

## **Tour Report of the Government of India, Ministry of Agriculture, Delegation to Mexico, USA and Netherlands during June 13 to 27 2001.**

1. The delegation consisting of Dr. Mruthyunjaya, Mr. Rajiv Ranjan Singh, Member of Parliament (RS), Mr. Saryu Roy, Member of Legislative Council (Bihar, Jharkhand) and Mr. P.K. Shahi, Progressive Farmer left Delhi, India on 13th June, 2001 at 8.50 P.M. to Mexico.
2. After travelling through Tokyo and Sanfranciso, reached Mexico on 14th June, 2001 at 6 P.M. Received by CIMMYT and reached CIMMYT guest house by 8.30 P.M. and stayed in CIMMYT guest house. Details of the meeting and visits were provided in the guest house.
3. As per the schedule, a meeting with Ms. Kinda Ainsworth, Head, Visitor and Conference Services, reviewed the programme schedule for the day, confirmation of Air Tickets, future programmes and departure plan from Mexico. E-mails were sent to confirm future plans to the World Bank and Dr. Gautum, National Director, NATP, New Delhi.
4. In the Board Room, presentations by Dr. Larry Harrinton, Director, Natural Resources Group, Dr. Jeff White, GIS/Modeling specialist, Dr. Prabhu Pingali, Director, Economics Programme, Dr. Michal Moriss, Economist, Economics Programme and Dr. Ravi Singh, PC, Wheat Programme were made followed by useful discussions. Dr. Mruthyunjaya presented a small souvenir in appreciation of India (ICAR's) longstanding and useful partnership with CIMMYT.
5. After ;inch, visited applied Biotech Centre and listened to the works by Dr. J.M. Ribert, Also visited the tissue culture laband seen the ongoing research works and their utility. Afterwards visited Welhausen-Anderson Plant Genetics Resources Centre and listened to the presentation by Dr. Skovmand and Dr. S. Taba. Visited the Gene Bank and Maize Mussum and got appraised of their activities. astly, heard to the presentation of Dr. D. Bergvinson on maize programme where some more details of QPM were obtained. The delegation, appreciated the contributions of CIMMYT and their relevance to India, Particularly, zero tillage, genetic improvements in wheat and maize like developing synthetic wheat, super wheat, hybrid wheat alien wheat, improving the efficiency of breeding through application of molecular markers, transgenic wheat for transferring useful traits like disease resistance, nutrition, quality, storage and supply of valuable germplasm, developing high protin maize varieties, yellow and white hybrids, avoiding continuous R-W crop rotation through diversification, etc. The delegation come to know of the useful work of R-W consortium and desired that workshop and training programmes be organized for farmers in Bihar for following zero tillage practices inviting specialists from ICAR, World Bank, CIMMYT office at Delhi etc. The delegation wanted to visit the villages. But due to paucity of time. it was not possible. However, they could see some stand of crops on the CIMMYT farm itself.
6. Left for Washington on 16th June 2001 and reached Washington in the evening, and stayed at Phoenix Hotel. Sunday, being a holiday and rest day, visited places of historical interest in Washington like White House, George Washington's tomb and Mount Vernon etc.
7. Left for the visit to World Bank in the morning on 18th June 2001. We were received by the Workd Bank staff at the main gate. Dr. Ridwan Ali welcomed the delegation. The purpose of the visit of the delegation was explained in the meeting. Besides the members of the delegation, the meeting was attended by Dr. Ridwan Ali, Sector Director, Dr. Gajanan Padmanathan, Regional Economist, World Bank, Delhi Office, Dr. (Ms.)

Dinaumali, Sr. Agril. Economits and Ms. Jeeva A.P., Economist, Rural Development Sector Unit of the World Bank.

Dr. Ridwan Ali stated that the World Bank activities in the rural development sector is highly decentralized and proper scientific advise will be sought from technical officials working in the Bank, advanced research centres like Iowa State University, Michigan State University, CGIAR institutions like CIMMYT, ICRISAT, etc.

