

**COSTS OF PRODUCING COTTON
IN THE WORLD
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Abstract

For the last about thirty years, the Secretariat of the International Cotton Advisory Committee has undertaken surveys on cotton of producing cotton in the world. Initially the data was updated ever 1-2 years but since 1983, reports on cost of production have been published every three years. The latest report was published in October 1998 and is based on the data for the year 1997/98. For the sake of consistency in the data collected year after year, since 1992, the same questionnaire has been used to collect information from various countries.

Introduction

The International Cotton Advisory Committee (ICAC) is an association of the governments having an interest in cotton production, consumption and trade. Currently, 42 governments are members of the ICAC. In member countries, governments have nominated an organization that may be a government, private or an association to represent with the ICAC. The data from countries that are yet not member of the ICAC has also been obtained from the government organizations. Thus, the source of information is the official statistics from various countries. Not all countries decided to participate in the survey. However, data are available for 29 countries. Many countries provided data for various regions or set of production practices thus the total number of entries are 55.

The data covers all inputs and operations from presowing to harvesting and ginning. It also includes economic and fixed costs. The questionnaire used in the survey is as follows:

Table 1

It is not possible to compare all countries and all entries in this paper thus 10 selected countries representing major cotton producing countries and production regions are discussed here. The countries and the legends used in the charts are as follows:

Table 2

Weed Control

Herbicides are used extensively in Colombia, Greece, Israel, Spain, Syria and the USA. Among five largest cotton producing countries of the world, in China, India and Pakistan herbicides are still used on less than 10% of the total cotton area, and weeds are removed through cultivation or manually. Data are not available but it is assumed that herbicide use is minimum in Uzbekistan, too. The cost of weed control operations is the highest in Syria, where a combination of herbicides plus mechanical operations cost US\$135/ha. Weeds are removed mechanically in Pakistan, and the cost is the lowest among the ten countries mentioned. The cost is higher in India because of manual operations. In the USA, herbicides are applied on over 90% of the cotton area, but separate data are not available and their cost is included in chemicals under insecticides.

Irrigation

About 55% of world cotton production comes from irrigated land. The remaining 45% is either partially irrigated or depends entirely on rain. Among the ten countries mentioned, irrigation is most expensive in Syria, which follows Israel among the 29 countries. In Israel, over US\$500/ha is spent in irrigation water and drip and sprinkler irrigation systems. In Syria, though cotton is flood (69%) and furrow (25%) irrigated, the amount of water consumed in ten irrigations exceeds 7,500 cubic meters. In China (Mainland), almost all cotton is furrow irrigated and the cost of irrigation/ha is US\$105. In Argentina, Australia, Pakistan and Turkey, water is almost free and only a nominal fee is charged.

Insecticides

Insecticides have become an integral part of cotton production practices throughout the world. But, the cost of insect control operations varies according to insect pressure. The need for insecticide use is minimal in Syria as less than 5% of the total area is treated with insecticides. Strict control by the Government of Syria of products and their use on cotton (only if absolutely required) has helped to build a strong natural biological control. The cost of insect control is low in Argentina because insecticide use is restricted to only a small percentage of the area. In most other countries, cost insect control is the highest among individual inputs in the cotton production system. The cost of insecticides is the highest in Turkey, followed by Australia, where the average number of sprays may exceed ten.

Fertilizers

Among the 29 countries who participated in the survey, cotton is generally grown without synthetic fertilizers in Argentina, Bolivia, some parts of Brazil and Uganda. Among the ten countries mentioned, there is high fertilizer

use in China (Mainland), where an average of over US\$200/ha is spent on fertilizers. In addition, because of intensive farming and easy availability, farmyard manure is regularly used; overgrowth is avoided through topping. Fertilizer costs are close to US\$180/ha in the Çukurova Region of Turkey. The cost is high in China and Turkey because of higher doses of nitrogenous fertilizers; phosphorous and potassium are rarely used in both countries.

