes developed over one hundred years, which can meet the requirement of Chinese smokers, with unique aromatic and taste characteristics, and proprietary core technologies.

"Chinese-style cigarettes" are mainly Chinese-style Virginia-type cigarettes and blended cigarettes, with the former taking a dominant position.

(c) *Change in Tar Content in Chinese Cigarette Over 20 Years*

It can be seen from this chart (Fig. 1.1) that in twenty years from 1983 to 2003, the weighted average tar content in Chinese cigarettes was reduced from 27.27 mg/unit to 14.3 mg/unit, a reduction of over 0.6 mg/unit per annum. Statistics from recent quality monitoring and testing on cigarette products show that major Chinese cigarette manufactures have the full ability to conform to the "tar limit regulation".

6. *Classification of Tobacco*

Most of the commercial tobaccos produced in the world are *Nicotiana tabacum*. The only other species used on a limited commercial scale is *N. rustica*. In addition to the botanical classification of the species, tobacco is classified on the basis of major types and general uses.

Because the properties of tobacco and, therefore, its usability vary markedly with variety, locality, system of production and curing method, standardization of the commercial product is essential for growers and users (i.e. manufacturers). It is based primarily on curing method (air-, sun-, fire- and flue-curing), locality of

tar limit regulation 限焦令
aromatic /ˈæraʊ'mætɪk/ 芳香的
proprietary /praɪ'praɪətəri/ 专有的, 拥有的

air-curing 晾制
sun-curing 晒制
fire-curing 熏制
flue-curing 烤制
tar content 焦油含量

stalk/stɔ:k/ (植物的)茎,秆
ripeness/'ri:pns/ 成熟

production (growth) and the way in which the leaf is to be used (cigarette, cigar, pipe, etc.). Further classification is then according to position on the stalk from which the leaves have originated and factors such as their color, quality and ripeness at harvest.

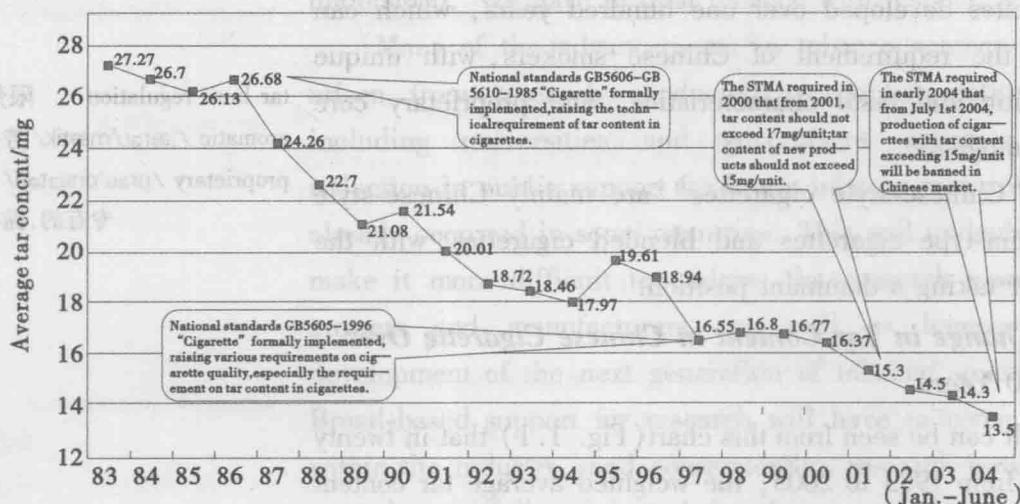


Fig. 1.1 Change in tar content in Chinese cigarette over 20 years

【注释】

nicotine 烟碱 指烟草植物中特有的一种植物碱,分子式为 $C_{10}H_{14}N_2$ 。烟碱是吸烟者获得满足生理需要的基本物质。

combustibility 燃烧性 烟叶具有的燃烧的特性。

blended cigarette 混合型卷烟 以烤烟、白肋烟、香料烟及其他晾晒烟叶为原料制成,烟气中具有烤烟及晾晒烟混合均匀协调的香气及吸味的卷烟。例如:典型的美式卷烟。

tar 焦油 从主流烟气中捕集到的总粒相物质(TPM)中减去水分为干粒相物质,从干粒相物质中减去烟碱即焦油。

cigar 雪茄 传统意义的雪茄烟是指全部用具有雪茄型香气的晒晾烟叶制成的圆柱形或方柱形烟支,其最内层的是芯叶,包卷在芯叶外面的是内包叶,包卷在最外面的是外包叶。近代为便于机械化生产,有的采用烟草薄片代替内包叶和外包叶,也有用特殊的卷纸代替内包叶,还有只用一张薄片代替内、外包烟卷制成的雪茄烟。