Dr. Padmanathan mentioned that the World Bank prepares a country agriculture strategy once in 2 to 3 years and support programmes and activities of the government taking up reforms in sectors like power, water, domestic market. The Bank's thrusts include diversification, R&D in agriculture, watershed development etc. Reference was made to Bihar Plateau Development Project and Suvarna Rekha Canal Project. It was stated by Mr. Saryu Roy that the main problem with Suvarna Rekha Project was phasing out plan by World Bank. World Bank officials said that they will look into the matter as it was completed around early 1980s. The World Bank's view was that there should be a fiscal study and the problem in that there is no response for the last 3 years. Further, the World Bak agreed to the view of considering funding proposal under disaster management on addressing the problem of foods in north Bihat. This proposal should also include addressing drainage issue. Cropping pattern may also need to be changed. Stress many also be put on minor irrigation projetcs. It was agreed to have a special meeting with World Bank officials at Delhi on the problems and proposals of Bihar.

8. After taking lunch at World Bank, left in the hired taxi to International Food Policy Research Institute, Washington. The meeting with staff, IFPRI was arranged at 2.30 P.M. The meeting was attended by Dr. Ashok Gulati, Dr. Peter Hazel, Dr. Phil G. Pardy, Dr. E.D. Bowilia and Dr. Suresh Babu. There was a general presentation on the mandate, activities, achievements and vision of IFPRI. The institute is working towards influencing policy makers towards the problems of poor people around the world and generate global opinion to address poverty, lw productivity and environmental degradation. It focuses its research on micronutrients, anti-poverty measures, micro-finance, urban food security, gender and intra-household food security, market reform, income and crop diversification, export, post-harvest management macro-economic policy global and regional implications of international trade, better communication with farmers, research prioritization etc. In brief, it searches policies for the poor people. IFPRI has recently completed studies in India on the impacts of watershed projects, public investments in agriculture etc. It's studies have indicated that rates of return to investments in agricultural R&D is much higher, more than 40-50%, vary across the problematic focus and also there is no evidence that rates of return to agricultural R&D have declined over time. India has to pay greater attention to precision farming, crop diversification, ecological approaches to pest management, pest-resistant varieties and improved water management practices. It has to move from food security to market driven growth. For this, institutional re-orientation, organisational restructuring, better co-ordination among several related departments, farmers coming together better roads, markets, communication, market, intelligence and above all an unified approach to development are needed. Local needs analysis should be the basis for research and policy reforms. NCAP and IFPRI can come togehter on a research study to think about policy strategies for development of eastern India.
9. Left for Demoinies in the evening and reached Demoinies at 11 P.M. Though Dr. Ratan Lal came to Airport to receive, some how we could not trace him and therefore, hiring a taxi left for the Hotel and reached the Hotel at 11.30 P.M.

Dr. Ratan Lal came in the morning and with him, after taking the breakfast went to Dr. Hansen, Associate Dean and Director, International Programms in Agriculture. He briefed about the set up, telling that there is one Vice-President and four Associate Deans relating to Extension, Education, Research and International Agriculture. The relation of Ohio State University with India goes back to 1950. They have honoured recently Ratan Tata with Honorary Doctorate. Ohio University had linkages with Punjab Agricultural University and Rajasthan Agricultural University during 1960' and 1970s. They are keen to re-establish these relations with India.

The University started working on conservation tillage since 1948 at four locations. Ground is never kept bare and is covered with organic matter from crop residues. Therefore the carbon content will always be very high. In case of India, since crop residues are used either as fuel or fed to animals, soils are exposed and carbon content becomes low, to the extent of even less than 1% which is highly undesirable. It was told that nearly 40% of the area under maize, wheat are covered under conservation tillage. It did not reduce yield but saved cost and time of operations (without delay).

The new focus in integrated research, extension and education is conceived like in the pyramid, with emphasis/basis on production efficiency, economic viability, environmental compatibility and social responsibility (whether society accepts the technology).