Harvesting

Cotton is machine picked only in a few countries. Among the ten countries listed above, cotton is 100% machine picked in Australia and the USA. The cost of picking cotton varies drastically among countries mainly due to differences in wages and the quantity of seedcotton. The cost of harvesting one hectare of cotton ranges from US\$340 in Syria to only US\$47 in Pakistan, though cotton is 100% hand picked in both countries. Though the yield in China is almost three times higher than in India, the cost of harvesting one hectare of cotton is almost equal in both countries. The cost is high in Australia and Syria because of higher yields. The cost of picking one hectare of cotton in the Çukurova Region of Turkey is US\$251 because of a scarcity of labor. Machine picking may be introduced in this region of Turkey very soon.

Ginning

In many countries, farmers sell their seedcotton to a middleman or directly to a gin and it is difficult to assess the cost of ginning, as custom ginning is not available. Differences in the cost of ginning per hectare are significant mainly because of the quantity of seedcotton produced per hectare. Among the ten countries mentioned, highest dollar amount is spent on ginning in Australia, i.e. US\$312/ha against US\$126/ha in the USA. In China, ginning is subsidized by the government and usually represents less than 5% of total production costs, against 26% in Australia. Data on the cost of ginning were not available from China, India, Turkey and Zimbabwe, as farmers sell their produce before it is ginned.

The cost of ginning a kilogram of lint in six out of the ten countries mentioned ranged from 18 cents/kg in Pakistan and the USA, to 26 cents/kg in Argentina, and 20 cents/kg in Australia and Syria.

Total Cost

Data from the ten countries mentioned showed that US\$1,907 and US\$1,805 is spent to produce one hectare of cotton in Syria and Turkey, respectively. This includes the cost of renting land for one year, which is US\$240 in Syria and US\$375 in the Çukurova Region of Turkey. Data on land rent were not available from Argentina, Australia, Bolivia, China (Mainland) and Zimbabwe. In the USA,

though the cost of producing one hectare of cotton is almost US\$2,400 in the Western Region, the national average, including land rent, is US\$1,288/ha. In the USA, on an average, farmers pay US\$115 for growing cotton on one hectare.

For comparison purposes, land rent has been excluded from the total cost of producing one hectare of cotton. The total cost of producing one hectare of cotton is in the range of US\$1,500 in Syria and Turkey and US\$1,200 in Australia and the USA, and is comparable in Bolivia, China, India and Pakistan.

In the world, it is most expensive to produce one hectare of cotton in Israel where it costs more than US\$3,000 to produce one hectare of upland cotton. Pima is even more expensive to produce. The cost of producing one hectare is over US\$2,000 in Mexico and in Cauca Valley of Colombia.

Data from many African countries are not available. But, the available data indicated that it is least expensive to produce cotton in Uganda followed by Sudan, Senegal, Bulgaria and Mozambique.

If the total cost/ha is high, it does not necessarily mean that the cost per unit of lint is also high. High yields in some countries reduce the kg/lint cost and, in other countries, low yields increase it. The cost of producing one kilogram of lint, excluding land rent and the value of seed, is close to US\$1.30 in Bolivia and Syria. Among the ten countries mentioned, it is least expensive to produce cotton in Australia and Pakistan: US\$0.64 and US\$0.65 kg/lint respectively.

Irrigated vs Rainfed Cost

Many countries grow cotton under irrigated and rainfed conditions at the same time. It was possible to compare the cost of irrigated versus rainfed cotton in seven countries.

Table 3

The data showed that the total cost of producing one hectare of cotton under irrigated conditions is high in all countries because additional expenditures are incurred, and the need for fertilizer and other operations also increases with the addition of irrigation water.

In most countries, the addition of irrigation water and other inputs that result in higher yields more than compensate for the additional cost incurred to grow cotton under irrigated conditions. Thus, higher yields under irrigated conditions result in lower cost per kg of lint, compared with rainfed cotton, except in Colombia. The cost of producing a kilogram of irrigated and rainfed cotton is almost the same in India and the USA, but higher yields under irrigated conditions will bring a higher income to the grower.

