Third Meeting of the Latin American Association for Cotton Research and Development

The Secretariat of the International Cotton Advisory Committee has a mandate to encourage regional cooperation on cotton research and development work. Within this mandate, ICAC has encouraged the establishment of a permanent network among the cotton growing countries of Latin America. A regional meeting was held in November 1986 at Presidente Roque Saenz-Peña in the Chaco, Argentina, which was attended by delegates from Argentina, Brazil, Dominican Republic, Ecuador, Nicaragua, Paraguay, Peru and Uruguay. One of the outcomes of this meeting was the establishment of a network of regular cooperation which would hold meetings every 2 or 3 years. A second meeting was held at Ica, Peru in October 1988, which was attended by delegates from Argentina, Brazil, Colombia, Costa Rica, Nicaragua, Paraguay and Peru in addition to delegates from Côte d'Ivoire and France. The second meeting established the rules and

regulations of the network, which was named the Latin American Association for Cotton Research and Development.

A third meeting of the Latin American Association for Cotton Research and Development was held at Campina Grande, Brazil from 19 to 23 August, 1991. It was sponsored by the Federation of Industries of the State of Paraiba (FIEP), Brazilian Enterprise of Agricultural Research (EMBRAPA), National Center of Cotton Research (CNPA), ICAC and the Food and Agriculture Organization of the United Nations. The venue of the meeting was the conference hall of the Federation of Industries of the State of Paraiba. ICAC provided financial support and assisted in the planning for the meeting.

The meeting started on the evening of August 19, 1991, in the Conference Hall of FIEP. The inaugural session was addressed by Mr. Ronaldo Cunha Lima, Governor of Paraiba, Senator Albano do Prado Franco, President of the National Federation of Industries, Mr. Agostinho Vellosa da Silveira, President of the Federation of Industries of Paraíba, Mr. Cassio Cunha Lima, Mayor of Campina Grande and many other elected representatives and high ranking government officials. Dr. Lawrence H. Shaw, Executive

Director of the ICAC also spoke on the occasion. The meeting was attended by delegates from Argentina, Bolivia, Colombia, Costa Rica, Ecuador, Mexico, Peru, Uruguay and a large number of research scientists from Brazil. It was also attended by Dr. S. Barbosa, Integrated Pest Management Officer of the FAO along with two cotton research scientists from Sudan. Dr. Lawrance Hunter, CSIR, Division of Textile Technology, South Africa who is also the current Chairman of the Working Group on High Volume Instrument (HVI) Testing of the International Textile Manufacturers Federation (ITMF) was especially invited by the ICAC to talk on "HVI Technology: Its Use and Misuse." The list of participants is annexed to this report.

Mr. Agostinho Velloso da Silveira, President of FIEP welcomed the participants and said that he hoped that state planning in the right direction will bear fruit and that one day Paraiba will be able to resume its previous position of cotton cultivation. He reminded everyone the days of the 1920's when cotton started gaining area in Paraiba. People saw cotton flourishing in this state and also witnessed its decline starting from the 1950's. He paid tribute to Mr. Arruda Camara who graduated from Montpellier, France, and conducted very useful studies to establish cotton in northeast

Brazil. He hoped that the deliberations of this meeting would give solutions to problems, particularly the attack of boll weevil, enabling the restoration of production of white gold in the state.

The Mayor of Campina Grande and the President of the National Federation of Industries in their speeches appreciated the contribution of FIEP in general and Mr. Agostinho in particular in hosting the meeting. They hoped that scientists will be able to develop cotton suitablefordryland cultivation and resistant to boll weevil which can certainly improve the economics of rural areas, and thus stop the shifting of population from rural to urban areas.

Dr. Shaw in his speech recalled the beginning of the establishment of a regional network in the Latin American countries. He was very pleased to see a close cooperation between the industry and researchers. He said that communication between producers and consumers leads to common understanding of each others' problems and to their solutions. His written speech, which was circulated during the meeting, suggested that regional projects be submitted to the ICAC for funding by the Common Fund for Commodities. The same proposal was further explained during the meet-

ing by M. Rafiq Chaudhry, Head of the Technical Information Section of ICAC. He stated that ICAC has been named an International Commodity Body (ICB) and, as an ICB, is able to sponsor projects for financing from the Second Account of the Common Fund for Commodities. Projects should be of high priority for the development and maintenance of a sound world cotton economy. He offered the help of the Technical Information Section of the ICAC in preparing such projects.