Burley tobacco 白肋烟叶 是晾烟烟叶的一种,具有吸收料液能力和填充能力较强、燃烧性好、香气浓郁等特点。

【译文】

1. 什么是烟草？

烟草是一种含有烟碱的特殊植物,属于茄科,烟草属。

烟草从种子发芽到最终转变成烟气的整个过程中经历栽培、加工制造和使用一系列环节,在这些环节中每一步骤都是一个独立的环节,而且同等重要。任何一个环节的疏忽或遗漏都会导致烟叶甚至卷烟品质的下降。

烟草和其他农作物一样,都是由遗传信息的载体——种子生长发育而来的。环境因素为遗传信息的充分表达提供了适宜的条件,如,人类通过改变栽培措施来改变烟株和叶片性状等基因的表达程度。收获后的加工处理使烟叶发生各种各样的生理生化反应,从而使烟叶具备令人满意的品质和可用性。

烟草作为可以燃烧的物质又不同于其他作物,烟草的植物学、物理、化学特性决定了其可燃性、烟气组成、吸味、香气和产品的可接受程度。

烟草自种子发芽到逐步形成烟气的漫长过程既是一门科学,又是一门艺术。普通烟草 (*Nicotiana tabacum* L.) 是目前在植物学、生命科学、物理和化学,以及生物技术领域研究最多的物种或其中之一,例如仅 1 个月内(1996 年 5 月)就有 231 篇涉及烟草的科学报道。总之,烟草虽已为世人所熟知,但是仍有许多方面还需要我们去探知和更加全面地了解。

2. 烟草的重要性

20 世纪,烟草已成为国际市场上最重要的经济作物之一。它不仅仅是 100 多个国家烟农的收入来源,而且从不同生产部门到批发零售环节的整个烟草行业已成为许多工业化和发展中国家的重要经济力量。随着烟草业的发展,在许多国家,地方及中央政府的税收有了大幅度提高。19 世纪烟草业的发展得益于科学技术的巨大进步。确切地说,如果没有这些科技成果,烟草业现在就不可能在全球达到如此重要的地位。

3. 面临的挑战

烟草业作为农业的一个产业尽管取得了相当显著的成就,但近年来可以看出它也经历了其他行业没有面临过的挑战和变革。烟草业的全球化、新法规及外界的影响大大改变了烟草业的发展环境。为了提供给消费者更好的烟草制品,在烟草业许多人依旧致力于生产高品质烟叶,而新的、不断变化的形势使得继续以此为中心变得有点困难。事实上,烟草业的许多人士正在为更有效地满足日益变化的新形势的需要而致力于新课题的研究。这些挑战应该被认为是积极的,因为 21 世纪烟草业将面临更多这样的挑战。

4. 烟草的研究

消费者的喜好左右着原料的需求,烟叶经销商们必须根据这些变化不断调整产品结构。烟叶品质和价格是其中的决定性因素。放眼未来,我们将看到,生物技术的应用会越来越广泛,从而提高产品的可用性和价值。在过去 75 年中,烟草植物由于某些特殊性,被广泛应用于遗传学研究。遗传学知识和技术创新方面的快速发展为烟草作物的基因改进提供了强有力的工具,这些成果可以用来更好地改进烟草的某些特性,包括农艺性状和抗病虫害等。

2000 年到 2010 年,10 万篇有关烟草的论文发表。从这 10 万篇科学报道中,我们不仅

了解到基础的植物科学知识,而且还充实了我们的化学、物理、工程学和健康科学的知识。20 世纪 80 年代后期,鉴定出烟草和烟气中的化合物数量有五千种。迄今估计有六千多种。本课程介绍了烟草自种子到形成烟气的整个过程中,每一个步骤都同等重要。总之,我们想强调的是:尽管现在已对烟草了解了很多,但未知的仍有许多,我们必须慎重对待烟草。

许多烟草科学方面的成果都是从公共研究机构包括大学和政府等的研究结果中获得的。一些国家已减少了对未来烟草研究的公共支持。无疑这将造成以满足烟农和制造商需要为目的的研究更加困难,同时也妨碍了下一代烟草科学人员的成长。烟草研究所需要的众多支持不得不全部来自烟草行业,因此研究计划的成本效率、行业价值及其成果在农场应用的难易程度必须被认真评估。