Dr. Ratan Lal explained about how burning of crop residues in states like Punjab will have adverse impact on global warming. He said nearly 1/3 of the source for global warming comes from agriculture owing to deforestation, ploughing and biomass burning. He said that the carbon content in the soils of Punjab and Delhi which were 1.5% and 1% respectively 40-50 years ago, are now at 0.2%. The practices like nitrogen broadcasting, pesticide use etc., will all add to the environmental problem as the soil is not in a position to absorb these chemicals.

It came out that due to globalization, steel industry in USA is under red, sugar is highly uncompetitive and highly subsidized, wheat and foodgrains are highly subsidized. If government do not subsidize, the industry is in trouble. It came out that the livestock sector is doing relatively well because of lower feed grain prices.

About 60% of the soyabean area is under GMO. GMO corn can be feed to animals. But now it is suspected to have entered into food chain and therefore there is also resistance to it by consumers.

One of the problems relate to the rural-urban interface and adjustment to change when urbanization takes place, particularly relating to water use, waste disposal, sanitation and health owing to animal husbandry, poultry etc.

Visited the Department of Food Science and Technology. It is a centre of excellence to serve the value added-food industry. The novel methods used here using non-thermal process food processing is the cutting edge are in this sector where fresh food can be kept for years. The philosophy of the laboratory is learning, discovery, outreach and teamwork. It came to our notice here that the Universities receive overwhelming support from the industry and alumnus. The industry set up their plants in University, make use of them, give it to University, also hire students for work and become prospective employees. This practice is working very well which is of interest to us back in India.

Visited the biotechnology laboratory headed by Dr. Desh Pal Verma. he felt that India has lots of opportunities but missing it as constructive activities do not take place. He said that he offered many collaboration opportunities, but there are no takers. He

mentioned that of the total global scientific literature, 25.4% comes from USA and its productivity contribution is 49.4% where as where as India's contribution to world scientific literature is not only meagre (2.5%) but also its productivity is nearer to zero (0.07%). He said that China is doing very well. Well should differentiate productivity from activity. India is doing peripheral activities, not the meat part of it. He suggested that you provide scientists incentives and hold them accountable. He felt that there are no real biotechnologists in India but they are the people who changed caps. They are all botany people. They have to be trained for longer duration. He feels critical mass is missing. Impact factor is double zero. In USA, a faculty is paid for 9 months. For 2 months, he has to generate his own resources and one month leave without salary. Staff will be tried for 7 years, if not found performing, will be fired. He said that he teaches for 15 hours per year, the rest is spent in research. He opines that research drives America. He also told that for the University, 25% comes from tuition fees, 25% from overheads of grants and 25% given by State. Scientists will work from clearing the glassware to publication of research paper. India Civil Service rule which govern research system should be changed. There are professors with different salaries, depending on how productive he is. Moreover, he has to pay around 50% tax to nation, state, country, city, parking etc. There is functional multi-disciplinary work in laboratories unlike in India where it is only on paper.

Discussed about the work plan between Dr. Hansen, Dr. Ratan Lal and Dr. Mullins, they are very eager to have it soon. Wanted to inform ICAR regarding follow up including signing of the Work Plan. They wanted to talk to Dr. Ramesh Kanwar of ISU to expedite the process as ISU is the co-ordinator of the consortium of US Universities of Ohio, Iowa, Texas A&M, etc.

10. Left for Iowa State University and reached the Airport and received by Dr. Ramesh Kanwar. A detailed programme was drawn up for the visit. As per the schedule, after taking lunch, went to the farm of Mr. Craig and La Vanne Gerifficon at 11655 NW 6th Street, 1A, Dr. John Greswell, ISU Extension field specialist was also present at the farm.