High Yielding Countries

Cotton yields are more than 1,000 kg/ha in various regions of various countries i.e. Australia New South Wales, Irrigated), Brazil (Northeast, Irrigated), Colombia (Cauca Valley), Israel (Upland and Pima), Mexico, Spain, Syria, Turkey (Çukurova) and the USA (West). In the high yield countries, it is most expensive to produce cotton in Spain followed by West Region of the USA, Colombia and Mexico. Because of low per hectare cost and high yields, the cost of producing a kilogram of cotton in Australia is 50% or lower compared to all other high yield countries except Northeast irrigated region of Brazil.

Exporting Countries

Among 7 major exporting countries, it is most expensive to produce cotton in the USA followed by Zimbabwe. Among major exporting countries, it is least expensive to produce cotton in Australia and Pakistan followed by Argentina.

Conclusions

Cotton production systems vary greatly among countries, making inter-country comparisons extremely difficult. Although data are available for 29 countries, it is not possible to compare them, as many countries have not provided data on all inputs. Land rent is a major cost in countries like Egypt, Iran, Spain, Syria and Turkey, but there is no system to rent land in other countries.

There are subsidies on production inputs in many countries; for instance, seed is supplied free of cost in some countries while other costs are monopolized by a lack of competition. Extension services are free in many countries, while in others farmers have to pay for the consultant. It is difficult to account for subsidies, special incentives and overcharging on some services.

Comparisons among specific countries are more reliable than comparisons among many countries at the same time. However, it is more reliable to compare individual inputs.

Economic and fixed costs are important components of the total cost of production. Economic costs include management and administration, interest on the capital invested, all repairs and general farm overhead. There are no systems to calculate such costs in many countries. The same is true for fixed facilities and their depreciation on the farm.

There are limitations to yield improvement in every other country. The nature of limitations also greatly varies among countries. Given the limitations in various countries, input use on cotton has been optimized in most countries. Consequently, the cost/ha will increase at a slower rate compared to the last 2-3 decades.

In the past 2-3 decades, the increase in the cost of production has been compensated in the form of an increase in yields. The current trend of stagnation of yields indicates that any increase in individual inputs will be reflected on cost/kg of lint.

It is expensive to produce a kilogram of cotton under rainfed conditions compared to irrigated conditions.

Table 1: Cost of Producing One Hectare 1997/98

Operation/Item	Unit	Quantity Per ha.	Cost or price per unit	Cost in local currency	Cost in US\$
1. PRE-SOWING					
Land rent for cotton					
Land revenue/tax					
Pre-soaking irrigation					
Ploughing					
Planking					
Other					
Sub-total					
2. SOWING					
Soaking irrigation					
Land preparation					
Seed					
Seed treatment					
Herbicides (Pre- sowing)					
Fertilizer (Basal dose)					
Drilling					
Other					
Sub-total					
3. GROWING					
Thinning					
Weeding					
Hoeing					
Herbicides (Post- sowing)					
Fertilizer (Total)					
Irrigation					
Insecticides					
Defoliation					
Other					
Sub-total					
4. HARVESTING					
Picking cost					
a.Hand picking (%)					
b.Machine picking (%)					
Stick cutting/slashing					
Other					
Sub-total					
Seed Cotton Costs					
5. GINNING					
Transportation to gin factory					
Ginning (Including bagging)					
Classing/grading charges					
Other					
Sub-total					
Variable Cash Costs					
6. ECONOMIC COSTS					
Management and administrative					
Interest on capital invested					
All repairs					
General farm overheads					
Other					
Sub-total					
7. FIXED COSTS					
Power supply					
Irrigation system at the farm					
Tractors					
Spray machinery					
Farm implements					
Other					
Sub-total					
8. TOTAL COST					
9. VALUE OF SEED COTTON					
10. NET VALUE OF LINT					
11. NET VALUE OF SEED					

