Because of politics and the Middle East War, the timing and venue of the workshop changed from February to May 1991 and from Florida to the Dominican Republic. A great debt of gratitude is owed to Dr Hamilton Redman of the Central Romana Co who rescued the workshop from visa problems. Delegates were hosted in superb surroundings at Casa de Campo on the southern tip of the island. Ten cane growing countries were represented by the 20–odd delegates who thrived for six days on a diet of soil and nutrition. Had the week not been interspersed with spells of Caribbean hospitality, there would undoubtedly have been a problem of indigestion or ironstone concretions! Committee members led discussions on the chosen topics, ample time for contributions from representatives of each country. With the exception of South America, all the major cane growing regions were represented. Salient points discussed were:

Nitrogen – There should be more emphasis on categorizing soils for their ability to mineralize nitrogen. Many countries are not taking cognizance of this soil characteristic resulting in either excessive or inadequate amounts of fertilizer N being applied.

There is renewed concern about the low nitrogen use efficiency by the crop and the possible impact of N fertilizer on the environment. The fate of applied N is being measured in some areas, but a concerted effort and substantial financial input are required to reduce the estimated 50% loss of applied N from the system.

Potassium – P fixation is fairly well understood and is being catered for in many but not all countries. The merits of using various extractants in conjunction with P sorption isotherm data need to be pursued.

Potassium – Soil K availability is undoubtedly a complex issue but progress is being made in quantifying the influence on it of clay mineralogy, base saturated soils, irrigation water, season, crop stage and K fixation properties.

Soil Acidity – There are many criteria used in the various countries for assessing soil acidity and there is considerable scope for improving the prediction of the likely response to the application of liming materials.

Trace Elements – A useful audit was made of the occurrence of trace element problems, the threshold values used and methods for correction of deficiencies.
Soil Classification System – During the course of the workshop it became increasingly clear that, for good communication, there is a real need to develop a universal soil classification system for use in all sugarcane growing regions. It was unanimously agreed that such a classification based on the South African Binomial system be investigated.

A comprehensive report on the workshop is now available to interested members. What cannot be adequately described, however, is the ICT ethos manifested in the eager sharing of technology with all those present—a time when science and human endeavor surpassed trivial political barriers. I hope this almost unique ISSCT ethos will continue to be carefully nurtured.

PHYSIOLOGY SECTION

REPORT ON THE SECOND PHYSIOLOGY WORKSHOP

TEXAS, USA, 8 – 12 APRIL 1991

The Physiology Section of the ISSCT held a highly successful workshop on 8 – 12 April 1991 on “Evaluating Potential for Plant Molecular Biology in Sugarcane Research”. The workshop was hosted by Dr James Irvine, and held at Texas A & M University and the Agricultural Research and Extension Center, Weslaco, Texas. There were 25 participants representing eight countries—Brazil, Colombia, France, Indonesia, Mauritius, Mexico, Taiwan and USA.

This workshop was a follow up of a joint Plant Breeding and Physiology Workshop on the same topic in Honolulu in 1988. There, sugarcane researchers mostly listened to invited lectures about research progress with model plants and easy to work with crops. It was generally felt that it would be a long time before any of this information could be applied to sugarcane. At Texas, some time was spent learning about recent breakthroughs with other crops, but most time was spent exchanging ideas and information about molecular biology research on sugarcane. At the conclusion of this workshop, there was the feeling that considerable progress has been made on sugarcane in the intervening three years between workshops.

The major topics covered at this meeting were transformation of monocots, genome mapping, gene expression, tissue culture and micropropagation. It is hoped to publish notes on the presentations and discussions elsewhere.

Reports on transformation in monocots included use of Agrobacterium with maize, sorghum and wheat; electroporation of rice protoplasts; and use of Jim Irvine’s Tex-Mex’ gene gun, an airless paint sprayer used to shoot genes through cell walls. Sugarcane tissue transformed by this method was displayed.
The largest section of the workshop concerned genome mapping, with use of isozymes, RFLPs, AP-PCR and PFE. A considerable amount of work is being carried out on sugarcane in several research institutes and universities in the USA and France. Several prominent sugar research organizations have provided the necessary financial support for much of this work.

A report on gene expression discussed use of novel peptides and proteins to enhance disease resistance in plants. Also discussed were progress in culturing sugarcane protoplasts and attempts to regenerate plants, and the problems of off-types which can occur in micropropagation.