Mr. Astrubal Pinto de Oliveira, former Ambassador of Brazil to Cuba, Mr. Jose Ernesto Souto Bezerra, Director of the Ministry of Agriculture and Agrarian Reforms, Mr. Ronaldo da Fonseca Soares, Secretary of Agriculture of Rio Grande do Norte State, Dr. Edgar J. Barboza Arp, President of the Techno-Administrative Council of CETIQT, Mr. Eduardo Paulo de Moraes Sarmento, Director of EMBRAPA, Mr. Francisco Pereira Batista da Mota, President of the Federation of Industries of Pernambuco State and Mr. Fernando Luis Goncalves Bezerra, President of the Federation of Industries of Rio Grande do Norte State also spoke on the occasion and expressed strong hopes for the revival of cotton production in Paraiba. The opening session concluded with the inaugural address from Mr. Ronaldo Cunha Lima, Governor of the State of Paraíba. In his address, the Gover-

nor talked about the grave situation of cotton production in the state. He hoped that the meeting would go a long way to improve the cotton production situation in Paraíba.

Program of the Meeting

This program was followed during the next four days:

Date/time	Program
August 20,1991	
8:15 am	Paper on "Raw Material Market Demands of the Textile Industry" by Dr. Edgar J. Barboza Arp, President of Techno-Administrative Council of CETIQT, Brazil.
9:35 am to 6:00 pm	Presentation of country reports on the status of cotton research and development work in Latin American countries: Peru, Costa Rica, Bolivia, Brazil, Argentina, Colombia.
August 21, 1991	Ecuador and Uruguay.
7:00 am to 4:00 pm	Visit to CNPA Cotton Research Station, Patos.
August 22, 1991	
8:30 am	Paper on "HVI Technology: Its Use and Misuse" by Dr. Lawrance Hunter, Division of Textile Technology, CSIR, South Africa.
10:00 am	Presentation of country reports on the status of cotton research and development work in Latin American countries: Mexico.
11:00 am	Paper on "Innovations of National Textile Industry" by Dr. Jose Alencar Gomes da Silva, Brazil.

2:00 pm to 6:00 pm	Formation and meetings of working groups on Genetic Improvement, Vegetal Protection Fiber and Seed Quality and Technology for the Small Growers.

August 23,1991

7:00 am	Joint meeting of the Working Groups and discussions on their recommendations.
10:00 am	Adoption of recommendations.

Dr. Edgar J. Barboza Arp in his paper gave the overall outlook of cotton production and consumption in the world. He anticipated higher consumption of raw materials including cotton in the years to come. He remarked that 33.7% increase in production of cotton has been observed in the last ten years. He noted that economic crises are also one of the reasons for lower production in Brazil but stressed that there were other reasons for the fall in production. He noted that with the sophistication coming in the textile industry, the requirements of the industry have become more specific. Today industry wants finer, stronger, more mature and more uniform cotton with less sugar and short fiber contents. He strongly supported the use of HVI in evaluating the characteristics of cotton and hoped that, in the near future, HVI testing will become routine in cotton.

Country Reports

Argentina

Mr. Aldo Angel Ricciardi presented a paper on "Problems of Cotton Production in Argentina and the National Cotton Program of the National Institute of Land and Livestock Technology (INTA)." In Argentina, from 1982 to 1991, cotton production increased from l52,000 tons to 296,000 tons, even though there were some bad years (l983,1986 and 1987). Cotton consumption in the country increased from 78,000 tons to 120,000 tons, thus leaving more cotton for export. The volume of the cotton imports in this period has remained almost constant. A long growing season, damping off, uncertain weather during sowing and picking, fusarium wilt, bacterial blight and losses due to pest attack are the causes of low yield in Argentina. At an early stage, cotton in Argentina is mainly attacked by thrips and aphids. At the growth stage it is affected by boll weevil, pink bollworm and *Heliothis* in addition to some other minor pests. However, special emphasis is directed at the control of boll weevil in order to escape from heavy losses, such as occurred in Brazil in 1983. INTA, which is responsible for research and extension work on cotton in the country, is currently evaluating differ-

ent systems of mechanical pickers, HVI technology for commercial adoption and development of superior varieties especially resistant to fusarium wilt. Mr. Ricciardi made the following three proposals for the encouragement of regional cooperation:

1. Collaborative research programs should be designed among various institutes of the region.

2. A regional germplasm bank of cotton should be established. It was offered that Argentina could serve as a center for such a bank.

