VETIVERIM

A Quarterly Newsletter of the Pacific Rim Vetiver Network

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Editorial

Unique Property of Vetiver: Water-logged Tolerance

This is the fourth part of a series of the Editorial on the unique property of vetiver. Vetiver *(Chrysopogon zizanioides)* has another unique property in that it can tolerate water-logged condition, the opposite situation of drought tolerance described in the Editorial of No. 64 of Vetiverim.

In order to be able to survive in the wetland habitat, vetiver has developed during its course of evolution, specialized cells, known as aerenchyma, in its leaves and roots that allow it to adapt to water-logged condition. This feature makes it able to move oxygen from its leaves to its roots and, thus not suffer from hypoxia (oxygen starvation). Some excellent research by P. Khnema and S.Thammathaworn of Thailand explains the process and shows in detail the cells that are able to achieve this. They produced a nice PowerPoint with many of the details. There is a fascinating discussion starting on page 12 which they conclude:

"Large lysigenous intercellular spaces were found in mature leaves, but very small sizes in developing leaves, which suggested relative gas circulation in roots and encouraged deeply root penetration. Consistently, we found that aerenchyma at root cortex and air cavity at pith were strong evidences of aeration system from leaves to roots. To avoid hypoxia / anoxia, large lysigenous intercellular spaces at laminas were a character of aquatic plants or long term flooding-tolerant plants by transporting O_2 from leaves to roots. Moreover, we guessed atmospheric O_2 could pass into vetiver via a pith cavity at culms according to the theories named, "Humidity-induced convection" and "Venturi-induced convection".

Although water-logged tolerance is common among wetland plants, vetiver, locally known in Thai as 'Faek Lum', is unique in that, due to having deep root system which enables it to absorb water in the aquifer, it can grow in the dryland. Compared to its close relative, *Chrysopogon nemoralis,* or 'Faek Don' (dryland vetiver), vetiver can tolerate drought better!

This is one of the properties of vetiver that makes it well-known as a "Miracle Grass". Able to grow in contrasting conditions of wetland and dryland, vetiver is used extensively in soil and water conservation, bioengineering, embankment stabilization and phytoremediation.

Vetiver for Energy*

Many organizations are building TLUD and rocket type stoves to stop the need for charcoal. The real problem is finding fuel! The lack of trees even finding sticks and trimmings for cooking fuel is so severe in Haiti and many parts of the world we need a substitute. Haiti Reconstruction International feels vetiver grass pellets is the best substitute and will stop the need for cutting trees. We believe making energy will be the best catalyst to propel farmers to plant more vetiver hedgerows and nurseries to produce them.

Vetiver pellets must be made cheaper than charcoal or imported fuel. We know that gasification of grass can be used instead of buying diesel fuel. The benefits of using modern technology will propel poorest economies helping those who need it most. Gasifiers have already been made for wood to run internal combustion engines, we are perfecting them to gasify grass. We need to ship vetiver to Cornell University who will be testing it for making it into fuel pellets. Cornell is the leading institution on developing grass for fuel, field crops and forages and business management.

We are hoping someone from the southern USA will donate 200 lbs of vetiver leaves (dried for a week) then bundled. HRI will pay for shipping, and write a tax deductible receipt for your sending it. Farmers and villagers buy lots of diesel fuel to run their wells and haul produce down the mountains. When we perfect local electrification it bring money to the top of the mountain and the people who are growing vetiver grass and saving the ecology.

If we are successful we will be developing the process to work all over the world with similar machinery. See more at http://haitireconstruction.ning.com (see below)

Latest Development of Haiti Reconstruction International (HRI)

HRI is working with Cornell University and wants to use Green Energy Technology for making vetiver pellets for stoves and electrification. We are shipping vetiver to Cornell University who will be testing it and making it into pellets. Cornell is the leading institution on developing grass for fuel, field crops and forages and business management.