Mr. Craig is a master farmer who has received awards from ISU and the State. He has 1100 acres of row crops, 800 acres share cropping and 300 acres custom hiring. he grows corn, soyabean, some oats and some alfalfa. He also grew seed corn, seed beans for seed company. They have a small herd of 40 cows, 50 poultry birds, piggery and few ducks. They take corn in the first year followed by soybean in the next year in a rotation. He has a huge mechanical shop with 4 big tractors, seed drills chaff cutter, trucks etc. He said that cost of production is raising and government supports though giving lot of subsidies, not being sufficient. He takes GM soybean and GM corn whose area he says is decreasing on account of the pest (corn borer) not seen in greater pressure after 1996. he has to pay 15% income tax to the government. He takes crop insurance, the premium is partly paid by government. He feels corporate farming may emerge eventually. He has his own storages and soils. his children are taking active interest in farming and as we were told, which is not common with other families in US.

The Department of Economics ISU, undertakes studies to look at the implications of entry of China into WTO in the world trade, the impacts of Farm Bill 1996 with particular reference to compliance with WTO and the needed changes in the next bill etc. They stated that traditionally the economic system was well adjusted to economic policies including subsidies. but with the WTO regime, the whole thin is disturbed and US has to pay lot of subsidies in limpsum as annyal payment. They feel there is lot of competition

to US in corn, wheat, soybean, sugar and peanut. Lower cost of production in competing countries on account of cheap labour and lower land costs should be recognized. On account of urbanization and increasing land costs, US may not maintain the longrun competitive advantage. They feel that giving higher subsidies is not WTO compatible but they have to do it which they say that they are cheating as many others do.

It was decided that the work plan with reference to marketing and trade will be pursued. Dr. Mruthyunjaya gave a seminar at the Food Sciences Laboratory on the topic, "Indian Agriculture, NATP initiatives and achievements" in the context of future collaboration with Iowa State University.

On the evening of 20th, a dinner meeting was organised where the Provost, Vice-Provost for extension, Research and Advanced Studies, Dean College of Agriculture Dr. Ramesh Kanwar were present. The dinner was hosted by ISU. Lots of issues relating to Indian agriculture, NATP and future course of action were discussed. Later in the evening, families from India met and discussed issues of mutual interest in the house of Dr. Kanwar.

On 21st, visited the Department of Crop Utilization. The products relating to corn, soyabean, with particular reference to pressed word, biodegradable plastics are impressive. Industry is participating by investing money in providing costly equipments, sharing them with ISU, absorbing graduate/undergraduate students etc. are seen to be good features worth considering by India.

In the afternoon, attended the Soil Tilth laboratory of USDA, located in ISU. Dr. Jerry Hatfield, Director, explained the activities. They are doing testing of soil and water for farmers and farms of Univesity. Also fix standards on the basis of weather, drainage conditions etc. It was told, which was a surprise to some extent, that farmers apply 140 to 150 kg of N per ha where as the recommended dose is just 100 kg/ha. This, he explained is on account of fertilisers being cheap. When asked about its effect on soil/ water quality, he could not explain.

11. Left for St. Louis on 21st in the evening. On the way to Airport, met the family of Dr. Dhua, Professor of Geography. Came to St. Louis and received by people from Monsanto and took us to the Hotel. The programme was already sent through E-mail to ISU on our request.

On 22nd, morning, left for Monsanto Chester field Campus by the company transport. We were received by Ms. Jane Burge and John Krebs and taken to the Visitor Laboratory. Dr. Kreb explained the work of Monsento, about the theory of work what they do etc. They have 320 ha at Chester Field and the farm is 17 years old. They have 1200 employees out of which 900 are researchers and nearly 1/3 are Ph.D. holders. They have about 250 laboratories and 100 plus growth chambers; and 2 acre of green hourse. Their vision is abundant food and a healthy environment. This is because they feel concerned about fast growing population, escalating food demand and at the same time preserving the health and fertility of soil and environment. Their main work relates to target yield through insect and herbicide resistenace. Their main work relates to target yield through insect and herbicide resistance. He explained about the biotechnology. He said biotechnology deals with tools and techniques of scientific research modifying plants. He explained the methods used in biotechnology. He said biotechnology deals with tools and techniques of scientific research modifying plants. he explained the methods used in biotechnology, viz. agro-bacterium method and genegun methods, followed by tissue culture process. Their products like Bollgard in cotton, against control of bollworm insect in cotton against stem borer in corn as