3. Joint venture programs with the international institutions like ICAC and Institute of Research on Cotton and Exotic Textile (IRCT) should be initiated.

Bolivia

Mr. Alberto Castillo Galarza presented a paper on "Past and Present Status of Research and Production of Cotton in Bolivia." The establishment of cotton in Bolivia was first explored in 1960. Cotton area increased to approximately 50,000 hectares by 1972/73. It remained in the

same range for three years until, due to unattractive cotton prices, it started declining gradually. The four cotton growing zones were affected, and the cotton area decreased to a minimum level of 1215 hectares in 1988/89. However, it has shown a little improvement in the last two years, pushing the area to over 15,000 hectares in 1990/91. In Bolivia, cotton improvement work is going on at the Regional Center for Research, Cañada Larga; Experimental State, Gran Chaco; and the Institute of Agricultural Research, El Vallecito. In the absence of any locally developed varieties, Bolivia has been introducing varieties from other countries. Reba B50 has remained the dominant variety for about ten years starting from 1977/78. In the last 3 to 4 years a number of varieties have been introduced from Argentina. Regional trials were conducted on these varieties, and lately Guazuncho has been recommended for commercial cultivation. Now, the variety development program has been streamlined to develop resistant varieties locally.

Brazil

A paper was presented on the “National Research Program on Cotton in Brazil" by Mr. Orozimbo Silveira Carvalho. In Brazil, cotton is grown under

a variety of management practices. On the average it is sprayed three times in Paraiba, while in the State of Sao Paulo it is sprayed seven times. Lack of irrigation facilities and damage from boll weevil are the major causes of depressed yields in all the regions. Cotton once sown is usually ratooned for four years by the growers thus providing conducive conditions for the multiplication of boll weevil. The work done with the financial assistance from FAO and the World Bank at CNPA has discovered some unidentified sources of genetic resistance to boll weevil. The character, which has shown its worth at a small scale, though recessive in nature, can successfully be inducted in future varieties. But, the experts agree that genetic tolerance may not be enough to combat heavy infestation of boll weevil. It is feared that boll weevil may spread to other states like Sao Paulo, Parana, Minas Gerais, Mato Grosso and Rio Grande do Sul, which are comparatively safe now. The breeders have remained successful in developing varieties resistant to fusarium wilt. Early maturity remains of high priority in developing a package of technology with least use of pesticides. In Brazil, due to a poor pricing policy for cotton, growers are using the best lands for sugarcane and other crops competing with cotton.

Costa Rica

Mr. Alvaro Rodriguez Aguilar presented a report on "Past, Actual Situation and Perspective of Cotton Research in Costa Rica." Cotton has been grown in Costa Rica for the last forty years, but it did not become an attractive crop for the growers due to high production cost, low prices for the produce, lack of resources and poor government policies towards cotton. Depending upon these factors the cotton acreage has been fluctuating in Costa Rica. Cotton was grown on 13,858 hectares during 1977/78, but the area decreased to only 307 hectares during 1991/92. The government has been taking steps to establish cotton as an economical crop in the country. In 1980, research on cotton was started with the objective to introduce and evaluate the germplasm, determine nutrition requirements for different zones, and to optimize cultural practices and investigations on low irrigation. But, its impact on the cotton acreage is not seen. In 1990, FAO organized the First Central American Meeting on Cotton, at San Jose in Costa Rica where it was identified that the climatic anomalies, i.e. unequal distribution of rainfall during the year and heavy rains during December which effect quantity as well as quality, are the main cotton growing problems in Costa Rica. It was emphasized that a full package, covering all aspects of

cotton production, is required to implement and to encourage cotton growing in Costa Rica.

