

国际大豆研究展望

H. E. 考夫曼

(美国伊利诺斯大学国际大豆计划主任)

摘 要

本文目的在于强调加强亚洲大豆研究工作的深度和广度,通过合作研究进一步提高产量。做为重要的全球性作物的大豆,是人类良好的食品、饲料、工业原料,并能用于出口赚钱,增加就业。大豆原产中国,首先传到南亚,后经欧洲传到北美。自本世纪廿年代起大豆生产与加工业在美国得到迅速发展,六十年代南美的巴西和阿根廷也高速发展了大豆生产与加工。十年前大豆又重新引回南亚。地处热带的印度、巴基斯坦等南亚国家很重视发展自己的大豆生产与加工业,以解决食用油及食用和饲用蛋白的不足,并节省进口大豆的费用。但这一地区增加大豆生产还有一些困难,如对大豆不象对粮食作物那样重视,研究得也较少,致使大豆生长在不利的环境条件中,许多国家未建立销售系统等。为改进热带及亚热带的大豆生产及利用,国际大豆计划(INTSOY)同其它国际组织合作以提高研究水平。INTSOY 主要计划之一是进行国际大豆品种试验。1973年以来已在131个国家进行了这一试验。通过试验比较了热带、亚热带地区大豆的增产潜力;弄清了种子品质是这一地区生产上的严重问题,而种籽小的品种生活力较好,且产量不低于大粒品种。INTSOY 还在植物保护及育种方面组织合作研究,赞助工作会议和培训计划。并重视加工利用、品种资源研究、生物技术及农业技术研究、防虫、固氮、以及教育、文献出版、交流等。INTSOY希望同亚洲蔬菜研究与发展中心,国际水稻研究所等国际中心和亚洲大豆研究改良网等区域性大豆网合作。并希望中国也参加研究网的活动。

(王惠民摘译)

INTERNATIONAL PERSPECTIVES ON SOYBEAN RESEARCH

H.E. Kauffman*

Director, International Soybean Program (INTSOY)

Introduction

Soybeans are a very important global food crop. Soybean meal makes up more than two-thirds of the total protein meal used throughout the world. Soybean oil represents about one-third of the total oil need. In a number of countries such as India and Pakistan, high deficits of edible oil dictate that they develop soybean industries to reduce their severe shortage. Soybeans can help the less-developed countries in other ways such as: (1) human food to improve nutrition, (2) animal feed for poultry or swine industries, (3) industrial raw materials, (4) cash crop for farmers and foreign exchange earner and, (5) increased employment from processing.

The objective of my paper is to emphasize the need to increase the scope and intensity of research on soybeans in Asia. Through cooperative research activities, yields can be increased significantly.

Historical Review

The purpose of looking at the history of soybeans is to put into perspective the current situation and the current interest in soybeans. Soybean production gains during the past two decades have been primarily concentrated in the temperate regions of the world. Although gains have been modest in tropical regions, research evidence clearly indicates the potential for future soybean gains in the tropics where they are most urgently needed.

You all know that soybeans were domesticated here in China more than 5,000 years ago. Since that time soybeans have evolved and are now grown in temperate, subtropical, and tropical regions of China. Although soybeans are grown widely, production in China has been somewhat stagnant during the past century in spite of significant increases in demands.

* University of Illinois, 113 Mumford Hall, 1301 West Gregory Drive, Urbana, Illinois 61801 U. S. A.

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Soybeans were carried by traders from Subtropical and regions of China to Southeast Asian countries. There have however, been many constraints to soybean production in tropical and subtropical regions of Asia-therefore, yields have remained low. Countries like Indonesia, which are large consumers of soybeans, have had stagnant production.

Soybeans were introduced into North America via Europe in the mid 1700's. However, it was not until the 1920's that soybeans began to be grown widely in the U.S.A. At that time industries were established to process all available soybeans and develop new products for consumers. You are acquainted with the dramatic increase in soybean production since that time.