yieldgaurd roundup ready for cotton of needs in soybeans roundup ready corn for weed control incorn are famous. They will kill the insects but safer too anilams and human beings. He said that the regulatory sysetm in the US is strict which consists of the US Department of Agriculture, being responsible for the oversight of field trails involving plants modified through biotechnology the food and drug administration (FDA) review the applicants data package confirming that food or feed products are safe for human or animals consumption and finally environmental protection agency (EPA) regulated plants protection traits such as insect protection. He said that 70% cotton, 30% corn and 57% of soybean in USA come from biotech seed. He said that biotech method which consists of gene identification, tissue culture, growth chambers, field trails, traits bred with popular varieties, regulatory approvals (FDA, USDA and EPA) and product marketed takes nearly 10 years, So, he siad that it is a long road to market. He took around different laboratories where all these works are being carried out including large growth chambers. It was a sight to see robots doing experimental work in the laboratories. They do better work and also fast. Ms. Rasmi Nair, toxicology specialist also talked about the technology and safety measures taken. She said countries like China, Japan, Argentina, Indonesia, South Africa are way ahed in use of biotechnology. India is at complex and some level of uncertainty is bound to be present. She is hopefyl that the resistance in Europe will subside soon. They want that biotech products are labeled which should be OK. She also said that the benefits of biotechnology are shared like 6% for seed companies, 9% for US consumers. 20% fopr monsato and 59% for US farmers. In China, Monsanto works with a local company besides, it has own Bt Cotton. There is no terminator concept in biotech products now tried, she clarified. She also said that the yield advantages is 25 to 30 % in other countries and 10 to 15% in USE crops froms crops from biotech seed.

The biotechonolgy of the future is in the area of food biotechnology, improving the food quality, taste, and nutritional benefits. Improvement in protein, sugar or amino acid content or decreasing saturated fat is possible. Biotech rice, being developed contains both betacarotence (a precusor to Vit A) and a healthy dose of iron. Ripening of fruits/vegetables, can be possibility. Another examples is in cheese production. It is no longer necessary to use a milk-clotting enzyme extracted from the stomach of calves. The same enzyme now is produced in fermenters by micro-organizms that have received the calf gene. About 70% od US cheese production benefits from this improvement. she told.

After taking food with Dr. (Ms) Rashmi Nair, went to Missouri Botanical Garden with her. Dr. P.M. Richardson, Manager of Graduate Studies, after receiving us at the Gate took us around herbarium and explained their collection, preservation and use. Very old herbariums are maintained well in the repository with very good condition with lots of details. Created by Henry Shaw, it is a center for education, scientific research and horticultural display. It is one of the world's leading programs in botanical research. It does research relating to exploration, discovery and classification of plants. It has promoted international scientific collaboration in this area. It imparts education to children, adults and graduate students. It also deals with IPM, water conservation, composting etc. It is a part of the Center for plant conservation, a national network that works to preserve rare or endangered species of US. We were taken to Library which has rich collection of literature, photographs of rare species of plants etc.

On 23rd morning we were taken to Monsanto Research Farm at Jerseyville. Dr. Nag Gubbiga, field agronomist received us and explained its activities. It has 97 ha and the

research facility began in 1984. Research studies here include initial exploratory experiments, development of new traits, evaluation of new biotechnology products and comparison of competitor products. It also hosts visitors from many countries to show Monsanto technology as it applies in the market place. The season works through April and October. It has a green house of 20,000 sq feet, heated and cooled for a 12 months operation growing corn, soybeans and cotton.

12. Left on 23rd Newyork, London and Amsterdam. But at New York, Air India flight was delayed by 4/1/2 hours an account of which, missed the connecting flight to Amsterdam. After getting down at London Airport, we were surprised to know that Air India did not even inform about rebooking to Amsterdam by next available flight which they had promised at New York. We got booked to another flight which left at 4 P.M. and reached Amsterdam and stayed in the Hotel.