Colombia

Mr. Guillermo Alvarez Alcaraz presented a paper on “Research on Cotton Cultivation in Colombia." Cotton in Colombia is now grown on about 570,000 acres, an area which has shown steady increase in the past ten years. But during that period, the lint yields remained at around 560 kgs per hectare with three good years (1983/84, 1985/86 and 1986/87) when they were over 620 kgs per hectare. One of the possible reasons may have been financial constraints, therefore applied research could not be undertaken to meet the requirements of the growers. However, in Colombia about 70% of the total area is treated with pre- and post-emergent herbicides. Growth regulators are not widely used due to inconclusive research results on the subject. The use of defoliants is also limited as cotton is mainly hand picked. Colombia has a very effective integrated pest management program to control, in particular, *Anthonomus grandis and Heliothis virescens. Trichogramma* and *Cardiochiles nigriceps* are reared and released for the control of bollworms. Efforts are underway to find out

the alternate hosts for *A. grandis.* The growers have been persuaded to bury the plant debris after final picking. The average number of sprays, which were 9-11 in 1988, has been reduced to 2-3 in 1991. Resistance to pesticides is being properly monitored with the help of some private pesticide companies. It was proposed that such collaborative research projects could be drawn to different countries of the region.

Ecuador

Dr. Martha Cevallos Moreira presented a paper on "The Cultivation of Cotton in Ecuador." Cotton in Ecuador is grown along the coast while the mills are in the mountains. The industry sector is much more attractive than cotton growing. The growers are not properly aware of land preparation techniques, fertilizer use and pesticides applications. They are suffering due to little financial support from the government. They spoil quality due to picking immature cotton. Then they are exploited by the middlemen due to a poor marketing system. A minimum support price exists, but it is not adhered to. Thus, the cotton crop is unable to compete with other crops. The development of local varieties, improved preparation of fields for cotton sowing, following the expert recommendations of fertilization (80N and

40P kg/ha), the destruction of plant debris and adoption of effective pest control measures were emphasized.

Mexico

Dr. Arturo Palomo Gil presented a paper on "Current Status and Perspective of Cotton Research in Mexico." Cotton was an important crop from 1955-68 when on average 2,136,000 bales of cotton were produced from an area of about 913,000 hectares. Since then, due to high cost of production, the area has been fluctuating with a declining trend. During this period, cotton was moved to the northern part of Mexico where irrigation facilities were better. Presently, 94% of the cotton in Mexico is irrigated. The main problems of cotton cultivation are water shortage, thermotoxicity, soil salinity and heavy pest attacks. A cotton production package is available for each zone. Best use of available water is one of the main objectives of research on cotton. The important cotton pests are *Pectinophora gossypiella, Heliothis zea* and *Anthonomus grandis.* The crop is sprayed on average seven times, but the critical periods of these pests are being ascertained to reduce the number of sprays. However, it has been accepted that short season cotton is a potential solution for decreasing the

use of pesticides. A lot of work is on-going on high plant density and narrow row spacing in addition to breeding for early maturity. Cotton in Mexico is sometimes attacked by verticillium wilt and root rot. The cotton breeding program, started in 1974, has been very successful and varieties resistant to wilt are now available. Laguna-89, which has high resistance to verticillium wilt and has reached the seed production stage, is a good substitute for DPL 80. The root rot disease has not been cured yet in Mexico.

Peru

The country report presented by Mr. Angel Delegado Miranda covered "The Situation and Perspective of Cotton Research in Peru." About 1% of the world's cotton, which is comprised of two types i.e., Tanguis and Pima Peruano, is produced in Peru. The Foundation for the Development of Cotton (FUNDEAL) is responsible for promoting cotton in the country. The Technical Assistance Department is working to develop a feasible technology so that growers can improve their economics. The immediate research objectives are to develop suitable varieties, improve quality and devise an IPM of cotton for wider adoption. The Seed Production Department is meeting over 90% of the certified seed requirements of cotton. The Genet-

ics Section and the Department of Biology at the National University of Agriculture in La Molina has an interesting program on improvement of cotton through biotechnological means. The main areas of interest are somatic embryogenesis and development of haploid plants through tissue culture.