Many groups are making TLUD and Rocket type stoves but the real problem is still finding fuel

HRI feels the lack of trees even sticks trimmings to find for cooking fuel is so severe in Haiti we need a substitute like grass pellets for the entire country. We know grinding vetiver grass and making them into pellets will cost more than making briquettes by hand. But we also know that making briquettes will take too long and not be excepted by the entire county. The need to make the pellets cheaper is critical but we know that gasification of grass can be used instead of buying diesel fuel. The benefits of using modern technology will propel the economy helping those who need it most.

Farmers and villagers buy lots of diesel fuel to run their wells and haul produce down the mountains. When we perfect local electrification it brings money to the top of the mountain and the people who are growing vetiver grass and saving the ecology. We have been looking for this same type of equipment that can be used all over the world in remote areas. But we will add gasifiers (not shown) to our trailers that will burn vetiver grass instead of diesel fuel.

Pelleting equipment will also be used for making animal pellet supplements. Making them from a combination of moringa, indigofera, vetiver & guinea grass with magnesium oxide, minerals and even worming medicine may be added.

Haiti Reconstruction International is putting most of our emphasis on vetiver grass because we feel it is the most important need in Haiti and most of third world countries.

***** *By Richard Grimshaw, TVNI Founder and Director*

Why Vetiver Grass?

1. When planted properly in hedgerows, vetiver not only stops erosion, it makes its own terraces that hold nutrients and moisture on the mountainsides. This will produce better soil as it collects leaves and debris making fertile humus.
2. Grass can be cut twice a year without hurting it terracing ability to make biomass! This cut vetiver will be made into fuel pellets. To make the grass pellets cheaper we will use the grass pellets in gasifiers that will run a generator to make the electricity.
3. Vetiver pellets will be used in TLUD stoves, a clean burning cook stove that will save lives and health of those now using charcoal.
4. The pyrolysis process of burning pellets burns the gasses and leaves the carbon which we want them to return to the soil of their gardens. It is a needed soil amendment that holds moisture and most microorganisms which are most important to produce more food.
5. The people in the mountains who have made money making charcoal will now be paid for selling grass cuttings for pellets. These pellets will be sealed in plastic bags and sold instead of marmits of charcoal by the same women who now sell charcoal at the markets.
6. Vetiver hedgerows are the best line of defense to mitigate hurricane destruction. Holding the moisture on the mountainsides not only revitalizes the soil and will bring back the trees. Putting carbon back into the soil not only grows more food it will clean the atmosphere and bring back the rain forests.

Achievement of the Vetiver Network International in 2013*

The worldwide vetiver family had another good year in 2013. It was exciting to see expanding use of Vetiver System applications in most parts of the world, often from people and places that we rarely hear from.

The year's highlight was The Second International Latin American Conference on the Vetiver System that was held in October in Medellin, Colombia, and very ably organized by Daniel Londono of the Colombian Vetiver Network. There was excellent attendance and some very interesting presentations from most of the region's countries covering various applications. It was interesting to see how individuals, communities, private companies, schools, and Universities were all making their contribution to furthering this great technology. I was personally moved by the work of Alois Kennerknecht of Lima, Peru, who, using his own money, had virtually single handed introduced VS for beautification, soil conservation, and other purposes to some very poor inner city urban communities. In Madagascar, our current "Vetiver Champion", Yoann Coppin, continues his excellent work with a number of cross sector applications that show what can be done when you put your mind to it! We thank the companies and individuals who contributed to the conference in kind and funds.

In late November we learned that Paul Truong had been shortlisted in the final 25 contenders for the St Andrew's Prize – an important UK environmental prize. His submission was based on his pioneering work on phytoremediation of wastewater and its potential for reducing diseases transmitted in dirty water. We will know whether he is a winner or not in May 2014. Water quality is an important area where VS can prove helpful. For example we recently learned that TechnoServe has a project in East Africa that addresses the coffee industry, including training over 120,000 Ethiopian coffee farmers in VS technology and using the VS application, that we are now calling, Vetiver Phytoremediation Technology (VPT), to treat wastewater from coffee pulping stations.