On 25th morning, hiring a taxi, went to ISNAR at 10:00 A.M. Met DG, ISNAR who explained about the activities of ISNAR in brief. They help institutions function optimally with good management and good policy. It has 80 staff members from 30 nationalities. It is 21 years old and serving about 100 countries in the world. In India, it plays leading role in the training programmes at NAARM, Hyderabad and also with state Universities and NGOs like MS Swaminathan Research Foundation. It is giving emphasis on distance education, IPR issue, biotech issues to develop leadership capacity of scientists in science. He stressed the need for long term investments in R&D as it takes 10-15 years to reach farmers with a proven and profitable technology. ISNAR will provide better tools of analysis, for fair understanding of factors influencing performance of farmers like credit, gender bias etc. But Director-General, ISNAR agreed that there is lot of uncertainty of new economic regime with harsher economic environment. It was also opined that it is now buyers market and there is demand for organic/ecological food and therefore it is not easy to make farmers wealthy in agriculture. Integration of agricultural research with environmental issues has become important. Issues of quality, high interest rate etc. are all becoming important. Ms. Apollonio explained about IPR services rendered to CGIAR Centres. She said that she will willing to correspond with the concerned official in ICAR in this issue. She provided some written details on this. It was opined that in such matters there should be global view to help the poor in the developing countries and CGIAR institutions and ARCs should take proactive role in this.

Dr. Ajit Maru talked about Information and Communication Technology (ICT) to strengthen R&D institutions to do research, education and extension better. He also talked about opportunities in the use of remote sensing, GIS, GPS etc. to address issues like food security, environmental degradation and suggested creating portals of agricultural information. He said that there is an urgent need to translate the global knowledge to local, useful knowledge to help farmers and reduce rural and urban divide. For this, he opined that there is need for greater leadership and vision. In India, he said that we have ICT infrastructure but content and functionality is missing. Institutional policy and strategy are needed. We may have to think of consortium approach for this. He also mentioned about the use of ICT in distance learning, not on line but off line like CD ROM etc. We should provide learning environment to farmers.

The lunch was hosted by D.G. and he again talked about issues of interest to India. Dr. Roseboom talked about Dutch agriculture which is mainly livestock based. However, floriculture is also important. Agriculture forms only 3% of GDP and more than 79% of their livestock products are exported. It was told Foot and Mouth disease has inflicted

about 15% loss. Water management is an important activity and pumping of water in 50% of the area is absolutely essential for survival of the Dutch people. It was opined that European Union is opposing to GM food because there is over production in Europe and the cost advantage of GM food also is only marginal, besides being with uncertain consequences. About 25 to 30% of the farmer income is subsidized and that is critical to agriculture. However, agriculture is not the critical sector of the economy of Dutch.

After lunch, Douglas Horton and Thomas Braunschweig discussed about the consultancy proposal on PME under NATP which has just been agreed by the Council. They wanted certain clarification regarding TOR, co-operating institutions, nodal point, budget etc. It was clarified that they should write to Council with a copy to Director, National Centre for Agricultural Economics and Policy Research who is the PI for PME project under NATP. They suggested dates in the 1st and 11nd week of September for the visit of ISNAR team to India for pre-project consultation and wanted confirmation. However, they will write a letter to the ADG(P), ICAR with a copy to Director, National Centre for Agricultural Economics and Policy Research for a suitable reply/confirmation quickly. Meanwhile they wanted a write up on the O&M part of NATP in general and PME work and its progress in particular to know more about the context of consultancy project. It was agreed that Director, National Centre for Agricultural Economics and Policy Research will send it soon after returning to India.

Left for Amsterdam in the hired taxi at 3.00 P.M. and reached the Hotel in the evening. Left for Paris in the morning of 26th and reached Paris at 11.00 A.M. After staying in Paris on 26th, left for India on the early morning of 27th, Reached India in the night of 27th. Resumed duties on June 28, 2001.