Uruguay

Mr. Walter Toledo presented a paper on "The Situation and Perspective of Cotton in Uruguay." Cotton was introduced to Uruguay in 1964, but it could not be established mainly due to the unavailability of technology suitable for local conditions. Therefore, it is still grown on only 100-200 hectares. In order to feed the textile industry, cotton is imported from Argentina, Brazil and Paraguay. It was emphasized that in order to promote cotton in Uruguay it is required that the competitiveness of cotton with other crops be improved, the taxation system should be revised and appropriate technology should be developed.

HVI Technology

Dr. Lawrance Hunter in his paper on "HVI Technology: Its Use and Misuse" said that in today's quality conscious market no mill can remain competitive unless the Mill knows accurately the properties of the cotton which it is buying and processing. He considered HVI systems a major step towards accurate characterization of cotton. Talking about the growth of HVI technology, he stated that over 600 complete and partial HVI systems have been installed by 1991, compared with 30 systems at the start of the previous decade. He discussed all the important fiber characters one by one and reported on the reliability of HVI testing. He observed that of all the presently measured HVI tests, fiber strength was worst correlated with traditional tests. He regarded rigid control of atmospheric conditions, particularly of humidity, necessary for accurate measurement of fiber characteristics. In order to have a minimum variation among various laboratories and characterize cotton more accurately, he observed that all HVI laboratories should use the same calibration cottons, sampling procedures, testing methods and sample preparation and conditioning. The complete presenta-

tion by Dr. Hunter has already been published in *THE ICAC RECORDER* Volume IX, No. 3, 1991.

Visit to CNPA's Cotton Research Station, Patos

On August 21, 1991 the participants were taken by bus to the CNPA's Cotton Research Station at Patos where they were shown various experiments on breeding, entomology and cultural practices. The crop which had been sprayed four times and was at the final stage of opening, still had boll weevil adults in the flowers on the regrowth. Mr. Eleusio Curvelo Freire, Head of the Breeding Section, briefed the participants of the meeting about the activities of the station. The breeding team at the station has been able to develop varieties with a high earliness. He explained that in spite of exhaustive motivational campaigns by the agricultural extension workers, the growers have not stopped the ratooning of cotton. He considered the implementation of the IPM system in the area an undesirable step. The growers are used to spraying against leaf worm (*Alabama hyalacia*) but they do not bother with the boll weevil as the damage caused

is not visible. However, the economic losses by boll weevil are much higher than any other pest in this region. More than 100 participants from the meeting travelled to Patos.

Working Groups

Four working groups were formed to discuss some of the subjects more in depth and to formulate recommendations. The participants were given the option to attend any of the working group meetings. The working groups along with their chairmen and the number of participants are as follows:

The recommendations by the four groups were discussed in a joint meeting with all the participants of the meeting held on August 23,1991. They were approved in the final session chaired by Mr. Agostinho Velloso da Silveira, President of the Federation of Industries of the State of Paraiba (FIEP), Brazil. The recommendations finally agreed on are as follows:

Genetic Improvement

1. The exchange of desirable germplasm should be encouraged in spite of the restrictions existing in some of the countries. In the first instance,

newly developed varieties should be exchanged while arrangements should be made to ensure such an exchange on a long-term basis.

2. The development of varieties with higher built-in tolerance to pests, and the initiation of fundamental studies on fungal diseases and their interaction with the climate were stressed.

3. Given the spread of boll weevil throughout the Latin American countries, early maturity should be given the top priority in the breeding programs.

4. It was recommended that regional varietal surveys should be undertaken, and that the bureaucratic limitations impeding the required exchange should be underscored.

5. Programs should be launched to speedup the multiplication of seed of new varieties, and the farmers should be ensured quick access to seeds of these varieties.

6. Brazilian Enterprise of Agricultural Research (EMBRAPA) should prepare a germplasm catalogue and coordinate the reports pertaining to breeding projects.

7. The breeders should have an access to HVI testing facilities. Studies should be initiated to analyze the deposition and quality of cellulose contents in the medium and long fiber, as well as on the improvement of fiber quality.