We would like to congratulate TVNI Director, Roley Noffke of Hydromulch, South Africa,

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* *By Dick Grimshaw, TVNI Founder and Director*

for being elected as Vice President of the International Erosion Control Association (IECA) with global responsibilities outside of the US. Roley has been a great supporter of the Vetiver System; has helped fund a number of vetiver programs and vetiver training courses; has carried some large mine rehabilitation and slope stabilization works in Africa using VS; and has shown how poor local communities can significantly improve their incomes through inclusion in the production and supply of large quantities of quality vetiver plant material. His example is laudable and should be an example to many other commercial operations that use VS.

Our website continues to be very well used. It is interesting to see the growing interest from countries such as the Philippines, Italy, Brazil, Myanmar amongst others. I have been busy updating the website (something I should have done a long time ago), and have now nearly completed an additional Vetiver System Library that is in the public domain and hopefully proves easier to find vetiver information and documents. You can still use the website search engine and the Vetiver Archives – they are all interlinked.

Sadly in the past year we have lost two of our longstanding Board members and friends. Monty Yudelman who died in January 2013 was well know in international circles, having been at one time the World Bank's Director of Agriculture and Rural Development where he oversaw a massive increase in Bank agricultural lending to impoverished farmers. Then this last November Mark Dafforn, our Secretary and Director, died suddenly at far too young an age. He will be remembered particularly for his work the National Academy of Science's 1993 study – "Vetiver Grass – A Thin Green Line Against Erosion" and his work with Robert Adams on the DNA of Vetiver, as well as for the good scientific advice that he gave us all. We are setting up two awards in their names - "The Monty Yudelman Award" and "The Mark Dafforn Award". Details will be posted shortly about the awards, but both will be open to people undertaking outstanding contributions to the Research and/or Development of the Vetiver System. The Yudelman Award already stands at $5,000 and The Dafforn Award is at $1000. If anyone would like to contribute you can do so either via our "Donate" button on our website http://www.vetiver.org or by mailing a check or money order.

The Vetiver System continues to attract a good deal of attention, and is particularly important for addressing Climate Change and Food Security issues. I firmly believe that VS is one of the most important tools for mitigating and preventing many of the land and water related environmental activities that are needed if this planet is to be a better place. We have a long way to go, and a lot of hard work remains particularly in information transfer and application. The three major legs of the Vetiver System: infrastructural slope stabilization, on farm soil and water conservation (erosion control), and treatment of contaminated land and water (phytoremediation) remain the keystones of the technology; together they address the critical areas mentioned above.

For those of you who may share this letter with your friends and interested clients you might care to read up on the history and achievements of TVNI and the Vetiver System in this document that I recently prepared.

The next big vetiver event will be the 6th International Conference on Vetiver (ICV-6) to be held in Da Nang, Vietnam in May 2015. Its theme will be "Vetiver System: Empowering Sustainable Development". It should be a very good and informative gathering, and is being ably organized by Man Tran, Vietnam Vetiver Coordinator. Mark up your diaries and join us in Da Nang.

Finally at this season of "Giving", I would like to tell you that in the past few days we have had some generous responses to our request for funds to support the ongoing work of the Vetiver Network. Thus far we have collected nearly $4,000. **We need more**, and I would ask those of you who have not yet made a contribution and who care about our planet, the solutions and opportunities that VS can provide, and the personal/business benefits that many of you have derived through the Vetiver Network to consider a tax deductible donation – easy to make via the secure "Donate" button on our website.

Thank you all for a good year, and Greetings!

Vetiver Works in Thailand: Model of Success*

Roles of Office of the Royal Development Projects Board (ORDPB)

The ORDPB is a government agency, acting as a central agency in collecting and processing the royal initiatives for the coordination of the implementation, monitoring and evaluation of the royal development projects. Each year, an amount of budget is allocated from the government to implement the projects. From 1981 to present, there are more than 4,400 royal development projects throughout Thailand.