5. 中国烟草行业的发展

烟草是在十六七世纪开始从西方传入中国的,经由菲律宾和越南传入中国南方,经由朝鲜传入中国东北。

(a) 中式卷烟

2003 年国家烟草专卖局(STMA) 针对我国烟草科技发展正式公布了一个指导方针,首次提出中式卷烟的基本概念,就专注于发展中式烤烟型卷烟,积极研究和开发中式混合卷烟,重视烟叶的基本状况,积极降低焦油含量,更多地顾及公共卫生、促进和谐烟草和社会发展提出了详细的要求。

(b) 中式卷烟的特点

中式卷烟是指经过一百多年发展起来的具有中国特色风格的卷烟,可满足中国吸烟者的需求,具有独特的香味和吸味,并拥有自主知识产权核心技术。

中式卷烟主要是中式烤烟型卷烟和混合型卷烟,前者处于主导地位。

(c) 20 年来中国卷烟焦油量的变化

20 年来中国卷烟焦油量的变化见图 1.1。从图中可以看出,从 1983 年到 2003 年,中国卷烟的平均焦油量从 27.27mg/支下降到 14.3mg/支,平均每年减少了超过 0.6mg/支。对卷烟产品最近质量监控和测试的统计数据表明,中国卷烟制造商有充分的能力遵守“限焦令”。

6. 烟草的分类

世界上生产的大多数商用烟草都是红花烟草,其他唯一有一定商用价值的种类是黄花烟草(*N. rustica*)。烟草分类除按物种的植物性状来分类外,类型和用途也是重要的依据。

烟草的特质及其可用性均随品种、生产区域、生产方式和调制方法的不同而产生明显的变化,因此,对烟草种植者和产品制造商来说制订烟叶商品标准都是十分必要的。首先按烟草的调制方法(晾、晒、熏、烤)、生产区域和使用方式(卷烟、雪茄、斗烟等)进行分类,再进一步依据烟叶的生长部位、颜色、质量和成熟度等因素来细分。

【习题】

1. Translate the following into Chinese.

Synopsis of this Lecture

This lecture will discuss the interrelationships among the growth of the tobacco

plant, the harvested leaves, their curing, processing and manufacturing, and the properties of the final product. Through each step of the process from tobacco seed germination to smoke yield the goal of the entire process is consumer satisfaction. A discussion of the breeding and genetics of the tobacco plant flows into a chapter about the new frontier of biotechnology. Tobacco is an ideal recipient for the introduction and expression of foreign genes for use in plant enhancement or disease resistance. Biotechnology will inevitably have an impact on future tobacco production and utilization. The combined study of the tobacco plant's physiology and the improvement of agronomic practices has enabled and will continue to enable us to enhance the leaf yield. This monograph will outline the general management practices for each of the major tobacco types flue-cured, light air-cured, Oriental, cigar and fire-cured. The economic losses, management, control, effects on tobacco's chemical composition and leaf usability will be studied in a chapter outlining major tobacco diseases. The minimization of pesticide residues is a worldwide issue and is featured in a discussion of tobacco insect management from production to storage of tobacco products. The basic chemical constituents of the tobacco leaf and the differences among tobacco types are presented in a chapter on leaf chemistry, followed by a discussion of tobacco's physical properties in relationship to manufacturing needs and properties. Tobacco's marketing systems, threshing and redrying, aging, fermentation and storage procedures blend into a section on cigarette design. This lecture will closely examine current practices and new developments in the area of cigarette manufacture and the study of smoke chemistry. Lastly, the topics related to cigars, cigarillos and smokeless tobacco products will be explored. This lecture is intended to offer a broad view of current tobacco knowledge/practices and features sections relating to the future of tobacco.

2. Please translate the following sentences into English.

明火烤烟是一种劲头较足的烟草品种,多用作管烟、香烟、嚼烟、鼻烟和烈性雪茄的调料。

香气纯正、饱满、焦油含量低,能降低对人体危害,为高科技生产烤烟型卷烟之极品。

Chapter 2 Tobacco Cultivation

★掌握烟叶的栽培环境(土壤、营养、气候等)和人为因素(施肥、收获等)对烟草生长的影响以及烟草栽培的常用语。

1. Environmental Influences

(a) Soil, Moisture and Air

heavy clay	重黏土
root system	根系
adequate /'ædɪkwɪt/	充足的; 适当的;胜任的
soil aeration	土壤通气性
drainage /'dreɪnɪdʒ/	排水
turgid /'tɜːdʒɪd/	肿胀
moisture /'mɔɪstʃə/	水分
desirable /dɪ'zaɪərəbl/	理想的
criteria /kraɪ'tɪəriə/	标准