Plant Protection

8. An integrated approach should be implemented and applied to control cotton pests, diseases and weeds.

9. In all the participating countries, the status of ongoing integrated pest control programs should be reviewed to supplement or amend them according to the needs.

10. The Latin American Association for Cotton Research and Development should establish working groups on research and extension in all member countries for exchange of information on IPM in cotton. The Working Groups should also be charged to perform the following functions:

- They should collect technical information from the local institutions for dissemination among the member countries.

- Newsletters or brief reports on the appearance of new pests and pathogens should be brought out.
- They should facilitate the exchange of beneficial insects and pathogens to permit large-scale benefits of biological control of pests.
- They should bring out periodical reports on the resistance developed to certain pesticides.
- The working groups should keep a record of beneficial insects and cultivars that have traits tolerant to diseases and pests.
- A catalogue should be prepared on pesticides and herbicides used against major pests and weeds respectively. The catalogue should include information on recommended doses and environmental safety.
- They should maintain a list of the specialized institutions on cotton in each discipline.
- They should prepare a document on plant protection rules and regulations of the member countries.

11. A list should be prepared and interchanged of pests and diseases warranting quarantine in each member country so as to take the necessary measures to avoid their introduction in areas which are not affected.

12. The next meeting of the Latin American Association for Cotton Research and Development should have a separate session on integrated Pest Management.

Cotton Fiber and Seed Quality

13. In view of the frequent technological innovations, meetings of growers, breeders, ginners, technologists and spinners should be arranged to understand the textile requirements for fiber quality.

14. Marketing of cotton based on quality should be promoted in all the member countries.

15. Steps should be taken at the national and international level to discourage marketing of contaminated cotton, especially when containing polypropylene and jute added during harvesting, transportation and bale packing.

16. Cotton breeding programs should be undertaken to bring genetic improvement in fiber strength and its maturity.

17. The present laboratory infrastructure, which exists in some countries to do fiber testing, should be strengthened with micro-spinning and trained manpower. For manpower training, the heads of the technological laboratories should be in constant contact with each other.

18. Seed testing laboratories should be established to determine and evaluate the primary substance value of the seed for industrial use.

19. Seed registration programs should be implemented in accordance with each country's national standards.

20. Seed quality laboratories should be established in accordance with the provisions and standards set at the national and international levels.

21. The technical and supporting staff of seed quality laboratories should be further trained in seed production and its quality evaluation.

Technology for Small Growers

22. It was realized that in a majority of the cases, new technologies are inconsistent with the socio-economic conditions of the small producers. Hence, increased financing and incentives should be given for research programs geared toward small producers' needs.

23. The rural extension service system should be reactivated and strengthened for quick and effective transfer of technology.

24. There should be a constant check and control on weight and quality of agro-chemicals.

25. The integration between research and extension should be improved as well as the transfer of technology to the small growers.

26. Active participation of the producers in marketing activities should be promoted with the help of concerned institutions.

27. The small producers should be supplied the necessary inputs and farm equipment on a timely basis. Credit facilities should be available to them easily.

28. Small associations of the growers should be established through special incentives.

29. The processing and textile industries should finance technical research programs.

30. The land tenure issues of the producers should be settled.

Declaration of the Meeting

All the participating countries agreed that the next meeting of the Association should be held in Colombia in 1993.

They elected Dr. Raimundo Braga Sobrinho from the National Center of Cotton Research, Campina Grande, Brazil to serve as the President of the Latin American Association for Cotton Research and Development until the next meeting. The National Center of Cotton Research of the Enterprise of Agriculture Research was designated as the Executive Secretariat of the Association until 1993. In order to implement the recommendations of the meeting and have their periodical review, a five member Executive

Committee was constituted. The constitution of the Executive Committee is as follows:

Dr. Raimundo Braga Sobrinho	Brazil
Mr. Aldo Ricciardi	Argentina
Mr. Guillermo Alvarez Alcaraz	Colombia
Mr. Arturo Palomo	Mexico
Mr. Angel Delgado	Peru

According to the bylaws of the Association adopted in the meeting, the Executive Committee will meet every year at its Secretariat, presently the National Center of Cotton Research, Campina Grande, Brazil. The Executive Committee will also prepare an agenda for the next meeting of the Association.

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