Royal Initiatives on Vetiver Grass

The development and promotion of the utilization of vetiver grass in Thailand was initiated by His Majesty King Bhumibol Adulyadej of Thailand in 1991 when he delivered his first speech on the grass that studies and experiments should be conducted on vetiver grass, summarized as follows:

"…the cultivation of the vetiver grass should be experimented at the Huai Sai and Khao Hin Sorn Royal Development Study Centres as well as in other areas to prevent soil erosion. The cultivation should be suitable and the data on the studies and experimentations covering all aspects should be collected…"

The Late Princess Mother and His Majesty the King have a genuine interest toward vetiver grass and its usefulness in soil and water conservation. This is the most critical starting point for the implementation works on vetiver grass in Thailand.

Implementation in Response to the Royal Initiatives

Altogether 50 agencies involved in the implementation with the ORDPB working as the central agency in the project coordination to ensure that the implementation followed the royal initiatives. Regarding the administrative management, the Committee on the Development and Promotion of the Utilization of Vetiver Grass According to the Royal Initiatives was set up with the task of formulating policies and frameworks, chaired by a Privy Councilor. The two sub-committees was also established, namely the Sub-committee on Academic, Monitoring and Evaluation; and the Sub-committee on Dissemination and Public Relations. To fulfill the royal initiatives, 5 Master Plans for the Development and Promotion of the Utilization of Vetiver Grass were drafted as guidelines for the implementations.

Implementation Results

More than 225 researches on vetiver in many aspects have been done. For applications and dissemination works, since 1992, there have been more than 3,000 million slips grown all over the country in different patterns in the agricultural plots and on the slope. The Contests on Vetiver Plantation and Vetiver Handicraft Making were also organized.

In addition, five Thai National Conferences on Vetiver have been organized to promote and enhance understanding on the use of vetiver among Thai people at all levels. They were held in:

- Chiang Rai Province (21-22 September 1993),
- Phetchaburi Province (24-26 August 1994),
- Bangkok (14-15 January 1996),
- Bangkok (28-29 November 2002, and
- Bangkok (28-29 November 2005).

** Paper presented at the Second Latin America International Conference on the Vetiver System held in Columbia, 3-5 October 2013 by Suwanna Pasiri, Deputy Secretary-General of the Royal Development Projects, Office of the Royal Development Projects Board, Bangkok, Thailand.*

International Cooperation and Assistance

Internationally, Thailand hosted two International Conferences on Vetiver (ICVs), namely:
- ICV-1 (1996): "Vetiver : A Miracle Grass" in Chiang Rai Province, and
- ICV-2 (2000): "Vetiver and the Environment" in Phetchaburi Province.

Thailand also organized three international training courses, namely:
- The International Training Course on the Vetiver System, between 19-30 November 2000, with 31 trainees from 15 countries,
- The International Training Course on Vetiver Handicraft-Making, held in 2005 with 3 trainees from Venezuela and 1 trainee from El Salvador, and
- The Training Course on Vetiver Handicraft – Making, held in 2007 for 2 Indian from Women Weavers.

It also assisted and actively participated in three International Conferences on Vetiver, namely:
- ICV-3 (2003): "Vetiver and Water" in Guangzhou, Guangdong, PR China, organized by the Chinese Academy of Sciences,
- ICV-4 (2006): "Vetiver and People" in Caracus, Venezuela, organized by the Polar Foundation, and
- ICV-5 (2011): "Vetiver and Climate Change" in Lucknow, India, organized by the Central Institute for Medicinal and Aromatic Plants.

Moreover, Her Royal Highness Princess Maha Chakri Sirindhorn as the patron of the Vetiver Network International (TVNI) graciously presided over every conferences and granted monetary support for the organization of the latest three ICVs in China, Venezuela and India, and prize money for the winners of the King of Thailand Vetiver Awards in every ICVs.