There were also two excellent laboratory evening sessions at Texas A & M on molecular cloning, restriction digestion and electrophoresis analyses; and an afternoon of laboratory exercises at Weslaco on sugarcane protoplast, meristem and callus culture, DNA extraction, particle gun transformation, use of GUS as a marker gene for transformation, non-radioactive detection of nucleic acids, and image analyses. These exercises emphasized the application of molecular techniques to sugarcane.

The Workshop was beneficial to the delegates, and several collaborations on research were arranged. The chairman and host organizations made a fine job of the whole workshop. Delegates recommended to ISSCT that a 3rd Workshop be held in 1993 at Copersucar, Brazil.

AGRICULTURAL ENGINEERING SECTION

REPORT ON THIRD AGRICULTURAL ENGINEERING WORKSHOP, CALI, COLOMBIA

28 JULY – 2 AUGUST 1991

The Third Agricultural Engineering Workshop "Cost Effective Mechanization" was held at CIAT near Cali, Colombia, from 28 July to 2 August. The Workshop was sponsored by Cenicafé, with simultaneous English/Spanish interpretation provided by Asucana. CIAT conference facilities were secure and excellent, with good accommodation, meals and refreshments at a very reasonable cost. There were 54 delegates representing 18 countries: Argentina, Barbados, Brazil, Chile, Colombia, Cuba, Ecuador, Fiji, Guatemala, Guyana, India, Indonesia, Jamaica, Mauritius, South Africa, Swaziland, Trinidad and USA.

The Director of Cenicafé, Dr James Cock, opened the Workshop and gave an overview of the Colombian sugar and panella industries. Four main themes were introduced by Gerhard de Beer (Workshop Chairman), Colin Hudson, Eddie Meyer and Jorge Torres. The complete spectrum of sugarcane mechanization from farm planning to harvesting and transport was covered. The introductory presentations were followed by contributions from other delegates and by discussion periods.
Commercial companies were given a separate opportunity to present information on their latest products.

Visits were made to Ingenios Central Castilla, Manuela, Mayaguez and Providencia to observe field operations, and to Cenicana to see its facilities. Heavy rain precluded some demonstrations, but delegates still had the opportunity to inspect a very large range of sugarcane machines and implements and to savour Colombian hospitality.

Four group discussions on the final day tackled one theme each. Conclusions were:

- Management standard largely determines cost effectiveness of production systems.
- Some operations can be eliminated without adversely affecting net profit.
- Skilful machine management is usually more important than machine/method choice.
- Operator performance is important, whether for sophisticated harvesters or for simpler operations such as herbicide application.
- Timing of operations is important - a mechanization plan for each field must be integrated into a program for the whole estate.
- To be cost effective, machines must be fully used and output increased.
- System analyses of all operations are required to determine the most cost effective option. This requires a full understanding of each operation's effect on net profit.
- Net profit, not maximum yield, should be the criterion against which the cost effectiveness of each operation should be judged.
- Cost effective trash handling methods must be developed for green cane harvesting.

The Workshop was successful, thanks to Cenicana's organization and the effort put into it by Sectional Committee members and Chairman Gerhard de Beer. It was agreed that green cane harvesting and trash management should be the subject of the next workshop, preferably in Queensland, Réunion or South Africa.

**BREEDING SECTION**

**REPORT ON THIRD ISSCT BREEDING WORKSHOP**

**BATON ROUGE, USA, 5-7 AUGUST 1991**

The workshop "Data Management in Cane Breeding" was held at Louisiana State University, Baton Rouge from 5-7 August 1991. It was hosted by Dr Freddie Martin, Head of the Sugar Station and Audubon Sugar Institute. Thirty-five participants attended, 190 from the USA and 17 from more than 10 other countries. Regrettably, there were no representatives from several countries with large breeding programs, such as Argentina, Brasil, Cuba, Mexico and the Philippines.
Dr Ken Tipton welcomed participants on behalf of the university at the very comfortable Borden Conference Center. Workshop sessions were kept informal, but were structured around four broad topics on which various participants made contributions verbally, through posters or through computer demonstrations:

- Choice of parents.
- Choice of crosses.
- Value of commercial census data.
- Taxonomic and characterisation data.