After soybeans were well established in North America they were tested in South America where a strong soybean industry was established in Brazil in the 1960's. Brazil quickly surpassed China in soybean production. Neighboring countries such as Argentina are rapidly increasing production. These soybeans from the temperate regions of China have been used to initiate and develop soybean industries in the temperate regions of North America and in South America.

Although these varieties are slowly being modified for subtropical environments in North and South America, soybean production in the tropics and subtropics lags behind that in the temperate regions.

In the past decade soybeans have been reintroduced into south Asia, notably India and Sri Lanka from North America. Although production in India is increasing quite rapidly, yields are quite low.

Needs in Tropical Asian Countries

Most Southeast and South Asian countries are short of edible oil or protein and therefore have a very strong interest in establishing or strengthening their soybean industries. India is looking at domestic soybean production to help their one billion dollars annual edible oil imports. India also has need for the protein meal for human food as well as animal feed. Soybeans have not been a traditional part of the diet in India and, therefore, to make soybeans an important human food will require extensive research and development activities. India is now committing its resources to strengthening its soybean industry. They have approximately one million hectares and are initiating a National Soybean Research Center.

This year another South Asian country, Pakistan, is importing more than four hundred million dollars worth of edible oil. They are also very short of protein meal for their poultry industry. Indonesia has traditionally produced and consumed soybeans but they are annually increasing their imports of soybeans. This year their imports will be more than five hundred thousand metric tons. The Philippines and Thailand are importing more than two hundred million dollars worth of soybean. They are very concerned because they do not have foreign exchange to continue to purchase that amount of soybean products.

As you are aware, there are many constraints to increasing soybean production in tropical and subtropical environments. The number one problem is that in the tropics soybeans have been of secondary importance to the major cereals—rice, wheat and maize. Since soybeans have been a secondary crop, relatively little research has been done by countries in the region. Soybeans are grown in a much less favorable environment which often has either excess or deficit moisture and frequently suffers from serious disease and insect problems. Marketing systems have not been established in many countries.

INTSOY Activities

The International Soybean Program at the University of Illinois (INTSOY) has been working with several other international organizations to try in developing research techniques which can improve the production and utilization of soybeans in the tropics and subtropics. Countries like China, which have historically been growing and consuming soybeans, take for granted the various aspects of successful soybean industry. Countries which are beginning to grow soybeans for the first time however, must look at all aspects before a viable soybean industry can be established.

The major INTSOY project has been the international soybean variety trials. The variety trials are composed by INTSOY but are made up of the best varieties from participating countries around the world. Since 1973 the International Soybean Variety Experiment (ISVEX) have been conducted in 131 different countries. There have been many benefits from these trials. Some of the general conclusions from the trial results are as follows: (1) the yield potential of soybeans is comparable in tropical and subtropical regions, (2) seed viability in the humid tropics is a serious problem and small-seeded cultivars generally

have better viability, (3) altitude in the tropics greatly influence yield and, (4) small-seeded varieties have the same yield potential as largeseeded varieties.

INTSOY has had several types of collaborative research projects in plant protection and in plant breeding. They have also sponsored a number of workshops and training programs in various parts of the world. Longterm collaborative programs in India, Sri Lanka, and Peru assisted the establishment of viable domestic soybean industries.

Major focuses of INTSOY will be: (1) processing and utilization, (2) production related activities such as germplasm preservation, evaluation and enhancement, and biotechnology research along with research on agronomic practices, integrated pest management and *Rhizobium* efficiency, (3) communication, education, and support services such as literature and publications exchanges. Since the funding for INTSOY is limited, INTSOY will work closely with regional soybean networks which are being established. The Asian Soybean Improvement Network will involve national programs in the region, in addition to the international centers such as the Asian Vegetable Research and Development Center (AVRDC), the International Rice Research Institute (IRRI), and the International Institute of Tropical Agriculture (IITA). We hope that China will also participate activity in this network.