In addition, Thai specialists were also dispatched to Myanmar, Madagascar and Vietnam to exchange knowledge and practice on the use of vetiver.
- In 1999, three vetiver specialists were sent to Myanmar to assess the situation of soil erosion and give advice on planting vetiver to solve the problem of soil erosion.
- In 2000, two experts were dispatched to Madagascar to assist in restoring the disastrous condition caused by a hurricane storm.
- In 2006, five experts were dispatched to Vietnam to help making rehabilitation plans for the area that was stormed by typhoon using vetiver grass.

Summary

There are two main reasons behind the success of the implementation works on vetiver grass in Thailand

(1) The King as the leading figure: His Majesty continuously has a genuine interest toward vetiver grass both academically and practically. His initiatives on the promotion of the use of vetiver grass has been well responded by the government in allocating budget for the concerned agencies to work on vetiver grass projects.

(2) The well-established working bodies: The committee and sub-committees are firmly formed with the concerned officials from related agencies acting as committee members. The duties include setting policies on research work, dissemination, extension, public relations as well as monitoring and evaluation

In conclusion, it can be concluded that the keys for the success of the implementation works on vetiver grass in Thailand come from His Majesty the King's initiatives on vetiver and hence in the involvement of the government agencies and financial support from the government.

A Brief Report on the Second Latin America International Conference*

The Vetiver Conference in Colombia was a very good event; about 130 people attended an excellent conference in Medellin, with about 30 foreign delegates. The presentations were detailed and covered the whole spectrum of VST with the emphasis on erosion and sediment control such as slope stabilization. The overall quality of presentations was very good, there is no doubt that VS will become quite "fashionable"! Some important and influential persons attended the conference, and it is expected that they will endorse the technology and see that it is extended. We were impressed by the enthusiasm and interaction of the participants. Particularly a one man effort, Alois Kennerknecht from Peru. He has single handily introduced eco-friendly techniques, including vetiver to the poorer urban areas of Lima. It really lifts ones heart and faith in humanity to see what he has done with and for the people of Lima. It also underscores how we can do so much with so little by introducing the Vetiver System to all parts of society.

One person who was unable to attend was Jaime Cervantes Calderas of Mexico. We would like to acknowledge publicly how much we appreciate Jiame's contribution to the sharing of vetiver information. How he finds it all is a mystery, but he obviously is a great "networker".

We also initiated a discussion of how VS might be networked better in Latin America, and how TVNI might help reinforce VS users and promoters in their discussion with administrators so as to accelerate its use. There are a few things that we could do immediately:

- Accelerating technical certification; there is a high demand for this and is important in a region where professional certification brings recognition in business.
- Giving a special and obvious link on our website to VS papers in Spanish and Portuguese.
- Making available the "promotional" paper that TVNI is preparing which may provide a useful document to Latin American Networks when discussing VS in broader terms than just slope stabilization
- Appointing a few selected people as TVNI Associate Directors (AD) for Latin America so that they can talk to policy makers and others on behalf of TVNI**.**

We had a special lunch meeting with representatives from the various countries. They want close affiliation to TVNI and they want to look closer at how they organize themselves. Daniel Londono has promised to orchestrate a continued discussion and he will come up with some form of agreed views as to what they think is the way to go.

The bottom line is that we think there has been terrific progress over the past 10 years in Latin America with VS and we suspect that the region could well be the leading VS light over the next decade. The region has a lot going for it: the countries are thinking "green"; those who see VS in action are very impressed, if critical before they are very positive when they see what VS can do, the need is immense in all areas of application; the region has intelligent and well educated professionals who recognize the value of VS and can move it forward. Many are committed to widen VS applications to outside of their own specific "commercial" needs.

For those who sponsored the workshop we want you to know that it was a good investment, it was well managed and organized, and the participants liked what they saw and learned. The conference room was as full at the end as it was the start! Those who came to see what VS is all about were very excited about what they learned, and in their different ways will support the introduction of VS in the future. It helped to strengthen the bond between VS users and VS has given them a great deal of confidence in the future. Of course there is a lot more to do, it will be challenging and perhaps unique in a culture that tends to not be very inclusive. TVNI provides an atmosphere of neutrality where inclusiveness and innovation can be generated by VS individuals and groups.