The Breeding and Germplasm Committee also took the opportunity to have a short business meeting, at which the main topics of discussion concerned the current situations of the World Collections vis-a-vis germplasm collections at other centers, the future planning, coordination and publishing of germplasm characterization information, and plans to launch a new Breeder’s Newsletter.

Participants visited the LSU crossing facility at St. Gabriel, where there are excellent photoperiod and glasshouse facilities for crossing and seedling raising. Scott Milligan demonstrated part of their data system there. In a brief visit to the Audubon Institute, Director Steve Clarke outlined the main lines of research. The non-toxic replacement, for lead acetate for pol determination was developed there, and is new commercial and standard in the Louisiana industry.

The success of this Workshop lay in the international representation, both young and experienced, who were looked after so well by Freddie Martin and his staff.

On 8th August most delegates visited the USDA Sugarcane Research Unit at Houma, where they were impressed by the good crossing facilities under controlled environments, and by the streamlined sample analysis laboratory. They also were invited to a typical Field Day for growers, where they were impressed with the direct contact between researchers and growers, and with the hospitality following the meeting.

PATHOLOGY SECTION

REPORT ON THIRD PATHOLOGY WORKSHOP
MAURITIUS, 22 - 26 JULY 1991

The Third Pathology Workshop was sponsored by and held at the Mauritius Sugar Industry Research Institute from 22 - 26 July 1991. It was attended by 93 delegates from 18 countries - Australia, Burundi, Colombia, Cuba, France (incl. Guadeloupe), India, Indonesia, Madagascar, Malawi, Mauritius, Morocco, Papua New Guinea, Reunion, South Africa, Sri Lanka, Sudan, UK, USA, and Zimbabwe. Of the delegates, 50 were visitors to Mauritius while the number of pathologists by profession was 51.
The workshop was officially opened by Maheutius Minister of Agriculture, Fisheries and Natural Resources, Mr M. Dulloo. The keynote speech, "Perspectives on the serodiagnosis of plant diseases," was delivered by Dr. Michael Clark (AFRC Institute of Horticultural Research International, East Malling, UK) who is famous for his development of the ELISA technique.

An overall picture of current research trends in pathology in various geographical zones and sugar industries was provided in the first session by delegates from Australia, Colombia, Cuba, France, Mauritius, South Africa, Sri Lanka and USA. Some 36 presentations were made in the remaining six sessions, and the main points being:

- **New findings, known diseases.** Aerial transmission of leaf scald; soil transmission of RSD; diagnosis of white leaf disease.

- **New sugarcane diseases.** Symptomatology, diagnosis and distribution of sugarcane bacilliform and clostero-like viruses and their transmission by mealy bugs; the latest on Ramu stunt; effect of yield of red leaf mottle virus and Pachymetra root rot.

- **Biotechnology.** Production and use of monoclonal antibodies for diagnosis and race differentiation of the bacteria causing gumming disease and RSD; RNA and DNA probes for characterization of the strains/races of bacteria causing leaf scald and gumming disease; probes for diagnosis of Fiji disease; initial steps in the production of transgenic sugarcane resistant to mosaic.

- **Techniques.** Application of new techniques such as fatty acid profiling for race identification; video image analysis to study reaction of seedlings to rust; novel technology for diagnosis of leaf scald and RSD.

- **Practical session on disease diagnosis.** Various experts demonstrated techniques in ELISA, electron microscopy, electrophoresis, monoclonal antibodies, restriction fragment length polymorphisms (RFLPs) and immunofluorescence. The advantages and shortcomings of the various methods were highlighted, as well as their specificity to the various agents and their complementarity in disease diagnosis.

Two interesting field trips were made for delegates to see symptoms of gumming disease, sugarcane bacilliform and clostero-like viruses, yellow spot resistance and yield loss assessment trials, aerial transmission of leaf scald and the damage it can cause.

A round table discussion was held on leaf scald owing to its increasing importance in various countries and novel aspects of its transmission. The International Smut Testing Program is approaching its conclusion, with some evidence for the presence of different races of the smut pathogen. New collaborative projects were set up on characterization of races of gumming and leaf scald pathogens, and the geographical distribution of sugarcane bacilliform and clostero-like viruses.
The workshop was very successful due to the great organization by MSIRI and support from the Mauritius sugar industry. This was the largest gathering of sugarcane pathologists ever held, and delegates were made aware of state of the art cane pathology.