

# The Second International Vetiver Conference

## Thailand

*January 18-22, 2000*

*Report by Criss Juliard*

### **SUMMARY**

**WHAT:** The Vetiver Grass Network's 2<sup>nd</sup> International Conference on Vetiver was held January 18–22. The King of Thailand through his development foundation sponsored and helped organize the conference, held in a coastal region of Thailand with the theme “Vetiver and the Environment.”

**WHO:** We were some 340 engineers, researchers, practitioners, development experts, donors and businesses from 5 continents and 31 countries. Vetiver Grass Technology, first introduced in India in 1986 under a World Bank agricultural/environment project, is now used in over 100 countries for soil/water conservation, erosion control, and environmental protection.

**THE SUBJECT:** Vetiver Grass Technology uses vegetation (bioengineering) to mitigate environmental degradation, improve soil fertility and crop production, reduce water contaminants and ameliorate reforestation and wetland practices. The plant's numerous and strong root system holds soil when planted in hedgerows. Its deep roots grow to 2-3 meters in a year, and because of their depth, bring nutrients back up to the surface like a biological pump. The King of Thailand is a fervent promoter of Vetiver Grass Engineering, and has personally seen that it is integrated into Thailand's rural development strategy. The King is a respected engineer committed since the 1960s to improve Thailand's land, forestry and water resources. He has some 20 patents to his name, most related to soil and water conservation processes. Through Royal Demonstration Centers, universities, research institutions, ministries and NGOs, vetiver grass engineering has been promoted on a national level with impressive success. The King requested that Thailand host the second conference to show the significant results obtained through broad promotion and research of vetiver technology.

**THE CONFERENCE:** Upon arrival at Phetchaburi, the conference site we were given some 15 publications covering recent research and application of vetiver; one was a 480-page bound document, the Proceedings, containing all the papers to be presented over the succeeding 3 days. The documents allowed us to follow each presentation since most presenters were not native English speakers. In addition, a CD-ROM entitled VGT for Environmental Protection was distributed to all participants. Six prizes totalling \$10 000 were offered by the King of Thailand for the best papers on the conference subjects.

### **DAY ONE:**

The conference opened with an impressive reception, dinner and cultural show organized by the Palace (dances, songs, fireworks, light shows). Next morning key papers were presented discussing basic improvements in the technology since the last international conference 4 years ago.

Key among these was a paper on the impact of The Vetiver Network, a well-managed information dissemination and exchange system linking some 17 national, regional vetiver

networks, and Internet sites, newsletters, and institutions. The Network's web site receives about 1,000 hits per month. Over 800 NGOs, 800 government agencies, 1,000 research stations and about 800 private individuals and commercial entities are part of and access The Vetiver Network.

The Vetiver Grass Network records research and field experience in the area of:

- soil and water conservation (recorded reduced soil losses between 70% and 90%)
- crop yields (increased by up to 20%)
- forestry development (soil stabilization to reestablish eco-systems)
- stabilizing engineering structure (extends life of roads, bridges, embankments)
- pollution control (reduces dangers of pollution and waste site thru absorption of heavy metals and toxins)
- improving groundwater (improves ground water recharge due to long roots)
- flood control (dynamic reduction of damages to croplands, river banks, hillsides)
- land rehabilitation (used for extremely degraded soils)
- disaster mitigation (after Hurricane Mitch, where vetiver had been planted in Honduras, very little damage observed on hillsides)
- other application (handicraft industry using the leaf and root and thatching stimulating rural income)

Field experiences in El Salvador, Tanzania, and the Philippines show that when provided several options to different conservation practices, over 80% of farmers applied and preferred vetiver. The technology is simple, inexpensive, gender positive and it works.

Other papers included the results of DNA studies on vetiver varieties, and its adaptive resistance to diseases. This was delivered by Dr. Robert Adams of Baylor University's Plant Biotechnical Center. A paper by Dr. Paul Truong, provided the result of his research in the heavy metal tolerance of the plant, and the global impact it is having on reducing landfill pollution and purifying polluted waters. A paper presented by Chinese researchers from the School of Life Science in Guangzhou Province and the Chinese Academy of Science gave results of experiments with four different types of grasses to reduce pollution levels of a lake damaged through chemical run-offs and improve surrounding infertile lands. Vetiver was found to have significantly improved the re-vegetating of abandoned area. Other papers the first day covered experiences in establishing country-wide dissemination programs which included our paper from Madagascar. Other countries included Venezuela (winners of the King's Vetiver prize), Ethiopia, Cameroon, Malawi, Thailand (the State Oil company adopted a complete vetiver remediation program to protect a gas pipeline recently established to supply the country's gas imports), Philippines.

## **DAY TWO:**

Day Two was the opening of a large exhibition fair set up on the resort grounds which included some 20 pavilions, all demonstrating a ministry, agency, university or NGO's work and research in vetiver. The extent and detail of this exhibition was daunting. Pavilions included the Ministry of Public work in protecting roads and structures using vetiver, the Ministry of Land

Management work in rehabilitating desolate lands, models of the State's Oil company's use of vetiver, the Ministry of Industry and Commerce's work in developing marketed handicraft products including charcoal briquets from compacted vetiver leaves; insulation panels, construction bricks of mixed cement/clay/vetiver leaves, tiles, nursery pots, household products of all types including mats, lamps, picture frames, hats, paper, screens all made from the vetiver leaf or root. Various universities displayed research results of work conducted over the past several years, the Ministry of Education showed the books it had developed to teach school children the value of vetiver. The exhibition took about two hours to visit.