** By Dick Grimshaw, Director, TVNI, and Paul Truong, Board of Director for Asia and the Pacific*

Finally, this was our first visit to Colombia and Medellin where the conference was held. Medellin is a beautiful city (2 million people) with well managed and maintained infrastructure. Unless you were informed you would never know that a few years ago it was the drug capital of the world, torn apart by the drug lords.

We have to thank all those who supported the conference and particularly Daniel Londono who organized it, with support from his father Jorge Londono and his friends. A job very well done and of course the attendees were an essential part of the success.

The Proceedings with presentations are up on the TVNI website at:
<http://www.vetiver.org/LAICV2F/index.htm

Abstract: Leaf Anatomy of Vetiver Grass Supporting the Potentially Carbon Sequestration*

Investigation of internal leaf structure can give a preliminary explanation of the potential carbon sequestration of the plant. This research was aimed at describing internal leaf structures of 11 vetiver ecotypes and observing some relative structures. It was found that all 11 ecotypes had a similar pattern of vascular bundle arrangement with the ratio of 1 : 3 : 1 : 3 : 1 for large : small : medium : small : large and Kranz structure, which is similar to C4 plants. Like aquatic plants, large lysigenous intercellular spaces in vetiver leaves were found to relate strongly to the aeration system. The present of aerenchyma at cortex layer could confirm gas circulation from leaves to roots and encouraged deep root penetration of vetiver by avoiding hypoxia condition. Moreover, "humidity-induced convection" and "venturi-induced convection" were assumed as a strategy to gain more gas circulation of vetiver. The sclerenchyma fibers in the bundle caps of the 'Loei' ecotype were extended from abaxial to adaxial surface, which was believed to play a dual function of mechanic and hydraulic (a short cut of water pathways) processes, which could retain stomata opening and longer gas exchange. Angle of the leaf wings reflected an adaptive high radiation and was useful for ecotype classification. In conclusion, the internal leaf structure was found in all 11 vetiver ecotypes, whose role was to sequester more C, particularly in the 'Loei' ecotype.

Keywords: Kranz structure, lysigenous intercellular space, arenchyma, vascular bundle.

** The King of Thailand Vetiver Award winning paper presented at the Fifth International Conference on Vetiver, held at CIMAP, Lucknow, India, 28-30 October 2011 by S. Thammathaworn, Nong Khai Campus, Khon Kaen University, Mueang District, Nong Khai, Thailand, and P. Khnema, Department of Biology, Faculty of Science, Maha Sarakham University, Kham Riang Subdistrict, Khantharawichai District, Maha Sarakham, Thailand*

Further Announcement of the First Philippine Conference on the Vetiver System

Date and Venue
March 5-7, 2014, Grand Ballroom, Intercontinental Manila, Makati City, Philippines

What is the Vetiver System?
The Vetiver System, currently used in over 100 countries, is a versatile and cost-efficient bio-engineering method that is responsive to environmental mitigation needs over a broad range of ecological conditions that are normally treated with traditional engineering solutions or none at all. At the core of this soil and water conservation system is a unique tropical plant, the vetiver grass *(Chrysopogon zizanioides)*. The Vetiver System's many environmental applications:

- Reduce soil loss by more than 90%

- Reduce rainfall run-off by up to 70%
- Increase crop yield by as much as 40%
- Improve tree seedling growth (15%) and survival rate (95%)
- Stabilize engineering structures, and reduce point source erosion from highway and building sites at reduced costs, often less than 90% of the cost of the "hard" engineering solutions
- Improve polluted sites (landfill stabilization, removal of excess nutrients, herbicides and pesticides from farmland)
- Improve ground water recharge
- Optimize what goes in and out of a river system
- Rehabilitate wasted land (gullies, mining, extreme degraded lands)
- Prevent or reduce natural disasters caused by hurricanes, landslides and flooding
- Provide large quantities of good quality forage for livestock
- Protect nearby crops from pests

Who Should Attend?