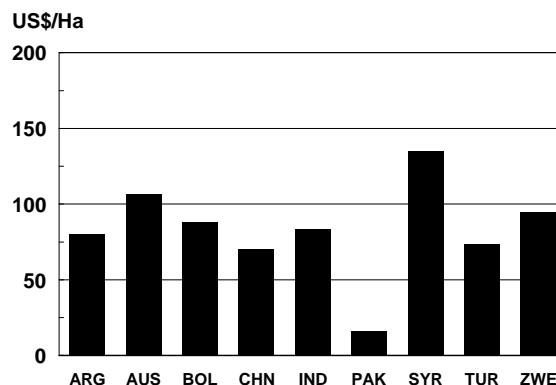
Table 2: Countries and Legends

Country	Legend
Argentina, Santiago del Estero, Irrigated	ARG
Australia, New South Wales, Irrigated	AUS
Bolivia	BOL
China (Mainland), Yellow and Yangtze River Valleys	CHN
India, Central South, Rainfed	IND
Pakistan, Punjab	PAK
Syria	SYR
Turkey, Çukurova Region	TUR
USA, Average	USA
Zimbabwe, Southern Africa	ZWE

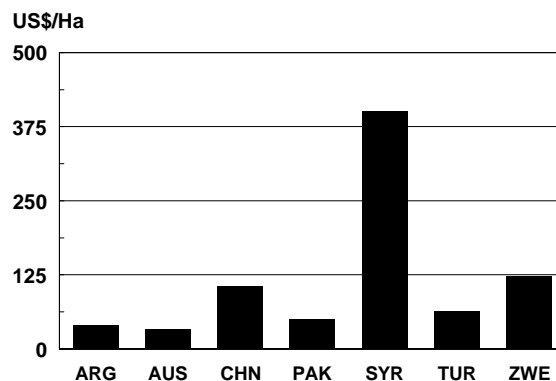
Table 3:

Country	Irrigated Region	Rainfed Region
Argentina	Santiago del Estero	Chaco
Australia	New South Wales	North - East North - West
Brazil	Northeast	Northeast
Colombia	South Cesar	Cauca Valley
India	Central South	Central South
South Africa	Mid-Transvaal	Mid Transvaal (ZAF1)
	Northern Natal	Natal (ZAF2)
USA	West	Southwest

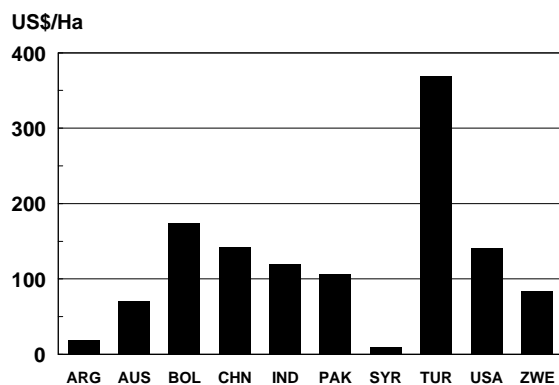
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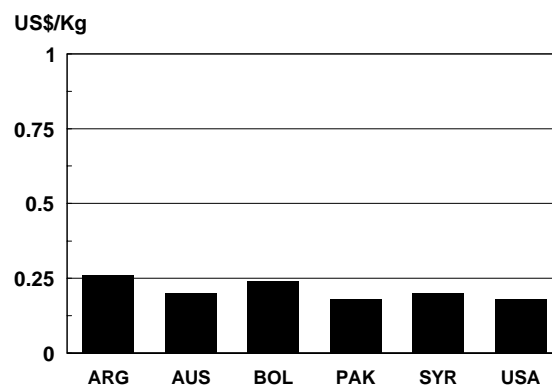
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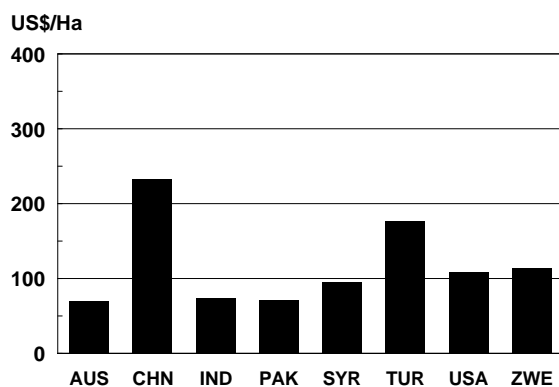
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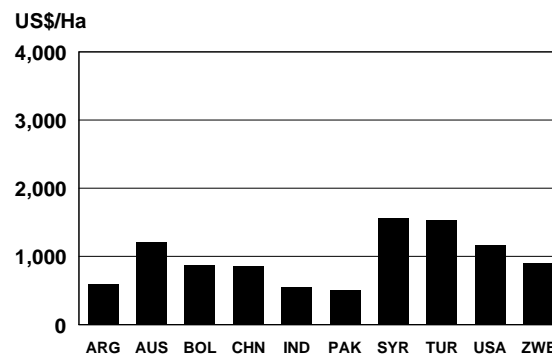
GINNING