Papers continued to be presented the entire day. They focused on field-testing techniques and field experience where vetiver provided sustainable farming and agro-forestry practices. Three panel discussion groups and four concurrent presentations in which some 40 papers were presented and discussed highlighted the day. Topics of interest included the positive effect of vetiver on crop yield and soil moisture (studies conducted by Kon Kaen University and the Thai Bureau of Land Management), the ability of sloping land farmers in Fiji and Vietnam to obtain sustainable farming and controlling cash crop through use of vetiver hedges, improving efficiency of vetiver propagation, rehabilitating degraded watershed in Ethiopia using vetiver, disseminating technology at the village level worker in India and at the decision level in South Africa.

It was clear from day two that Thailand, which had initiated vetiver research and application since 1991 was far ahead of other countries in knowledge and widespread usage of vetiver. Thailand was propagating biomass using tissue culture, and went from producing about 6.5 million plants in 1993 to a production and utilization level of about 99 million plants per year (1999 figures). Agricultural development difficulties in Thailand had been exacerbated by land degradation, especially in ecologically fragile areas, and rainfalls had carried away precious topsoil and plant nutrients. It was estimated that Thailand was losing between 12.5 to 62.5 tons per hectare per year. Applying vetiver in hedgerows was able to reduce that loss by about approximately 85%. The Thais were proud of this achievement, and reserved Day 3 to "show and tell" what they had accomplished.

### **DAY THREE – Technical tour**

Participants to the conference spent Day 3 visiting four project sites where vetiver had been planted either for public demonstration purposes or by individual farmers for their own use. The visual impact of these visits was impressive. The first site was the Huai Sai Royal Development Study Center, one of 14 throughout the country. This one had been chosen because vetiver was used to rehabilitate the harsh environment and specific ecosystem. The site had been selected in 1993. It was an inhospitable, rock-covered region with little or no vegetation. Dr. Paul Truong from Australia had visited the site at the time of selection, and had advised the Center to chose another area since the sub-strata was basically hard rock. However, upon the insistence of the King, the site was maintained. Holes 15 cm in diameter were chiseled in the rock landscape to permit young vetiver to be planted with potting soil. Dr. Truong informed us that over the 7 years since he had seen the site the transformation was impressive. Vetiver was planted in both large circles and semi circles; slow growing trees and fruit trees (mangos, citrus, tamarind) had been planted in various arrangements for demonstration purposes. We were shown how the long vetiver roots helped maintain humidity and brought nutrients up to the surface. The fruit trees were growing well, the hard-pan soil and rock had turned into productive land.

The second site demonstrated vetiver usage in an integrated farming system. The grass was planted in hedgerows, and in a semi-circle and circle around the base of fruit trees that had been planted in poor sandy and dry land conditions. Vetiver leaves were cut periodically and used for mulch, as the leaves become a good source of organic matter helping improve the soil's potential

in retaining water and plant nutrients. This was done next to trees where no mulch had been used. We were able to witness the difference in fruit size and taste, as well as see the difference in vegetation between areas where vetiver was planted and where it was not. Vetiver was planted around pond edges to prevent soil erosion. The diversity of plants serve as supplement to the paddy as well as poultry and fish farming practiced in the area.

The third site was 770 ha area that had been an uninterrupted pineapple growing plantation for 20 years, and without proper soil and water conservation measures, the land was no longer suitable for cultivation by individual farmers. The Department of Land Development decided in 1994 to use the land as a study area and incorporate the use of vetiver to restore soil, water and forest or forest ecological system. Vetiver was planted along the contours across the slopes, and along check dams along gullies. By 1999, the vetiver system had helped maintain topsoil and moisture, which led to an improved ecological system. Natural vegetation grew to cover the soil and fostered growth of the trees. Again, Dr. Paul Truong had been at the site at the outset of the project and indicated now that the reforestation and re-vegetation were “unbelievable.”

The last site included the farm of Mr. Songsak a small citrus grower. He first planted vetiver as a nursery in a field adjacent to lime trees. He saw that the lime trees that rimmed the vetiver nursery did not have yellow leaves like the others further away, and in fact produced larger quantities of limes. He consulted with vetiver extension agents who suggested he rim all his trees with vetiver as the grass, through its long root system maintains ground humidity during the flowering season, extending the time flowers remain on the tree, and thus increase the pollination period. The farmer has become a “Soil Doctor” who provides farmer-to-farmer extension services to neighbors. We were able to see where he had stabilized the bank of a river that runs along part of his farm, which had eroded during recent floods, using vetiver.

In the evening, we had another outstanding dinner and Thai show, complete with singers, dancers, marionettes and demonstration. We also had a business meeting to help discuss the venue and topic of the next vetiver conference planned for 2004. It was agreed that the Chinese will host the next vetiver conference, and the topic would be “Vetiver and Water.” This was chosen to help stimulate research on vetiver usage to improve water quality, prevent coral degradation in coastal regions, mitigate flood damage and to reduce water wastage in agriculture.

#### **DAY FOUR:**

This was a half day with some 15 concurrent presentations on such topics as soil and water attributes of vetiver, research and general studies in China, Bangladesh, Zimbabwe, the US Army and India, and evaluation of vetiver application in road construction, in perfume, and cotton yields. Most interesting were the closing sessions that included summary comments from organizers of the conference and Richard Grimshaw, Founder of the Vetiver Network, on the future outlook for vetiver.

There was an additional field visit to a model farmer as we drove back to Bangkok. The farmer had applied vetiver on hillsides, but had not seen spectacular result, this in part because he had been among early users, and had used a variety of vetiver that is no longer recommended.

#### **SUMMARY**

Vetiver has made significant inroads in the minds of professionals who several years back scoffed at the idea that a grass indigenous to India could be used to replace civil engineering works, could have multiple environmental applications, and could offer inexpensive and reliable solutions to soil degradation and loss of soil fertility.

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