- Environmental and other policy makers
- Local government units
- Watershed managers
- Public infrastructure planners and managers
- Research institutions and Academe
- International development agencies/Non-government organizations
- Private sector involved in construction, property development,mining, among others
- Farming communities

Why You Should Attend

- Gain new knowledge on the value and economics of the Vetiver System from an outstanding faculty of regional experts and end-users
- Establish friendships and collaborative activities with a diverse mix of attendees

Programme

March 05, Wednesday

09.00 - 10.00 Opening Ceremonies
Keynote Speaker and Guest-of-Honor Honorable Ferdinand R. Marcos , Jr.Senat or, Republic of the Philippines
10.00 - 10.30 Tour of Exhibits
Morning Coffee/Tea
10.30 - 11.00 Plenary 1: State of the Philippine Environment
11.00 - 12.00 Plenary 2: The Vetiver System
I ntroduction on the Vetiver System
Dick Grimshaw OBE, Founder, The Vetiver Network International
Global Applications of the Vetiver System
Paul Truong, Director for Asia and the Pacific, The Vetiver Network International
History of Vetiver Use in the Philippines
Mary Noah Manarang, President, VGFT Farm
Open Forum
12.00 - 13.00 Lunch
13.00 - 13.30 Plenary 3: The Application of Vetiver in Real Estate Development
13.30 - 14.30 Case Studies
Case Study 1: Treating Industrial Wastewater Through Vetiver
Case Study 2: Integrated Applications of Vetiver – Gabions and Coco Nets
Open Forum

14.30 - 15.00 Afternoon Coffee/Tea
15.00 - 17.00 Workshops
Workshop 1: Slope Stabilization
Mary Noah Manarang, President, VGFT Farm
Workshop 2: Prevention & Treatment of Contaminated Wastewater
Paul Truong, Direct or for Asia and the Pacific, The Vetiver Netw ork International

March 6, Thursday
08.30 - 08.45 Summary of Day 1
08.45 - 10.00 Case Studies
Case Study 3: Stabilizing Geo-Hazard Areas
Case Study 4: Implementation of Vetiver Use in Public Infrastructure
Case Study 5: The Application of Vetiver in Philex Mining Operations
Open Forum
10.00 -10.30 Morning Coffee/Tea
10.30 -12.30 Workshops
Workshop 3: Reclamation of Mine Tailings
Paul Truong, Direct or for Asia and the Pacific, The Vetiver Netw ork Internat ional
Workshop 4: Propagation Methods of Vetiver
Mary Noah Manarang, President, VGFT Farm
12.30 - 13.30 Lunch
13.30 - 15.30 Workshops
Workshop 5: Soil Improvement, Wetland and Marginal Land Restoration, Crop and Pest Control
Dick Grimshaw, OBE, Founder, The Vetiver Netw ork International
Workshop 6: Agricultural Use, Nitrogen Fixing and Integrated Pest Management
Features of Vetiver
15.30 - 16.00 Afternoon Coffee/Tea
16.00 - 16.30 Plenary 4: Socio-Economic Impact of Vetiver
16.30 - 17.00 Summary of Day 2
Closing Ceremonies

March 07, Friday
08.00 – 17.00 Technical Tour to Anvaya Cove Beach and Nature Club, M orong, Bataan

CALL FOR CASE PRESENTATIONS

Abstract Submission Deadline: January 15, 2014
Notification of Acceptance
Manuscript requirements below:
Abstract Submission Guidelines
• All abstracts must be submitted no later

Registration Fees

Cut-off Date Early Bird: Until Dec 31, 2013
Late Registration: Jan. 1 – Feb. 28, 2014
On-Site: Mar. 1 – 5, 2014
Conference: PhP 5,000. PhP 5,500 PhP6,000
Technical Tour: PhP 1,000 PhP 1,500 PhP 2,000

Delegate's Registration Fee covers admission to all Plenary and Case Study sessions indicated in the Programme, Workshop sessions of choice, all meals indicated in the Programme, and a conference bag. The Technical Tour Fee covers for roundtrip transportation in an air-conditioned motor coach, site visit, lunch.