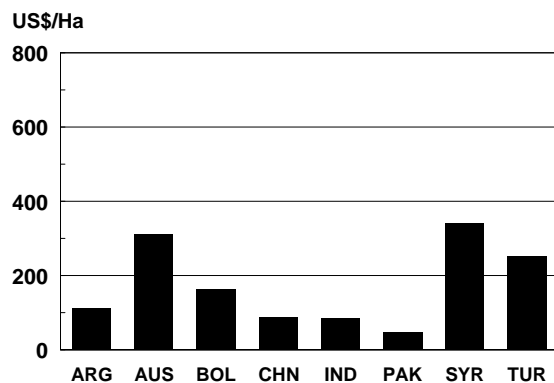
FERTILIZERS



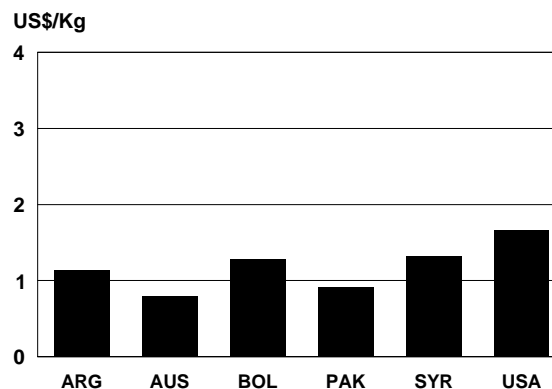
TOTAL COST (Excluding Land Rent)



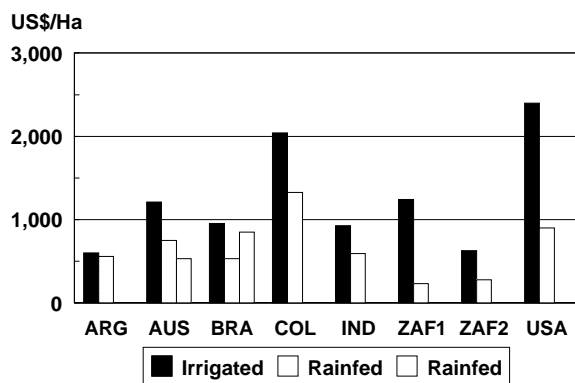
HARVESTING



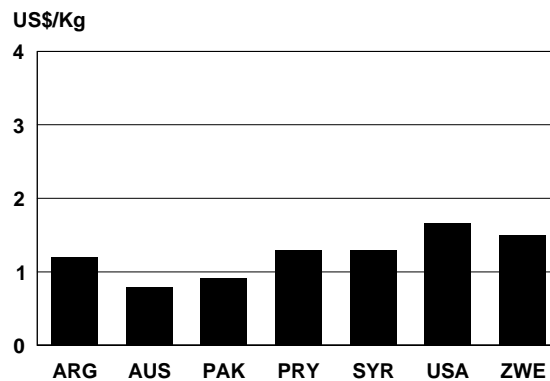
COST PER KG LINT



IRRIGATED VS RAINFED



EXPORTING COUNTRIES



IRRIGATED VS RAINFED