Although tobacco can be grown in a wide range of soils from sands to heavy clays, each type has reasonably specific soil requirements to produce optimal quality. Tobacco has a very active root system which is required to support the development of an enormous leaf area within a short period of time. Adequate soil aeration, water and nutrient supply are three major requirements for maximum leaf expansion. It is evident that to ensure thorough soil aeration and drainage at all times, a relatively open, loose soil structure is essential. On the other hand, for maximum foliage expansion it is essential that the tissues be fully turgid at all times, and this, in turn, requires an abundant moisture supply in the soil. The need for a balanced and adequate supply of plant-food elements to support this growth is obvious.

(b) Nutrition

Desirable leaf quality or "usability" requires a subtle balance of chemical and physical properties, involving visible, physical and chemical criteria. All these quality

factors are affected, directly or indirectly, by nutrition.

Mineral nutrition plays an important role in producing high quality leaf tobacco. Nutritional disorders in tobacco (*Nicotiana tabacum* L.) are basically physiological and biochemical phenomena induced by deficiency, excess or interaction among certain elements under specific environmental conditions. Such disorders are generally characterized by visible symptoms in the plant which reflect the imbalance of its metabolic system.

(c) Temperature and General Climate

Tobacco is a native of the subtropical zone. For economic reasons, it is now being produced commercially in almost every corner of the earth, between latitudes 55°N and 40°S, although the best locations are generally in a much narrower belt. The most important basic requirements are at least 120 (preferably 140) frost-free days for field growth, adequate water for the particular type, sufficiently high temperatures and sunlight for fundamental biochemical and physiological processes. Also, the incidence of certain tobacco diseases, such as blue mold, is significantly influenced by moisture and temperature.

(d) Day Length

In 1918, two scientists, W. W. Garner and H. A. Allard of the USDA, discovered the fundamental principle that the relative length of day and night controls tobacco flowering. They named the phenomenon photoperiodism. Short-day plants flower when days are short and nights are long, but do not flower under other conditions of day length. Long-day plants flower only when the days are long and nights are short. Still others are day-neutral, or show no preference as to day length.

nutritional disorders	营养失调
subtropical zone	亚热带
belt	地带
frost-free days	无霜期
blue mold	霜霉病

photoperiodism	光周期现象
short-day plants	短日照植物
long-day plants	长日照植物
day-neutral	日照适中

2. Agronomics (Human Intervention)

(a) Seeds and Seedling

Tobacco seeds are extremely small in size. There are about 10 000 ~ 13 000 seeds per gram. Each flue-cured tobacco plant may produce 12 to 15 grams of seed, about 150 000 seeds, sufficient for about 250 sq. meters of conventional seedbed for widely grown types such as burley and flue-cured.

Essential factors for a good seedbed location include maximum natural warmth, southern slope with free exposure to sunlight, effective windbreaks, sufficient surface and underground drainage, fertile soil with desirable texture, tilth and moisture holding power and the bed should be some distance from the curing barns to avoid contamination by diseases.

Transplanting seedlings to the field by pulling (bareroot) or by using intact roots (soil plug, pot, etc.) has been the focus of some research (Suggs & Mohapatra, 1988). Intact-root transplants are intuitively attractive because transplanting shock is decreased. Also, because intact-root plants are grown in an orderly array in cells or other containers, they can be automatically singulated and fed into a transplanter. Intact-root transplants are often expected to yield more than bare-root transplants.

(b) Plant Populations and Leaf Production

Among various tobacco types, there is an extremely wide range of spacing variation. The effect of spacing (plant populations) on leaf usability and quality is far greater than yield. Plant populations range from 8 000 to 30 000 per ha for broad leaf types. Within this range, the widest spacing applies to dark air-cured and fire-cured types and the closest to shade-grown cigar wrapper. However, Oriental tobaccos may be planted at populations as large as 150 000 per ha. Closer spacing of plants results

flue-cured	烤烟
exposure /ik'spəʊʒə/	暴露
texture /'tekstʃə/	质地
tilth /tɪlθ/	耕层
seedlings /'si:dlɪŋz/	幼苗
intact /in'tækt/	完整的

transplanter /træns'plɑ:ntə/	移栽机
bare-root transplants	裸根移植
plant populations	植物种群
air-cured	晾(烟)
fire-cured	明火烤(烟)
ha = hectare /'hektə:/	公顷 (1 ha = 104 m ²)