Registration Payment
Payments can be made through any of the following options:

Bank Deposit
Account name: VGFT Farm – Philvetcon
Account no.: Savings Account 10150-0003173
Bank: Union Bank of the Philippines
Bank address: Unit A2 Cluster El Dorado, California Garden Square,
Libertad Street, Highway Hills, Mandaluyong City, Philippines
Swift code : UBPHPHMM Libertad-Mandaluyong Branch
Note: Please send a scanned copy of the deposit slip thru e-mail at meet_inc98@yahoo.com or through fax 926.0224, together with the filled up Registration Form.

Check Payment Please make check payable to:
VGFT Farm – Philvetc on and send to the Conference Secretariat.

Paypal
Account name: philvetcon@gmail.com

Cancellation and Refund Policy
No refund will be given to any cancellation of registration. However, substitution of registered participant will be allowed.

Conference Meals
Delegates with special dietary requirements are requested to indicate this in the Registration Form.

Conference Hotel
All technical sessions stated in the programme will be held at the Intercontinental Manila, a business hotel that is centrally located in Makati City, the country's premier financial and commercial district. It is 8 kilometers from the Ninoy Aquino International Airport.
Intercontinental Manila is extending a preferential accommodation rate to all delegates and guests of the 1st Philippine Conference on Vetiver until December 31, 2013. Reservations made after this date will be subject to room availability. All reservations must be guaranteed by credit card. All hotel charges will be settled directly with the hotel upon check-out.
Room category: Deluxe
Room Rate (Single/Twin): PhP7,000.00 nett per roomnight
Nett rates are inclusive of daily buffet breakfast at the hotel's coffee shop, government taxes and service charge.

Ideas from <vetiver-system@googlegroups.com>

Vetiver Network Newsletter

I suspect that most vetiver users have never looked at the 20 newsletters that we published (snail mail) back in the 1990s. I have made it much easier to do this as I have included a table of contents alongside the link for each newsletter. There is some interesting information, particularly on early research in India and other countries. There are some nice graphs etc. and the data is on the whole reliable. If you have the time, take a look at: <http://www.vetiver.org/g/archives_newsletters.htm>.

I have at the same time cleaned up the **website archives.** The starting point for the archives is at: http://www.vetiver.org/g/archives.htm. Archival titles are sorted first by country and then by alphabetical order. The majority of the broken links have been repaired. I will try and keep them better up to date in the future. Enjoy!

Richard Grimshaw, TVNI Founder and Director

How Does Vetiver Survive Water Logging?

I am often asked how vetiver can survive water logging. This unique plant has special cells in its leaves and roots that allow it to adapt to water-logged conditions. In effect it is able to move oxygen from its leaves to its roots and does not suffer from hypoxia (oxygen starvation). Some excellent research by P. Khnema and S.Thammathaworn of Thailand explains the process and shows in detail the cells that are able to achieve this. They produced a nice PowerPoint with many of the details. There is a fascinating discussion starting on page 12. They conclude:

".. Large lysigenous intercellular spaces were found in mature leaves, but very small sizes in developing leaves, which suggested relative gas circulation in roots and encouraged deeply root penetration. Consistently, we found that aerenchyma at root cortex and air cavity at pith were strong evidences of aeration system from leaves to roots. To avoid hypoxia/anoxia, large lysigenous intercellular spaces at laminas were a character of aquatic plants or long term flooding-tolerant plants by transporting O_2 from leaves to roots. Moreover, we guessed atmospheric O_2 could pass into vetiver via a pith cavity at culms according to the theories named, "Humidity-induced convection" and "Venturi-induced convection". These two scientists received the coveted "King of Thailand Award" for this work. They deserve it. Vetiver is truly a remakable grass. (see: Leaf Anatomy of Vetiver Grass Supporting the Potentially C Sequestration (2011)

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